IR congress news

CIRSE 2013 - Barcelona
Saturday, September 14, 2013

# THE WAVE OF INNOVATION

*Michael J. Lee*
*CIRSE President*

*Robert Morgan*
*Scientific Programme Committee Chairman*

*José J. Muñoz Ruiz-Canela*
*Local Host Committee Co-Chairperson*

*José J. Martinez Rodrigo*
*Local Host Committee Co-Chairperson*

**Welcome to CIRSE 2013, the high-point of the IR calendar! As always, a carefully constructed scientific programme packed with clinical data and latest innovations awaits you, as well as myriad opportunities to improve your practice and interact with peers from around the world.**

**While we hope you will make the most of the social programme on offer, let's waste no time in getting started with our busy scientific programme – make sure you catch the latest trends in IR, such as today's introduction to renal denervation.**

## Interventional radiology and renal denervation

*Jon Moss (EBIR)*

Hypertension is said to be the single largest contributor to death on the global platform. Estimates are around one billion for the world population, which translates into roughly one in seven people. Approximately one third of these are treated and controlled, another third treated but uncontrolled and the final third remain untreated (Fig. 1). A largely asymptomatic disease, the 'sting in the tail' is the long-term damaging effect it has on many of the body's systems, particularly the heart, brain and kidneys. Two thirds of strokes and half of all heart attacks are caused by hypertension. There is a linear relationship between blood pressure and cardiovascular death, so that with every 20 mm increase in systolic pressure, the 10-year risk doubles.

Although there have been huge steps forward in the pharmacological control of hypertension over the last 50 years, there are many obstacles – not least patient compliance. We should not underestimate the challenges in persuading a patient with no symptoms to take lifelong medication (sometimes suffering side-effects) with little, if any, short-term gain.

Resistant hypertension is a defined sub-group:

- BP consistently >140 mm (>130 mm if diabetic)
- On at least 3 different medications
- Treatable secondary causes (e.g. adrenal disease) excluded.
- Poor compliance addressed

The prevalence of this sub-group in the hypertensive population is difficult to accurately quantify (a figure as high as 30% has been quoted) and a more reasonable estimate after specialist work-up and investigation is more likely to be 5-10%. However, with as many as one third of the population suffering from hypertension, this adds up to a substantial global healthcare problem.

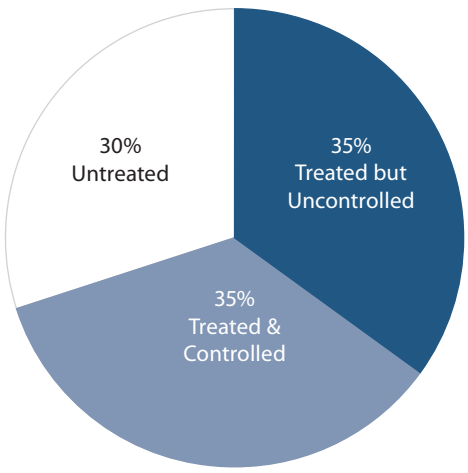



*Fig. 1: The epidemiology of hypertension*

**Sympathetic nervous system**

The cause of hypertension remains largely elusive, but for several decades we have known that the sympathetic nervous system appears to be in overdrive, referred to by some as a 'sympathetic storm'. This complex system of nerves provides a communication pathway between many parts of the body: brain, heart, kidney, blood vessels, skin and muscle, to name but a few. Nerves linking the brain and the kidney are of particular interest and over-activity in these pathways leads to the retention of sodium and water, vasoconstriction and activation of several neuroendocrine systems. These all summate and have a potent adverse effect on blood pressure. Early work in the 1930s involved surgeons dividing these nerve pathways and this often resulted in a potent lowering of blood pressure. The price, however, was significant post-operative morbidity and mortality and with the advent of ever increasingly potent medications, the operation fell into disuse.

**Catheter-based renal denervation**

With the development of radiofrequency (RF) energy probes for interrupting abnormal nerve pathways in the heart and treating malignant tumours, an opportunity was grasped using the same technology to destroy the sympathetic nerves running to and from the kidneys. This entails a minimally invasive endovascular approach, far safer than the surgical attempts of the 1930s.

The procedure involves applying some form of energy (e.g. RF) to the inside wall of the renal artery, thereby destroying the sympathetic nerves that run on the outside of the vessel (Fig. 2). Both the afferent (running from the kidney) and the efferent (running to the kidney) nerves are targeted in a non-selective manner. The renal artery is accessed using standard endovascular catheters from the femoral artery. Both kidneys are treated and the procedure takes around 30-45 minutes. The procedure is carried out under local anaesthesia and conscious sedation and many patients can be treated on a day-case basis.

### Don't miss it!

**An introduction to hypertension for interventional radiologists**
**CIRSE meets ESH**
Saturday, September 14, 16:15-17:15
Room 115

**Jonathan Moss**
*(EBIR)*
*Gartnavel General Hospital*
*Glasgow, UK*

*Prof. Jon Moss is the Chairperson of the CIRSE Renal Denervation Task Force, which is responsible for investigating the potential of this new therapy and advising the Executive Committee accordingly. This investigative work involves collaboration with other medical interest groups, as well as looking into possible trials, registries and data collation, and organising information events for the IR community.*

*Prof. Moss is interested in both vascular interventions and non-vascular interventions, and has been instrumental in developing the BSIR national registries, which include BIAS, a performance indicator registry for iliac interventions. In 2007, he was appointed to the honorary chair in radiology at the University of Glasgow. In addition to having written over 16 book chapters and 63 publications, he serves on the editorial board of CVIR. Prof. Moss has delivered many presentations and lectures at national and international meetings, including the Andreas Gruentzig Lecture at CIRSE 2011, and will act as Local Host Committee Co-Chairman for CIRSE 2014 in Glasgow.*

*continued on page 2* >>

>> **The renal denervation team**

A multidisciplinary approach to RDN is essential, and this reflects good practice and governance, to maximise patient safety and outcomes. The team should include, as an absolute minimum, a hypertension specialist and a vascular interventionalist. Careful patient selection is critical and other causes such as 'white coat' hypertension, poor compliance and treatable secondary causes of hypertension should be excluded.

The interventionalist must be familiar with renal artery catheterisation and rescue procedures should complications arise, e.g. arterial dissection, occlusion and embolisation. Interventional radiologists are in a strong position to fulfil this role and already undertake other renal artery intervention such as stenting and embolisation.

**The technology**

A US company (Ardian) launched the first commercial product (Fig. 2) and this device remains the global leader. With so much commercial interest at stake, there has been an almost unprecedented explosion in activity from the device industry. To date there are six CE-marked devices, with another 50 or so in various stages of development. Other forms of therapy, such as high intensity focussed ultrasound, drug-laden nanoparticles and local drug delivery, are being researched. Much of this technology is running ahead of itself and there is very little good evidence to support the newer devices at present, although that is rapidly changing.

Most of the CE-marked devices need a suitable 'landing zone' of about 2 cm within the renal artery, with a minimum diameter of 4 mm. This remains a significant issue for some patients with early arterial branching and multiple renal arteries which are often under 4 mm in diameter.

**Evidence base for RDN**

Pioneering work led by Esler in Australia led to a trail-blazing 'proof of principle' publication (Symplicity HTN-1) in the Lancet (2009). This was followed by another landmark study from the same group, this time a randomised controlled trial (Symplicity HTN-2) in the same journal in 2010. Both these studies showed a convincing drop in office blood pressure in the

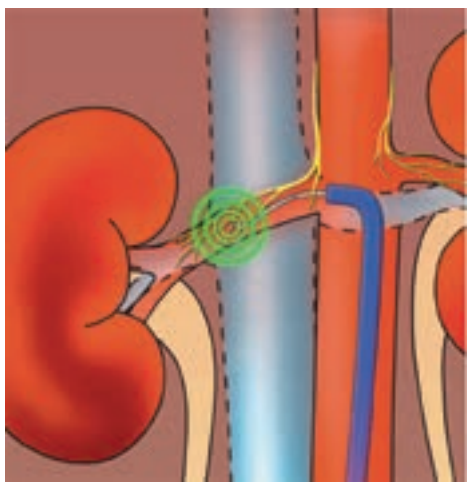


*Fig. 2: Diagrammatic representation of renal denervation*

region of 33 mmHg systolic and 11 mmHg diastolic at 6 months. In the randomised study, there was no drop in BP in the control arm and the group difference was highly significant. These were small studies including less than 200 subjects and a third and larger trial Symplicity HTN-3 (600) is underway in the USA and includes a sham arm. The evidence base for the other CE devices is less mature and with small numbers, but larger trials are in progress.

There is little long-term data with such a new technology, but 36-month results seem to demonstrate durability.

From a safety perspective, there have been surprisingly few concerns. Anecdotal reports of arterial dissection and other vessel damage seem few and far between. Perhaps this is because the devices are only used when there is a normal renal artery free from atheromatous disease. Further confirmation of safety will require larger numbers followed longer term, and the on-going national registries should address that concern.

The procedure holds major potential, but the evidence must be carefully assessed before CIRSE establishes a formal position on training and advocacy. To carefully 'test the waters', CIRSE has established the Renal Denervation Task Force, which is working, in close collaboration with other medical interest groups and industry representatives, to establish the future direction of the therapy. This includes careful evaluation of trials and technologies, which is being done on CIRSE's behalf by Professors Anna Belli, Dierk Vorwerk, Mick Lee, Jim Reekers, Jan Peregrin and myself. It is important that CIRSE, and interventional radiology as a discipline, are involved at this early stage, and I hope this will bode well for the future.

**Other indications**

Although the evidence base and national and international consensus statements only support the use of RDN for resistant hypertension, there may be other indications. The involvement of the sympathetic nervous system in so many of the body's systems has encouraged physicians to explore new indications. Cardiac failure, diabetes mellitus, sleep apnoea, chronic kidney diseases, intractable ascites and polycystic ovarian syndrome are all currently being investigated.

**RDN at CIRSE 2013**

While RDN is still in its infancy, and a cautionary approach must be taken, requiring a solid evidence base before moving it beyond the trial stage, CIRSE is nevertheless keen to keep its members abreast of the latest data and techniques. To this end, several session types have been included in this year's programme, namely a dedicated Special Session, several Hands-on Workshops and a CIRSE meets ESH session, which will take place this afternoon. Our hypertensionist colleagues are sure to have valuable insights to share with us, and their presence at CIRSE is most welcome.

**The future**

RDN appears to have a solid and exciting future and we may only be on the first few pages of a very thick book. Some have likened it to angioplasty in importance to the interventional radiology community.

The thirst for high quality evidence and cost effectiveness at national level and international level should keep RDN firmly on the rails. At a time of global financial uncertainty, the pressure is on in many countries to offer clinically effective and cost-effective medicine. RDN deserves to be on the medal podium.

## RDN Programme at CIRSE

Hands-on Workshop
**Priniciples to practice: Renal denervation**
*Saturday, 08:30-13:00 (3 groups), Simulator Gallery*

CIRSE meets ESH
**An introduction to hypertension for interventional radiologists**
*Saturday, 16:15-17:15, Room 115*

Special Session
**Renal denervation**
*Sunday, 10:00-11:00, Room 112*

Hands-on Workshop
**Renal denervation**
*Sun/Mon/Tues, 11:15-12:45, Room 118*

## Satellite Symposia

**Sunday, September 15**

**Boston Scientific**
Innovation in renal denervation
*13:00-14:00, Room 112*

**Medtronic**
Medtronic's renal denervation leadership in evidence, technology and therapy development with 6 years of clinical experience and thousands of patients treated
*17:30-18:30, Room 115*

**Monday, September 16**

**Covidien**
The next frontier in renal denervation technology for the treatment of resistant hypertension
*14:15-15:15, Room 115*

**Boston Scientific** (session in German)
So einfach kann Fortschritt sein –
renale denervation mit Boston Scientific
*14:00-15:00, Learning Centre*

**Terumo Europe**
The hot topic collection: from a novel carotid stent to renal denervation and cellular therapy
*14:15-15:15, Room 112*

**St. Jude Medical**
Clinical update on EnligHTN™, the original multi-electrode catheter-based renal sympathetic denervation system
*18:00-19:00, Room 115*

# Opening Ceremony and Awards – 14:30, Room 116

**Welcome to the largest IR conference of the year! As always, the CIRSE Annual Meeting is bringing together the top researchers and lecturers in the world to provide a unique collection of workshops, lectures, special sessions and hot topic symposiums which explore every aspect of IR.**

The range of procedures, techniques and devices on offer at the congress is a testament to the innovation and hard work of interventional radiologists, working as individuals or as research groups. To celebrate these achievements, please join us today at 14:30 in Room 116 for our Opening Ceremony and Awards, with entertainment provided by the internationally renowned guitarist, Pedro Javier González.

## Welcome Address

*Michael J. Lee, CIRSE President*
*José J. Martinez Rodrigo & José Joaquin Muñoz Ruiz-Canela, CIRSE 2013 Local Host Committee Co-Chairpersons*
*Robert Morgan, CIRSE 2013 Scientific Programme Committee Chairperson*

## CVIR Editor's Medal Award

The continued increase in qualifying articles, reader interest and author submissions meant that an impressive 19 articles were nominated for the prestigious Editor's Medal. However, there was one clear winner:

**Uterine artery embolization versus myomectomy: impact on quality of life – results of the FUME (Fibroids of the Uterus: Myomectomy versus Embolization) Trial**
*I.T. Manyonda, M. Bratby, J.S. Horst, N. Banu, M. Gorti, A.M. Belli*
Cardiovasc Intervent Radiol. 2012 Jun;35(3):530-6. doi: 10.1007/s00270-011-0228-5. Epub 2011 Jul 20.

## Gold Medallist

**José I. Bilbao**

*Laudation: Hervé Rousseau*

José Ignacio Bilbao studied medicine at the University of Navarra; following his specialisation in radiology at the University Clinic of Navarra (CUN), he worked in the hospital's Radiology Department. In 1991 he became Associate Professor of Radiology and Physical Medicine at the University of Navarra and a Professor in 2007. From 1998 until 2004, he directed the Radiology Department of the CUN.

Prof. Bilbao has authored 35 book chapters and co-edited a book on radioembolisation with Dr. Reiser in addition to publishing 155 articles in Spanish and international peer-reviewed journals and editing and reviewing for 10 Spanish and international journals, including JVIR, for which he is associate editor.

In 1986, Prof. Bilbao co-founded the Spanish Society of Vascular and Interventional Radiology (SERVEI) which he headed from 1992 until 1995. He is currently President of the European Congress of Radiology (ECR 2013). Further, he served as the delegate for international affairs of the Spanish Society of Medical Radiology (SERAM) from 2002-2006. Today, he is one of the society's representatives in the National Commission on Radiodiagnostics.

## Excellence and Innovation in IR

*Sophie Lerouge*

*Gilles Soulez*

Kindly sponsored by the R.W. Günther Foundation, the Award for Excellence and Innovation in IR celebrates one of the key aspects of interventional radiology – that of innovation.

This year, the award will go to a team of IR researchers from Montreal, Canada, for their innovative work in developing a radiopaque gel combining occlusive and sclerosing properties for the treatment of endoleaks, vascular malformations and venous disease.

The team have developed an innovative material which fulfils an unmet need in embolisation procedures and has potential for several IR applications. This gel is based on the combination of chitosan (a natural biocompatible polymer), sodium tetradecylsulfate (STS – a well-known sclerosing agent) and iodine contrast agent.

The gel shows good short-term radiopacity, meaning it loses its visibility after a few hours, whereas ethanol is not visible under fluoroscopy and the high and permanent radiopacity of Onyx precludes follow-up by CT scan and can impair further embolisation procedures. Further, the gelation kinetics offers good control at injection and limits migration. Another advantage is that the biocompatibility of chitosan hydrogels suggests that this new embolising agent could be used to embolise large areas without systemic toxicity.

Patented in the US and Canada, the gel was developed by a team working at the CHUM research centre (University of Montreal, Canada). The project was a collaboration between the Laboratory for Endovascular Biomaterials (LBEV, headed by Dr. Sophie Lerouge), and the team of interventional radiology and imaging research (Research Director, Dr. Gilles Soulez). Dr. Lerouge is a Professor at Ecole de technologie supérieure (ÉTS) as well as the holder of the Canada Research Chair in Endovascular Implants and Biomaterials. She heads a multidisciplinary research programme which aims to improve endovascular implants and therapies, and she has particularly focused on understanding the mechanisms involved in failures or complications during treatments, and strategies to resolve these by developing innovative coatings and thermogels. Dr. Soulez is the Academic Chair of the Department of Radiology, Radio-Oncology and Nuclear Medicine, Faculty of Medicine at the University of Montreal and has published over 140 articles in peer-reviewed journals. He is also a reviewer for a number of well-regarded English- and French-language journals, and has been involved in multiple preclinical and clinical research studies, exclusively dedicated to vascular and interventional radiology.

The team will be represented at CIRSE 2013 by Dr. Soulez.

## Pedro Javier González | Guitarist

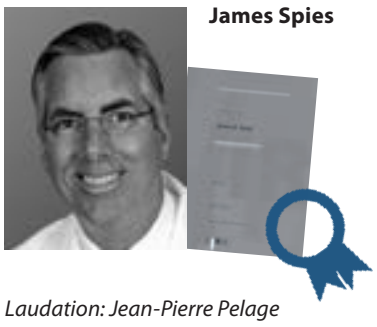
Entertainment will be provided by Pedro Javier González, a Spanish guitarist well-known for his excellent and versatile playing, having recorded eight music albums and collaborated with classical, flamenco, jazz, pop and rock artists. Throughout his long and varied musical career, González has received several awards for his flamenco guitar-playing.

In addition to his membership of El Ultimo de la Fila and flamenco band Arrebato, he began his solo career in 1996, releasing a compilation of pop and rock classics in his Guitarra album. His work as a producer, arranger and music director resulted in his nomination for the "Best Musical Arranger" at the Spanish Music Awards in 2004.

Nowadays, he is focussing once again on his skills as a solo guitarist. This includes giving classical-flamenco concerts, starting a new jazz duo project, founding the Transversal projects and making his debut with the Concierto de Aranjuez in Moscow accompanied by the Russian Philharmonic Orchestra.

## Distinguished Fellow

**James Spies**



*Laudation: Jean-Pierre Pelage*

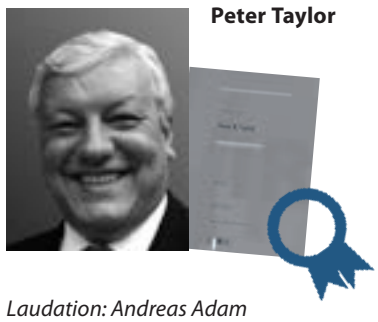
James B. Spies is Professor and Chair in the Department of Radiology at Georgetown University Hospital in Washington DC. After attending Georgetown University School of Medicine, Dr. Spies completed a Radiology Residency at the University of California, San Francisco and a fellowship at New York University School of Medicine in Vascular and Interventional Radiology.

He was in private practice for several years before joining the faculty of Georgetown University in 1997, when he became an associate professor of radiology. Dr. Spies received his professorship in 2003 and has served as chair of the Department of Radiology at the Georgetown University School of Medicine since 2005.

Prof. Spies is a Fellow of the SIR and the ACR and has served on numerous national committees for both organisation and currently serves as Secretary of the SIR. Prof. Spies has been a reviewer for numerous journals, including JVIR, *Human Reproduction, Obstetrics and Gynecology, the Journal of Women's Health,* the *European Journal of Radiology* and many more.

## Distinguished Fellow

**Peter Taylor**



*Laudation: Andreas Adam*

Peter Taylor trained as a vascular surgeon at St. Mary's Hospital in Paddington and was appointed to Guy's and Lewisham Hospitals in 1991 and subsequently to Guy's and St Thomas' Hospital in 1997. Notable collaborations with early endovascular pioneers included Claude Miahle, Fred Keller and Julio Palmaz which placed Guy's at the forefront of aortic endovascular intervention in the UK.

Prof. Taylor has written many peer reviewed papers and book chapters. He is co-chairman of the international Charing Cross Meeting held annually in London and is a regular speaker at the Veith Symposium in New York. Along with John Reidy he organises the Guy's Thoracic Masterclass which is an international meeting concentrating on cutting edge endovascular thoracic intervention. He is also a referee for nine major vascular journals. Prof. Taylor was president of the Vascular Society of Great Britain and Ireland in 2008-2009. He became Clinical Professor of Vascular Surgery at King's College London in 2010 and was made an honorary fellow of the British Society of Interventional Radiologists in 2010.

## Distinguished Fellow

**Bien Soo Tan**

*Laudation: Anthony Watkinson*

Tan Bien Soo's initial training in interventional radiology was in the Department of Diagnostic Radiology at the Singapore General Hospital (SGH), followed by a fellowship at Guy's Hospital in London. Soon after returning to Singapore in 1995, he was appointed Director of Vascular and Interventional Radiology in SGH.

Dr. Tan was the inaugural Chairman of the Cardiovascular and Interventional Radiology Section of the Singapore Radiological Society from 2000 to 2002. Having trained in Europe, he has been a corresponding member of CIRSE since 1996. He was conferred CIRSE fellowship in the year 2000 and is also a corresponding fellow of SIR.

In 2011, he joined the team of editors at CVIR. He is currently the President-Elect of the Asia Pacific Society of Cardiovascular and Interventional Radiology and the organising chairman of the Asia Pacific Conference of Cardiovascular and Interventional Radiology 2014, which will be held in Singapore. He was Head of the Department of Diagnostic Radiology in SGH from 2002 to 2010. He was also the President of the Singapore College of Radiologists from 2009 to 2011.

BTG

# CHARITY RUN & FOOTBALL CUP

## Go an extra 2 miles for children with cancer!

Another exciting evening of sports and socialising awaits you in here Barcelona – and as it's for charity, you don't even have to feel guilty about staying up late on a school night!

The event will take place tonight at 19:00 at the MarBella Sports Centre, overlooking the Mediterranean Sea. Shuttle buses* will be waiting outside the congress centre to take participants and spectators to the night's event.

The venue offers a 400-metre running track and a football field, as well as changing and showering facilities. The total distance of the run will be 3.2 kilometres; many participants have already signed up, and anyone who still wishes to join can register at the Kuoni desk, located in the entrance area of the congress centre.

This year, football teams from Germany, the UK, France, Switzerland, the Czech Republic, Italy and Belgium will battle it out for the coveted title – will any of them be able to beat 3-in-a-row champions Spain on their home turf?
Join us for an exciting play-off and cheer your team to victory!

A fixed amount of €5,000 plus the amount raised at this event will be donated to the Österreichische Kinder-Krebs-Hilfe (Austrian Childhood Cancer Organisation) – an independent, not-for-profit society and registered charity, which is financed exclusively from private donations.

Its mission is to support children and young adults suffering from cancer, as well as their families, by assisting them in medical, social, psychological and legal aspects. For more information, please visit www.kinderkrebshilfe.at.

Kinder - Krebs - Hilfe

**Register now at the Kuoni booth!**

A collection point for voluntary donations will be available at the event.

**If you haven't signed up yet, be sure to nip back to your hotel to pick up your running shoes or your pom-poms – the buses leave the congress centre at 18:30 tonight!**




* The transfer from the CCIB to MarBella Sports Center takes approximately 5 minutes. After the event, shuttle busses from the sports centre to some central points in the city will be provided.

CIRSE supports compliance with ethical standards. Therefore, CIRSE emphasises that the present invitation is directed to participants of CIRSE 2013 and recommends that the participants who want to take part in the BTG Charity Run and/or Football Cup shall bear any and all costs in this context (including donations) themselves.
Kindly note that participation in the BTG Charity Run and/or Football Cup is NOT included in the CIRSE 2013 registration fee!

# Improving Safety, One Tick at a Time

*Tochi Ugbor, CIRSE Office*

While it may be true that to err is human, making mistakes is also a luxury that is not afforded to all humans alike – for medical doctors a simple mistake can have fatal consequences and must be avoided where possible. Numerous studies have been carried out examining the tragic impact human error can have on clinical practice. A landmark study released in 2009 was one of the first to draw attention to a simple yet effective solution to the problem – the Safety Checklist.

In 2011, the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) created the first international safety checklist for interventional radiology (IR). Only one year after it was published, the checklist is already proving a valuable tool for improving IR patient safety in Europe.

**How Ticking Boxes Can Save Lives**

According to CIRSE President and co-author of IR Safety Checklist, Professor Michael J. Lee, "The advantage of a safety checklist for IR is that its ensures that human error in terms of forgetting key steps in patient preparation, intra-procedural care and postoperative care are not forgotten". In addition, implementation of the checklist in his institution, Beaumont Hospital in Dublin, Ireland, has also "…helped build rapport within the IR team and most importantly, it has meant that all patients receive appropriate peri-procedural care and medications that help prevent complications." This is comparable to the experience at the AMS, Academic Medical Centre, in the Netherlands which has employed a similar checklist for several years.

**How the Checklist Works**

The checklist was created by an expert group of interventional radiologists and tested in four European hospitals. First published in 2011, the single-page document was based on the WHO Surgical Checklist and the Dutch RAD PASS Safety Checklist for IR. Comprising three sections – "Procedure Planning", "Sign-in" and "Sign-out" – the checklist can easily be modified to suit the requirements of individual hospitals.

**A Forecast for Success**

The renowned Surgical Safety Checklist, sponsored by the World Health Organisation (WHO), was the first medical safety checklist to gain widespread acclaim from various institutions around the world. The WHO Surgical Safety Checklist was used as a model for CIRSE's IR Safety Checklist and is therefore seen as an indicator of the possible benefits that implementing the IR Safety Checklist can bring.

The WHO Surgical Safety Checklist first came into the limelight when the results of a year-long pilot study on the checklist were published in the New England Journal of Medicine in 2009. The study highlighted how the list had led to reductions in complication rates of over 33% and significant decreases in mortality rates. Subsequent studies estimated that as many as half a million deaths per year can be prevented simply by implementing the Checklist. The WHO Surgical Safety Checklist is now being used in over 1,800 hospitals around the world.

**A Promising Future**

Despite its recent introduction, CIRSE's IR Safety Checklist has already seen its first successes. Currently in place in various hospitals throughout Europe, it has led to significant improvements in the safety dynamics of these institutions. The IR Safety Checklist was also well received by the European Commission's Health and Consumers Directorate-General and CIRSE representatives have been invited to Brussels for talks on patient safety in IR.

CIRSE hopes that the widespread adoption of the checklist will lead to improvements in patient safety within Europe and also well beyond its borders. The society has made the checklist available, free-of-charge, on its website.

| Procedure Planning | Sign-in | Sign-out |
|---|---|---|
| · Helps collect important information on the patient's medical history (e.g. allergies to contrast agents)<br>· Helps the medical team prepare for possible<br>· Completed by the IR or ward nurse | · Lists the immediate checks that must be performed when the patient is in the IR suite (e.g. confirmation of patient identity)<br>· Completed by an IR resident, nurse or IR staff while the patient is in the room | · Helps plan and collect information on follow-up tests and treatments required<br>· Completed by the operating IR |

# 5 minutes with Prof. Erika Denton

*Consultant Radiologist, National Clinical Director for Imaging at the Department of Health, UK*

**Q:** Professor Denton, your view of there being an inadequate provision of interventional radiology (IR) in England is well documented. What has been the consequence of this on patients and medical institutions?

**A:** It must be said that England has had fantastic IR services from centres of excellence led by some of the country's leading interventional radiologists, such as Prof. Andy Adam, Prof. Tony Watkinson and Dr. Tony Nicholson, just to name a few. However, these doctors and their hospitals only cover the need for IR procedures of a small geographic region. People from more rural areas often do not have access to much-needed IR services, such as trauma interventions or uterine fibroid embolisation (UFE) which is often required by women whose fibroids are causing them severe problems, such as very heavy menstrual bleeding.

I am of the firm opinion that all patients should have the same choices when it comes to treatment options, regardless of where they live. Right now there is considerable variation in provision of IR throughout the UK, particularly for potentially lifesaving emergency and out-of-hours procedures. The larger centres therefore have the responsibility of extending IR beyond their patient radius by training interventional radiologists from other institutions and, together with support from the Department of Health and NHS Improvement create IR services in co-operation with neighbouring hospitals.

**Q:** Today's patients show an increasing desire to take control of their own health, often seeking state-of-the-art IR procedures. How and why should institutions support them to make informed decisions?

**A:** I think that hospital staff and administrators should imagine every patient is one of their loved ones, their child, mother or brother. This ensures everyone understands and supports patients seeking the best and least invasive treatments and gives them all the information they need to make an informed decision and decide what is best for them.

**Q:** How can patients benefit from a superior IR service in terms of treatment quality and safety?

**A:** I think one of the best examples illustrating the benefits of IR service is treatment of the diabetic foot. Due to the constantly increasing prevalence of diabetes in an aging population, the number of major amputations in patients with Type II diabetes has nearly doubled over a 10 year period. The use of IR techniques, especially when applied from an early stage, significantly reduce the risk of amputation and therefore improve quality of life.

**Q:** How essential is IR's integration in emergency treatment protocols?

**A:** IR plays a major role in emergency medicine. Due to the unexpected nature of emergencies, IR's formal integration into trauma care naturally requires 24-hour IR cover. There are many ways in which this can be done, either by moving the patient to the IR or the other way around. Either way, the acute admissions unit must have a formal and organised plan in place. Working ad hoc in such situations is not acceptable. The trauma service interventional radiologists provide must be part of recognised care.

**Q:** In your experience, what financial and non-financial benefits does a well-resourced IR service bring to a hospital?

**A:** Today we have plenty of evidence that UFE and endovascular aneurysm repair (EVAR) re-vascularisation of the lower limbs for ischemia do not only spare many patients a hysterectomy or an amputation, but are also cost effective. Of course when looking at this you have to include the wider costs for the healthcare system, including such aspects as workdays missed after major surgery versus speedy recovery time, etc.

**Q:** How can hospital administrators contribute to giving patients the opportunity of benefitting from interventional radiology?

**A:** In order to unlock IR's full potential, it is vital to create the proper environment, especially in terms of staffing and technology. The most important factor in this, of course, is putting together a good IR team with dedicated nurses and, if possible, creating a proper IR department with its own beds. An on-call rotation for dedicated IR radiographers should also be established. Of course there should be enough state-of-the- art equipment, and interventional radiology should welcome the opportunity to share this with colleagues from other disciplines if necessary to ensure provision of modern facilities.

Intervention IQ

*These articles were originally published in Intervention IQ magazine. For further information on a range of IR issues, please visit www.iqonline.eu, or visit our IQ Lounge here at CIRSE.*

**Don't miss it !**
**Training and accreditation for IRs**
**Special Session**
Saturday, September 14, 08:30-09:30
Room 115

# The IR/DR Certificate in the USA

*John Kaufman*

**John A. Kaufman**
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*Oregon, USA*

*Dr. John Kaufman is Professor of Radiology, Surgery, and Medicine at Oregon Health and Sciences University, and Chief of Vascular and Interventional Radiology and Associate Director of the Dotter Interventional Institute. He is passionate about the importance of multidisciplinary collaboration and has co-founded several multidisciplinary programmes at OHSU in vascular health, fibroid treatment and liver tumours. He is also highly involved in the IR community, being a past president of SIR, as well as receiving CIRSE Distinguished Fellowship in 2011. Dr. Kaufman has published over 95 peer-reviewed articles, more than 110 contributions and chapters, and edited or authored 6 books, including an introductory IR textbook with Prof. Michael Lee.*

Interventional radiology (IR) was recognised as a primary specialty of medicine in the United States (US) in September 2012. This was the culmination of over six years of work by a joint task force of the American Board of Radiology (ABR) and the Society of Interventional Radiology (SIR). The new specialty will reside within the ABR, joining diagnostic radiology, medical physics and radiation oncology as the fourth primary specialty under its supervision. The approving body, the American Board of Medical Specialties (ABMS), is the umbrella organisation that oversees all of the specialty boards in the US. Achieving this required the support of diagnostic radiology (DR) as well as the approval of other specialties, especially those that are heavily involved in image-guided interventions. Support from other specialties would have been unanimous, but vascular surgery (also a primary specialty in the US) objected. Despite this, the ABMS determined that the best interest of patients would be served by changing IR from a sub-specialty to a specialty. The proposal is now with the Accreditation Council of Graduate Medical Education (ACGME), which is developing the details of the programme requirements and certification requirements for programmes.

The ABMS approved IR as a primary specialty as well as the training programme that would lead to certification in both IR and DR (the IR/DR certificate). A freestanding certificate only in IR was not sought by the ABR and SIR. The reasons for this were the previous failure to approve an IR-only certificate by the ABMS in 2009, rejection of this concept by DR and the overwhelming interest in maintaining DR competency by current US interventional radiologists and trainees. The basic structure of the training will be an internship, three years of DR, and two years of IR (the current model in the US is an internship, four years of DR, and one year of IR). Although this change appears minor and simple, it is actually quite profound and complicated. The extent of this change will be clearer after the ACGME has completed the detailed programme requirements, but there are several that are already obvious.

Currently, IR trainees are sub-specialty fellows who apply for an IR fellowship from a DR residency during their third year of training. They all complete their DR residency before matriculating to the IR fellowship. With the new certificate, it is possible (in fact desirable) for medical students to apply directly from medical school. This complicates the application and resident selection process, as programme directors must now anticipate a change in the resident workforce after PGY 4, one year earlier than the conventional DR residency. Funding for positions is very limited in the US, so adding positions is not easy. Most DR residency programme directors do not want to "lose" residents after PGY 4, as it becomes difficult to cover diagnostic rotations and call.

The IR and DR programme directors must now work closely together, as they effectively share certain residents. Yet, the DR programme director is best positioned to ensure appropriate training during the DR years, and IR programme director for the IR years. The IR/DR residents will be required to take the same physics and general radiology written examination at the end of PGY 4, so the DR training for these residents during PGY 2-4 will be identical to that of a DR-only resident. Fortunately, in most instances these two programme directors will report to the same Radiology Chairman and reside in the same department. Nevertheless, this will potentially complicate the supervision of training.

Extending IR training from the current one year to two years may decrease the overall number of interventional radiologists graduating each year. Most IR fellowships do not have the clinical volume or funding to support double the number of current fellows. However, the conversion of all fellowships to IR/DR residencies will take 4-5 years, during which time new programmes are expected to come on-line, and most current fellowships will expand somewhat.

Lastly, there are concerns that small DR residencies that currently do not have IR fellowships (approximately 1/3 of all DR residencies) will be disenfranchised because of their inability to offer an IR/DR certificate training programme. This will be mitigated if the ACGME ensures maximum flexibility of entry-points into the IR/DR programmes, so that individuals completing a DR residency at one institution could complete the IR residency portion at another. This would also alleviate some of the concern that big IR fellowships have regarding their ability to obtain sufficient slots within their associated DR residencies. Some IR fellowships are so large relative to their DR residency that they would require half or more of the residents each year to fill the IR/DR programme. Allowing the flexibility to fill the IR portion of the residency with some residents completing DR training at another institution will therefore be helpful to both small DR and large IR programmes.

There are numerous advantages to specialty recognition of IR in the US, foremost of which is ensuring the best training – and therefore care of patients undergoing IR procedures. The IR/DR proposal was built and approved on enhancing the non-procedural training aspects, as well as providing increased exposure to the incredibly diverse spectrum of diseases and procedures encompassed within IR. Specialty recognition also brings advantages in terms of funding (the US Government provides some support for primary specialty training, but none for sub-specialty fellowships), stature within hospital hierarchy and interactions with payers.

All things change, and rarely do we have control over that change even when we think that we do. The IR/DR certificate in the US is a change for the positive that will require much work, with inevitable unintended consequences. The final result remains to be defined, but will result in improved training for interventional radiologist and improved care of our patients.

# The IR Education Pathway: Syllabus, Curriculum and Certification

**The last year has been an exciting one for educational progress in IR, as CIRSE developed two important training curricula. Combined with the existing EBIR qualification, this offers a complete training pathway for prospective IRs, from undergraduate training to post-graduate specialisation, and on to EBIR certification.**

These documents are a decisive step towards a harmonised European training pathway for IR. Approaches to training future IRs vary greatly across Europe, and radiology education, especially at undergraduate level, tends to focus on purely on diagnostic radiology. The IR Curriculum and Syllabus counter these issues by providing a framework for training which can be recognised and used throughout Europe, bringing Europe closer to CIRSE's goal of having standardised high-quality IR training across Europe.

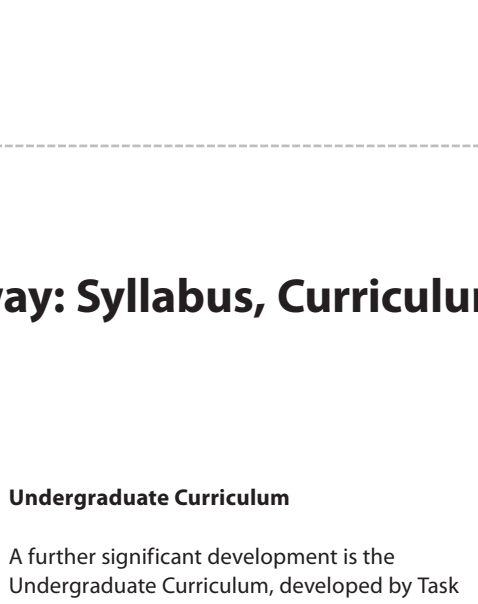
Prof. Anna-Maria Belli led the Curriculum and Syllabus Task Force. Their proposals for a new curriculum were combined with an improved and expanded version of CIRSE's existing syllabus. The curriculum describes the objectives, learning methods, outcomes, supervision and assessment of IR training, while the syllabus addresses the knowledge and competencies which ought to be covered. Together, they cover the breadth and depth of knowledge that is to be acquired before an IR qualification can be achieved.

The importance of patient safety is highlighted throughout the document, demonstrated by the curriculum's emphasis on key safety topics such as the ALARA principle. Indeed, the document itself is a tool to improving patient safety, as it ensures that the necessary skills and knowledge are formally documented, and will enable more unified training across the European continent. This will allow a high base-level of competence, and allow IRs more flexibility in moving to different hospitals or countries.

**Undergraduate Curriculum**

A further significant development is the Undergraduate Curriculum, developed by Task Force Member Prof. Elias Brountzos. This was published on the CIRSE website and outlines the main learning outcomes that should be imparted to undergraduate medical students.

If adopted, this curriculum will ensure that medical students are aware of key IR procedures, allowing them to make a more fully informed choice once they move to post-graduate level. The document was distributed in the autumn to universal acclaim, and Members are encouraged to send the document to their medical school deans or others in charge of undergraduate teaching.




**The European Board of Interventional Radiology**

Here in Barcelona, yet more candidates are sitting the prestigious EBIR exam. Since 2010, the examination has allowed IRs from all over Europe to demonstrate their competence, and there are currently more than 280 EBIR holders.

Further exams will be offered at ECR 2014 in Vienna, and CIRSE 2014 in Glasgow – more information can be found by visiting the CIRSE website.

In the last year, the Executive Board and EBIR Examination Council invested much effort into further improving the exam. The expertise of a qualified educationalist was engaged, who provided valuable advice in ensuring that the exam is rigorous, just and reproducible. The oral and written components have thus been improved, and the acceptance criteria for sitting the exam have been tightened.

The timely publication of the Curriculum and Syllabus gives a firm basis for the exam, making it fairer for candidates, who now have a solid reference frame to work from. Combined, this complete educational structure offers a clear and unambiguous pathway to ensuring a high quality of IR care in Europe.


**Completing the educational circle**

Not only will this improve the standard of care provided by IRs in Europe, it also strengthens IR's position as a fully-fledged clinical subspecialty. The existence of a harmonised training pathway for IRs promotes pan-European co-operation, as all IRs will be able to access the same depth and breadth of training, making it easier for them to take their work abroad.

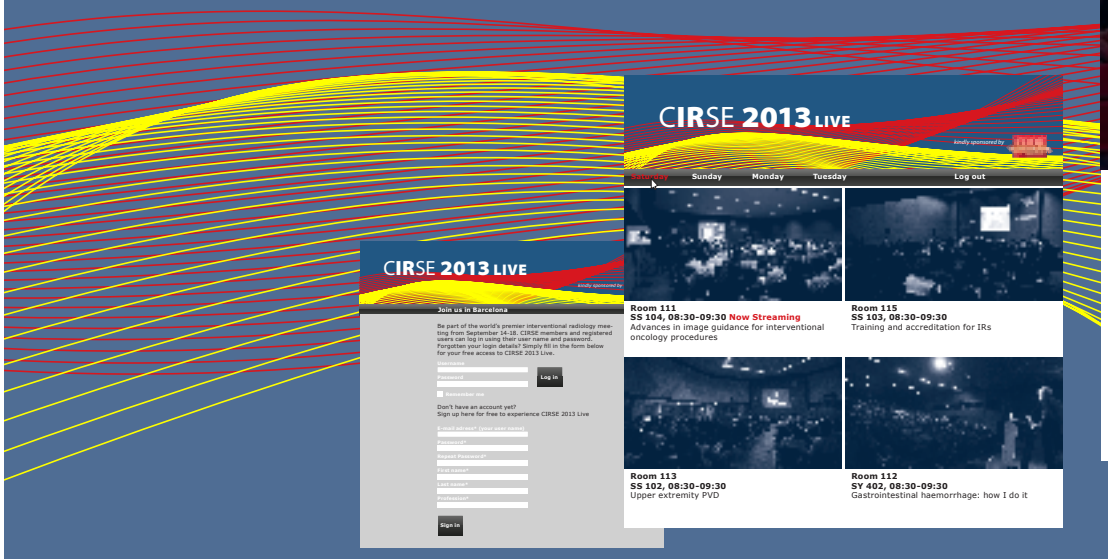
The IR Curriculum and Syllabus is available on the CIRSE website, and will be revised and updated every five years.

**Good luck to those sitting the exam here at CIRSE 2013!**

# CIRSE 2013 LIVE

**The CIRSE live stream returns this year, having been an instant hit when it made its debut last year. CIRSE 2013 LIVE will be hosted on www.esir.org and is a great way to share some of the highlights of the Annual Meeting with those who are unable to attend.**

Bring your family to the Awards Ceremony via CIRSE 2013 Live, and let them see you going onstage to collect your award. Or get your colleagues back home to join you for a cutting-edge lecture, so you can discuss it together when you return.





**10:00-11:00**
**SS 102 - Upper extremity PVD**

102.1 - Optimal imaging assessment for supra-aortic and upper limb arterial disease
*C. Hohl (Siegen/DE)*

**Coming up next:**
**SS 202 - Aortoiliac disease**
Saturday 10:00-11:00

Check the live stream programme:
**Saturday | Sunday | Monday| Tuesday**

# Restaurant and Snacks at CIRSE 2013

**At CIRSE 2013, you can take advantage of the Congress Centre's coffee bar and restaurant facilities, located in the exhibition hall.**

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**If you prefer a quick snack or a fresh drink, the cash coffee bar will be open all day.**

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**Drop by to see what's on offer!**

# IR in desmoid tumours: a new frontier

*Georgia Tsoumakidou, Afshin Gangi (EBIR)*

**Don't miss it !**
**New clinical applications for interventional oncologists 1**
**Special Session**
Saturday, September 14, 10:00-11:00
Room 115

**Georgia Tsoumakidou**
*University Hospital of Strasbourg*
*Strasbourg, France*

*Dr. Tsoumakidou works as part of a highly innovative IR team that is well-known for its ground-breaking work in oncology and musculoskeletal interventions. The team was awarded the EPOS Educational Magna Cum Laude Award in 2009 and 2010, as well as the Electronic Poster Educational Magna Cum Laude Award and Educational Cum Laude Award in 2011. Her recent papers include 'Interest of Electrostimulation of Peripheral Motor Nerves during Percutaneous Thermal Ablation' and 'Percutaneous MR-guided cryoablation of prostate cancer: initial experience'.*

*The team is led by Prof. Afshin Gangi, who is renowned for his pioneering IR work, and who delivered last's year prestigious Gruentzig Lecture at CIRSE.*

Desmoid tumours (DT) are monoclonal neoplasms originating from the musculoaponeurotic tissues and characterised by an infiltrative growth, a tendency towards local recurrence and an inability to metastasise [1, 2]. Though histologically benign, their locally invasive behaviour often leads to unfortunate consequences such as disfigurement, functional impairment or even fatality.

Treatment options for DT depend on the aggressiveness of the lesion and the presence of symptoms. Surgery has traditionally been considered the therapeutic mainstay for primary, resectable, localised DT. Because surgical resection is often associated with considerable and unacceptable function loss, radiotherapy, chemotherapy, hormonal therapy, non-steroidal anti-inflammatory drugs and even a wait-and-see policy have been advocated as further therapeutic options, either alone or in combination [3, 4]. Unfortunately, recurrence rates are high (in the range of 19-77% after surgery), and various strategies to improve outcomes have become the subject of much on-going clinical and laboratory research [1, 2]. In recent years, a better understanding of the aetiology of the aggressive fibromatosis has resulted in the identification of three distinct mutations (T41A, S45F and S45P), with the S45F mutation being responsible for a high recurrence rate after surgical excision of the primary tumour (relative risk of 3.5) [5, 6].

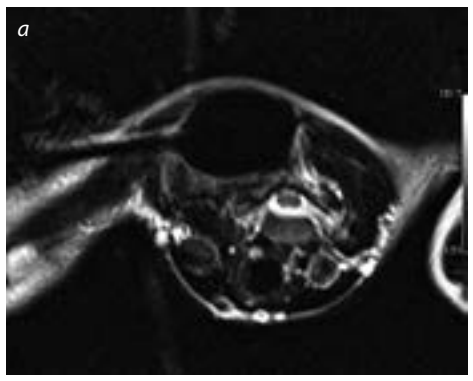


*Fig 1: Voluminous cervico-thoracic DT treated with percutaneous cryoablation in two consecutive sessions. (a) The superior part of the lesion was treated with percutaneous cryoablation under MR guidance and the inferior 6 months later under CT guidance (b). (c) The MR control before and after treatment demonstrates the complete resolution of the lesion. (d) Significant reduction of the tumour size was noted 6 and 12 months post-treatment. The patient was symptom-free at short- and long-term follow-up.*

Over the past few decades, different percutaneous image-guided thermal ablation techniques (radiofrequency, cryo-, microwave ablation and HIFU) have gained a distinct position in oncology [7]. The above techniques have been used for curative and palliative treatment of a variety of benign and malignant tumours (kidney, liver, lung, prostate, bone, and soft tissue lesions). They have a limited invasive character and are associated with a low complication rate, when compared to surgery.

Interestingly, until now, only few reports existed in the literature regarding the use of percutaneous techniques for the management of desmoid tumours. In 2010, Kujak et al. [8] published the first series of extra-abdominal DT treated with cryoablation, and in 2013 Barrow et al. [9] described the use of radiofrequency ablation for the treatment of multiple recurrent desmoids of the abdominal wall in a patient with familial adenomatous polyposis.

In order to support the role of IR in the management of patient with DT, we will concentrate on the following questions. Which patients are good candidates for percutaneous treatment? When and how should we treat them? Which ablation technique is most suitable? Which imaging modality should be preferred?

Percutaneous ablation techniques should be reserved for patients with extra-abdominal desmoid tumours. The intra-abdominal desmoids are usually infiltrating, very aggressive lesions associated with Gardner's syndrome. They surround vital visceral structures that would be sacrificed in an attempt to treat them. Thus, surgical excision with large safety margins, radiotherapy or even a wait-and-see policy should be preferred in the above cases. Extra-abdominal desmoids that have failed to respond to surgical treatment are excellent indications. A biopsy should always be performed prior to treatment in order to exclude malignancy (differentiation of DT from fibroblastic sarcoma and low-grade fibromyxoid sarcoma) and give information regarding the presence of specific mutations that influence prognosis. Extra caution should be paid when treating patients with familial adenomatous associated extra-abdominal desmoids or patients positive for S45F mutation, as the recurrence rate and local aggressiveness of the lesion after treatment can be high. Voluminous lesions should not be excluded from percutaneous treatment, but in these cases, treatment in consecutive sessions should be preferred in order to avoid complications due to the large ablation zone (post-ablation syndrome, cryo-shock phenomena).

Cryoablation should be preferred over the other ablation techniques. The ablation zone (ice ball) can be clearly visualised with imaging (hypo-dense ice ball on CT and signal void area on MRI), thus verifying the sufficient coverage of the lesion with sparing of the neighbouring vital structures.

The destructive effects of cryoablation can be grouped into two major mechanisms: cellular (chemical and mechanical) injury caused by the extra- and intracellular ice formation; and vascular injury due to arterial thrombosis. The currently available cryotherapy equipment relies on the Joule-Thomson effect of argon gas to freeze tissue and helium gas to thaw tissue. Metallurgic advances have led to the development of 17-gauge probes that have been easily adapted to percutaneous interventions. The number and type of cryoprobes necessary should be based on the size and configuration of the lesion to be treated. When the lesion is in proximity to healthy neighbouring structures, the existing passive and active insulation techniques ($CO_2$ dissection and hydrodissection, respectively), and temperature monitoring (thermocouples) should be advocated in order to avoid complications. For superficial lesions, extra caution should be paid to avoid skin necrosis. Compared to surgery, cryoablation is less invasive and patient recovery is quicker. Compared to radiofrequency ablation, cryoablation is less painful and requires less analgesia.

US, CT and MR guidance are all suitable imaging modalities for the placement of the ablation electrodes and cryoablation probes. Regarding monitoring of the ablation zone, CT and MRI should be preferred, as they are not disturbed by the artefacts of the produced gas or ice ball (for RF and cryoablation, respectively).

Our experience includes eight cryoablation procedures of extra-abdominal desmoids in six symptomatic patients whose tumours have failed to respond to standard therapy. Procedures were performed under CT (6 cases) or MR guidance (2 cases). Cryoablation was performed in two consecutive sessions for voluminous lesions. A combined open surgical and CT-guided approach during the same session was used in a female patient with a local recurrence on the pelvic wall after surgical excision of the initial pelvic DT. All patients experienced significant reduction of the tumour size (>75%) and pain level following treatment. In four patients, complete resolution of the lesion was observed. In one patient with a neck DT, we were surprised to find necrosis in parts of the tumour which were not covered by the ice ball.

To conclude, we believe that image-guided cryoablation is an alternative treatment to extra-abdominal DT when conventional treatments have failed. Because of its minimally invasive nature, cryoablation causes less damage to surrounding tissues, when compared to surgery. Significant tumour size reduction and symptom regression can be safely achieved. Clinical features and genetic-mutational analysis should be taken into account during procedure planning. Patients bearing mutations responsible for local recurrences may benefit from a more aggressive ablation with larger safety margins. Further research with long-term follow-up and larger samples are needed in order to establish the role and validate the efficacy of the IR techniques in the management of DT.

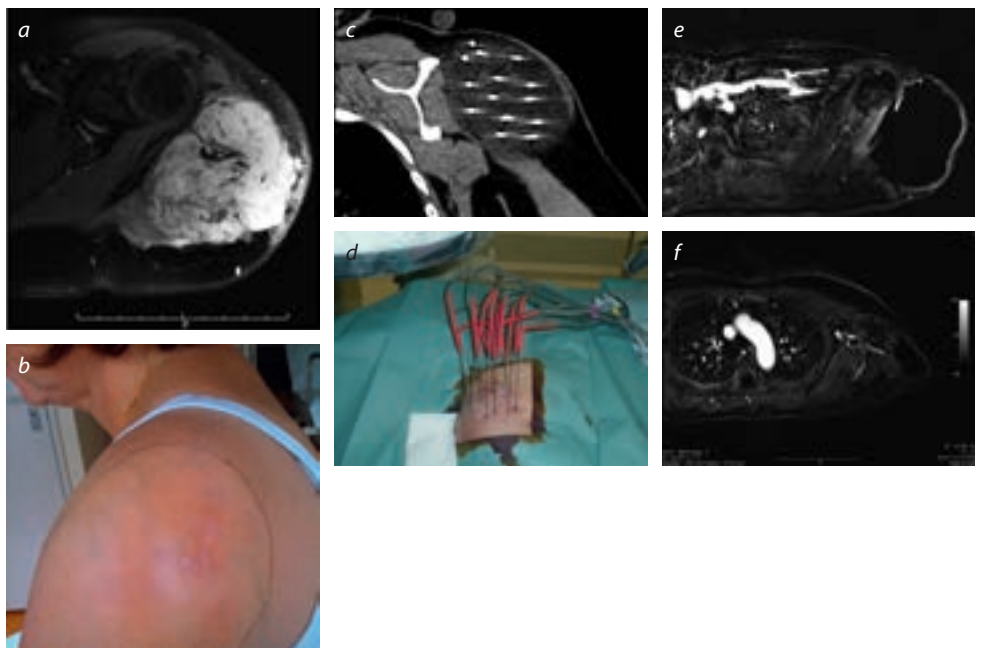


*Fig 2: (a, b) Voluminous local recurrence after surgical resection of an extra-abdominal DT on the left shoulder. (c, d) Fourteen cryoprobes were placed under CT-guidance for ablation of the tumour. Note the hypodense ice ball covering the majority of the lesion. The patient had a small residual lesion that was also treated with percutaneous cryoablation under MR guidance. (e, f) The MR at 3 months and 1 year post-treatment revealed complete necrosis of the lesion and significant volume reduction.*

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# IR management of Budd-Chiari syndrome

*Antonin Krajina (EBIR)*

**Don't miss it !**
**Hepatic, portal and mesenteric vein thrombosis**
**Special Session**
Saturday, September 14, 11:30-12:30
Room 115

**Antonin Krajina**
*(EBIR)*
*University Hospital of Hradec Králové*
*Hradec Králové, Czech Republic*

*Prof. Antonin Krajina is an IR at the University Hospital of Hradec Kralove in the Czech Republic, where he received his initial medical degree. His IR fellowship was completed at the Oregon Health Sciences University, Portland (USA) under Prof. Josef Rösch, Dr. Stanley Barnwell and Prof. Frederick S. Keller. His research and clinical career has encompassed many vascular procedures and devices, particularly portosystemic shunts, balloon and stent angioplasty, AAA stent grafts, intra-arterial infusions and neurointerventions. Prof. Krajina has held CIRSE Fellowship since 1999, and has served as an editor/reviewer for CVIR, JVIR, European Journal of Radiology and Acta Scandinavica Radiologica.*

Budd-Chiari Syndrome (BCS) is an uncommon disorder of the liver caused by hepatic venous outflow obstruction and characterised by a clinical triad of tense ascites, hepatomegaly and abdominal pain. The inability of blood to drain from the liver leads to post-sinusoidal portal hypertension, ischaemia and congestive necrosis of liver parenchyma and congestion of the entire gut. The obstruction can develop at any level of hepatic venous outflow and usually is associated with other uncommon disorders. In a rare veno-occlusive disease (VOD) caused by hepatotoxic chemicals, the obstructions are at levels of hepatic sinusoids and venules. The hepatic vein thrombosis (HVT) that is associated with hypercoagulopathic conditions involves the mid- and large-sized hepatic veins [1].

HVT is the most common cause of BCS in European and American countries. BCS also develops with obstructions of hepatic vein orifices or suprahepatic portion of the inferior vena cava (IVC) by a congenital web-like membrane, which is most often seen in Asian and South African countries [2, 3]. Tumour compression or direct tumour invasion into the intra and suprahepatic portion of the IVC or large hepatic veins may also lead to BCS. In some patients, however, no cause of BCS can be identified.

The clinical course of BCS depends on the extent of involvement and rapidity of development and progression of venous occlusion. A rapidly progressing VOD or HVT involving most of the hepatic venous system may have a fulminant course and lead to acute liver failure [4]. In most patients with HVT or membranous IVC web, however, BCS has a sub-acute or chronic course, as only some hepatic veins are involved and a membranous web only partially obstructs IVC. These patients usually complain of mild abdominal pain from liver swelling and have chronic signs of portal hypertension, mainly refractory ascites and gastroesophageal variceal bleeding similar to liver cirrhosis [5, 6]. This paper will concentrate mainly on diagnosis and treatment of HVT.

**Diagnosis of Hepatic Vein Thrombosis**

Imaging techniques, including ultrasonography, CT or MR imaging, and hepatic and IVC venography, help to confirm clinical suspicion of HVT.

In HVT, the ultrasonography reveals no flow signal in large hepatic veins with hyperechoic thrombus replacing the veins. There can be a reversed or turbulent flow in hepatic veins and large intrahepatic venous and subcapsular collaterals, especially in the vicinity of hepatic vein ostia, corresponding with a spider-web venous network.

CT or MR imaging demonstrates a lack of visualisation of hepatic veins; hypertrophy of the caudate lobe, which is often the only part of the liver parenchyma properly perfused due to its separate venous drainage; and compression and narrowing of IVC (Fig. 1, 2). On contrast-enhanced CT during acute and sub-acute phases of the disease, the enlarged caudate lobe becomes significantly opacified, while the remaining liver parenchyma appears patchy due to lack of perfusion and necrosis. Extrahepatic collateral formation reflecting portal hypertension is similar to that in chronic liver cirrhosis.

Hepatic and IVC venography are done by femoral or jugular vein approach. The transhepatic approach should be reserved only for patients where local thrombolysis or balloon angioplasty of the obstructed veins is planned. Hepatic venography may identify stenosis or thrombus in hepatic veins, but more often demonstrates the classic spider-web pattern of collateral veins and lymphatics with absence of sinusoidal filling. The IVC venography demonstrates intrahepatic IVC narrowing by enlarged caudate lobe. IVC

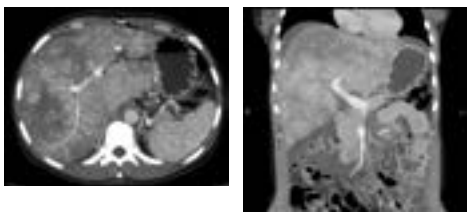

*Fig. 1, 2: 46-year-old woman with chronic hepatic vein thrombosis. There is significant hepatomegaly with hypertrophy of the caudate lobe and inhomogeneous opacification of the liver parenchyma due to severe venous congestion and ischaemia.*

pressure gradients need to be measured, particularly if a surgical shunt is considered.

Liver biopsy if needed can help to differentiate chronic cirrhotic type of HVT from cirrhosis of other origins. HVT is characterised by congestion liver cell loss, and fibrosis in the centrilobular area.

In differential diagnosis of HVT, congestion due to heart failure and constrictive pericarditis should be considered.

**Treatment of Hepatic Vein Thrombosis**

HVT is a manifestation of one or several underlying hypercoaguable conditions including myeloproliferative disorders (polycythemia vera and essential thrombocytopenia), use of oral contraceptives, paroxysmal nocturnal hemoglobinuria, Behcet's disease, lupus anticoagulant, antithrombin III deficiency and protein C deficiency. HVT treatment usually starts with systemic anticoagulation, which may improve the outcome of non-bleeding patients as heparinisation facilitates spontaneous recanalisation of thrombosed hepatic veins. Diuretics and paracentesis are used for control of ascites [7, 8].

The surgical treatment modalities [9-11] include portocaval or mesoatrial shunting and liver transplantation. The side-to-side portocaval shunt, which transforms the portal vein into an outflow tract, has been mostly recommended. However, early mortality rates of surgical portocaval shunting average 25%, and early shunt thrombosis occurs in approximately 25% of patients. An increased pressure in the IVC exceeding 20 mmHg also precludes the shunting procedure unless the pressure gradient across the intrahepatic IVC is corrected by a stent implantation or a cavo-atrial shunt placement. Survival of surgically shunted patients was not proved to be longer as compared with patients treated only by medical therapy [12]. Liver transplantation for the treatment of HVT should be reserved for patients with severe cirrhosis or with fulminant liver failure, as its prognosis is not as good as for other indications [13].

Restoration of hepatic outflow is thus attempted mainly by interventional techniques including local thrombolysis, recanalisation of obstructed vein(s) by balloon angioplasty and stent placement, and by TIPS. Local thrombolysis and dilation of the obstructed hepatic vein can be done by the retrograde approach when the involved vein(s) can be catheterised. A stent placement was reported to improve long-term results of dilation. When a retrograde approach is not feasible, the transhepatic approach can be used for local thrombolysis and angioplasty. The transhepatic tract, however, must be embolised in this case to reduce risk of haemorrhage.

TIPS has become an alternative to surgical shunting, as it avoids laparotomy and can be performed in more acutely ill patients with a lower morbidity and mortality than surgery. Furthermore, TIPS drains the portal venous system to the suprahepatic part of the IVC, and thus bypasses the frequent intrahepatic IVC stenosis by caudal lobe compression (Fig. 3, 4) [14-16].

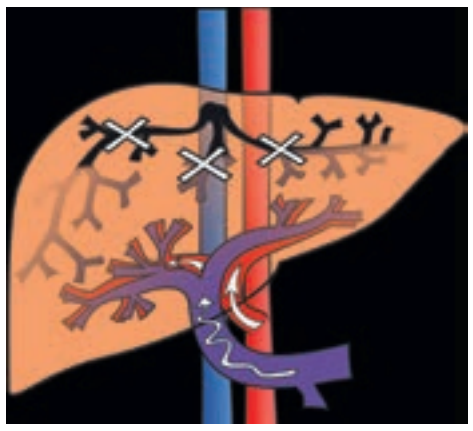

*Fig. 3: Schematic depiction of the liver circulation with massive thrombosis of hepatic veins (crosses). Oxygenated blood inflow is through the hepatic artery (curved arrows), while blood flow in the portal vein is slow down (zigzag arrow) (Courtesy of Vanda Machova).*

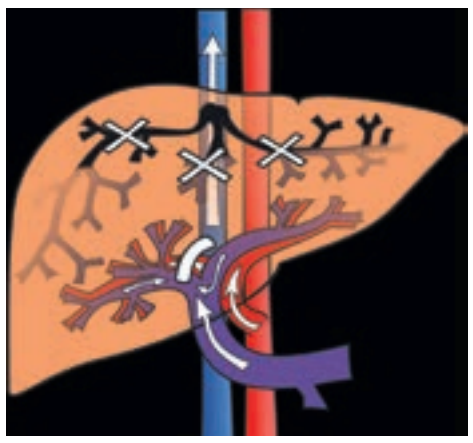

*Fig. 4: TIPS placement turns the portal vein branches into the outflow veins (small arrows), and thus decreases venous congestion in the liver parenchyma (Courtesy of Vanda Machova).*

**Technique of TIPS in Hepatic Vein Thrombosis**

The TIPS procedure in patients with the HVT is technically more difficult because of distorted liver anatomy.

Catheterisation of the right or middle hepatic vein may be occasionally possible with acute or sub-acute HVT when venous thrombus is still soft (Fig. 5). With chronic fibrotic venous obstruction when only residual venous stumps remain, the catheter is wedged into a stump for the portal vein puncture. In cases without any hepatic vein stump, direct puncture from the IVC is necessary. In such cases, puncture should be started as close as possible to the presumed location of the hepatic venous confluence to avoid the frequent intrahepatic IVC stenosis.

Portal vein localisation and its puncture may be difficult because of present hepatomegaly, enlargement of the caudate lobe and small size and low flow in the intrahepatic portal branches (Fig. 6). We have been using the Rösch-Uchida portal access set. The curved metallic cannula is buried into the liver parenchyma and the puncture is performed with a flexible trocar covered with a tapered 5 Fr Teflon catheter. The manually bended cannula keeps the direction of the puncture (Fig. 7).

A PTFE-covered stent-graft should be used for creation of TIPS, as it avoids or decreases formation of pseudo-intimal hyperplasia and thrombotic shunt occlusion [18] (Fig. 8). However, care has to be taken not to extend the covered parts of the stent-graft into the portal vein and the IVC, which could impair the flow. Precise measurement of stent-graft length is therefore necessary and sometimes the combination of two overlapped stent-grafts is preferred, also because the intrahepatic channel is often longer than in other patients. Addition of an expandable stent placement into the

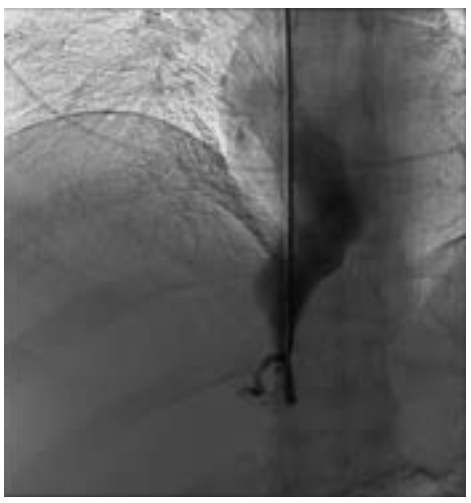

*Fig. 5: No hepatic veins are patent and the inferior vena cava is narrowed.*

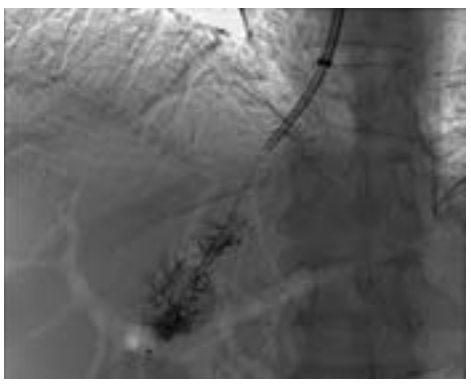

*Fig. 6: The TIPS puncture was made directly from the stump of the hepatic vein. Injection of $CO_2$ opacifies the portal vein bifurcation.*

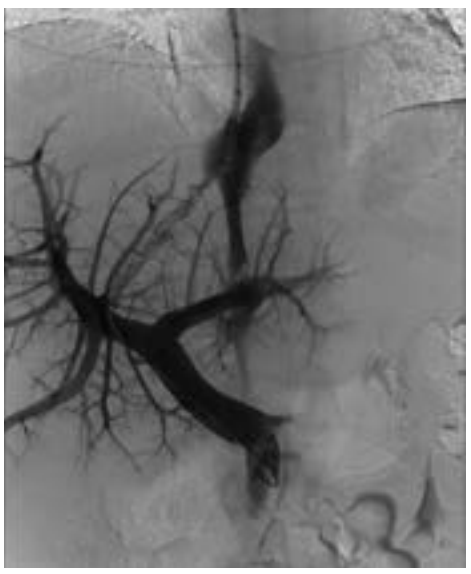

*Fig. 7: Transjugular portography performed after balloon dilatation of the intrahepatic tract revealed sites of future lower and upper anastomoses of the shunt.*

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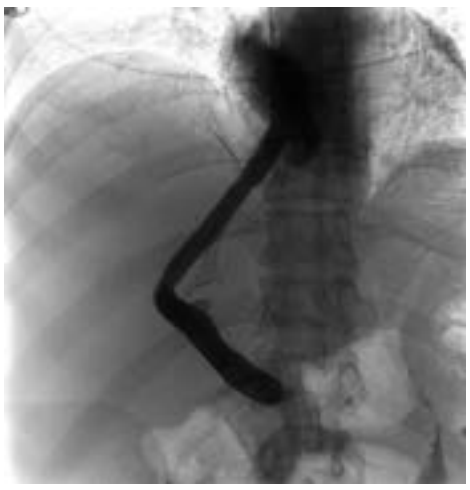

*Fig. 8: TIPS was finished by implantation of the stent-graft (Viatorr, Gore), which has significantly improved long-term patency in comparison to bare stents.*

stenosed IVC will improve general venous circulation.

**Complications of TIPS in Hepatic Vein Thrombosis**

Associated hyperincoagulability and longer shunts created with bare stents have contributed to poor long-term patency of TIPS reported in this group of treated patients. TIPS dysfunction requiring revision was reported in about 70% of cases at 6 months despite aggressive anticoagulant therapy [19]. Sepsis is a rare complication after TIPS and its higher incidence reported by Cejna (the cause of death in 16% patients) [20] might have been related to immunologic impairment in haematologic diseases. An increased rate of sepsis has not been reported by others. Another complication of TIPS reported only in patients with HVT is delayed development of the intrahepatic haematoma 7-14 days after shunt creation. This is also our experience. This is probably due to a combination of anticoagulation therapy, venous congestion and potential injury during TIPS creation.

**Results of TIPS in Hepatic Vein Thrombosis**

The technical success rate of TIPS in patients with HVT averages 95%. However, long-term patency of TIPS created with bare stents in patients with associated hypercoagulable conditions has been poor and despite aggressive anti-coagulation therapy, many shunts occluded. Some patients (38%) [21], however, remain asymptomatic and without portal hypertension despite significant shunt stenosis or even occlusion. It seems that by using TIPS they gain time to develop sufficient venous collateral. Recent experience indicates that use of PTFE stent-grafts will change these poor results. A randomised study showed that use of PTFE stent-grafts in non-BCS patients significantly improves TIPS patency and decreases the rate of clinical relapses and need for re-interventions. The up-to-date experience revealed better patency with use of these dedicated stent-grafts in combination with anticoagulation therapy in the HVT group of patients as well. In our group of 38 patients with median follow-up of 52 months, the average 5-year re-intervention rate per patient was 1.65 procedures in the bare stent group, and 0.67 procedures in the stent-graft group. The primary patency rates were 52.9 % at 1 year and 20% at 5 years using bare stents and 80% at 1 year and 33.3 % at 5 years with dedicated stent-grafts [22].

**Conclusion**

TIPS should be the first choice of treatment for HVT which is not controlled by medical therapy. In some patients, predominantly with liver failure, TIPS may serve as a bridge to elective liver transplantation [23].

The use of TIPS-dedicated covered stents leads to a lower dysfunction rate with a lower number of re-interventions needed to re-establish the shunt patency, but strict simultaneous anticoagulation treatment and treatment of the underlying haematological disease are necessary [24-27].

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# What is relevant before, during and after IR procedures with regard to sedation and analgesia?

*Benedikt Preckel*

**Don't miss it!**
**Anaesthesia, sedation and analgesia for IR**
**Special Session**
Saturday, September 14, 11:30-12:30
Room 112

**Benedikt Preckel**
*Academic Medical Centre*
*Amsterdam, The Netherlands*

*Prof. Benedikt Preckel has a great interest in the topic of sedation by non-anaesthesiologists outside the OR from both a clinical and research perspective, in addition to his own work as an anaesthesiologist. In his department, specially trained sedation anaesthesia nurses independently give moderate to deep sedation during gastro-enterologic and interventional radiologic diagnostic and therapeutic procedures. His presence at CIRSE is a great opportunity for IRs to gain deeper understanding of principles relating to anaesthesiology and sedation, as well as improve collaboration.*

In the IR suite, most patients are treated using sedation in combination with local anaesthesia. However some procedures, namely neuroradiological procedures, require deep anaesthesia with absolutely no movement of the patient. While the radiologist and his team normally apply sedation, dedicated anaesthesiology staff perform anaesthesia. Before anaesthesia, every patient is assessed to get an impression of the procedure- and anaesthesia-related risks for the individual patient. In addition to the medical history, diagnostic tests (e.g. laboratory tests, electrocardiogram) are frequently used to support decision-making before performing the interventional procedure.

**Risk assessment**

But the question remains whether the perioperative risk of the individual patients can indeed be minimised by selected preoperative diagnostic tests. What is the usefulness of these tests if they are performed on a selective basis only and not extensively? Data from clinical studies show that, based on patient history and physical examination, 60-70% of laboratory tests ordered might not be necessary.

However, risk assessment does indeed require a complete (and sometimes time-consuming) evaluation of patient history. In some cases, additional diagnostic tests might be indicated to improve risk assessment for the respective patient, and if these tests are not performed before admission of the patient, this might lead to a delay in the daily schedule of the IR suite. So the main question is: who will do the pre-assessment of the patient and who is sufficiently trained to decide which patients might profit from additional pre-procedural testing?

For patients undergoing anaesthesia, the anaesthesiologist will usually see the patient beforehand. For patients undergoing sedation only, the use of a medical history questionnaire filled in by the patient and sent to the hospital before scheduling the interventional procedure allows risk assessment on the computer without seeing the patient personally. This also allows us to adapt the schedule of a respective patient to allow additional tests on the morning of the procedure, although a small risk remains that new significant relevant findings (e.g. latent myocardial ischaemia, low haemoglobin values) will lead to cancellation of the IR procedure.

In principle, every diagnostic test performed should give the possibility of reducing peri- and post-operative complications or leading to changes in clinical management. Although routine testing seems attractive (no delay, fewer time-consuming evaluations), a study from Austria has shown that restricting pre-operative diagnostic testing to the recommendations of current guidelines might lead to a saving of millions of Euros in one country alone [1]. This is mainly because additional testing is unnecessary in healthy patients. A recent review by Johansson and colleagues addresses this question for patients subjected to elective surgery [2]. Data from high-quality studies do not show any beneficial effect of routine testing in non-cardiac surgery. Specific testing based on pathological findings from patients' medical history seems reasonable, but no good data supporting this practice for these patients are available. Regarding elective IR, there are no specific data or guidelines, but one might speculate that this patient population is in line with office-based surgical patients.

**The role of guidelines**

Why are there different guidelines from different international societies for the same patient population if all guidelines are based on the available evidence? One reason might be the fact that for a lot of medical procedures, we do not have sufficient evidence-based literature to support our work. This means that expert opinion is often the only basis for recommendations. This might also be one reason why only a small percentage of doctors follows current guidelines when screening the patient for elective surgical procedures. How could this guideline adherence be improved? In the United States, in some circumstances reimbursement has been linked to adherence to guidelines. For example, this was done for pre-operative beta-blocker therapy in cardiac risk patients. However, more recent (and of more reliable quality) data showed an adverse effect of pre-operative initiated beta-blocker therapy and one might speculate that linking a dedicated therapy to reimbursement will lead to additional complications in a special patient population.

**Post-procedural monitoring**

During one of the talks in today's session, there will also be a short look at the post-procedural situation. Which kinds of monitoring are necessary during and after IR procedures? While oxygen saturation and blood pressure measurement are keystones of routine monitoring, electrocardiogram might also be beneficial in cardiac risk patients. In the last few years, continuous capnography has been recommended for improvement of safety in patients undergoing moderate to deep sedation. With capnography, one gets quite prompt information on the breathing pattern and breathing frequency of a sedated patient, while in contrast oxygen saturation will only fall at a late moment after severe breathing disturbances (when all oxygen reserves are extinguished). Because breathing and airway complications are the main reason for fatal complications of anaesthesia outside the operating room, capnography might be a useful addition to routine airway monitoring even in sedated patients.

**Complication avoidance**

What are the main complications of procedures performed under sedation, and how can we prevent them? To answer this question, more data have to be generated on frequency and severity of complications. The World SIVA International Sedation Task force has suggested a simple tool for registering sedation-related complications [3]. Electronic versions of this tool should allow getting more insight into the field of sedation-related complications.

When is it reasonably certain that a patient can leave the IR unit and go home after having received sedative or analgesic medications? A recent practice guideline for post-anaesthetic care might help interventional radiologists make the correct decisions and implement local protocols for these patients [4].

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# Poster Awards 2013

## SCIENTIFIC POSTERS

### Magna Cum Laude

Ophthalmic arterial infusion therapy for retinoblastoma
*T. Yamane[1], S. Suzuki[2], Y. Aihara[2], M. Mohri[3]; [1]Yokohama/JP, [2]Tokyo/JP, [3]Kawasaki/JP*

### Cum Laude

Enhanced antitumor efficacy of hyperthermia and drug delivery using a doxorubicin-conjugated Resovist complex
*M.J. Jeon, Y.I. Kim, S.-H. Lee, I.J. Chung, S. Jung, C.-H. Ahn; Seoul/KR*

Histological characterization and comparison of tissue effects following irreversible electroporation, vascular targeted photodynamic therapy, radiofrequency, and cryotherapy ablation: implications for focal therapy
*T. Wimmer[1], S. Kimm[2], G. Srimathveeravalli[2], D. Gerber[2], A. Scherz[3], J.C. Durack[2], J. Coleman[2], S.B. Solomon[2]; [1]Graz/AT, [2]New York, NY/US, [3]Rehovot/IL*

### Certificate of Merit

Radiofrequency ablation of bilateral benign thyroid nodules
*M.J. Hong; Seoul/KR*

Anatomical variations in splenorenal shunt in chronic liver disease for successful IR in portal hypertension: a preliminary report
*S. Achiwa, K. Kobayashi, S. Hirota, Y. Inao, M. Yamanishi, Y. Furukawa, Y. Kako, S. Yamamoto, H. Maeda; Nishinomiya/JP*

Chronic Budd–Chiari syndrome: spectrum of endovascular management
*A. Mukund, S. Rajesh, A. Arora, S.K. Sarin; New Delhi/IN*

Endoscopic ultrasound-guided intrahepatic portosystemic shunt in a porcine model
*P. Chabrot, L. Poincloux, J. Genest, A. Abergel, G. Bommelaer, L. Boyer; Clermont-Ferrand/FR*

Retrograde approach for failed antegrade recanalization for below-the-knee artery occlusions
*J.D. Kim[1], J.I. Bae[2], J.H. Won[2], Y.H. So[3]; [1]Daejeon/KR, [2]Suwon/KR, [3]Seoul/KR*

## EDUCATIONAL POSTERS

### Magna Cum Laude

Tips and tricks for successful adrenal vein sampling
*N.F. Gafoor, E. David, C. Dey, G. Annamalai, R. Pugash; Toronto, ON/CA*

### Cum Laude

Ultrasound-based review of neck nerve anatomy and its spatial relationships for prevention of iatrogenic nerve injuries during US-guided procedures
*E.J. Ha, J.H. Baek, J.H. Lee; Seoul/KR*

MR-guided focal cryoablation of recurrent prostate cancer: how we do it
*C.G. Overduin, J.G.R. Bomers, D. Yakar, J.P.M. Sedelaar, E.N.J.T. van Lin, S.F.M. Jenniskens, J.J. Fütterer; Nijmegen/NL*

### Certificate of Merit

Grading abdominal visceral injuries in major trauma for planning interventional radiology management
*D. Fascia, E. Kashef, M. Jenkins, M.S. Hamady; London/UK*

Prostatic artery embolization – important anastomoses and learning when to stop
*L. Fernandes, H. Rio Tinto, J.A. Pereira, T. Bilhim, M. Duarte, J.M. Pisco; Lisbon/PT*

Endovascular treatment of combined aortoiliac aneurysmal disease: preserving the internal iliac artery with the snorkel graft technique
*A. Picel, N. Kansal; San Diego, CA/US*

Low and high-flow soft-tissue vascular malformations of the upper limbs: key MRI and contrast-enhanced MRA findings
*E.P. Eyheremendy, M. Nazar, M.F. Grana, E. Mondello; Buenos Aires/AR*

Vascular anatomy of the pancreas and its importance in interventional radiology
*A. Williams[1], D.W. Cain[2], C.E. Ray, Jr.[1]; [1]Denver, CO/US, [2]Aurora, CO/US*

Advertorial

# Gore Scientific Program


## Sunday, September 15

**V** **8.00 – 8.20**
**Gore Satellite Symposium / Room 133**

**How much does stent design matter in treatment of the peripheral artery?**
*Moderator: Eric Verhoeven, Nuremberg, Germany*

- Overcoming the unmet needs with the next generation dual component GORE® TIGRIS® Vascular Stent
  *Konstantinos Katsanos, London, UK*
- Early clinical experience with the GORE® TIGRIS® Vascular Stent
  *Michael Piorkowski, Leipzig, Germany*

**N** **17.30 – 18.10**
**Gore Satellite Symposium / Room 133**

**Tips a la carte. Portal hypertension: TIPS is a team approach!**
*Moderators: Frederik Nevens, Leuven, Belgium*
*Boris Radeleff, Heidelberg, Germany*

- TIPS patients presented and discussed, using the GORE® VIATORR® TIPS Endoprosthesis. The impact of 'early tips' data.
  *Speakers: Andreas Koops and Daniel Benten, Hamburg, Germany*

## Monday, September 16

**V** **8.00 – 8.20**
**Gore Satellite Symposium / Room 133**

**Unique technologies for the treatment of aortic disease**
*Moderator: Jost Philipp Schäfer, Kiel, Germany*

- Effect of internal iliac artery interruption: Is preservation a must?
  *Martin Delle, Stockholm, Sweden*
- Dealing with acute aortic syndromes, logistic challenges and decision processes
  *Mohamad Hamady, London, UK*

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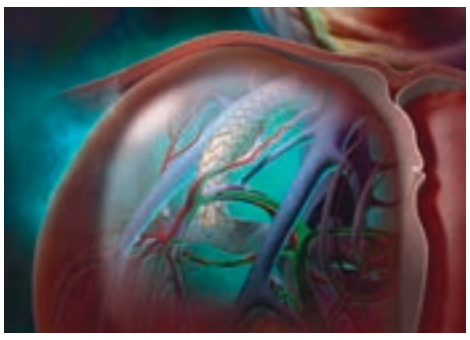
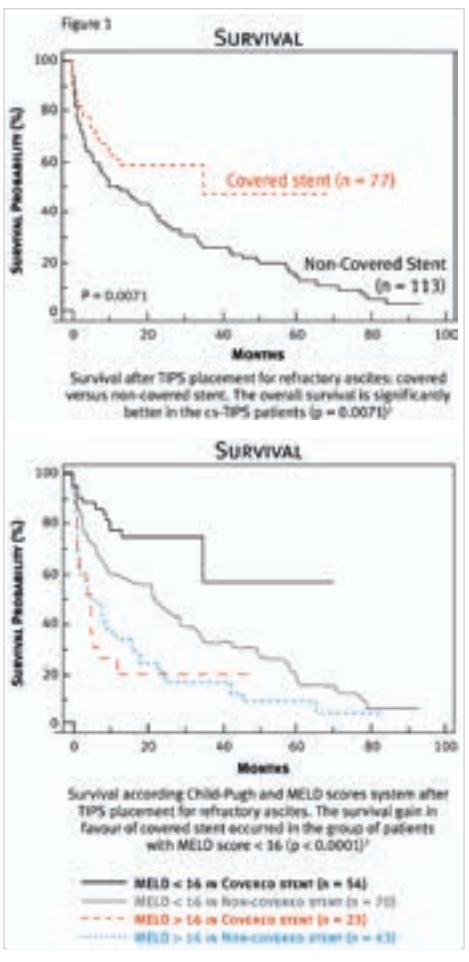


# Unmatched Data, Unsurpassed Patency and Superior TIPS Performance

**The GORE® VIATORR® TIPS Endoprosthesis is an innovative solution for TIPS.**
The Only FDA and CE Mark Approved Stent-Graft for TIPS
- Unsurpassed patency
- Superior radial strength
- Device flexibility
- Brilliant visibility under fluoroscopy
- Optimal configurations for TIPS applications




Adapted with permission from Acta Gastroenterologica Belgica

**INDICATIONS FOR USE UNDER CE MARK:** The GORE® VIATORR® TIPS Endoprosthesis is indicated for use in the treatment of portal hypertension and its complications such as: variceal bleeding refractory to, or intolerant of, conventional therapies, inaccessible varices, gastropathy, refractory ascites, and/or hepatic hydrothorax. Refer to *Instructions for Use* at goremedical.com for a complete description of all contraindications, warnings, precautions and adverse events.
**INDICATIONS FOR USE IN THE US:** The GORE® VIATORR® TIPS Endoprosthesis is indicated for use in the de novo and revision treatment of portal hypertension and its complications such as variceal bleeding, gastropathy, refractory ascites, and/or hepatic hydrothorax. ℞ Only

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**GORE® VIATORR® TIPS Endoprosthesis Compared to Bare Metal Stents**
In a randomized prospective trial, Bureau, *et al.*, found the actuarial rates of primary patency in the GORE® VIATORR® Device group and bare metal stent group were 76% and 36%, respectively, at 2 years ($p = 0.001$ – log-rank test)[1]. In a retrospective analysis of cirrhotic patients with refractory ascites, Maleux, *et al.*, found that TIPS using the GORE® VIATORR® Device offers better symptomatic control of the ascites at one year follow-up and a better overall survival, compared to bare metal stents[2]. (Figure 1)

**GORE® VIATORR® TIPS Endprosthesis Compared to Endoscopic Band Ligation (EBL)**
In a randomized, controlled clinical trial with TIPS performed within 72 hours after diagnostic endoscopy and a 1-year follow up, results demonstrated an 86% actuarial survival in the early-TIPS group versus 61% in the pharmacotherapy – EBL group ($p < 0.001$)[3]. The 1-year actuarial probability of remaining free of failure to control bleeding and of variceal rebleeding was significantly higher in the early-TIPS group than in the pharmacotherapy – EBL group (97% vs. 50%; absolute risk reduction, 47 percentage points; 95% confidence interval [CI], 25 to 69; number needed to treat, 2.1 patients; 95% CI, 1.4 to 4.0).
The conclusion was that patients with cirrhosis who were hospitalized for acute variceal bleeding and at high risk for treatment failure, the early use of TIPS was associated with significant reduction in treatment failure and in mortality.

**TIPS Compared to Large Volume Paracentesis (LVP)**
Although randomized comparisons of the GORE® VIATORR® Device vs. LVP are in progress, data from bare metal stents provide evidence of the effectiveness of the TIPS procedure compared to continued LVP in ascites patients. In a meta-analysis of individual patient data, it was reported that bare metal stent – TIPS significantly improves transplant-free survival of cirrhotic patients with refractory ascites[4]. The cumulative probability of developing the first episode of hepatic encephalopathy (HE) was similar between the groups ($p = .19$). The average transplant-free survival at 12, 24 and 36 months of follow-up was 63.1%, 49% and 38.1% for patients allocated in the BMS-TIPS group and 52.5%, 35.2% and 28.7% for patients allocated to large volume paracentesis (LVP), respectively. (Figure 2)

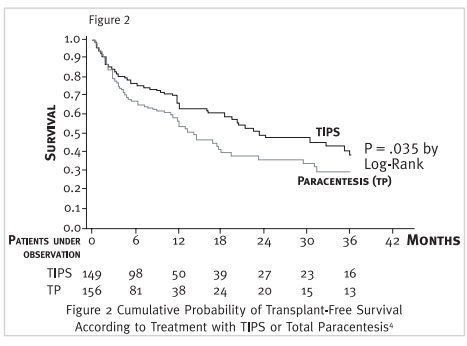


Figure 2 Cumulative Probability of Transplant-Free Survival According to Treatment with TIPS or Total Paracentesis[4]

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**Health Economic Benefits**
Bureau *et al.* reported that TIPS with bare metal stents has been less cost effective than other procedures. This is mainly owing to the monitoring and the revisions required to maintain shunt patency. It has been shown that the use of covered stents could result in cost reduction because of decreased clinical relapses and decreased need for shunt revisions[1].
TIPS is a safe intervention that reduces the need for LVP. Careful calibration allows satisfactory relief of ascites with a low incidence of HE. It has been demonstrated that extremely low complication rates and exceptionally high patency rates can be achieved with the use of GORE® VIATORR® TIPS Endoprosthesis. In the United Kingdom, health economic data favoured TIPS with a cost of £500 per month of patient follow-up for TIPS and £3,500 per month of patient follow-up for paracentesis. Careful patient selection for this procedure has demonstrated significant health economic benefit in favour of a dedicated TIPS endoprosthesis[5].

**Conclusion**
A large body of published data demonstrate numerous clinical advantages of GORE® VIATORR® TIPS Endoprosthesis in treatment of patients with refractory ascites and variceal bleeding. Furthermore, GORE® VIATORR® TIPS Endoprosthesis may be associated with decreased patient-care costs compared to other therapies. Considering these results, the role of GORE® VIATORR® TIPS Endoprosthesis in the management of portal hypertension should be considered. The improvement of TIPS patency by using ePTFE-covered stents is maintained over time with a decreased risk of hepatic encephalopathy and a decreased risk of death. Furthermore, data demonstrate the clinical advantage of GORE® VIATORR® TIPS Endoprosthesis in treatment of patients with variceal bleeding and refractory ascites. Finally, GORE® VIATORR® TIPS Endoprosthesis has demonstrated a decrease in associated patient-care costs. Considering these results, the role of GORE® VIATORR® TIPS Endoprosthesis in the management of portal hypertension should be considered.

GORE VIATORR® TIPS ENDOPROSTHESIS

**Reference:**
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# New stent technologies for the biliary tract

*Mariano Giménez*

**Don't miss it !**
**Gastrointestinal and genito-urinary interventions forum**
**Special Session**
Saturday, September 14, 10:00-11:00
Room 113

**Mariano E. Giménez**
*University of Buenos Aires*
*Buenos Aires, Argentina*

*Prof. Mariano Giménez specialises in gastrointestinal interventions, and places great importance on good collaboration with his surgical colleagues. He is a past-president of the Sociedad Iberoamericana de Interventionismo (SIDI), and has previously contributed to Congress News on the topic of interventional radiology in Latin America. He is also on the board of directors for the International Hands-On Course in Minimally Invasive Surgery and Interventional Radiology, which is organised annually by the Daicim Fundación and SIDI. Prof. Giménez invited CIRSE to participate in the 2011 course, establishing valuable grass-roots links between CIRSE and her valuable overseas Group Members.*

Until recently there had not been any major developments with regard to biliary stents. However, this has changed with the introduction of covered stents, biodegradable stents for the treatment of benign biliary stenoses and drug-eluting stents for malignant stenoses.

**Biliary stenosis**

Benign stenoses in the biliary tract generally arise as a result of secondary surgical lesions. Biliodigestive anastomosis stenoses, whether following surgical repair or not, are common conditions seen by interventional radiologists. Therefore, once a biliary injury has occurred, especially in the case of complex lesions, repair is carried out by hepatico-jejuno anastomosis.

The success rate of the procedure in tertiary centres range from 85% to 95%. When the repair is not done by an HPB surgeon, the results are alarmingly compromised.

Strictures of biliodigestive anastomoses present with clinical signs of repeated cholangitis, with or without jaundice. Complementary laboratory studies report elevation of alkaline phosphatase and leukocytes. Ultrasound identifies intrahepatic dilatation of the bile duct in 50% of the cases and MRI can be used to identify the stricture of the anastomosis. The presence of pneumobilia and of an intestinal loop in the area may confound the diagnosis, especially in non-dilated bile ducts.

In many of these patients, treatment of the cholangitis consists of antibiotic therapy and percutaneous drainage of the bile duct, which can also confirm the diagnosis of a stricture. Once the infection is under control, a percutaneous dilation of the stricture will be performed with a high pressure balloon, unless there are severe construction deficiencies in the previous biliodigestive anastomosis. Long-term success rates with this technique range between 45% and 71%, according to the data series.

Recurrence rates with this technique are approximately 40% and as successive dilations are needed at around four months, it is necessary to find other minimally invasive treatments for these patients. When balloon dilation is ineffective or when the patient presents with repeated cholangitis, the treatment to follow next is still a matter of controversy. Repeat hepaticojejunostomy, liver excision or, in even selected cases, liver transplantation may be carried out depending on the case.

**The rationale behind biodegradable stents**

In the last eight years, as another treatment option, we have been carrying out sustained percutaneous dilatation with multiple plastic stents for 9 to 12 months at our centre and in an unpublished series. Even though it is a treatment which offers long-term patency results of 80%, it is technically complex – both the placement and removal of the catheters – and when done percutaneously, requires one or two internal-external percutaneous drainages for several months. Therefore, biodegradable stents could allow sustained dilatation, without the long-term complications of catheters or metallic stents.

The first publications referring to their possible use in the bile duct date back to mid-2000s. Later, several animal studies confirmed their feasibility and absence of deleterious effects in their utilisation and degradation. This led to these stents being subsequently used in humans. Recently, some isolated clinical cases in benign strictures and as splints in biliodigestive anastomosis have been reported. Our group has recently published the first series and follow-up of patients with benign biliary strictures treated with biodegradable stents.

**Current models**

There are various biodegradable stents under study. The stent used by us is a biodegradable stent manufactured from commercially available polydioxanone absorbable surgical suture material. Polydioxanone is a semi-crystalline, biodegradable polymer belonging to the polyester family. The stent is radiolucent, with radiopaque markers at both proximal and distal ends.

Theoretically, this biodegradable stent allows long-term dilatation without the need for removal. It is braided from a monofilament of specially treated polydioxanone, an absorbable suture and implant material in use for over 20 years. Degradation occurs by hydrolysis. The monofilament loses 50% of its breaking strength after 3 weeks and is absorbed within 6 months; reduced pH accelerates hydrolysis.

Our group has recently published the results of the first series of patients with hepaticojejunal anastomosis stenosis treated with biodegradable stents. The 13 patients treated showed a success rate of 84.6%, with a follow-up of between 18 and 24 months (Fig. 1a, 1b).

During the follow-up, two patients presented symptoms of cholangitis requiring re-drainage. In one, when new drainage was placed, both hepatic ducts and anastomosis were patent, suggesting that the stents had been effective, but a short loop in the Y-shaped Roux used for the hepaticojejunal anastomosis reconstruction was observed, causing reflux of intestinal fluid to the anastomosis. This condition, together with a bilateral stricture, had been overlooked during the first procedure. In these cases, cholangitis was not accompanied by severe fluctuations of alkaline phosphatase.

In the other patient with a repeated cholangitis, re-drainage was performed confirming the stricture of the anastomosis, and a partial excision of the strictured biliary area and a repeat hepaticojejunostomy were carried out. The pathology report indicated stent inclusion in the biliary mucosa with little inflammatory components (Fig. 2).

The results in our series have prompted us to consider changing the management algorithm of this condition, and therefore, in case of strictures of biliodigestive anastomoses without severe construction deficiencies, the treatment option will be drainage with placement of a biodegradable stent, thus replacing the treatment presently used, which is balloon dilation.

At present we are investigating the use of biodegradable stents in biliary tract partial stenoses without surgical repair (Fig. 3). Our preliminary experience in 4 patients is satisfactory, but a larger number of cases are needed with prolonged follow-up to determine the feasibility of the method.

**Drug-Eluting Stents**

The present treatment of jaundice in patients with malignant non-resectable obstructions of the biliary tract is endoscopic or percutaneous placement of metallic stents.

Due to advances made by minimally invasive procedures and the use of palliative oncological drugs, patients not only have a better quality of life, but also survive longer.

This means that patients show a recurrence of jaundice before dying. Metallic stents tend to become obstructed due to the following:
1) Tumour ingrowth or overgrowth
2) Biliary sludge and food impaction, and/or
3) Mucosal hyperplasia in the stent, as a result of chronic inflammatory reaction to the stent mesh.

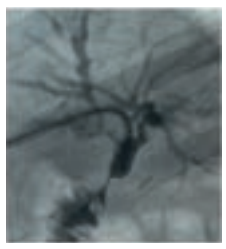
In order to reduce the probability of obstruction, covered stents have been used which, even though they display better long-term patency, tend to experience early complications such as migration, cholecystitis, pancreatitis and restenosis at the proximal end.

Therefore our challenge was to find a stent with better permeability and no more complications than a simple uncovered nitinol stent.

With this in mind, we carried out a test comparing nitinol stents vs. drug-eluting stents. The physiopathological rationale was that a drug-releasing stent could not only delay tumoural ingrowth, but might also delay the formation of bacterial biofilm on the stent which forms the base for the deposit of biliary sludge in it.

Our results with a group of 29 randomised patients showed that the group with drug-eluting stents had better permeability, moving the 50% permeability point from 6 months (nitinol stent group) to 9 months (drug-eluting stent group) (Fig. 4).

If future studies confirm our results with these stents and with biodegradable stents, it will lead to a change in the algorithms for the treatment of these patients.



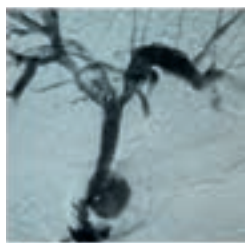


*Fig. 1a: Hepaticojejunal anastomosis stricture. Biodegradable stent placed. Identification of radiopaque markers.*

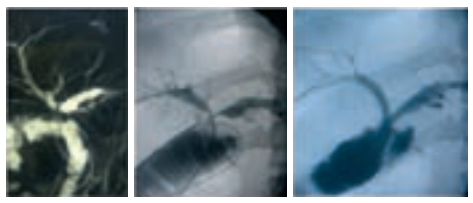


*Fig. 1b: Stenosis of hepaticojejunal anastomosis. Percutaneous drainage and double placement of biodegradable stents.*

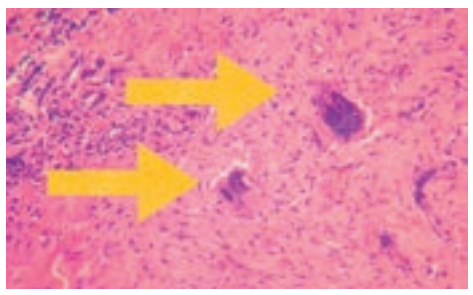


*Fig. 2: Anatomical pathology of resected biliary mucosa, showing biodegradable stent material with minimal inflammation.*

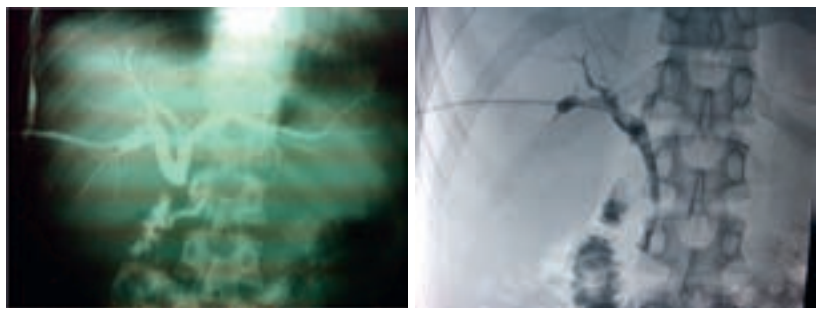


*Fig. 3: Partial biliary stenosis of secondary biliary tract injury and placement of biodegradable stent.*

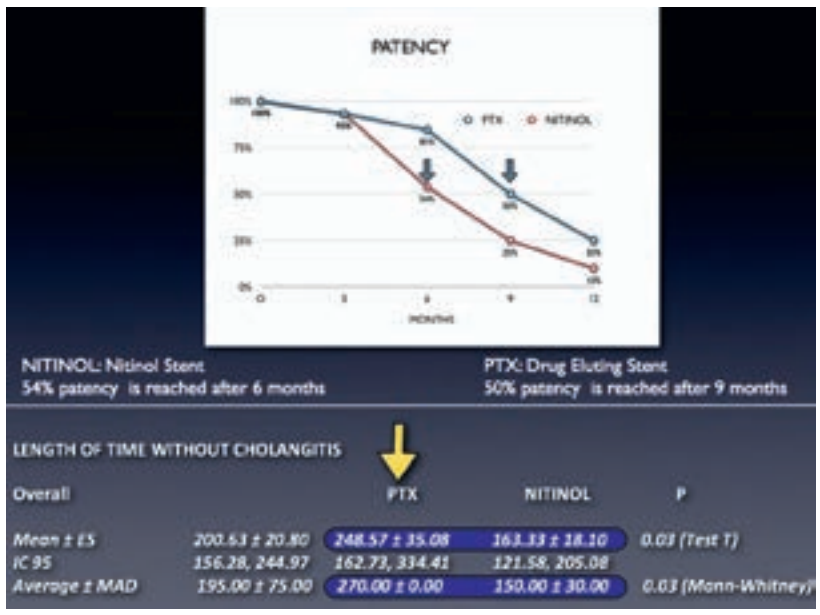



*Fig. 4: Biliary tract malignant stenosis. Permeability curve between stent, with and without drugs. The permeability of the drug-eluting stent is better.*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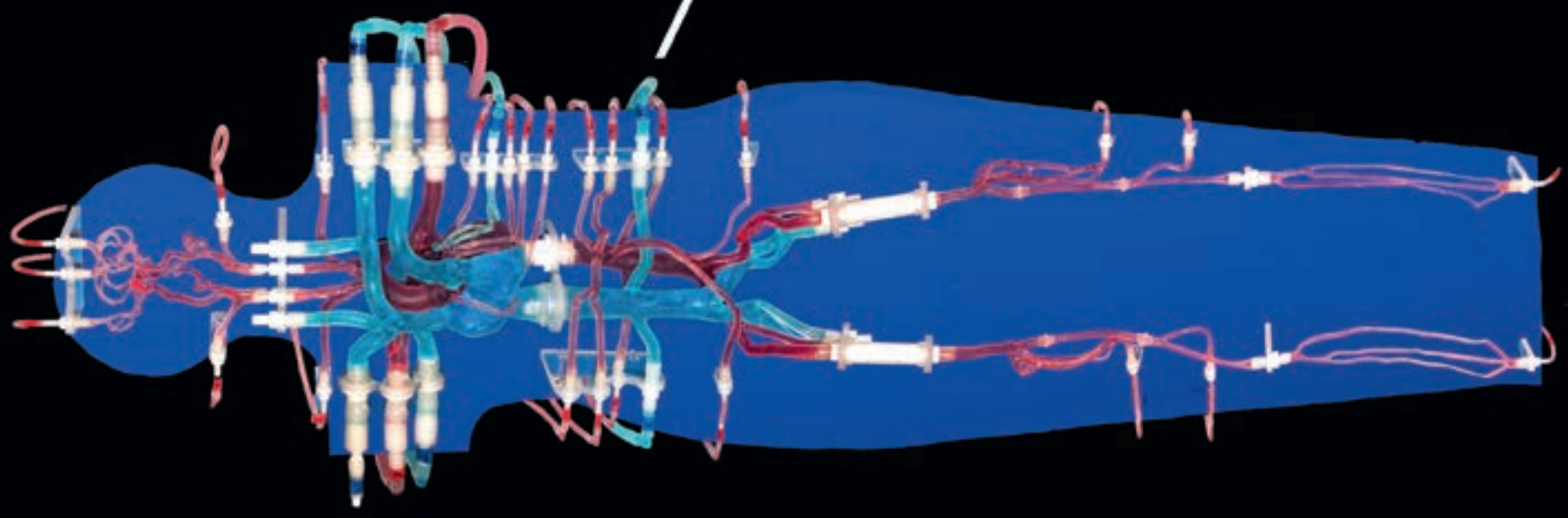

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Advertorial

# New Product Launches

## COVIDIEN

### RapidCross™ Rapid Exchange PTA Balloon Dilatation Catheter

**www.covidien.com/rapidcross**
- Kink-resistant rapid exchange port withstands tortuosity[1]
- Longer 170 cm catheter length offers improved distal access
- Low profile tip is designed to enable crossing and treatment of the tightest lesions

The RapidCross™ Rapid Exchange PTA Balloon Dilatation Catheter is designed exclusively for BTK use with its low profile tip, its robust, kink-resistant RX port, and long 170 cm catheter length.

The balloon delivers smooth crossing with its proprietary lubricious coating, and up to two-to-three-times faster deflation than competitive products, for increased efficiency[1]. To address the common problem of kinking with RX balloons in BTK lesions, Covidien designed RapidCross™ Rapid Exchange PTA Balloon Dilatation Catheter with a unique in-line RX port and alloy support wire for optimized kink resistance. It is the only BTK balloon that has 170 cm working length on a tapered balloon, offering improved distal access.

[1] Covidien Rapid Exchange Balloon Catheter Competitive Test (RE-PV12123a – 2013, Feb 6)

## COVIDIEN

### Emprint™ the new microwave ablation system from Covidien

Covidien is celebrating five years in safe microwave ablation with the anticipated release of the Emprint™ advanced ablation system.

Come and get a sneak peek at the Emprint™ system: booth # 52.

Learn more about the "Science of Powerful Predictability" at the Covidien Learning center #2 and at the lunch symposium on Sunday at 13:00 in room 115.

Indications, contraindications, warnings and instructions for use can be found in the product labeling supplied with each device. All claims and descriptions are for CE regulated countries. Availability of these products may vary in countries outside EU. COVIDIEN, COVIDIEN with logo and Covidien logo are US and internationally registered trademarks of Covidien AG. ™ Trademark of a Covidien company.

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## IVASCULAR

### Luminor Drug Eluting Balloons

iVascular is a leading European company focused in developing and innovating advanced medical devices and therapies for the treatment of disorders of the vascular system. iVascular has implemented a vertical integration project to innovate and produce vascular devices from basic raw materials to the final device or implant.

iVascular launches the Luminor Drug Eluting Balloon line to complete its peripheral interventions product portfolio. Based on the Oceanus 14 Balloon and Oceanus 35 platforms, the new Luminor 14 and Luminor 35 provide extra accessibility to most challenging anatomies.

Luminor 14 and Luminor 35 include the technology TransporTech designed to deliver the right amount of paclitaxel on the arterial wall to optimize clinical outcome. TransporTech consists on a direct ultrasonic deposition, multilayer ultrathin coating with a uniform drug load. To find out more about iVascular products, please visit us at **www.ivascular.es** or at our booth 26.


## LAURANE MEDICAL

### The Madison™ – Optimized manual access for simple, safe and successful bone biopsies, even in hard bone

Containing both an aggressive trocar introducer and manual drill with patented cutting cannula technology, the Madison™ Comprehensive Bone Biopsy System features the clinician-minded design and unsurpassed durability that Laurane Medical products are renown for.

Efficient, cost effective and time saving – the Madison™ requires fewer device steps and imaging passes for precise placement with tactile control. This coaxial, disposable and versatile kit contains all you need to manually penetrate any bone density with ease, returning structurally intact and highly readable specimens. An expert in bone biopsy products for over a decade, Laurane Medical prides itself with superior success rates and high quality interventional products.

Watch our new Madison™ instructional video at **www.lauranemedical.com** and meet us at CIRSE Stand 18 to discuss the best option for your bone biopsy procedures.

## MERIT MEDICAL

### HepaSphere™ Microspheres

Merit Medical is pleased to introduce a new, smaller 30-60 micron size HepaSphere™ Microspheres. This new size gives physicians the ability to achieve more distal occlusion and to optimize embolisation by more precisely matching the sphere size to the size of the targeted vasculature.

HepaSphere Microspheres' proprietary design allows more complete and targeted occlusion of the blood vessels with or without delivery of doxorubicin HCl for the embolisation of hepatocellular carcinoma and embolisation of metastases to the liver. When packaged in their dry state, the microspheres measure 30-60 microns, but when reconstituted, they expand to 120-240 microns. HepaSphere Microspheres rapidly absorb aqueous solutions such as contrast media, saline, or reconstituted doxorubicin HCl.

HepaSphere Microspheres compress in the vessel lumen, providing more surface contact with vessel intima. The hydrophilic surface and spherical shape prevent aggregation within microcatheter lumens and in the vasculature, promoting ease and accuracy of delivery.


## OPTIMED

### sinus-Venous – innovation in venous therapies

The sinus-Venous stent is the first stent specifically designed for obstructions in iliofemoral veins. The unique stent design is dedicated for the use in the low-pressure system. sinus-Venous offers the ideal balance between strength and flexibility. This is essential for an effective treatment of venous diseases such as post thrombotic syndrome, May-Thurner syndrome or deep vein thrombosis. Intelligent features including the independent ring segments and flash-link connectors ensure an outstanding performance with highest radial force and perfect adaptation to the vessel. Permanent blood flow is restored even under high mechanical stress and complex anatomic conditions.
Implanting the sinus-Venous stent contributes to an improvement of the patient's quality of life and dramatically reduces the risk of post-thrombotic syndrome.
The sinus-Venous stent is available in sizes from 12 to 18 mm in stent diameter and 60 to 150 mm in length.
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## PHILIPS

### EPIQ brings expanded performance to the Interventional Suite

EPIQ, the new premium ultrasound from Philips, introduces solutions that improve diagnostic confidence, speed decision making and improve connectivity. With EPIQ multimodality image retrieval is available at the push of a button on the system, without the use of an external reading station. The system's fully integrated fusion capabilities feature streamlined workflows to allow clinicians to achieve fast and effective fusion of US/MR/CT/PET with live ultrasound. Additionally, EPIQ features advanced needle navigation for challenging interventional cases, such as hard to visualize small-lesion biopsies or ablations. Such solutions to improve connectivity and increase speed of fusion have the potential to improve workflow and clinical confidence, even in challenging diagnostic cases.

## STERYLAB

### MULTICORE: the most advanced automatic biopsy device

MULTICORE® provides an optimised needle visualization under ultrasound guided biopsy procedures. By the natural of its constituent material it functions at any angle of entry into the body in relationship to the generation of sound waves by the ultrasound transducer. Thanks to its perfect smoothness, avoids any risk of seeding of malignant cells along the needle's path from the patient's body out. Specimens provided through MULTICORE® are particularly abundant and allow a quick, safe and easy biopsy procedure, either performed manually or through the most common imaging guiding systems, such as CT, US, MRI.

Advertorial

# New Product Launches

## TERUMO

### TERUMO Europe N.V. announces the launch of MicroThermX™ Microwave Ablation System

MicroThermX™ is a powerful, reliable and user-friendly microwave system. Microwaves technology treats tumors faster than RadioFrequency Ablation and there is less impact by heat sink effect.

MicroThermX™ is simple to use; its small and lightweight generator can easily be moved and stored. Its lightweight and flexible cables allow an easy antenna manipulation. When using multiple probes, its synchronous wave alignment technology allows flexibility in antenna placement without any risk of skin burn and creates a consistent area of necrosis.

MicroThermX™ is a CE marked and FDA approved device which is produced in the US by BSD Medical Corporation and boasts more than 1 000 successful procedures.

TERUMO was a pioneer in Interventional Oncology with the introduction of Drug-Eluting Beads technology in Europe and it aims to indorse its support to the Interventional Oncology community by offering a complete solution for Interventional Oncology.


## VIDACARE

### Hard Bone Lesions Made Easy, with powered bone biopsies using OnControl's new coaxial needle

The OnControl® powered bone access system, using Vidacare's handheld driver platform combined with procedure-specific needle sets, represents the first major advance to bone biopsies in over 40 years. Since 2009, our bone lesion biopsy solutions have provided interventional radiologists a faster, more reliable tool for accessing dense and hard-to-reach bone lesions. Introduced in 2012, the coaxial biopsy tray is specifically designed for multiple bone biopsies from a single cortex penetration, and also remains clearly visible through imaging for precise placement.

For more information on OnControl bone lesion biopsy solutions, see us at booth #50, visit **Vidacare.com/OnControl** or email us at **oncontrol.international@vidacare.com**




# CIRSE 2013 Student Programme – be inspIRed!

The tremendously popular medical student programme is now in its fourth year and we heartily welcome all students to the Congress! As a hub of research and innovation, CIRSE 2013 is the ideal place to find out more about the specialty and to address any queries about IR that students may have.

Students are fundamental to the development of IR, as they will lead the discipline forward in its next generation. However, there is frequently a lack of information available to students about IR as a specialty. It is crucial to counter this lack of awareness by offering a way for students to gain a comprehensive overview of the discipline – so the student programme for the CIRSE Annual Congress was created.

The CIRSE 2013 student programme is designed to showcase the unique aspects of IR as a specialty and a career path whilst also facilitating the answering of any questions students may have. The aim of the student programme is to provide a thorough introduction to IR, and through this, spark the interest of bright young minds that would otherwise be unaware of what the discipline has to offer.

The student programme gives students the opportunity to:

- get to know the world of interventional radiology
- learn from the most renowned doctors of the specialty
- experience the dynamic atmosphere of a professional medical congress
- explore new options for your professional future
- interact with like-minded students and doctors

## Dedicated Student Programme

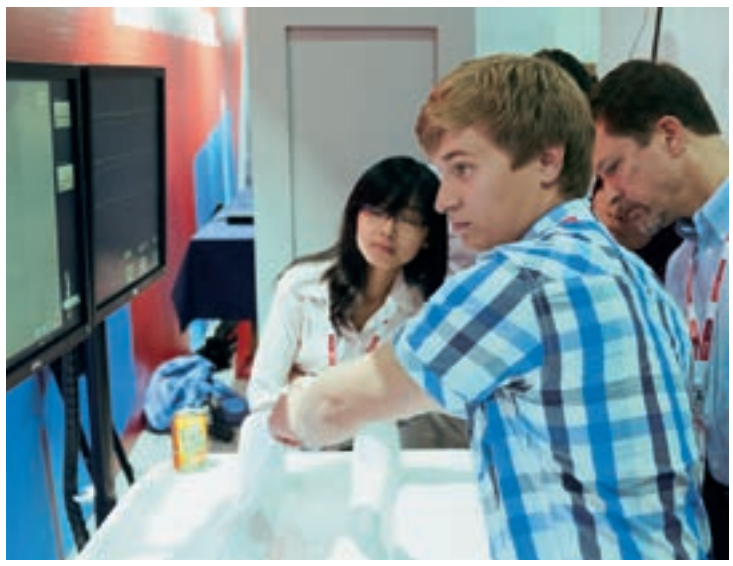
A number of sessions are dedicated to undergraduate medical students and aim to provide an introduction to interventional radiology. The Introducing IR sessions consist of lectures and an interactive question and answer session with top interventional radiologists. This session will be held in both English and Spanish, to make IR as accessible as possible. In Hands-on Experience Simulation, specialists and instructors introduce students to IR techniques and procedures, providing a unique opportunity for participants to practice their skills on a virtual patient. Leading medical companies will demonstrate the tools of the trade in the Hands-on Experience Learning Centre. Participants can get a feel of the interventional radiology devices and understand how they work to prevent or treat an array of conditions.

## Recommended Student Programme

The student programme also contains a range of recommended courses and sessions, which have been especially chosen as being well-suited for medical students and doctors at the beginning of their careers. Included are a variety of session types, namely Foundation Courses, Special Sessions and Workshops. In addition to the courses named in the student programme, medical students are welcome to attend all sessions at CIRSE 2013, apart from the Hands-on Workshops.

In recognition of the difficulties faced by many students, CIRSE has strived to make the student programme as accessible as possible, with free registration for students, a hand-picked programme, a €200 travel and accommodation support grant to the first 200 applicants from outside Barcelona and a complimentary congress lunch for every full day of the Congress. There is a printed programme available for students, with a timetable of the dedicated and recommended sessions, as well as an overview of the types of sessions and topics available.

We wish the students a wonderful Congress and eagerly await their feedback!



## Don't miss it – what's on just for students!

**Saturday, September 14**
**Introducing IR (Spanish)**
SP 306 Student Programme
Room 133
11:45-13:15

**Introducing IR (English)**
SP 708 Student Programme
Room 112
17:30-18:30

**Sunday, September 15**
**Basics of angioplasty and stenting**
SP-HoW 1 Student Programme
Hands-on Experience
Simulator Gallery
16:15-17:15
*Pre-registration necessary!*

**Monday, September 16**
**Essentials of Femoral Artery Access and Haemostasis: Proper Techniques and Management of Complications**
Hands-on Experience
Cordis Cardiac & Vascular Institute
Learning Centre
16:00-17:00
*Pre-registration necessary!*

**Basic embolisation techniques**
SP-HoW 2 Student Programme
Hands-on Experience
Simulator Gallery
16:45-17:45
*Pre-registration necessary!*

**Tuesday, September 17**
**Interventional Radiology at COOK Medical**
Hands-on Experience
COOK Medical Learning Centre
16:00-17:00
*Pre-registration necessary!*

*To find out more about the course or connect with participants, please visit our dedicated Facebook page or website:*
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**www.cirse.org/students**

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Intervention

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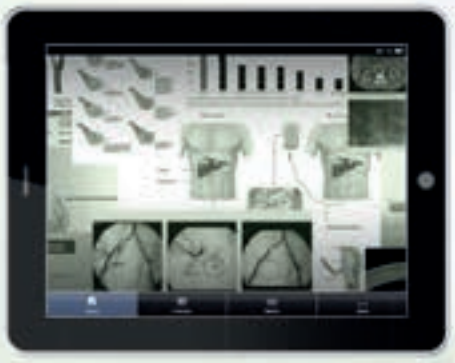
Intervention IQ is a centre for information and tools promoting IR to healthcare professionals. Available across all digital formats, IQ houses a wealth of articles and interviews dealing with an array of conditions that affect our society today, and healthcare systems as a result. Like IR itself, IQ is innovative and dynamic, having recently been digitally re-launched.


## Intervention IQ app now available

IQ is building a community of healthcare professionals who are interested in IR. The Intervention IQ app, available from the Apple Store, Google Play and Google Currents, means you can follow the latest content and access the IQ archives at your convenience.



## Free unlimited downloads

Information-sharing is vital for promoting awareness and information on IR. With this in mind, IQ launched the Download Centre, allowing you free and unlimited use of select content for your own meetings and presentations. Experience what's on offer by visiting the IQ Lounge!

## Connect with IQ

IQ strengthens its links with the IR community via social media as well as through the IQ blog, which is designed to meet the demand for a user-friendly and comprehensive resource for promoting awareness of IR.

## Find out more at the IQ Lounge!