

From scientific articles by our faculty to in-depth interviews with experts, to the latest developments in the international world of IR, and so much more! We hope you enjoy reading your copy of Congress News at the 32nd CIRSE Annual Meeting in the wonderful city of Copenhagen.

CIRSE 2017 – Copenhagen
Saturday, September 16, 2017

CIRSE 2017

IMPACT THE FUTURE OF IR

Don't miss today's Opening Ceremony, which will combine three artistic performances with a presentation from Prof. Sadek Beloucif on the importance of the doctor-patient relationship and continued education for effective clinical management. Find out more over the page...

See you in Auditorium 1 at 14:30!



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Dear colleagues,

It was almost ten years ago that we set foot in Copenhagen for a CIRSE Annual Meeting, which welcomed around 4,800 attendees. Since then, not only our congress attendance has grown; when we look back over this decade, we see a strong evolution of interventional radiology, both in size and reputation. Thanks to advances in technology and techniques, game-changing interventional radiology research in fields such as neurology and oncology has meant that a number of minimally invasive therapies have become a mainstay in medical guidelines and interventional radiologists have positioned themselves as key members of multidisciplinary teams. On this note, there have been exciting developments in the field of patient management whereby interventional radiologists truly assume responsibility for the patient they are treating. In 2017, we are happy to say that our annual congress reflects the bright future of this medical discipline, with a plethora of sessions to suit all experience levels.

We continuously endeavour to offer delegates a full and wide-ranging educational programme. As endovascular therapies are such a major focus of the congress, the programme will again consist of three distinct categories: arterial, venous and aortic interventions; the latter covered in the Interdisciplinary Endovascular Aortic Symposium (IDEAS), a parallel multidisciplinary programme which will run from Sunday to Tuesday for the third year and will include the IDEAS Training Village, introduced last year, for practical hands-on learning in cooperation with our industry partners. Alongside sessions on embolotherapy, stroke treatment, interventional oncology and non-vascular

interventions, there will also be a big focus on clinical practice this year, with ample attention given to anaesthesia, sedation and analgesia, and patient management, which will be the theme of the not-to-be-missed Opening Ceremony today. On Tuesday, there will be the "CIRSE Meets..." Session with the European Wound Management Association, which will cover the essentials of wound care, focusing on ulcers. We are once again running the Student Programme for medical students from all over Europe and have expanded sessions for the younger generation of IRs through our European Trainee Forum, which aims to provide a network for trainees and newly qualified IRs in Europe.

A New Level of Learning

Last year, new session formats including Expert Round Tables (ERT) and Expert Case Discussions (ECD) made their debut, which we hope will again boost audience participation. The Super Tuesday session, which was also introduced last year, will put important scientific papers and trial results in the spotlight. Likewise, the News on Stage sessions will showcase new study results, techniques and hot topics in IR by researchers during the early afternoons in the exhibition area to give delegates the opportunity to engage in lively discussion in an informal atmosphere.

Building upon the collaborative learning environment, which takes note of current and future trends in the subspecialty, we are proud to announce the first Women in IR Session, which aims to understand why there is a lack of female doctors entering interventional radiology and identify clear solutions on how this gap can be overcome. As noted earlier,

the importance of clinical knowledge and entrepreneurial thinking for the future of interventional radiology is increasingly being recognised. In order to account for this, a new workshop, Successful Strategies in IR, will provide practical insights and solutions from a variety of clinical examples. As learning about the latest medical devices and equipment is an integral part of the congress experience, CIRSE 2017 has come up with a new training format called Hands-on Device Trainings (HDT). This new format replaces the Hands-on Workshops and will be more device-orientated, with clearer learning objectives and guidelines. All Hands-on Device Trainings are linked to a theoretical workshop within the programme.

Are You Ready (for the new radiation safety directive)?

Since the creation of our Radiation Protection Subcommittee and the Radiation Protection Pavilion (RPP) at CIRSE, it has been one of CIRSE's key initiatives to provide advice and education on radiation protection for those working in the medical field and their patients. With new radiation protection legislation on the way, it will become indispensable to stay ahead of the game, which is why this topic will be a core theme of CIRSE 2017, featuring the Radiation Protection Pavilion and a Hot Topic Symposium on radiation risks and prevention for both patients and physicians.

We hope you enjoy your time in Copenhagen and look forward to seeing you around!

A CIRSE Opening and Awards Ceremony Like Never Before

Don't miss it!
Today at
14:30 in
Auditorium 1

The Opening and Awards Ceremony really is a key moment of the Annual Meeting: the official kick-off, a celebration of our members' achievements and a chance to enjoy some artistic entertainment. For the latter, we've seen water glass harmonies, Scottish folk dancing, an Italian orchestra and Greek Olympic Games drummers, among many fantastic performances over the years.

Following an introduction by our President Elias Broutzos, Local Host Representative Poul Erik Andersen and Scientific Programme Committee Chairperson Christoph Binkert, our invited speaker Prof. Sadek Beloucif will cover the topic du jour: patient management, with a fascinating presentation entitled "Cure – Care – Coordination: Towards a New Medical Paradigm for Patients?" alongside interpretive

dance pieces exploring these three concepts in medicine.

Sadek Beloucif is Head of Anaesthesiology at Avicenne Hospital and Professor at the Sorbonne Paris-Cités University in Paris, France. He is currently President of the Ethics Subcommittee for the European Society of Anaesthesiology and was President of the

French Biomedicine Agency from 2008-11. In 2016, he was appointed President of the Committee of the Foundation for Islam in France. We are honoured to have such a revered and accomplished figure for this very special Opening and Awards Ceremony.

See you in Auditorium 1 at 14:30!



CIRSE 2014, Glasgow/UK



CIRSE 2007, Athens/GR



CIRSE 2010, Valencia/ES

The Award of Excellence and Innovation in IR



Since its establishment in 2012, the Award of Excellence and Innovation in IR has been given to some of the most innovative physicians in the field. Sponsored by the Rolf W. Günther Foundation for Radiological Sciences, the award comes with a €5,000 cash prize and is presented to the winner during the Opening and Awards Ceremony of the CIRSE Congress. Every year, applicants from around the world who have published original research in a peer-reviewed scientific journal, invented a registered patent or published data on an innovative device or equipment are evaluated by a review board, with the prize going to the most relevant contribution to the advancement of IR.

This year, two great innovators have been chosen who have paved the way for a completely new strategy in acute ischaemic stroke management with a ground-breaking invention and a high-class clinical trial. Hans Henkes will receive the award for the invention of the Solitaire Stent and Wim H. van Zwaam will be the representative accepting the award for the MR CLEAN trial.

Hans Henkes, for the invention of the Solitaire™ revascularisation device



In 2004, Prof. Henkes invented the Solitaire™ revascularisation device, which was initially designed for the treatment of cerebral aneurysms. Incidentally, he found out that it could also be applied for the removal

of intracranial thrombi and performed the first successful intracranial stent thrombectomy in Europe in 2008. This stent retriever represented a considerable improvement in acute ischaemic stroke management compared to other thrombectomy devices available at the time. The Solitaire™ stent became an international patent in 2004, followed by the US patent in 2014. It has since saved thousands of lives and prevented countless cases of stroke-related handicap.

About the invention

The Solitaire™ device is comprised of a nitinol scaffolding design attached to a guidewire. After being delivered through a microcatheter, it is deployed across a clot and removed along with the clot to enable revascularisation of the occluded intracranial vessel. If applied within 8 hours of symptom onset, the Solitaire™ can remove the thrombus from a large intracranial occlusion and restore blood flow to a degree that will allow nearly 70% relative improvement in functional outcomes at 90 days.

About the inventor

Prof. Hans Henkes has held numerous clinical positions throughout Germany, and, since 2007, has been the Medical Director of the Neuroradiological Clinic at Stuttgart's Katharinenhospital. He has published more than 240 articles, mostly focusing on neuroradiology, neurological diseases, neurodegeneration and intracranial aneurysms. His papers have been cited over 4,000 times.

The MR CLEAN trialists, represented by Wim H. van Zwam

About the trial

The Multicenter Randomized Clinical Trial of Endovascular Treatment for Acute Ischemic Stroke in the Netherlands (MR CLEAN), published to great acclaim in the *New England Journal of Medicine* in 2015, was the first randomised controlled trial (RCT) showing a clear benefit of endovascular treatment in acute ischaemic stroke. The two-year outcome published in April 2017 confirmed the benefit of endovascular treatment. Designed as an RCT of intra-arterial treatment versus no intra-arterial treatment in patients with a proximal intracranial arterial

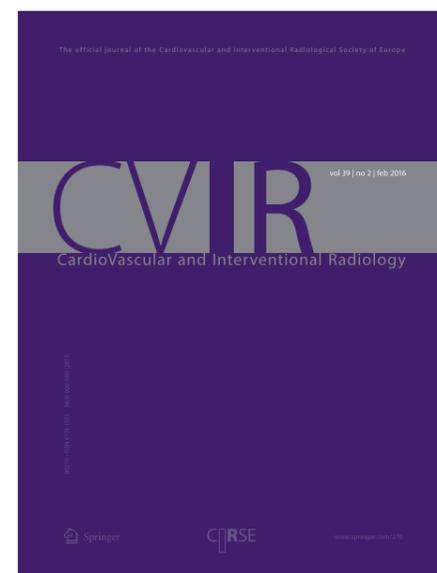
occlusion, 500 patients were randomised between December 2010 and April 2014 in 16 centres in the Netherlands. Functional outcome at 90 days as well as secondary clinical outcomes showed a clear benefit for the intervention group. Contrary to previous studies which could not demonstrate preferability of endovascular intervention over standard treatment, during the MR CLEAN trial the latest generation of thrombectomy devices (stent retrievers, including the Solitaire Stent) were used, significantly changing the outcome in favour of endovascular treatment. In less than one year, this has resulted in the worldwide adaptation of guidelines incorporating endovascular treatment as standard treatment.

About the MR CLEAN trialists

The MR CLEAN trial is a joint interdisciplinary study comprising neurology, neuroradiology, radiology and interventional/neurointerventional radiology with six principal investigators together with the three (shared) first authors from the Universities of Rotterdam, Amsterdam and Maastricht. They will be represented by Dr. Wim van Zwam, interventional radiologist and head of neurointerventional radiology at Maastricht University Medical Center.



CVIR Editor's Medal



This year's Editor's Medal will be presented to a Brazilian research group for their investigation on methods for benign prostatic hyperplasia:

Transurethral Resection of the Prostate (TURP) Versus Original and PERfectED Prostate Artery Embolization (PAE) Due to Benign Prostatic Hyperplasia (BPH): Preliminary Results of a Single Center, Prospective, Urodynamic-Controlled Analysis

F. C. Carnevale, A. Iscaife, E. M. Yoshinaga, A. M. Moreira, A. A. Antunes, M. Srougi. CVIR 2016 (Jan) Vol 39: 44-52

More Winners at CIRSE 2017...

Gold Medallist

Dierk Vorwerk

Laudation: Johannes Lammer



Dierk Vorwerk was born in 1958 in Düren, Germany, and raised in Turkey and Germany. He attended medical school in Mainz and Cape Town, South Africa. After graduating in 1983 and completing his military service, Dr. Vorwerk joined the Department of Radiology at the University of Technology in Aachen, headed by Prof. Rolf Günther. He completed his radiology training in 1990 and served as a consultant in the same department. After being its deputy chairman from 1996 to 1998, he was appointed Chairman of the Department of Diagnostic and Interventional Radiology at the Klinikum Ingolstadt, an 1,100-bed teaching hospital in the south of Germany, where he continues to work to the present day.

Prof. Vorwerk was appointed as an Associate Professor in 1992 and Professor in 1996. He has published more than 200 papers and book chapters and more than 250 abstracts in the field of radiology with a special focus on ultrasound, interventional radiology and computerised tomography. His main fields of interest are vascular interventions, stroke therapy and embolisation techniques.

Prof. Vorwerk was awarded the Wilhelm Conrad Röntgen Award in 1993 and the

Hermann Holthusen Award in 1996 by the German Röntgen Society and also received the Mackenzie Davidson Memorial Lecture from the British Institute of Radiology in 1999. He is an Honorary Member of the Turkish Society of Interventional Radiology, Romanian Society of Radiology, Austrian Society of Radiology and the South African Vascular Society (VASSA). Prof. Vorwerk was also the Chairman of the 2008 German Radiology Congress and was later made Chairman of the German Society of Interventional Radiology (DeGIR) from 2012 to 2014. He served as President of the German Röntgen Society (DRG) from 2015 to 2017. Prof. Vorwerk has served as reviewer, consultant and editorial board member of many radiological and medical journals, including *JVIR*, *JEVT*, *CVIR*, *NDT*, *RöFo*, *Circulation*, *Clinical Nephrology*, *Kidney International* and *European Radiology*.

He was appointed as Editor-in-Chief of *CVIR* in 2003, a position he held until this year. Within CIRSE he has served in various Executive Committee positions, heading the society as President from 2000 to 2001.

Distinguished Fellow

Yasuaki Arai

Laudation: Thierry de Baère



Dr. Yasuaki Arai received his medical degree at Jikei University School of Medicine and his PhD in medical science at Nagoya City University Graduate School of Medicine. He completed his internal medicine training at Tokyo Medical Center and then started his career in interventional radiology at the Department of Diagnostic and Interventional Radiology at the Aichi Cancer Center. After seven years as the Department Chief, he moved to the National Cancer Center and became Chief of the Department of Diagnostic Radiology. Between July 2012 and March 2016, he also devoted himself to the service as the Director of the hospital with the aims of pursuing better management with open dialogue, improving medical safety and governance and activating research and treatment, including palliative care. The hospital established the Interventional Radiology Center to accept more patients. He also supports the President of the National Cancer Center as an Executive Advisor.

Engaging in interventional radiology, Dr. Arai has introduced a number of new devices and techniques for better treatment, such as an implantable catheter and port system for hepatic arterial infusion chemotherapy, as well as the interventional CT system (Angio-CT).

The latest device he invented was a tip-deflecting microcatheter for easier manipulation.

In 2002, he established the Japan Interventional Radiology in Oncology Study Group (JIVROSG) to build a framework for conducting clinical trials. JIVROSG has conducted clinical trials in the field of interventional oncology, including palliative care. This has already led to substantial changes with the result of the clinical trial with Korean physicians focusing on transarterial chemoembolisation for hepatocellular carcinoma leading to Lipiodol authorisation in Japan and its indication outside of Japan.

As for educational activities, Dr. Arai has given lectures related to interventional radiology and clinical trials worldwide – building bridges at home and overseas. There are many international visitors who observe cases at the National Cancer Center Hospital; some of them spend several months to a year with his interventional radiology team. Dr. Arai is the Associate Editor of several leading journals, including the *Journal of Vascular & Interventional Radiology*. He serves as a consultant for Japanese government agencies and is the past President of the Japanese Society of Interventional Radiology (JSIR). During his term he sought to spread interventional radiology as a treatment option to the public and health administration of Japan.

Distinguished Fellow

Mario Bezzi

Laudation: Fabrizio Fanelli



A native of Rome, Italy, Mario Bezzi attended the Sapienza University of Rome, where he graduated with a medical degree in 1982. He then entered Sapienza's Department of Surgery and practiced there for one year. This postgraduate training was instrumental in improving his clinical background and skills in surgical procedures. At that time, however, he was involved in the first clinical applications of intraoperative ultrasound and became drawn to diagnostic imaging.

In 1986, he completed his residency in Diagnostic Radiology at the Sapienza University of Rome, followed by a two-year fellowship in CT-US-MRI at the Thomas Jefferson University and the University of Pennsylvania. In 1988, he started his interventional career in the Division of Vascular and Interventional Radiology at the University of Rome Hospital under the guidance of Prof. Plinio Rossi. Many of the procedures in non-vascular radiology which are now considered routine, were either introduced in Italy or further developed by the team of interventional radiologists working in this division.

Currently, Mario Bezzi is Associate Professor of Radiology at the Sapienza University of Rome and Chief of the Division of Interventional Radiology. His clinical practice consists mainly

of image-guided therapy in oncology, and his research interests focus primarily on liver tumours. He has been involved in a number of grant-funded studies, where he has often served as principal investigator. Nowadays, his interest is also centred on MR-guided focused ultrasound, and he is involved in a European project which focuses on the application of MRgFUS in moving organs. He has also widely contributed to research in interventional radiology, having written 15 book chapters, edited a book on biliary tract radiology and presented more than 430 papers at various global conferences. Furthermore, he has published 150 articles in both Italian and international peer-reviewed journals, and his works have received approximately 2,600 citations with an H-index of 30. Professor Bezzi is also a reviewer for international journals, including *CVIR*, *JVIR* and *European Radiology*.

He became involved in the activities of CIRSE early in his career when he was nominated as Chairman of the Scientific Programme Committee in 1996 for the CIRSE Meeting in Madeira. He assisted in the organisation of the 2006 CIRSE Meeting in Rome and, for four years, was Editor-in-Chief of ESIRonline, the online platform that houses all the presentations and webcasts of CIRSE events.

Distinguished Fellow

Ernst-Peter K. Strecker

Laudation: Peter Reimer



Born and raised in Berlin, Germany, Ernst-Peter Strecker began his medical career with studies in Berlin, Vienna and Heidelberg, and received his medical degree from the University of Heidelberg in 1968. After that, he went on to train in radiology for six years, starting at Rhode Island Hospital in the U.S. While there, he accepted a position as a Research Fellow for Johns Hopkins Hospital in Baltimore where he trained under EA James and Robert White. His training in radiology was completed under Prof. Werner Wenz at the University of Freiburg, Germany, where he was introduced to the art of catheter angiography and image-guided interventions by participating in the development of vascular interventional radiology with balloon percutaneous transluminal angioplasty and tumour embolisation.

In 1978, Dr. Strecker was offered the position as the Chief Physician of the Department for Medical Imaging, Interventional Radiology and Nuclear Medicine at the Diakonissen Krankenhaus in Karlsruhe, Germany, where he stayed for 29 years. In 1982, he also became a Professor of Radiology at the University of Freiburg.

After retiring from official functions in January 2008, Prof. Strecker has continued to work on

new methods for interventional radiology and technical developments, and has remained an active reviewer for several IR journals. He was also a visiting Professor at the Asan Medical Centre's Department of Interventional Radiology in Seoul, South Korea, during 2008, and was a Consultant Radiologist at Siloah Hospital in Pforzheim, Germany, until recently.

Ernst-Peter Strecker is an accredited author in over 150 publications, 90 peer-reviewed original scientific articles and 9 chapters for books. He holds 25 patents for instruments and devices in interventional radiology, including the knitted Strecker Stent, which was the first certified stent for clinical applications to treat disease of the arterial, venous, intestinal and respiratory systems and which has now been implanted in thousands of patients. Prof. Strecker has received several honourable awards, including the Boris Rajewski Medal from the European Association of Radiology which he received in 1980 for his mathematical model of mesenteric perfusion (mesentericography). He has also been awarded the Andreas Gruentzig Lecturer's honour by CIRSE in 2004, and received the CVIR Editors' Medal in 2005.

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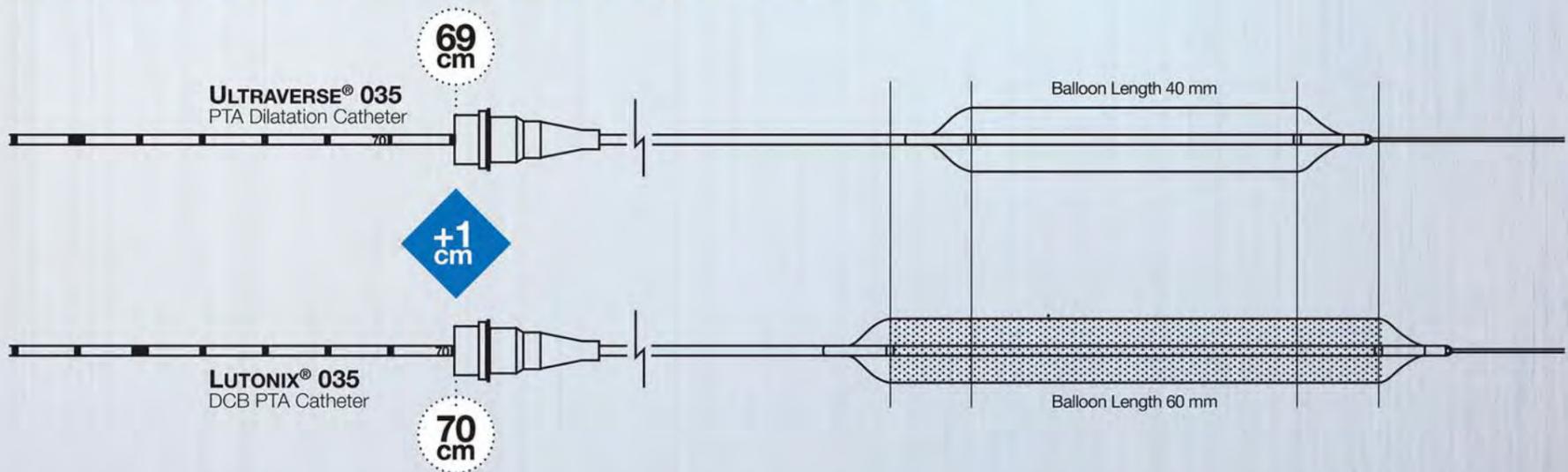
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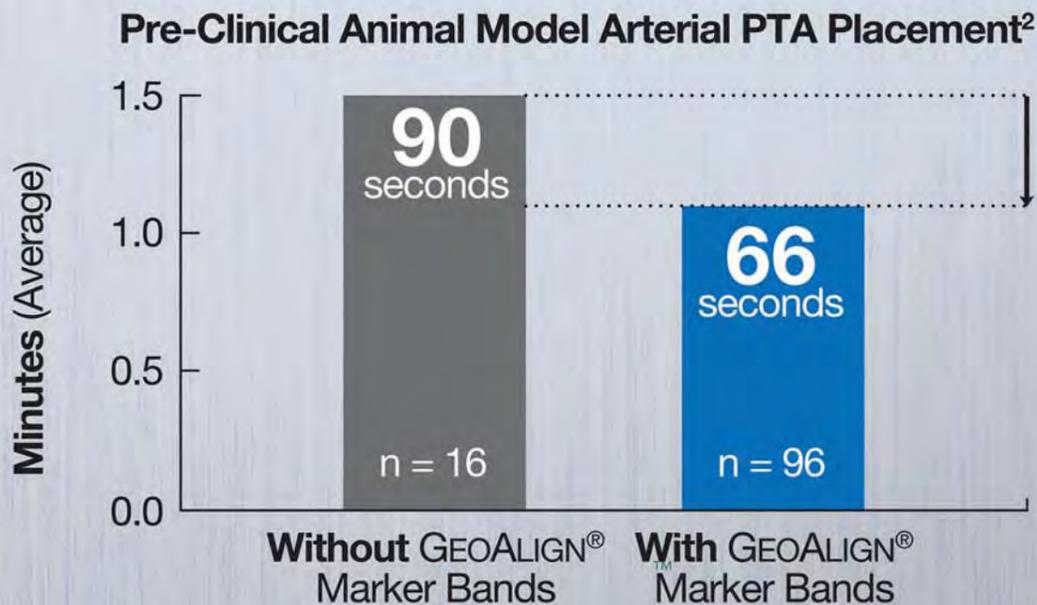


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3D Navigation: do we need it?

Reto Bale

Thermal ablation is a minimally invasive method for local tumour treatment and is considered the first choice for treatment of unresectable liver malignancies. Long-term outcomes depend on the rate of complete ablation of the entire tumour [1-4]. Due to excellent short- and long-term results, thermal ablation is accepted as an alternative to surgical resection in very early HCC (single HCC <2 cm) [5]. However, in tumours >2 cm, surgical resection is still considered the method of choice. This is due to unacceptably high local recurrence rates after thermal ablation of larger lesions. For instance, in CRLM >3 cm local recurrence rates ranging from 45% to 70% have been reported. By contrast, the local R1/2 rates after resection of primary and secondary liver tumours are in the range of 8-24% [6,7]. If similar rates can be achieved by minimally invasive thermal ablation, it will challenge resection as the first-line therapy.

Rationale for the application of 3D navigation systems in thermal ablation

Tumour size is the most important prognostic parameter for local control after thermal ablation. The unacceptable results after ablation of large lesions are related to insufficient coverage of the tumour by the ablation zone. If the volume of the ablation zone at one electrode/antenna position does not cover the tumour including a safety margin, multiple overlapping ablation zones must be acquired. This is barely achievable by conventional freehand US, CT, or MRI guidance, and requires a major change in tumour ablation strategies. This challenging task is the transfer of a virtual three-dimensional ablation plan (with multiple probe/antenna placements) into the real patient [8].

3D navigation systems

3D navigation systems enable real-time tracking of different surgical instruments with respect to patient-specific imaging data (CT, MRI, PET, SPECT and real-time ultrasound) by using mechanical, optical or electromagnetic 3-D coordinate measuring systems [9]. Aiming devices allow for precise percutaneous targeting of any anatomical structure in the patient. The world's first (non-commercial) aiming device for frameless stereotactic punctures was developed in Innsbruck in 1995 and it was first applied for radiofrequency ablation of the Gasserian ganglion in a patient with trigeminal neuralgia in the following year [10]. Later, the same guidance technique was used for fractionated frameless stereotactic interstitial brachytherapy in patients with head and neck cancer [11], percutaneous pelvic fracture fixation [12], retrograde drilling of osteochondral lesions [13] and thermal ablation of tumours in different organs [12-15]. The first multi-probe stereotactic RFA of a large liver tumour was performed in Innsbruck in 2001 [15].

Workflow of stereotactic thermal ablation

The technique of stereotactic radiofrequency ablation using multiple RFA probes has been described previously [16,17]. In brief, the anaesthetised patient is immobilised on the CT table. Fiducials are attached to the skin of the patient. During temporary disconnection of the tracheal tube (TT), a contrast-enhanced CT is acquired. On the frameless stereotactic (neuro)navigation system (Medtronic Inc.), multiple trajectories are planned using the 3D CT dataset. A dynamic reference frame is attached to the patient immobilisation system. After unsterile patient registration using the skin fiducials and checking the registration

accuracy, sterile draping of the patient is performed. An aiming device (Atlas) is adjusted using special guidance software. Coaxial needles are advanced along the trajectory to the pre-planned target during temporary disconnection of the TT. The coaxial needles serve as guides for the RFA electrodes. To check the needle positions, a native control CT is superimposed to the planning CT. After biopsy, RFA electrodes are introduced via the coaxial needles for serial tumour ablation. After ablation, a contrast-enhanced CT is obtained and superimposed to the planning CT by means of image-fusion software, thereby verifying the ablation zone covering the tumour including a safety margin.

Alternatively, the CAScination navigation system may be used [18]. It was originally developed for intraoperative navigation for liver surgery and, in cooperation with our group, adapted to the requirements of SRFA. It is also based on optical tracking technology. In contrast to the (neuro)navigation system, sterile reflective skin markers act as a dynamic reference frame. This requires a slightly different workflow. In contrast to the standard approach described above, the patient is sterilely draped and the sterile markers are attached to the skin prior to the planning CT. The markers are automatically detected on the image data set as well as on the real patient, allowing for fast automatic registration. The fiducials have to be placed in a way that they do not interfere with the needles. Registration continuously changes during the respiratory cycle, requiring adjustment of the aiming device during breath-hold.

Accuracy of stereotactic targeting

Using the Medtronic and the CAScination navigation system in combination with the Atlas aiming device, the reported accuracies in phantom studies were $1.64 \pm 0.919 - 1.84 \pm 1.189$ [19] and $2.3 \pm 1.3 - 2.8 \pm 1.6$ mm [18]. In the patient, the median lateral error at the needle tip was 3.2 mm (range: 0.01-9.4 mm) [20]. Beyer et al. compared stereotactic IRE (SIRE) needle placement with non-navigated conventional IRE (CIRE) for percutaneous ablation of liver malignancies in a total of 20 patients [21]. Accuracy of needle placement for SIRE was higher than that for CIRE (2.2 mm vs. 3.3 mm mean deviation, $P < 0.001$). SIRE demonstrated a significantly higher accuracy compared with CIRE.

Clinical mid- and long-term results after stereotactic thermal ablation

Colorectal liver metastases

Our group reported 98 SRFA treatment sessions of 189 CRLMs in 63 consecutive patients [17]. LR was identified in 16% of the tumours (31/189), with no significant differences ($P = 0.635$) when comparing the tumour sizes <3 cm (17.7%), 3-5 cm (11.1%) and >5 cm (17.4%). Using SRFA, the overall survival (OS) is not affected by tumour size. The median OS was significantly different when comparing unresectable and resectable patients (27 vs. 58 months, $P = 0.002$) with OS rates of 92%, 66% and 48% at 1, 3 and 5 years, respectively, in resectable patients. Tumour size did not affect OS and DFS. SRFA challenges resection as the first-line local treatment of patients with CRLM.

Intrahepatic cholangiocellular carcinomas

Seventeen inoperable consecutive patients with 52 ICCs were treated with SRFA [22]. A median OS of 60 months was achieved. The two largest tumours with diameters

>10 cm were completely ablated. These SRFA data of unresectable ICCs are superior to the published data on resection. SRFA is a minimally invasive alternative to resection.

Metastatic melanoma to the liver

In a recent paper, the results after SRFA of 75 melanoma liver metastases in 20 patients was presented [23]. The primary and secondary success rates were 89.3% and 93.3%, respectively, with an overall local recurrence rate of 13.3%. Four of ten local recurrences were re-treated successfully by SRFA.

During follow-up, 9/20 patients developed extrahepatic metastatic disease and 10/20 had liver recurrence at any location. The median OS from the date of SRFA was 19.3 months, with an OS of 64%, 41% and 17% at 1, 3 and 5 years, respectively, with no significant difference between patients with cutaneous and ocular melanoma. RFA is an attractive alternative to resection in patients with melanoma liver metastases.

Focal liver lesions in paediatric patients

SRFA may even be an alternative to surgical resection of focal liver lesions in patients with inherited metabolic disorders [24]. SRFA was successfully applied for the removal of single large liver adenoma in a 22-year-old woman and a 20-year-old man with glycogen storage disease type Ia and of a suspicious lesion in a 16-year-old girl with tyrosinemia type I and α -fetoprotein elevation.

Conclusion

For thermal ablation, the lesion including a safety margin has to be covered by the ablation zone in order to achieve complete necrosis. In lesions >2-3 cm, multiple overlapping ablation zones are required. This is barely achievable by conventional US- and CT-guidance. The

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Don't miss it!

New tools for guiding and monitoring liver ablation
Special Session
Saturday, September 16, 08:30-09:30
Auditorium 10



Reto Bale
Medical University Innsbruck
Innsbruck, Austria

Prof. Reto Bale is one of Europe's leading experts on stereotactic guidance. His technical expertise in a wide range of imaging modalities has formed the cornerstone of his pioneering work in real-time tracking and automation. This has been successfully applied within his department (the Department of Microinvasive Therapy at Innsbruck's University Clinic for Radiodiagnostics) to treat not only an impressive number of patients, but also a wide range of conditions. While liver tumours (both primary and secondary) form the bulk of their work, Prof. Bale's team also applied their unique skills in the treatment of pelvic fractures and other bone issues. Prof. Bale's work has been cited almost 4,000 times.

superior short- and long-term results after SRFA as compared to the standard approach definitely justify the additional costs and efforts that are associated with this technique. Stereotactic thermal ablation procedures (SRFA, SMWA, SIRE) are reliable and reproducible and challenge surgical resection as the first-line treatment in primary and secondary liver tumours. In addition, it may also be applied in other organs, such as bone, lung, kidney, soft tissue and lymph nodes.

Multi-probe SRFA of liver tumours has become the main indication for 3D-navigated interventions at our centre, with increasing numbers over the past sixteen years. In the first 6 months of this year, 130 liver SRFAs have already been performed by our group.

ESIRonline: The World of IR at Your Fingertips

Petra Mann, CIRSE Office

ESIRonline is our online educational platform, featuring over 9,000 recorded presentations from all of our recent congresses! Visit www.esir.org to find out more.



Topic Packages

Since its introduction in 2008, ESIRonline has continuously improved its search mechanisms. Topic packages, a feature added in 2013, have become particularly popular with ESIRonline users, as they provide easy access to the most relevant presentations and documents on specific IR topics. So far, 36 packages have been compiled, ranging from stent grafting to oncologic procedures all the way to the provision of IR services. In the past two years, the following topic packages have been added:

INTERVENTIONAL ONCOLOGY

Early-stage HCC
Intermediate-stage HCC
Oncologic management of metastatic disease
Oncologic interventions: bone
Oncologic interventions: lung
SIRT for HCC and liver metastases: an update
Colorectal liver metastases
Renal tumour ablation: an update
Spinal interventions and bone tumour ablation

VASCULAR

TEVAR
EVAR
Aortic stent grafting: an update
Critical limb ischaemia
Venous interventions and IVC filters
Venous stenting
Carotid and supra-aortic interventions
TIPS and portal vein interventions

NON-VASCULAR

Gastrointestinal Interventions

IR-MANAGEMENT

Provision of IR Services

EMBOLISATION

Prostate embolisation
Embolisation of peripheral and pulmonary AVMs: an update
Women's health

NEUROINTERVENTIONS

Acute stroke interventions



Live Streaming and On Demand

At CIRSE 2017, all sessions will once again be live-streamed for those interested who did not have the chance to travel to Copenhagen. First introduced at CIRSE 2012 and recently extended to ECIO, live-streaming of the CIRSE conferences has been met with great interest by many members.

In addition to live streaming, the recorded lectures are available for viewing almost immediately after they have ended, allowing users to access the more than 180 sessions from each congress 24 hours a day.

live.cirse.org

What does the future hold for ESIRonline?

In its pursuit to continue being the most comprehensive and user-friendly learning platform for interventional radiology, ESIRonline is planning to include several new features.

We chatted to Programme Director Prof. Stefan Müller-Hülsbeck about the upcoming changes.

CIRSE: ESIRonline has come a long way since its establishment in 2008. In your opinion, what have been the most important steps in its development?

Müller-Hülsbeck: Since its beginnings, ESIRonline has been well received by IRs from around the globe. There was simply a need for a tool which would allow physicians to have online access to CIRSE conference lectures, scientific presentations and posters. For the first time, physicians who had not been able to attend the conferences could view content online and those who had attended could watch missed sessions. In 2013, ESIRonline was complemented by a monthly topic package. Many of the new packages also include expert videos related to the topic.

Throughout the years, the website's visual appearance has also been optimised. We have, for example, included colour-coding for the various fields of IR that match those of the annual congress. Another massive step in the website's development was the introduction of live streaming and being able to view sessions online very shortly after they have taken place. Last but not least, the website's search tool was modified and improved.

CIRSE: You are currently planning to include an e-learning project enabling the acquisition of CME points. Can you tell us a bit more about this?

Müller-Hülsbeck: The ESIRonline committee meets several times a year for brainstorming sessions on how to further improve the site. This think-tank identified some unmet needs in our services to attract younger IRs, such as offering additional information for basic and intermediate-level vascular, non-vascular and oncologic procedures, and customising it to those young physicians' needs. This information should cover both new aspects of daily IR practice and preparing for the EBIR exam in conjunction with the CIRSE syllabus. This will be called Basics in IR.

Basics in IR will kick off after CIRSE 2017 with topic modules covering 10 different IR topics. As these modules fulfil the criteria of UEMS-based CME accreditation, each physician who has completed a module will receive the corresponding credits.

CIRSE: What other innovations and additions to the page are you planning in the long run?

Müller-Hülsbeck: ESIRonline must continue being as dynamic as the field of IR. Our goal is to provide comprehensive information for all aspects and at all levels of the field. As mentioned before, a major step forward in our educational concept will be the establishment of Basics in IR. In the long run, we are hoping to build up a case library serving not only as a preparation tool for the EBIR exam, but also as a tool to find solutions for case management, so that CIRSE members can better prepare for the challenges of their daily practice.

Today's Featured Papers

will be presented in the Free Paper sessions, taking place from 16:15-17:15 and from 17:30-18:30

16:15-17:15

FP 606 Prostate intervention

Auditorium 11
Prostatic artery embolization versus transurethral resection of the prostate in the treatment of benign prostatic hyperplasia: 6-month results of a clinical trial
A. Sáez de Ocariz García, I. Insausti Gorbea, S. Solchaga Alvarez, R. Monreal Beortegui, P.J. Giral Villalta, S. Napal Lecumberri, F. Urtasun Grijalba; Pamplona/ES

FP 607 Imaging

Room 19
Comparison of imaging quality and adverse effects of hepatic arterial angiography: Iopamidol 250 versus Ioversol 320
M.J. Gu, Y.H. Kim; Taegu/KR

17:30-18:30

FP 706 Bone and spine intervention

Room 19
Prospective randomized trial comparing intradiscal ozone injection with surgery for the treatment of disc herniation
A.D. Kelekis¹, G. Bonaldi², A. Cianfoni³, J. Buric⁴, D. Hooper⁵; ¹Haidari/GR, ²Bergamo/IT, ³Lugano/CH, ⁴Bologna/IT, ⁵Austin, TX/US

FP 707 EVAR

Auditorium 3
Use of endoanchors in the treatment of intraoperative type IA endoleaks after EVAR with short necks: mid-term results
E. Beropoulis, K. Stavroulakis, G.F. Torsello, K.P. Donas, A. Stachmann, C. Herricks, G. Torsello, T. Bisdas; Münster/DE

FP 708 Vascular intervention: renal and visceral arteries

Room 20
Establishment and maintenance of hypertension intervened by RDN: an experiment on hypertensive canine
L. Ling; Nanjing/CN

FP 709 Biopsy

Room 18
Performance of a new blunt-tip coaxial needle for percutaneous biopsies or drainages of "hard-to-reach" targets
R.L. Cazzato, J. Garnon, J. Caudrelier, G. Tsoumakidou, G. Koch, A. Gangi; Strasbourg/FR

Perceptions and misconceptions of the IR gender gap

Tze Min Wah, EBIR

"Gender equality isn't a battle of sexes but a battle of equality, waged by women and men standing side by side."

Elizabeth Broderick, former Australian Sex Discrimination Commissioner

It is important for us all to understand that it is everyone's responsibility to address gender gaps in the workplace; this is neither feminist propaganda nor is it simply "political correctness". Indeed, there is a bigger picture and with this in mind, let us explore the evidence as to 'why' it is imperative that we (male and female) must come together to address this issue so as to allow the next generation of female leaders to take centre stage.

McKinsey & Company is a global consulting firm that was established in 1926 to try to address societal challenges. In 2007, McKinsey & Company published the first report on *Women Matter: gender diversity, a corporate performance driver* [1]. It is a comprehensive report, and chillingly illustrated that, across Europe, only 11% of women were represented in the membership of the listed companies (Fig. 1).

It also illustrated that, despite Europe having more female university graduates than male (55% vs. 45%, respectively), this did not translate into having more female employees in the workplace. Their employment rate is 21% less than their male counterparts and often with a 15% reduction in pay.

Almost a decade later, McKinsey & Company has recently reported that, despite making progress, we are still a long way away from achieving gender parity in the workplace [2].

Although there are now more female university graduates, this has not been translated into gender diversity in the workplace, suggesting that there is a leak in the pipeline ('leaky

pipeline phenomenon' [3]) during women's career progression in both private and public sectors, including healthcare [4]. The 'glass ceiling' [5] experienced by women in the workplace is often multifactorial.

The barriers are multitudinous. The working environments often are male-orientated with 'anytime, anywhere' performance and a 'linear' career progression trajectory which does not allow for career breaks or opting out along the career path easily. The need to master the male codes in order to climb the career ladder is often off-putting for women. In addition, there is a general lack of role models and mentoring schemes in place to help women to understand 'how to get there'. Women often have the double burden of responsibility that comes with being a mother, carer, etc. and this has further compounded their ability to stay on course during their career [1].

The Harvard Business Review [6] had reported a worrying trend of highly qualified women dropping out of their mainstream career. In a survey of three graduate classes from Harvard Business School, only 38% of female graduates have ended up in full-time jobs; a broad gauge of their MBA graduates had shown that a staggering 33% of white female graduates are in part-time careers in comparison to only 5% of their male counterparts. The authors had also summarised the findings of a private-sector task force, "The Hidden Brain Drain: Women and Minorities as Unrealized Assets" that was sponsored by Ernst & Young, Goldman Sachs and Lehman Brothers. This task force carried out a survey specifically designed to investigate the role of off-ramps and on-ramps in the lives of 2,443 highly qualified women with honours in undergraduate, graduate and professional degrees. What they found was 37% of women took a career break, mainly for more 'family time' whilst 24% of men had a career break, mainly for 'changing career path'. As a result of this, women suffered both financial loss and lost on re-entry at a later date

during their career path, e.g. 95% of women would like to return, however, approximately 74% managed to return with only 40% in full-time jobs [6].

The evidence is compelling that talented women do leak out of their career progression and the question is then why is it important for us all to address workplace gender gaps? The mercenary answer: because more women in the workplace mean a higher GDP growth per capita. McKinsey & Company has reported a staggering potential to increase the contribution towards the GDP: US \$12 trillion could be added to the global economy with gender parity [7]. More importantly, talented women are equipped with diverse leadership skills that have contributed towards better and more effective decision making, thus leading to a positive impact on the organisational culture and performance. Interestingly, organisations that managed to keep talented women also managed to retain more male talent in their organisation [2].

This talk aims to explore whether there is a leaky pipeline phenomenon for female IRs in leadership positions. I thus asked CIRSE to provide the data for the CIRSE Executive Committee appointments over the last 8 year (2009-2017) to give a glimpse of how it looks currently (Fig. 2). I will also be presenting results on a survey CIRSE recently carried out with female members.

The data has provided an insight into the scale of the challenges facing women in IR. This talk aims to invite constructive debate to help explore the potential solutions that we (men and women!) can together implement, and how we can keep pace with the changing times and attract the best and brightest to our ranks in the years ahead. On that note, I am looking forward to seeing you all (male and female) participate in this thought-provoking discussion.

Don't miss it!

**The IR gender gap
Women in IR**
Saturday, September 16, 11:30-12:30
Auditorium 3



Tze Min Wah
(EBIR)
Leeds Teaching Hospitals
Leeds, UK

Prof. Tze Min Wah was appointed consultant interventional radiologist at Leeds Teaching Hospitals Trust (LHT) in Nov. 2003. From 2003 to 2004, she was a COOK interventional fellow and also spent a visiting fellowship thanks to the Stanley Melville Award (awarded by RCR, London) under the supervision of Prof. Peter Mueller at Massachusetts General Hospital, Boston, to learn how to set up an interventional oncology service at LHT. She is passionate about developing patient-centred IO cancer treatment and IO as the fourth pillar of cancer care. A keen researcher and educator, she successfully defended her PhD in 2014 whilst working full-time as an IR and bringing up two children. She is a champion for female leadership and believes much can be done to improve gender diversity in IR.

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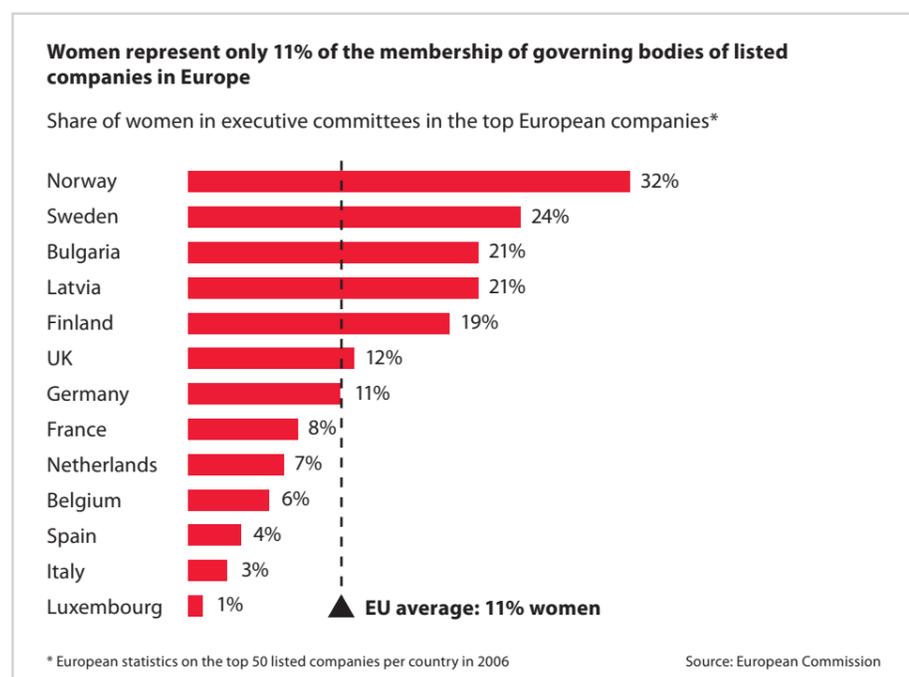


Fig. 1: A large gender gap in the membership of governing bodies of listed companies in Europe [1].

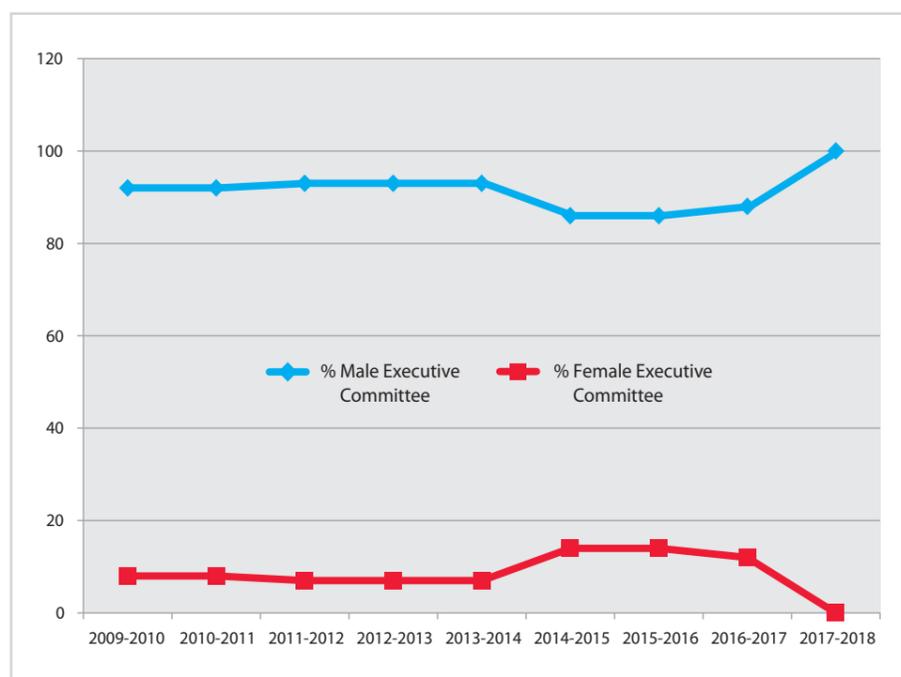


Fig. 2: CIRSE Executive Committees from 2009-2017.



CIRSE Radiation Protection



New radiation safety legislation in 2018!

Visit the Radiation Protection Pavilion

CIRSE's Radiation Protection Pavilion, located in the exhibition hall, is here for you during the entire Annual Meeting, offering information material, interactive tools, and opportunities to engage directly with experts in radiation protection. This year, you can learn more about the impact of European Directive 2013/59/Euratom on safety standards and regulations regarding radiation exposure and how it will affect practitioners and patients.

Today's RPP Mini-Talks, which feature short expert presentations, offer an introduction to the wide range of topics on radiation safety which will be covered over the next few days of the programme. We hope to see you there!

Today's RPP Mini-Talks

	Time	Mini-Talk	Speaker
SAT SEPT 16	12:45 - 13:15	Opening Ceremony	E. Brountzos (Athens/GR) W. Jaschke (Innsbruck/AT)
	13:15 - 13:30	Personal protection innovations (MDT X-Ray)	D. Janssen (Hilvarenbeek/NL)

Focus on Radiation Protection at CIRSE 2017

Michelle Weiss, CIRSE Office

Initiated in 2014, the Radiation Protection Pavilion (RPP) has been gaining attention and popularity at the CIRSE annual congresses over the last three years. This year marks the fourth year of its campaign to heighten awareness on radiation protection and dose management in interventional radiology.

As radiation protection gains greater awareness, industry is reacting in tandem with the European Commission, which has created new Basic Safety Standards on radiation protection that must be complied with by February 6, 2018. At this year's RPP, a carefully selected programme of mini-talks will supply delegates with vital information on topics ranging from research in radiation protection to improving radiation safety in the IR suite to room design, workflow and protection verification.

Werner Jaschke, Chairperson of the Radiation Protection Subcommittee, enthusiastically agreed to talk with us about the effect the RPP has had on attending delegates, the potential ways to improve radiation risks which still exist and the future plans for the campaign.

CIRSE: Now in its fourth year, how do you think the RPP has impacted physicians who attend the congress?

Jaschke: Having the Radiation Protection Pavilion at CIRSE has increased awareness significantly. After four years of campaigning, we believe that we have accomplished a lot, but there is still a long way to go until radiation protection is truly an integrated part of our daily routine work. Each year, more and more

people are attending sessions on radiation protection. Physicians bring the things they learn here back to their centres, and the following year we see the effect of that in the audience numbers. This year there will even be a Hot Topic Symposium on radiation protection, which proves that the interest is there and the idea is expanding.

CIRSE: What aspects of radiation protection do you think physicians and medical professionals still need to keep improving on?

Jaschke: Physicians still need to improve on selecting appropriate and effective radiation protection measures, such as shielding and equipment settings. It's easy for people to get stuck in their bad habits: someone might start smoking when they're 20, and then they're more likely to still be smoking when they're 60, and they are also more likely to suffer the effects of that. We can extend this metaphor to many things, including radiation risk: if doctors have gotten into the bad habit of not wearing the proper garments or glasses, they are increasing their risk of radiation exposure, but awareness is increasing and things are improving. If we look at the anti-smoking campaign, it took 30 years to get that rolling, so hopefully we will be able to accomplish this in less time.

Another point is that, right now, aprons tend to be "one size fits all." This means that many people are not getting the proper protection. A recent article in *AJR* showed that technicians attending fluoroscopic procedures have a



higher risk of developing left-sided cancers, and in female technicians, the study indicated a higher risk of breast cancer: these effects may be related to the current design of the radiation protection garments. As you'll see at the Pavilion, industry has reacted to this by providing additional protection for the shoulder and upper arms, which also increases the protection of breast tissue.

It's also important to keep in mind that if people are not needed in the angio suite then they shouldn't stay in there. In hybrid rooms, it is common to see 11 people in a room where only 5 are needed. If it's not necessary to have them present, then save them the radiation exposure and get them out.

CIRSE: Do you think this Pavilion has made a difference in raising awareness of the risks of radiation?

Jaschke: It certainly has made a difference, but to what extent we don't know. The Pavilion is only a small part of a worldwide effort to increase radiation safety for healthcare professionals and patients. CIRSE is trying to change attitudes and ignorance regarding radiation protection issues. It is very encouraging that interventional radiologists of all ages and nationalities are attending our sessions.

CIRSE: The Radiation Protection Pavilion has worked closely with the European Society of Radiology over the last four years, providing a space to showcase ESR's Eurosafe Campaign; what's the importance of collaborating with other societies when it comes to radiation protection?

Jaschke: It's important that we make a joint effort to avoid risks for patients and professionals, but also to inform physicians and the public about the high safety standards in IR. We need to have everyone reaching for the same goal: reducing radiation exposure in patients and physicians. But we also have to keep in mind that the risk of radiation is very, very low compared to other risks in life. Most people we treat are of an older age and suffering from severe diseases. We should, therefore, be very sensitive to how we discuss radiation-associated risks with our patients. In most cases, benefits outweigh risks substantially.

CIRSE: What are your hopes with continuing the Radiation Protection Pavilion?

Jaschke: At CIRSE 2017, an important topic we are covering is radiation protection in paediatric patients. Our little patients deserve our close attention, because they are very sensitive to radiation. Regarding patient safety in general, our campaign will be boosted by the new EU directive which will be part of national legislation in 2018. This directive states that EU countries must ensure compliance of the Basic Safety Standards by February 6, 2018, including placing a greater focus on awareness of patient protection by taking into consideration not just the patient's exposure during a single procedure but each patient's lifetime exposure and documenting this as well. Therefore, CIRSE 2017 aims to enhance the awareness for the new legislation in the IR community.



Make sure to join us at the Radiation Protection Pavilion Opening Ceremony at 12:45!

ICCIR 2018

International Conference
on Complications in
Interventional Radiology

June 7-9, 2018
Poertschach | Austria



CIRSE foundation

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Date and Time

Saturday, September 16, 2017, 13:00-14:00

Location

Auditorium 15

Chairman

J. van den Berg – Switzerland

BIOFLEX COF – The Effect of Stent Radial Force: Results of Preclinical Study and Interim Results for RCT – M. Funovics – Austria

BIOFLEX PEACE – Pulsar-18 All-Comers Registry 12-month Results for the Full Cohort – C. Nolte-Ernsting – Germany

BIOLUX P-III – Passeo-18 Lux All-Comers Registry 12-month Results for the Full Cohort of 700+ Subjects – G. Tepe – Germany

BIOLUX 4EVER – Combining Passeo-18 Lux DCB and Pulsar-18 BMS 12-month Results of Full Cohort – K. Deloose – Belgium

REACT – REsponse Adapted Combination Therapy: Concept and Study Outline for an RCT – R. Langhoff – Germany



News on Stage

The aim of this session format is to allow physicians to showcase the latest results from multi-centric trials, ground-breaking techniques and many more IR hot topics in an informal and open atmosphere. The presentations will be displayed in a dedicated open area next to the exhibition, giving delegates the opportunity to engage in active, lively discussions.

Today at 13:15-14:15, in the News on Stage Area

NoS 404 Vascular News on Stage

- 404.1 Accelerated thrombolysis for post-thrombotic syndrome using the acoustic pulse thrombolysis EkoSonic® Endovascular system (ACCESS PTS) study: initial results of a multi-centric study
M.J. Garcia (Wilmington,DE/US)
- 404.3 Randomized clinical trial to compare ultrasound-enhanced delivery of paclitaxel and DEB in patients with critical limb ischemia and femoral-popliteal disease: outcome of the PACUS trial after 18 months
C. Del Giudice (Rome/IT)
- 404.4 Multicenter feasibility study of microwave radiometry thermometry for noninvasive differential diagnosis of critical limb ischemia in diabetic patients
C. Lalenis (Athens/GR)
- 404.5 Supervised exercise therapy versus percutaneous angioplasty versus combined angioplasty and exercise for intermittent claudication: systematic review and Bayesian network meta-analysis of randomized controlled trials
M. Pantelidou (London/UK)
- 404.6 Peripheral endovascular interventions using human Thiel-embalmed cadavers with extracorporeal flow for medical device testing, development, and training
H.M. McLeod (Dundee/UK)

The OHSU Does Doctor Dotter Proud

Charles Theodore Dotter (1920–1985) was a pioneering American vascular radiologist and one of the founders of interventional radiology. His vision lives on in the daily work of IRs worldwide and at the Dotter Interventional Institute, which is now a fully-fledged IR department at the Oregon Health and Science University (OHSU).

In many ways, Charles Dotter was ahead of his time. Towards the end of the 50s, when invasive approaches using X-rays to enhance their ability to diagnose diseases were only just being developed, he was already thinking beyond the diagnosis and actively working towards directly treating them. Credited with the first transluminal angioplasty in 1964, he fought hard to open colleagues' minds to the vast potential of interventional radiology, recognising the possibilities for both the patient and the future of medicine in general.

Charles Dotter was a pioneer in every sense of the word, not only inventing procedures but sometimes also crafting the tools for them. His techniques and methods were embraced by Eberhard Zeitler and Andreas Grüntzig, whose work was instrumental in kick-starting the success story that IR has embraced ever since. Their work also helped open the minds of the American medical community. This story also highlights the close cooperation of the IR communities on both sides of the Atlantic, which has its roots in the earliest days of IR and has been a pillar in the development of the specialty.

Thus, it is exciting to report that at the OHSU, where Charles Dotter spent most of his pioneering career and was the chairman of the School of Medicine Department of Diagnostic Radiology for 33 years, the Dotter Interventional Institute has achieved full departmental status as of July 1, 2017.

"Creating a new department is a big decision. And in the case of interventional radiology, I could not be more thrilled to bring the Dotter

Interventional Institute's new status across the finish line," Interim Dean John Hunter stated in a press release, "Its departmental status recognises not only the legitimacy of the discipline and its essential function in diagnosis and cure, but also honours the legacy of OHSU and Charles Dotter as a birthplace for work that has transformed medicine."



Dr. John Kaufman, the Institute's inaugural Chair.

The Dotter Interventional Institute, a freestanding division in the OHSU School of Medicine separate from the Department of Radiology, was founded a few years after Dr. Dotter's passing and has ever since remained an important centre for interventional radiology with many influential minds working there. The late IR pioneer Josef Rösch, credited with developing TIPS, was also a colleague of Dotter at OHSU and then went on to be the first director of the Institute. In 2012, when the American Board of Medical Specialties recognised interventional radiology as a primary specialty of medicine, the Oregon Health and Science University began to take steps to elevate the Dotter Interventional Institute to departmental status. Five years later, the Institute, which proudly bears the

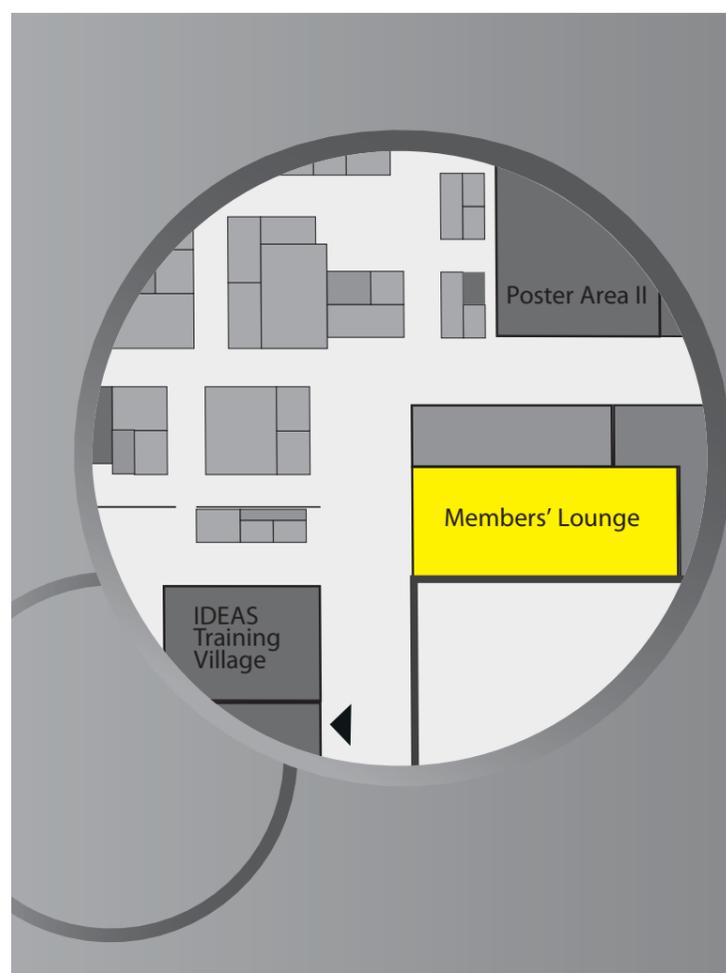
name of one of IRs most influential and visionary minds, has officially gained the status of an IR department, with CIRSE Distinguished Fellow and 2017 Faculty Member, Dr. John Kaufman serving as inaugural Chair.

The Institute's new status further reinforces its position as one of the leading centres of

IR, boasting a unique legacy which is closely tied to the history of our specialty and some of its most brilliant minds. Without a doubt, the Dotter Interventional Institute will also remain a strong part of the transatlantic ties that have contributed to the development and success of IR.



Dr. Charles Dotter treating a patient.



Join Us in the Members' Lounge!

As a special service to members, CIRSE is offering a Members' Lounge at Copenhagen 2017.

All CIRSE Members are invited to come and relax with colleagues.

The Members' Lounge is located in the Exhibition, next to the IDEAS Training Village.



Communication through open access publication

Join us at the Launch of CVIR Endovascular

Saturday, September 16, 11:00-12:00, Room 17



CIRSE is happy to announce the launch of CVIR Endovascular, a new online open access journal with a multidisciplinary approach and open peer review.

Find out more on www.cvirendovascular.org

How to deal with varicose veins

Michael Åkesson

Venous disorders of the legs occur frequently and range in severity from minor asymptomatic telangiectasia to chronic leg ulceration due to major incompetence of venous valves. Venous disease of the legs causes considerable morbidity and is also costly, with roughly 2% of national healthcare resources being spent on treatment.

Varicose veins are a common manifestation of venous incompetence in the lower limb, with approximately one third of the population showing some degree of varicose veins appearing as dilated, elongated and tortuous superficial veins. Incompetence of the superficial and/or perforating vein valves leads to pathological haemodynamic changes of the venous pressure in the lower leg. These haemodynamic changes in the venous pressure induce inflammatory reaction in the tissue which can result in skin changes such as hyper-pigmentation and indurations with eventual ulceration. Normally, this develops over a long period of time, and only a minority of the patients with superficial vein incompetence seeks initial help in this advanced stage.

Instead, the typical patients with varicose veins that contact the healthcare system for the first time have symptoms such as heaviness, aching, cramps, swelling and cosmetic issues from the tortuous superficial veins. Most commonly it is a female in her mid-forties, even though men have the same risk of developing superficial vein incompetence. These patients are often active people in the middle of their life and career, well-informed and expecting results. They wish to get rid of the problem fast and easily, inside the national healthcare system or outside through a privately financed treatment.

During today's special session, *Varicose vein: time for IR*, a number of senior specialists in this field will try to bring you up to speed on what strengths and weaknesses the IR community might have in this area.

You will be guided through how to organise a venous service unit. Of course there will be organisational differences between different countries and healthcare systems, but the basics are the same. You will learn about different techniques for truncal ablation, thermal or non-thermal. What about phlebectomy when we do truncal ablation? Is ultrasound-guided sclerotherapy a stand-alone therapy for truncal ablation or is it a complementary treatment?

Finally, one of the speakers will deal with the most complex problem of venous incompetence: the venous ulcer. There are a number of issues to consider when treating these complex patients. What therapy do they need? Should we organise a multi-specialist cluster dealing with leg ulcers? What actions are needed to get all leg ulcer patients referred to a leg ulcer specialist?

Clinical assessment – a crucial starting point

To get all of the above to fall into position, you have to start with a well-documented clinical assessment and work-up. The medical history can best be taken using a questionnaire. This saves time, but it is of utmost importance that the physician can personally clarify the answers in detail.

Clinical examination remains the foundation for any medical assessment, even in this time of advanced technology. It will give the physician the opportunity to get to know the patient as a

person and allow him/her to take the individual into consideration when evaluating clinical findings and offering therapeutic treatment. Furthermore, the patient's expectations need to be considered, and possible outcomes, side effects and risks of the offered therapy need to be fully disclosed.

The goal of the clinical exam is to understand the anatomy and pathophysiology of the incompetent veins, assess their functional importance and then develop a therapy plan. Contraindications to treatment, such as deep vein thrombosis, lymph oedema, arterial occlusive disease, immobility and any systemic disease need to be ruled out.

A preoperative duplex ultrasound investigation should be performed by the operating physician to verify venous insufficiency and to be used as preoperative planning of what vessels are to be treated. In addition, ultrasound is important to identify potential complications and risks. The operator must have a good knowledge of venous ultrasound diagnostics and duplex techniques. These skills are required as the entire treatment procedure is guided by ultrasound monitoring.

Adding together all the information above, a classification according to CEAP can be made. CEAP is the acronym for clinical severity, aetiology, anatomy and pathophysiology, and this classification of varicose veins indicates the degree of symptoms of varicose disease and is used in many countries for reimbursement classification.

Join us today and learn more about how to organise and develop your IR knowledge to start treating this interesting patient group!

Don't miss it!

Varicose vein: time for IR Special Session

Saturday, September 16, 11:30-12:30
Auditorium 11



Michael L. Åkesson
Lund University/Scandinavian
Venous Centre
Malmö, Sweden

Dr. Åkesson is a senior consultant at the Scandinavian Venous Centre, and the CEO and owner of the MedPACS Network AB. He previously worked as a consultant in interventional radiology at Skåne University Hospital. Dr. Åkesson has been actively involved with several CIRSE events, holding workshops on varicose vein ablation at CIRSE 2013, and on TEVR at CIRSE 2011. He has also contributed to various publications, including articles on endovascular recanalisation of chronic iliac vein occlusion and sub-intimal angioplasty of infra-inguinal arterial occlusions for critical limb ischaemia. Dr. Åkesson is a member of the Swedish Society of Radiology.

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Poster Awards 2017

SCIENTIFIC POSTERS

Magna Cum Laude

Idarubicin-loaded DC Bead® for chemoembolization of HCC: interim analysis of IDASPHERE II (FFCD 1307) multicenter single-arm phase II trial
B. Guiu¹, P. Chevallier², P. Merle³, M.-A. Pierredon Foulongne¹, A. Rode³, A. Bouvier⁴, O. Guillaud³, P.-J. Valette⁵, J. Dumortier³, J.-P. Joly⁶, E. Nguyen Khac⁶, T. Yzet⁶, M. Lartournerie⁷, J.-C. Barbare⁶, M. Boulain⁷, S. Manfredi⁷; ¹Montpellier/FR, ²Nice/FR, ³Lyon/FR, ⁴Angers/FR, ⁵Pierre Benite/FR, ⁶Amiens/FR, ⁷Dijon/FR

Cum Laude

Randomized clinical trial to compare ultrasound-enhanced delivery of paclitaxel and DEB in patients with critical limb ischemia and femoral-popliteal disease: outcome of the PACUS trial after 18 months
R. Gandini¹, C. Del Giudice²; ¹Rome/IT, ²Paris/FR

Proof of concept of a gene-directed enzyme prodrug therapy with intra-arterial delivery of mesenchymal stem cells in a rabbit VX2 hepatic tumor model
O. Pellerin, I. Amara, P. Beaune, I. de Waziers, C. Déan, M.R. Sapoval; Paris/FR

Certificate of Merit

Preoperative portal vein embolization and percutaneous intrahepatic split by ablation: feasibility and safety of radiological stage 1 ALPPS
A. Lunardi, R. Cervelli, C. Lombardo, I. Bargellini, L. Crocetti, U. Boggi, D. Caramella, R. Cioni; Pisa/IT

Concurrent N-butyl cyanoacrylate embolization and endovascular aneurysm repair (EVAR) can reduce the risk of endoleak and reintervention compared with conventional EVAR
Y. Watanabe, T. Fukuda, H. Matsuda, A. Kono, K. Kiso, Y. Morita; Suita, Osaka/JP

The origin of the last normal branch from the feeding artery of pulmonary arteriovenous malformations
M. Maruno, H. Kiyosue, S. Tanoue, N. Hongo, S. Matsumoto, H. Mori; Yufu/JP

Supervised exercise therapy versus percutaneous angioplasty versus combined angioplasty and exercise for intermittent claudication: systematic review and Bayesian network meta-analysis of randomized controlled trials
M. Pantelidou¹, K.N. Katsanos², R. Brar¹, S. Patel¹, A. Diamantopoulos¹, H. Zayed¹; ¹London/UK, ²Patras/GR

Two-year results from the IN.PACT global studies and outcomes in patients with diabetes
M. Brodmann¹, G. Ansel², T. Zeller³, A. Micari⁴, P. Peeters⁵, G. Tepe⁶; ¹Graz/AT, ²Columbus, OH/US, ³Bad Krozingen/DE, ⁴Cotignola/IT, ⁵Bonheiden/BE, ⁶Rosenheim/DE

Percutaneous deep venous arterialisation (LimFlow procedure) for end-stage critical limb ischaemia: early experience from 2 European centres
C. Del Giudice¹, D.A. van den Heuvel², M.R. Sapoval¹, S. Kum³; ¹Paris/FR, ²Nieuwegein/NL, ³Singapore/SG

EDUCATIONAL POSTERS

Magna Cum Laude

Modified balloon-occluded retrograde transvenous obliteration (BRTO) techniques for the treatment of gastric varices: balloon-occluded antegrade transvenous obliteration (BATO)/vascular plug-assisted retrograde transvenous obliteration (PARTO)/coil-assisted retrograde transvenous obliteration (CARTO)
S.K. Kim¹, N.B. Mani¹, M.D. Darcy¹, A.W. Park²; ¹St. Louis, MO/US, ²Charlottesville, VA/US

Cum Laude

Approaches for percutaneous vertebroplasty of the upper cervical spine
I. Genah, B. Hamze, C. Parlier, V. Bousson, J.-D. Laredo; Paris/FR

Certificate of Merit

Transarterial radioembolization of hepatocellular carcinoma: how to interpret post-treatment imaging
P. Scalise, G. Lorenzoni, I. Bargellini, L. Crocetti, F. Turini, R. Cioni, D. Caramella; Pisa/IT

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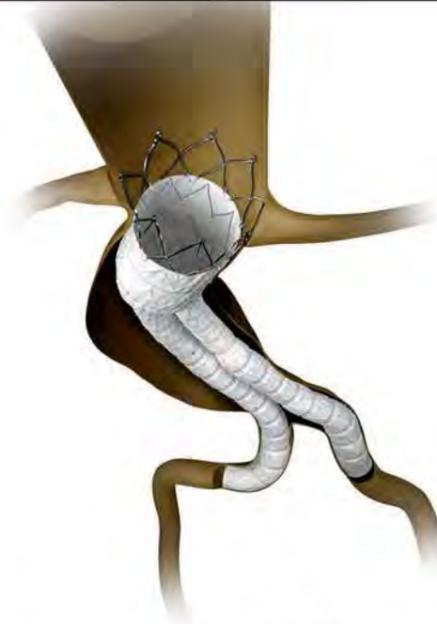
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2. Innovation 5-year results. Borsetto G. LMC, 2017.

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**LEADERS IN ONCOLOGIC
INTERVENTIONS**

CIRSE

Cardiovascular and Interventional Radiological Society of Europe

CIRSE: Your Global Community

Helen Hemblade, CIRSE Office

As one of the largest interventional radiological societies in the world, CIRSE endeavours to do all it can to bring together interventionalists and encourage multidisciplinary collaboration. The society has, furthermore, always striven for strong alliances between national societies to safeguard the interests of interventional radiology on a global scale.

As a result, more and more IR societies from around the world are joining CIRSE, making it an increasingly global network. Among the 35 group members, 15 are from outside of Europe.

France

The Société Française de Radiologie (SFR) finalised its CIRSE membership in early 2016. CIRSE is honoured to welcome such a dynamic member!

Europe

Around three-quarters of our members are based in Europe.



North/South America

10% of our members are based in North America and Latin America.



Asia

A tenth of all our members are based in the Asia Pacific region – and the number is growing!

Middle East

Our members in the Middle East make up an important part of our membership.

Africa

We are proud to have a number of members in Africa!

The Exciting Future of IR in Hong Kong

Dr. Lik-Fai Cheng, President of the Hong Kong Society of Interventional Radiology



The Hong Kong Society of Interventional Radiology (HKSIR) was established in Hong Kong on January 5, 2001, by a group of radiologists who had a common interest in interventional radiology. It is classified as a public charitable institution under Hong Kong law. As a society, its objectives are threefold:

1. To engage and support education and research for interventional radiology;
2. To promote and establish close contacts among medical professionals who are interested in working in the field of interventional radiology;
3. To promote honourable interventional radiology practice, and to establish an ethical and healthy environment for the practice of interventional radiology in Hong Kong.

Growing Stronger

In October 2017, the HKSIR will be holding its 17th Annual Scientific Meeting, which will feature talks from renowned local and international speakers. Our Annual Scientific Meeting has a general theme each year. Last year we focused on peripheral vascular disease revascularisation. HKSIR also frequently

holds other educational activities such as, inter-hospital educational meetings, and non-vascular IR and angiogram courses for trainees. Over the years, we have organised symposia with live case demonstrations on vertebroplasty; liver, renal and bone RFA; balloon-occluded retrograde transvenous obliteration of varices; and uterine and prostatic artery embolisation. Every year, HKSIR sponsors its members to attend overseas IR conferences and courses, including CIRSE, APCCVIR and other international IR meetings.

To date, we have approximately 370 qualified radiologists in Hong Kong. HKSIR membership is available to any radiologist with an interest in IR; we currently have 182 radiologists on our membership list. Hong Kong has, however, not developed a formal qualification in interventional radiology. We estimate that there are approximately 40 radiologists who are specialised in IR. We are also working closely with the Hong Kong College of Radiologists towards such a qualification. HKSIR associate membership is also open to any healthcare professionals who are involved in IR work; associate members are mostly radiographers and radiology nurses.

Healthcare in Hong Kong

The population of Hong Kong is over 7 million, according to our latest census. We have a very efficient public health care system which takes care of at least 90% of in-patients. Towards the end of March 2017, we had performed close to 60,000 simple to complex IR procedures on patients in public hospitals. Although it is not easy for interventional radiologists to be proficient in all modern IR procedures, I believe that interventional radiologists in Hong Kong collectively possess the skills that enable them to handle most IR procedures in neurointerventions, vascular & non-vascular IR.

Hong Kong is geographically located in Southern China, where hepatitis B-related disease is highly prevalent. To put this in numbers, there are approximately 1,500 newly diagnosed hepatocellular carcinoma (HCC) cases per annum. Interventional radiologists in Hong Kong carry out various therapies for treating HCC including RFA, chemoembolisation and Yttrium-90 internal irradiation. Approximately 80 liver transplants are performed in Hong Kong each year. Although our surgical colleagues have been doing a fabulous job with such a high number

of procedures being carried out, there are inevitably complications that interventional radiologists have to deal with.

I think that interventional radiologists in Hong Kong face the same challenges as our international counterparts, the main one being turf battles with other procedural specialists. Currently, HKSIR is the only representative of interventional radiologists in Hong Kong. It is only through continuous learning and developing new skills that we will stand a higher chance of becoming stronger as a specialty. We look forward to future collaboration with CIRSE.



Don't miss it!**Uterine fibroid embolisation
Special Session**Saturday, September 16, 10:00-11:00
Auditorium 3**Anna-Maria Belli**
(EBIR)
St. George's
London, UK

Former CIRSE President Anna Belli is well-known for her work in the vascular interventional field, particularly in uterine artery embolisation. She is currently Professor of Interventional Radiology at St George's Hospital and Medical School, where she works with a renowned team of vascular specialists. Alongside her many contributions to CIRSE over the years, she has been President of the British Society of Interventional Radiology (2001-2003), a member of the Council of the British Institute of Radiology (2007-2009), and a long-standing advisor for both NICE and the Medicines & Healthcare Regulatory Authority. She is the author of more than 130 peer-reviewed publications and more than 20 chapters in IR. She is actively involved in many meetings, both as an organiser and a lecturer, including ECR, CIRSE and the BSIR.

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Uterine fibroid embolisation and fertility

Anna-Maria Belli, EBIR

Current evidence confirms that uterine fibroid embolisation improves quality of life and is a safe, efficacious and cost-effective treatment for symptomatic fibroids.

However, the current data are insufficient to provide strong evidence of its place in women desiring fertility. Uterine fibroids are implicated as a contributing factor for subfertility even if the uterine cavity appears hysteroscopically normal. Fibroids are implicated as the sole cause of infertility in less than 3% of cases. The location of the fibroids is important with submucosal fibroids implicated in decreased fertility and increased pregnancy loss, possibly as a result of changes in uterine anatomy, alteration in uterine function with increased contractility and local hormone changes induced by fibroids. Despite this, many women with large fibroids conceive without difficulty.

There is no recognisable adverse impact on fertility when uterine artery embolisation has been used in the management of women with post-partum haemorrhage [1]. However, these women are younger and, in general, do not have symptomatic fibroids. Women with symptomatic fibroids tend to be older (late 30s onwards) and many have completed their families, making comparison with long-standing surgical procedures, such as myomectomy, difficult.

There are theoretical reasons why UFE may affect fertility. These include: ischaemic injury to the myometrium; the presence of necrotic tissue in the fibroid left behind, which may increase the risk of uterine rupture; residual fibroid mass, which may be responsible for pregnancy complications; and impairment of ovarian function, leading to premature menopause or reducing chances of achieving pregnancy. For all these reasons, women actively pursuing fertility have been

discouraged from having this treatment and/or excluded from UFE trials. This understandable precautionary measure means that the data on younger women undergoing invasive treatment for fibroids are insufficient for meaningful comparison and interpretation.

If the fibroids are contributing by their mass effect on the uterine cavity and distortion of normal structures, then UFE is unlikely to improve the situation as the bulk of fibroids remains.

With regard to ovarian reserve, ovarian failure has mostly been confined to women over 45 years. The evidence to date has shown that in women <40 years, ovarian insufficiency recovers after UFE if it is affected at all [2,3]. The technique of embolisation may be important. It has been proposed that aiming for stasis in the uterine artery as an end-point could increase the risk of occlusion of the ovarian arteries – but there is no objective evidence to support this theory.

A systematic review of the literature in 2013 compared the cumulative pregnancy rate following UFE with the age-adjusted rate in the general population (mean age 36 years) and concluded that the 68% pregnancy rate was comparable [4]. A review from 2010, however, highlighted higher rates of spontaneous abortion and postpartum haemorrhage in the UFE population than for non-UFE fibroid patients [5].

The myomectomy literature reports pregnancy rates of between 8% and 46%; pregnancy rates after UFE are also reported to range from 8% to 47%. Superficially these are similar, but are there differences in outcome? It is difficult to interpret the published literature with confidence. A recent systematic review of the literature on embolisation for PPH reported

more frequent rates of abnormal placentation. In theory any treatment that scars the uterus may lead to increased rates of invasive placentation with post-partum haemorrhage, and, logically, both myomectomy and UFE may cause this. There also seems to be an increased rate of first-trimester miscarriage after UFE. Uterine contractility may be affected by fibroid bulk and it is logical that this is more likely to occur with UFE, where the fibroids are left behind, than with myomectomy.

All studies conclude that further research is needed in this area. The results of another RCT (the FEMME trial) which will assess ovarian reserve after UFE and myomectomy are awaited, but this trial will not inform on fertility rates, as gynaecologists were reluctant to enter young women into this trial [6].

UFE has been well investigated and found to be safe and effective for the treatment of symptomatic fibroids. However, I am pessimistic that we will obtain good quality evidence to directly compare fertility rates and outcomes with different treatment regimes. Instead, we are left with a pragmatic approach, which is to offer myomectomy as a first option and reserve UFE for those women whose fibroids recur and in whom repeat surgery is to be avoided. In a sense, this is a self-fulfilling prophecy, as these women will be older with scarred uteruses. Thus we may never learn the answer to the question of whether there is an advantage of one therapeutic modality over another.



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Words from a Gold Medallist

Helen Hemblade and Michelle Weiss, CIRSE Office

Dierk Vorwerk, former CIRSE President and, until recently, Editor-in-Chief of CVIR, has had a highly accomplished career and dedicated many years to the Society. He will be awarded the CIRSE Gold Medal at this year's congress.

When I finished medical school I was not so sure what I wanted to do. I liked surgery but was afraid of not being able to stand it physically. Internal medicine was not my favourite either. I chose radiology because this was helpful for everything. Quite early in my training I rotated into IR, and, since there was a shortage of seniors, I was given plenty of opportunities and supported by my head physician, Rolf Günther, to develop my skills. So, I fell in love with radiology through IR.

It is a pleasure to see CIRSE becoming the most prolific IR society in the world and to help organise our large IR conference. The keystone here is the central office in Vienna.

The best training for IRs is hands-on to develop their skills. Nevertheless, continuous theoretical education by conferences and reading IR dedicated journals is a must to stay up-to-date with modern trends and developments.

Monomania is an attitude which is frequently found among doctors but is not helpful for the patient. Modern clinical management of patients does require an interdisciplinary approach to serve the patient best. Shared decision-making is mandatory and should be required by the regulating bodies. Radiologists in IR need to be more prominent to patients by doing clinical rounds; they should offer office hours and outpatient treatments. In almost all European countries these instruments exist for IR and they should be used.

I loved the challenge of convincing gynaecologists to use UFE. Unfortunately, this worked only partially and we still have a long way to go. Another challenge was to build-up a neurointerventions service and training in order to have enough people to fulfil a 24-7 service to our neurological partners.

Artificial intelligence will become a challenge for radiology, but IR seems pretty robust in this regard as IR is the hands-on clinical arm of radiology. If IR offers a 24-7 service of excellence, I envision a bright future for the subspecialty, as it increasingly becomes a discipline, particularly in emergency situations and treatments.

IR is important for radiology and radiology is important for IR. The speciality should stay together to keep its strength.



The CIRSE 2017 event in the CIRSE society app

Your toolkit for the 2017 Annual Meeting in Copenhagen:

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STUDENT CORNER

Risha Rose, CIRSE Office

be inspIRed...

5 Things to Look Forward to at CIRSE 2017

1. The best of IR is at your fingertips...

With around 6,700 participants, 250 hours of education, and 6,000m² of technical exhibition, CIRSE 2017 is rich in opportunities to learn about interventional radiology. With this incredible array of activities, it is also a bit overwhelming for the IR newcomer, so the CIRSE Student Programme has put together a recommended sessions guide to help medical students navigate this exciting event. From the student-exclusive session *Introducing IR*, to workshops, fundamental courses, special sessions, expert round tables and expert case discussions, the student-recommended sessions will be nothing short of inspiring!

2. Networking & finding an IR Mentor

Building and expanding your professional presence can be heavily influenced by who you know and who you meet along the way. CIRSE 2017 offers students incredible opportunities

to build their network, find mentors, and perhaps even meet their future supervisors and colleagues. Two of these opportunities include the Student Mentoring Breakfast, where students and professionals come together in a relaxed atmosphere to meet and socialise, and the European Trainee Forum (ETF). The ETF represents CIRSE's Junior Members and young IRs in training, and will hold onsite sessions and activities in the ETF Pavilion throughout the congress.

3. Building new relationships

CIRSE's Student Programme is here not only to introduce medical students to the fascinating field of IR, but also to encourage future generations of interventional radiologists to build relationships and create a community with one another at an early stage in their career. This is why students can find their own exclusive Students' Lounge where they can

hang out, eat lunch, plan their day, or simply use as a meeting place before going to the best socialising event of the week – the Students' Evening. The Students' Evening is the perfect opportunity to party, drink (each student gets a free drink voucher), and, in the spirit of the hosting country, practice their "hygge" skills with new-found friends in the heart of Copenhagen.

4. Getting your hands dirty

One of the best ways of learning is by doing, and CIRSE 2017 is once again offering students the opportunity to experience IR procedures first-hand with three different types of student-exclusive hands-on sessions: hands-on device training, simulation training and company learning centres. Each session will focus on a separate topic and students will have the chance to use devices and perform mock procedures. Participation is free, and

session details can be found in the student recommended sessions. Advance registration for these sessions is required and requests for open spots can be made at the registration desks.

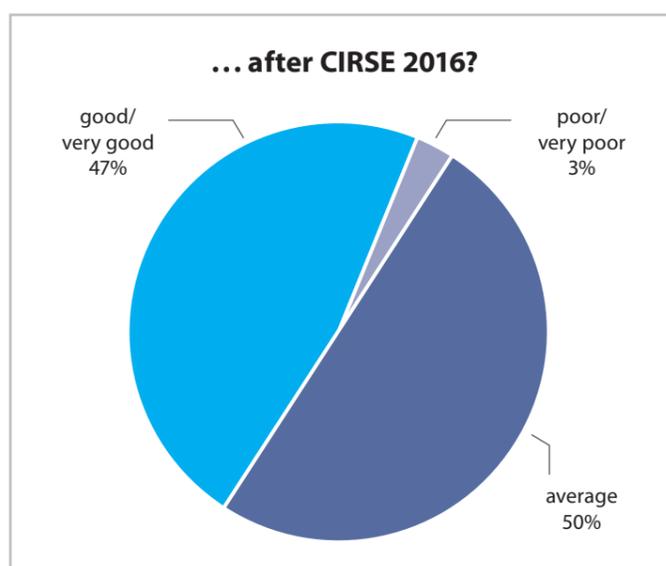
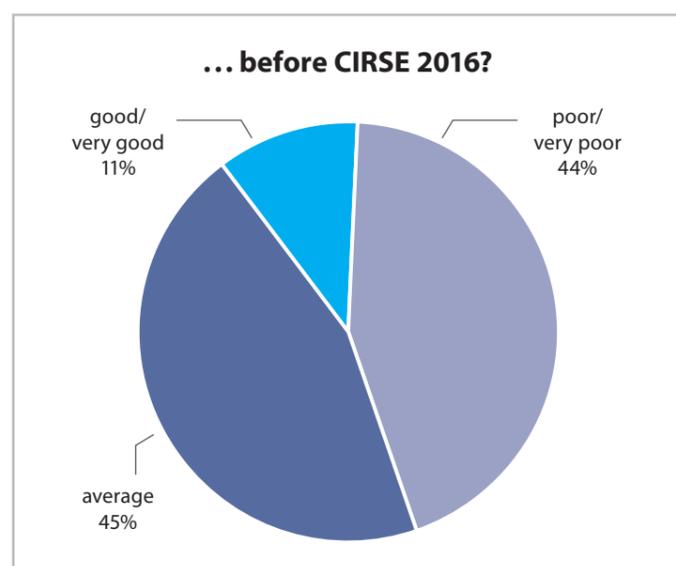
5. Showing off your IR knowledge

Last year, students' IR knowledge increased profoundly from the beginning to the end of the congress (see chart), and 86% of students stated that, because of this new knowledge, interventional radiology had become more attractive as a career choice for them. This year, to continue the excellence in learning and information retention, students are encouraged to take part in the Students' Quiz – a fun, pub-style, team-based IR quiz. Students will have the opportunity to show off everything they learned, and the winning team will receive prizes. Join the fun on Tuesday in the Students' Lounge.



How would you judge your knowledge of interventional radiology...?

We spoke to students at CIRSE 2016 about how the programme impacted their knowledge of the subspecialty (n=64):



QUESTIONS OF THE DAY

Saturday, September 16, 2017

Be in with a chance to win daily prizes by sending your answers to students@cirse.org by 18:00 tonight.

Answers to the below questions can be found within today's Congress News and/or at today's student-recommended sessions.

The first two correct responses will win €20 Amazon vouchers. Ready... set... GO!

1. What does the radiation protection directive, which is part of the national legislation in 2018, state EU countries need to do by February 6, 2018?
2. What are the three short talks that will be hosted by the European Trainee Forum in the ETF Pavilion?
3. Approximately what percentage of IRs in Europe are women?
 - a. 5-7%
 - b. 10-12%
 - c. 25-30%
 - d. >40%

CVIR

Take a selfie

with the new CVIR Editor-in-Chief Prof. Klaus Hausegger at the CVIR booth and win tickets for the CIRSE 2017 Dinner & Farewell Party!

- 1. Take a selfie** with Prof. Hausegger's cutout at the CVIR booth.
- 2. Post your selfie** on our Facebook page adding #CVIRatCIRSE and tagging yourself in the picture.
- 3. Collect the most likes** and win one of our great prizes!

The two entries with the highest number of likes will win tickets for the CIRSE 2017 Dinner & Farewell Party!

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IR's Next Generation at CIRSE 2017

Ben Raho, CIRSE Office

This year, CIRSE will feature an elaborate on-site programme for IR trainees, residents and IRs at the beginning of their career, including two IR Trainee Sessions, the ETF Pavilion, featuring short talks on relevant topics, as well as a dedicated ETF Quiz on Tuesday morning.

Interventional radiology has continuously been linked with innovation and creative ways of thinking, and, in order to foster this originality with an influx of bright young minds, CIRSE is expanding both its Student Programme as well as its European Trainee Forum (ETF), an initiative for trainees, residents and young IRs. This expansion will be seen at CIRSE 2017 through an extensive on-site programme solely dedicated to interventional radiologists in training as well as IRs at the first stages of their career and will include two IR trainee sessions offering carefully selected content and speakers, the first of which will take place today and will discuss technologies set to shape the future of IR.

IR Trainee Session: Future IR technologies

During this brand new session at CIRSE, speakers will give short presentations on the topics at hand. There will also be plenty of time for participants to ask questions and start discussions on these important themes.

To open the session, Philippe Pereira will outline the current stance of interventional oncology and discuss potential future developments in the field, before passing the baton to Reto Bale, who will delve into

an emerging area of IO: the application of stereotaxy and robotics in tumour ablation. Shifting the focus then to endovascular interventions, Mohamad Hamady will provide a comprehensive overview of the advances in technology that are taking place within endovascular interventions. With existing technology rapidly improving and virtual reality entering the scene, training on simulators and virtual simulations will be an increasingly important part of education within interventional radiology. With this in mind, Michael Strøm will cover this interesting topic in his talk and offer insights into the future of training schemes in IR. The session will then be rounded off with a contribution by Peter Kecskemethy, a renowned, international expert in the role of artificial intelligence and big data management. He will provide insight into A.I. and machine learning and its impact on the future of interventional radiology.

With such a strong line-up, the IR Trainee Session *Future IR technologies* is a must for any trainee, resident and young IR attending CIRSE 2017, and is bound to be a major highlight of this year's programme. On Tuesday, the second IR Trainee Session will cover how to build a successful career in interventional radiology, and will feature talks from distinguished leaders of the European IR community.

The European Trainee Forum Pavilion

In 2016, CIRSE created the European Trainee Forum in order to develop a framework for numerous activities dedicated to enhancing IR training around Europe and to help young

IRs in the first stages of their career. Over the last year, it has grown rapidly as a network of young European professionals and, for the first time at this year's congress, trainees, residents and young IRs will get their own designated area in the exhibition area to socialise and build their professional network. This space, called the ETF Pavilion, will be located near the simulator gallery. The ETF Pavilion will feature a short talk every day on issues relevant to young IRs and trainees. The topics for each day are as follows:

- Saturday Sept 16:
Grants and European mobility as an IR
- Sunday Sept 17:
IR training opportunities in the USA
- Monday Sept 18:
Taking the EBIR Exam – practical advice

On Tuesday morning, there will also be a new event called the ETF Quiz, taking place in the ETF Pavilion. This will give trainees the chance to test their IR knowledge and compete with each other in a fun, buzz-in quiz. Don't miss out on the chance to win tickets to the CIRSE Dinner Party, Amazon vouchers and other exciting prizes!

The European Trainee Forum is open to all young IRs or those still in training and has an inclusive policy. Do you have ideas on what CIRSE could do to help improve IR training in your country? Do you have questions about the work of CIRSE and the ETF? Come visit us in the ETF Pavilion to find out more about the activities of the European Trainee Forum or check out www.cirse.org/etf.

IR Trainee Session: Future IR technologies Saturday, September 16, 17:30-18:30

- **The state of the art and future of interventional oncology**
P. Pereira
- **Reliability in percutaneous tumour ablation – fusion, stereotaxy and robotics**
R. Bale
- **Future technologies in endovascular interventions**
M. Hamady
- **Simulator training: potentials and limitations**
M. Strøm
- **Big data, AI and machine learning**
P. Kecskemethy



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IO in intermediate-sized tumours

Roberto Cioni

Hepatocellular carcinoma (HCC) represents one of the few cancers for which locoregional treatments are recognised as having the potential to cure and/or prolong survival and, as such, are included in international guidelines [1-4]. This is due to the unique nature of HCC, which, in most cases, occurs in patients with underlying virus- or alcohol-related cirrhosis. Therefore, treatment choice in patients with HCC is driven not only by tumour staging, as in the great majority of cancers, but also by careful evaluation of liver function and physical status. Another specific feature of HCC is that it is the only tumour that can be cured by organ transplantation, with the aim to treat both cancer and underlying liver disease [1-4]. These characteristics create a complex scenario and prompt the need for close cooperation among interventional oncologists, surgeons, hepatologists and anaesthesiologists [4].

Decision-making for the treatment of HCC is supported by guidelines endorsed by different societies worldwide, including the European Association for the Study of the Liver (EASL), the European Organisation for Research and Treatment of Cancer (EORTC), the American Association for the Study of Liver Diseases (AASLD), the Asian Pacific Association for the Study of Liver (APASL), the Korean Liver Cancer Study Group and the Japan Society of Hepatology [1-3,5,6]. Among these guidelines, differences in recommendations are formed based on cancer epidemiology, techniques available and expertise in various countries.

The Barcelona Clinic Liver Cancer (BCLC) classification has emerged during recent years as the standard classification that is used for clinical management of patients with HCC [7,8]. This classification links stage stratification with a recommended treatment strategy and defines the standard of care for each tumour stage. It has been endorsed by an EASL panel of experts and the AASLD guidelines [1,2]. According to the BCLC staging system, refined in 2016, image-guided tumour ablation is recommended in patients with very early and early-stage HCC. Very early HCC is defined as the presence of a single tumour <2 cm in diameter with good health status (ECOG-0) and well-preserved liver function (Child-Pugh class A). Early HCC (BCLC stage A) is defined in patients presenting single tumours >2 cm or 3 nodules <3 cm of diameter, ECOG-0 and Child-Pugh class A or B [2,8].

Even if not specifically categorised by current guidelines, patients with solitary intermediate-sized HCC (>3 cm and <5 cm), can be considered as a specific subset of early-stage HCC patients. The size of the tumour makes ablation alone unlikely to be radical with current techniques, but transarterial chemoembolisation (TACE) does not, theoretically, represent a treatment option at this stage. When clinically significant portal hypertension and abnormal bilirubin contraindicate surgical treatment, a combination of TACE followed by radiofrequency ablation (RFA) has been used to minimise heat loss due to perfusion-mediated tissue cooling and increase the therapeutic effect of RFA [9]. A number of randomised control trials (RCTs) and meta-analyses comparing transarterial therapies with ablation have been published, but, unfortunately, the strength and clinical impact of the results of these meta-analyses is impaired by the limitations of the included studies. The third arm of monotherapy (TACE alone) is often missing, and different TACE regimens and therapeutical protocols have been applied. Moreover, in most cases, study results include combined treatment of HCC <3 cm or patients who are not stratified according to tumour size. When this kind of stratification is done, it has been demonstrated that combined therapy (TACE+RFA) is better than ablation alone in patients with intermediate-sized tumours [10,11]. TACE with drug-eluting beads has also been performed after an RFA procedure to increase tumour necrosis by exposing the peripheral part of the tumour to high drug concentration, whereas only sublethal temperatures may be achieved in a standard RFA treatment [12]. More recently, microwave ablation (MWA) has been performed as neoadjuvant therapy before TACE (Fig. 1) [13], but further research to determine optimal methods of combining chemotherapeutic regimens (both agent, route of administration, time interval between TACE and RFA or vice versa) with RFA is needed. It has been suggested that a single-step "combined" approach, with both procedures performed in the same session, makes it possible to obtain and amplify the synergistic effects of RFA and TACE [14]. Initial reports seem to suggest that with the use of current MWA devices, percutaneous ablation of HCCs larger than 3 cm can be performed with high efficacy [15,16].

Researchers and companies are also exploring new strategies for increasing the results of ablation. The HEAT trial, a phase III, randomised, double-blinded, placebo-controlled study, has recently been completed which investigated the efficacy and safety of lyso-thermosensitive liposomal doxorubicin in combination with RFA compared to RFA alone in the treatment of nonresectable HCC [17]. When heated during an RFA procedure to $\geq 40^{\circ}\text{C}$, lyso-thermosensitive liposomal doxorubicin produces high drug concentration in the surrounding margins of the ablation zone. RFA + lyso-thermosensitive liposomal doxorubicin did not improve the efficacy of normal practice RFA. However, among the 285 patients with a solitary lesion who received at least 45 minute RFA dwell time, the hazard ratio for overall survival was 0.63 (95% CI: 0.41–0.96; $p = 0.04$) [17]. The ongoing OPTIMA study is testing the hypothesis that adding lyso-thermosensitive liposomal doxorubicin to a standardised RFA lasting ≥ 45 minutes increases survival compared with standardised RFA alone [18].

Patients with solitary large tumours (exceeding 5 cm in size) deserve a special mention. It has been suggested that patients with large solitary tumours may benefit from surgery because surgical mortality has decreased, and because patients with operable solitary large tumours may be a self-selected group with a low tendency for multifocal disease [19]. Different ablative modalities are not currently providing a sufficient volume of ablation to successfully treat these tumours, and when the tumour size is above 5 cm, the advantages of combination therapies seem negligible [9,10]. On the other hand, the results of TACE as a stand-alone therapy in tumours larger than 5 cm, which are characterised by heterogeneous structure and vascularisation, are suboptimal, with a high rate of incomplete response and postembolisation syndrome [20]. In this setting, transarterial radioembolisation has been suggested as a treatment option, in which the main anti-cancer effect is given by radiation and the embolic effect of microparticles containing radionuclide (Yttrium-90) is negligible [21].

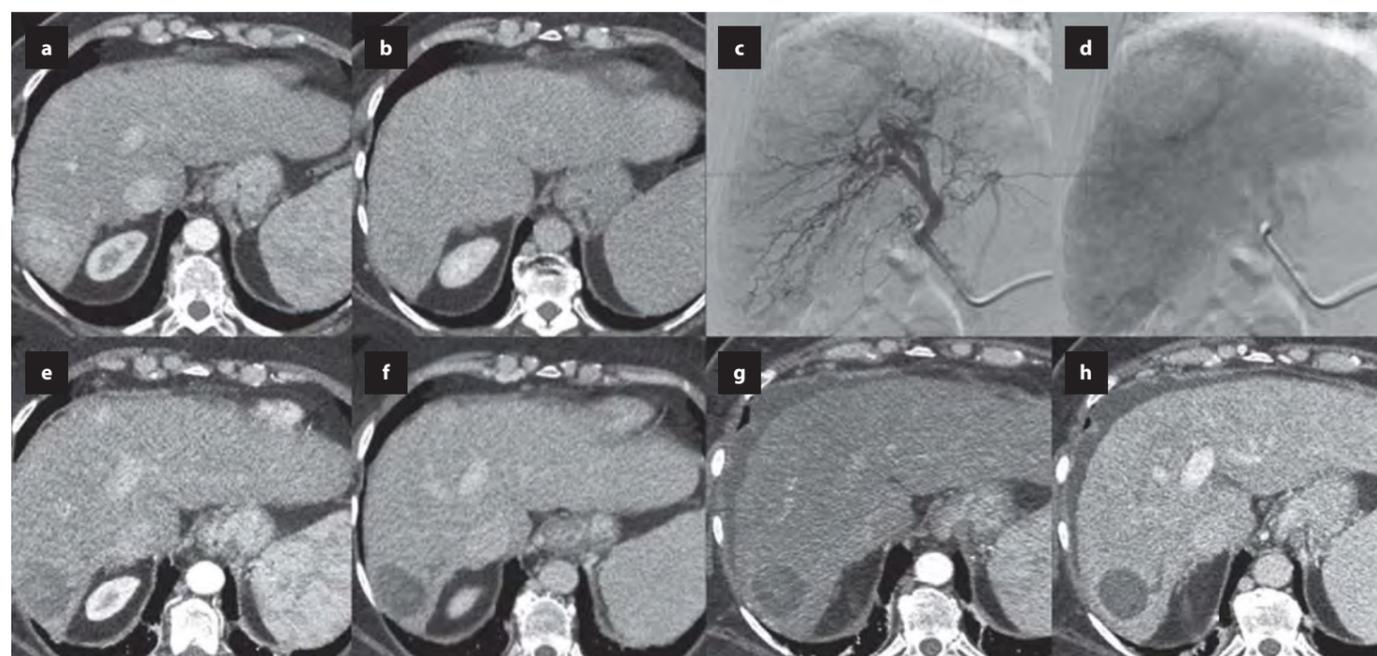


Fig.1. Contrast-enhanced CT shows a single HCC, 43 mm in largest diameter, in segment 7 (a: arterial phase; b: delayed phase). After MWA, angiograms show peripheral hyperenhancing rim surrounding the avascular ablation zone (c, d) and drug eluting beads TACE (2 ml, 75 mg of Doxorubicin, DC-Beads, BTG) is performed. 1-month CT (e: arterial phase; f: portal phase) and 1-year CT (g: arterial phase; h: portal phase) confirm complete response.

Don't miss it!

Therapies for HCC based on size criteria
Special Session
Saturday, September 16, 10:00-11:00
Auditorium 15



Roberto Cioni
Pisa University Hospital
Pisa, Italy

Dr. Roberto Cioni is the Director of the Subdivision of Interventional Radiology in the Department of Clinical and Experimental Medicine at the University of Pisa, where he completed his specialisation in diagnostic radiology in 1993. Prior to this, he completed his medical degree at the University of Florence. Dr. Cioni's particular research interests are angioplasty and vascular stenting, renal and liver diseases, thoracic biopsies, drainages and thermal implants in the lung and skeletal areas. He has published over 100 articles and chapters in national and international publications and has lectured all over the world.

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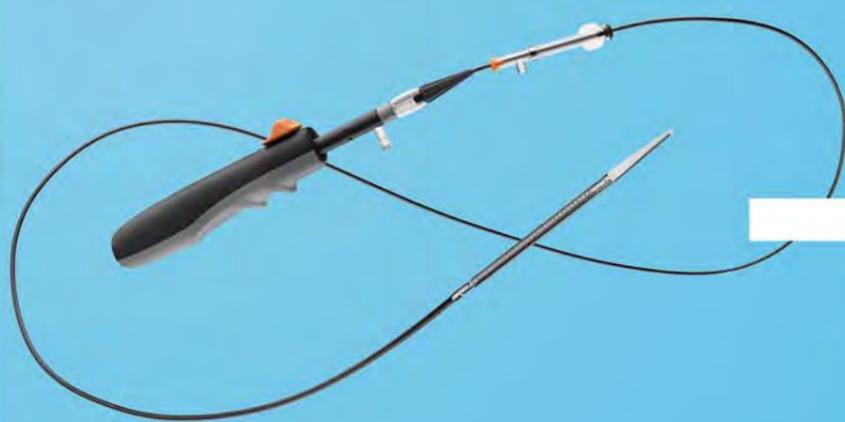
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Auditorium 3

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Sunday 17 September, 11:30-12:30

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J. Van Den Berg

Vessel prep technology: When DCB alone is not
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Saturday 16 September, 14:00

Tuesday 19 September, 12:45

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M. Treitl

Sunday 17 September, 12:45

Monday 18 September, 12:45

Extending the life of dialysis AV access: lessons
learned in using DCBs

K. Katsanos

Research data mandatory for guidelines

José Ignacio Bilbao, EBIR

It has been estimated that at least 50% of published research studies are poorly conducted, making them difficult to interpret and use to inform best practice. Therefore, to recommend a new approach in daily practice, and thus assess and improve the quality of care, it is recommended to select strong quality indicators (QIs). These are measurable items referring to structures, processes and outcomes of care and need to be evidence-based. For developing QIs in a time-efficient and resource-saving manner, it is worth generating them from clinical guidelines already available or coupling the process of guideline development with the formulation of appropriate QIs.

Medical guidelines are documents produced with the aim of guiding decisions and criteria regarding diagnosis, management and treatment in specific areas of healthcare. They identify, summarise and evaluate the highest quality evidence (mostly from systematic reviews) and most current data about prevention, diagnosis, prognosis, therapy risk/benefit and cost-effectiveness.

Systematic reviews are a type of literature review that collect and critically analyse multiple research studies (mainly randomised clinical trials) using methods that are selected before one or more questions are formulated and then finding and analysing studies that relate to and answer those questions in a structured methodology.

Systematic reviews

Systematic reviews (SRs) are considered the gold standard for healthcare decision-making as they evaluate the quality and confidence of all the available evidence. Their power depends, obviously, on the quality of the information handled. Although they can be based on registries, medical records or case-control studies, randomised clinical trials are the most rigorous method for generating evidence of comparative effectiveness.

The methodological quality and completeness of reporting the systematic reviews is fundamental for optimal implementation of evidence-based health care and the reduction of research waste. An SR must follow, and maintain constantly, the following steps: defining a question and agreeing on an objective method; a search for relevant data from research that matches certain criteria; extraction of relevant data; assessing the quality of the data; and analysing and combining the data.

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In regard to shortcomings within SRs and meta-analysis (use of statistical techniques to combine and summarise the results of multiple studies) which would influence their quality, recent reports indicate that there is lack of clear guidance regarding best SR practices to minimise bias. SRs must be built on a protocol that describes the rationale, hypothesis and planned methods of the review. Protocols should be available and accessible under their registration in tools such as "Prospective Register of Ongoing Systematic Reviews" (PROSPERO). The methodological quality and the completeness of reporting are evaluated by the use of protocols/checklists, among others the "Preferred Reporting Items for Systematic review and Meta-analysis" (PRISMA). However, while PRISMA serves as a resource to improve the quality of reporting of SRs, it is not an instrument to gauge the quality of a SR. For achieving the latter, methods like GRADE (Grading of Recommendations Assessment, Development and Evaluation) were developed for grading evidence.

Medical guidelines

Chong et al. assert: "In order for practitioners to continue to act in the best interest of their patients, organisations will need to be vigilant to ensure that the medical guidelines they produce remain up to date."

Medical guidelines (MG; also called "clinical practice guidelines") are widely used to inform decisions on evaluation and treatment; healthcare providers rely on these documents to implement evidence-based medicine. However, many MGs lack quality by failing to meet widely accepted standards which undermine their clinical utility. Several institutions, such as the Institute of Medicine (IOM) have published a set of standards for developing rigorous and trustworthy guidelines. A standard is defined as a process, action or procedure that is deemed essential to producing scientifically valid, transparent and reproducible results.

The process of developing and funding MGs needs to be transparent because "transparent" guidelines should give users confidence that the document is based on the best available evidence, is largely free from bias, and is clear about the purpose of recommendations to individual patients and, therefore, trustworthy.

One of the more complex issues, when drawing up MGs, is how to handle the conflict of interest (COI) defined as a "set of circumstances

that creates a risk that professional judgement or actions regarding a primary interest will be unduly influenced by a secondary interest." The impact of these conflicts may be partially attenuated by the declaration of all interests and activities potentially resulting in COI by the members of the panel. Disclosures should attend to commercial, non-commercial, intellectual, institutional and publication information campaigns.

Ideally, the panel should have 10 to 20 members and should include generalists and subspecialists of the topic but also epidemiologists, statisticians, "guidelineologists" (experts in the guideline development process) and public representatives. Multidisciplinary can lead to better performance (clarity in creativity in strategic decisions) and may lessen the impact of the influence caused by each individual member of the panel. Multidisciplinary increases the likelihood that all relevant scientific evidence will be critically assessed and identified and increase the sense of "ownership" among audiences.

Guideline developers must define outcomes of interest and the anticipated timing of their occurrence. Stating that a practice is clinically effective is insufficient and specification of the outcomes is required. Guidelines must process the path between the evidence and the recommendation with objectivity and transparency. Recommendations must be classified in relation to their strength and direction and should be clearly worded to avoid any misunderstanding.

Concluding Points

Despite the above points about methodology and transparency, there are several recent articles that enhance the lack of quality of some guidelines and several of them fail to meet the published standards for trustworthy recommendations.

Another important aspect to remember is that the durability of class "I" recommendations varies across individual guidelines even using the same literature. The reason for these discrepancies seems to be related to the low quality of the SRs used for constructing an MG. Common shortcomings are: lack of assessment of publication bias, lack of declaration of conflicts of interest, and lack of providing an *a priori* protocol.

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Don't miss it!

Importance of R&D in IR
Special Session

Saturday, September 16, 11:30-12:30
Auditorium 10



José Ignacio Bilbao
(EBIR)

University Clinic of Navarra
Pamplona, Spain

Prof. Bilbao heads the University Clinic of Navarra's Interventional Radiology Department, which he co-established. He has been an active member of CIRSE since its beginnings and has attended every congress, often presenting award-winning posters and oral presentations or giving invited lectures. Prof. Bilbao was awarded a Gold Medal at CIRSE 2013 and was the Josef Roesch Lecturer for CIRSE 2010, speaking on TIPS. Earlier in 2017, he received a Gold Medal at the European Congress of Radiology. He has served on a number of CIRSE committees over the years, and currently leads CIRSE's Registry for SIR-Spheres Therapy (CIRT).

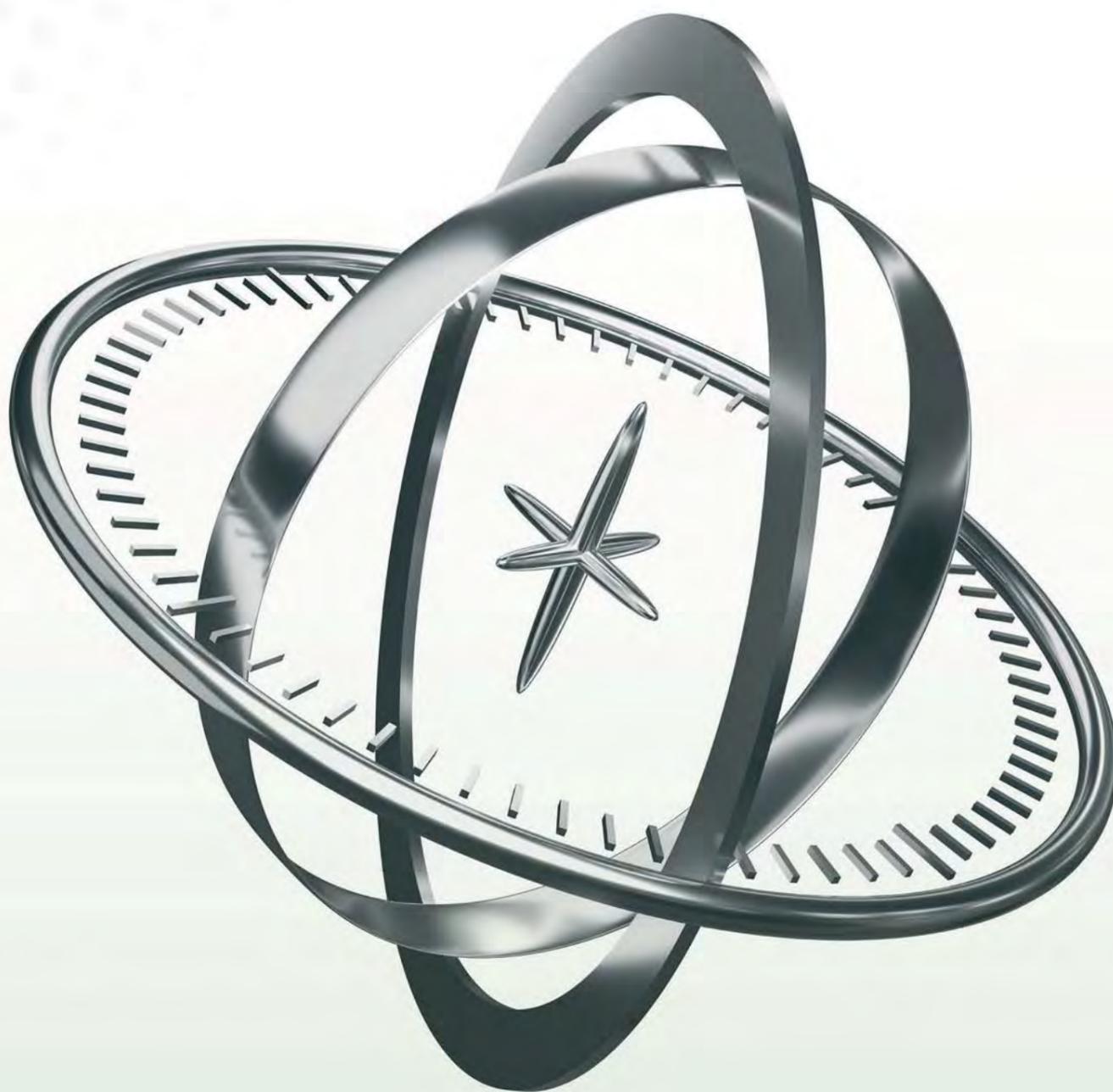
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