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subsequently,
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President's message

Welcome to a latest edition of the EACTS newsletter. We are working on several projects, on behalf of the members we are serving, to achieve better treatment for all our patients.

he programme for 27th
Annual Meeting in Vienna is
being carefully prepared. The
programme committee met twice
during the year, once in December
when an outline of the topics
considered important for 2013 were
identified and again in May to select
the abstracts. Some 1,300 highquality abstracts were submitted.

During April over two hundred members reviewed all the abstracts. I thank all of you who gave precious time for this important task. It is a lot of work but it is essential and assists the programme committee in making the final selection. It is always the case that we cannot accept all the good quality papers that are submitted due to time constraints and the framework of the programme. We appreciate your research and thank you heartily for sending the abstracts to the EACTS Annual Meeting.

Please keep working and be sure we are recognizing your scientific work. The programme committee continue to add new elements to the programme, in an attempt to improve and better adapt to your suggestions and the huge environmental changes that happens at many levels.

We are confident that Vienna is going to offer you a great meeting and also allow us to enjoy the hospitality of one of the most attractive cities in Europe.

EACTS Committees

In addition to the programme committee work, I must mention the work done by so many of you during the year. All councillors and committees are working extremely hard on behalf of EACTS on the priorities established some months ago.

These priorities include the Quality Improvement Programme (QUIP), and education through a common training programme for the whole EU, in collaboration with the UEMS.

As you know, we launched the Quality Improvement Programme at the Annual Meeting in Barcelona,

EACTS Academy Course	2012	2013	
Fundamentals in Cardiac Surgery I	39	45	
Fundamentals in Cardiac Surgery II	38	19	
Coronary Course	21	20	
Endovascular	25	29	
Thoracic I	17	16	
Advanced Aortic	n/a	43	
Left Ventricular Outflow	n/a	15	
HC & PE	n/a	September	
Robotic Surgery	n/a	December	
ECMO	n/a	October	
Congenital Surgery	20	October	
Heart Failure	24	November	
Chest Wall Diseases	17	November	
Leadership Part I	12	November	
Valve Surgery	11	2014	
Thoracic II	12	December	
Total attendees	237	187	



Jose L Pomar

with a goal of improved quality of care and outcomes in our daily work, implementation of the guidelines programme and increasing the accuracy of the risk scores to adequately assesses our patients. Under the direction of Domenico Pagano the QUIP has made exceptional progress in the intervening months.

To date, six groups have been established; Allied Professionals, Clinical Consensus & Guidelines, Publishing Outcomes, Education, Network for Outcomes Research, and Perfusion. Each group has commenced work on their stated goal and objectives and will report to the members in Vienna.

Education Group

The Education Group under the direction of Leslie Hamilton and Rafa Sadaba have spent many months examining the best educational programmes from the Netherlands and the United Kingdom. From this they have created a document which makes recommendations for a common training programme.

Recently, I had the pleasure of welcoming the Presidents of sixteen national societies to Windsor to discuss this important initiative. I am happy that there was broad consensus among the Presidents and I look forward to updating you all in Vienna.

EACTS Academy

In November 2011, EACTS opened the EACTS House in Windsor. Since

that time the EACTS Academy has offered a wide range of courses, from foundation courses through to advanced specialist courses. The Domain chairs and faculty are to be congratulated on the quality of the programmes offered. We thank all the faculty members who gave up precious time to come to Windsor.

Another active committee of EACTS is the Surgical Training and Manpower Committee who, in addition to the courses in Windsor, organised successful courses in Tehran and Nieuwegein. A report on these activities can be found on page 8.

All your hard work for EACTS has enabled us to become the most prestigious Annual Meeting of the specialty in the world, with more delegates than any other, to have a Journal with an increasing impact factor, and to welcome scholars from fifty-seven different countries to our educational courses during the whole year. This provides an exceptional link for all scientific societies of Cardiovascular and Thoracic Surgery and an outstanding platform for the younger surgeons and trainees.

Finally, we continue to maintain our co-operation with other international scientific societies dealing with cardiovascular and thoracic diseases like ESC, EAPCI, AATS, STS, ATCVS, ESTS, and ESCVS, in the main spirit of EACTS – promoting education of members for the benefit of the patients.

Jose L Pomar, President EACTS

Clinical updates: Five years after SYNTAX trial

Piroze Davierwala, Friedrich W Mohr

Department of Cardiac Surgery Heart Center Leipzig, University Leipzig, Germany

oronary artery bypass graft surgery (CABG) has been the "Gold standard" of treatment for coronary artery disease (CAD) for more than half a century. Percutaneous intervention (PCI), as a therapy option, came into being in the late seventies and ever since, with improvement in operator ability and device technologies, the spectrum of PCI has expanded to treat patients with increasingly complex multivessel disease (MVD) and left main disease (LMD). Many multicenter randomised trials comparing PCI (balloon angioplasty, bare-metal and drugeluting stents [DES]) with CABG for MVD have been published to date1,2,3, most of these being criticised for including highly selective patient populations with less complex disease. not representative of real world practice or having insufficient statistical power. Contrary to this, the SYNTAX trial was exclusive, as more than two-thirds of the patients (n=3075, 71%) screened were recruited, either in the randomised (n=1800) group, when eligible, or the PCI and CABG nested registries (n=1275). when not suitable for randomisation, thus reflecting the real-world scenario4. It incorporated patients with complex CAD, including left main disease (LMD) and threevessel disease (3VD) and is the largest trial to date that compared CABG using the latest techniques (arterial grafts) to PCI with DES. The newly developed SYNTAX score was used to assess the complexity of every patients CAD. Another unique feature of this trial was the utilisation of the Heart Team approach, involving a local interventional cardiologist and a cardiothoracic surgeon, to assess patient eligibility for either treatment.

Although previous trials have shown no compelling benefit in terms of five-year allcause and cardiac mortality for CABG, they have consistently reported significantly greater rates of repeat revascularisation for PCI1,2,3. Conversely, the final five-year follow-up results of the SYNTAX trial for the whole randomised cohort not only



Friedrich W Mohr

confirmed that CABG is associated with lower rates of repeat revascularization (13.7% for CABG versus 25.9% for PCI [p<0.0001]), but also demonstrated a significant benefit in cardiac mortality (5.3% for CABG versus 9% for PCI [p<0.003]), occurrence of major cardiac and cerebrovascular events [MACCE] (26.9%

for CABG versus 37.3% for PCI [p<0.0001]), and myocardial infarction [MI] (3.8% for CABG versus 9.7% for PCI [p<0.0001]) in patients undergoing CABG. The rates of all-cause mortality and stroke, however, were not significantly different between

Further subgroup analysis, although observational and hypothesis-generating only⁶, showed that five-year MACCE rates for the vs 36.9% PCI; p=0.12) and those vs. Coronary Artery Bypass Surgery for

Effectiveness of Left Main Revascularization) trial will be able to resolve what the best treatment strategy would be for these subset of patients. In contrast, patients with 3VD without LMD had 50% greater 5-year MACCE rates when treated with PCI (24.2% CARG vs 37.5% PCI; p<0.001). Similarly, medically treated diabetic patients, who underwent CABG, also had lower five-year MACCE rates (29.0% CABG vs 46.5% PCI; p<0.001).

The CABG registry consisted of patients ineligible for PCI i.e. usually patients with highly complex or diffuse coronary artery disease. The MACCE (23.2%), all-cause death (12.6%), MI (3.8%) and repeat revascularisation (6.7%) rates at five years in these patients were consistent with those in the randomised CABG arm. The PCI registry included patients, who were considered high-risk for CABG, probably due to severe multiple comorbidities, poor ventricular function, etc. This probably explains the poorer outcomes (MACCE: 42.9%, all-cause death: 35.5%, death/stroke/MI: 35.3%) of patients in the PCI registry.

To summarize, 63% of all patients are still best treated with CABG; these include patients in the CABG registry (n=644) and in the randomised trial (LMD and 3VD with SYNTAX score ≥ 33 [n=605], 3VD with

"The final five-year follow-up results of the SYNTAX trial for the whole randomised cohort, not only confirmed that CABG is associated with lower rates of repeat revascularisation, but also demonstrated a significant benefit

Piroze Davierwala and Friedrich W Mohr

SYNTAX score 23-32 [n=415]). Only 7% of patients would probably be best treated with PCI (PCI registry). For the remaining 30% of patients PCI can be, at best, only an alternative to surgery (LMD and 3VD

with SYNTAX score \leq 22 [n=574], LMD with SYNTAX score 23-32 [n=195]).

Thus, the SYNTAX trial has revolutionised decision-making in patients with MVD by introduction of the SYNTAX score, a heart-team approach and evolving a close cooperation between cardiac surgery and interventional cardiology, which is reflected in the published ESC/EACTS guidelines on revascularisation⁷. Repeat revascularisation rates, which were significantly higher in the PCI arm, not only in the overall group, but also in all three SYNTAX score tertiles, still remain an unsolved problem even in the DES era, and continue to be a major cause of concern for interventional cardiologists.

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in cardiac mortality."

entire LMD subgroup (31.0% CABG patients with LMD with low to intermediate risk SYNTAX scores were not significantly different between treatment groups. The ongoing EXCEL (Evaluation of Xience Prime

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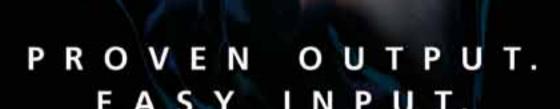
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Programme highlights at the 27th Annual Meeting of the EACTS: " President's message



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Euromacs registry, first year experience, statistics, perspective

Hetzer, R1,5., Gummert, J1,3., Mohacsi, P1,2., Krabatsch, T1,2., Bushnag, H1,4., Potanov, E.5. De By, T.M.M.H.1, on behalf of the Euromacs Members. 1 Euromacs Association. Berlin. Germany, 2 Swiss Cardiovascular Center, Inselspital. Bern, Switzerland, 3 Herz und Diabetiszentrum Nordrhein Westfalen, Germany,

4 Klinik für Herz- und Thoraxchirurgie, Halle/Saale, Germanv. 5 German Heart Institute Berlin. Germanv.

Introduction

he Euromacs registry was initiated in 2010 as a database in which European hospitals implanting mechanical circulatory support devices, aimed at long term functioning in patients with end stage heart disease, could register their perioperative as well as follow-up data. The database was built by Dendrite Clinical Systems, a professional medical database developer, to collect clinical data of both adult and pediatric patients, and with the possibility to register all assist devices that are allowed on the European market. With the large numbers of patients, from different European countries, the long-term aim of the Euromacs registry is to produce significant statistical outcomes based on a standardized dataset. One year on from the 2012 go live date, statistics derived from the data of the first 450 patients demonstrate that the functionalities of the Euromacs registry indeed serve their purpose. With 36 institutional members and more hospitals and national groups interested in contributing, the expectation that the database will obtain an increasing role in analyzing statistics and offering reliable and significant data on which future clinical decisions can be based, seems to be justified.

Structure of the database

Each participating hospital enters into an agreement with Euromacs to ensure timely entry of quality data. Patients that consent to participation in the database are informed by their attending physician about the use of their data. Although a standard information sheet that has been approved by an ethics committee is available, hospitals are free to adapt the text within the limits of local regulations or legislation.

The database consists of three major sections:

- 1) Baseline data, with demographic information and the clinical condition of the patient at admission;
- 2) Implantation data, with respect to the implantation and its immediate clinical outcome;
- 3) Follow-up data, to register data resulting from different events, such as:
 - replacement of the device and its reasons
 - placement of a second device (LVAD -
 - clinical events such as infections and problems with drive line
 - routine follow-up
 - events which terminate the registration: transplantation, death or withdrawal

All sections offer the possibility to include a wide range of data with respect to relevant surgical, physical and laboratory values of the patients who receive an implantation.

The register provides basic data using pull down menus; while the technical

characteristics of all devices used in European clinics are integrated into the registry. Thus a standardized set of fixed data has been created, the evident result of which is the reduction of bias to an absolute minimum.

First year's experience

After a year of building and testing, the Euromacs registry went live in April 2012. The initial 15 hospitals which entered the agreement with Euromacs started to upload the data from their patients retrospectively from January 1, 2011.

Figure 1 shows the development of the first 15 months of the patient registry. As centers submitted their data retrospectively, the figure shows a higher number of entries in the early

well as into the Euromacs registry.

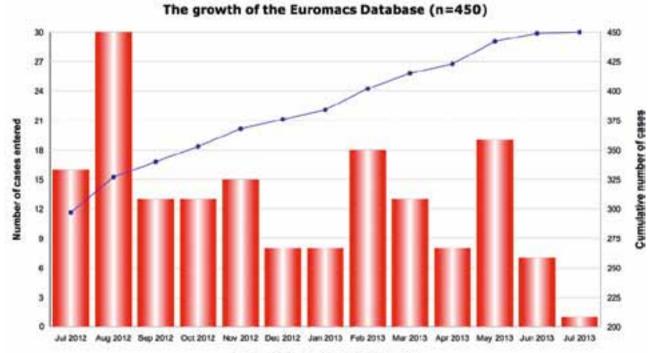
3) Many clinicians find the amount of data to be uploaded from each patient time consuming. The first years' experience has demonstrated that the larger centers often have the possibility to delegate the task of data entry to a data manager. However, several centers have asked Euromacs to reduce the number of data fields.

In order to cope with the factors which obstruct the growth of the registry, Euromacs has taken the initiative to develop, in cooperation with Dendrite Clinical Systems. an "upload-my-data" software tool. Once implemented, this tool will enable the center to copy its existing local database to the Euromacs registry.

also obtain data. These data will however be restricted to the use of their own devices and any proposals to compare performance of individual devices will not be granted.

Perspective

After being operational for one year, the first analyses of data from the Euromacs registry look promising. Detailed analyses will be published in peer reviewed journals. As the number of participating hospitals is growing, and as the number of implanted assist devices increases every year, the expectation that a large amount of significant data will be generated seems to be justified. Having gone through the learning curve, and once the thresholds which have hindered hospitals and



Date of implantation / Month and year

Figure 1. Euromacs Registry Development April 2012-July 2013



months. It is expected that this temporary effect will reduce over time.

Although Euromacs is a welcome tool, particularly for smaller implanting centers, the number of registered patients initially fell behind expectations. The reasons that can be suggested for this are threefold:

- 1) Each individual hospital is offered the standard agreement with Euromacs. In most instances, the agreement has to go through an approval procedure at the legal department. In some cases the ethics committee has to approve the participation of the hospital as well as the information given to the patients prior to asking their
- 2) Throughout Europe a large number of local and/or national databases are active. Almost all individuals responsible for these registries do see the necessity to generate patient data on a European level, but they wish to avoid double data entry into the local database as

In addition, and with the cooperation of several experienced centers. Euromacs has started to define a core database. This core database contains all relevant data on the long term performance of devices, the major events and the follow-up of patients. Individual centers can choose to use the original extended database or the core database, and Euromacs will be able to combine all core data from both versions of the registry so that the outcomes of all patients can be analysed.

Access to data

The access to the Euromacs data is not restricted to the participating hospitals. Any study proposal, aimed to be used for scientific research with the aim to be published, will be considered by the Euromacs board. Requests comparing the performance of individual centers will not be granted, with the exception of those cases in which the centers themselves agree with such a comparison. In case of doubt about the integrity of a study proposal an international scientific committee, composed of renowned researchers, will advise the board.

Besides scientists, the industry which develops and produces assist devices can



national groups to submit their accumulated data have been removed, further growth of the registered number of patients with mechanical circulatory support is likely.

The participation in the EACTS Quality Improvement Programme provides further confidence that the integrity of the registry is such that it corresponds with requirements in respect to reliability of sources and of the database itself.

At the same time, the demands emerging from evolving EU regulation with respect to long term ("post market") follow up of medical devices opens up the possibility to serve the industry by accumulating large numbers of follow-up data which will eventually benefit clinicians and their patients.



Raising Standards through Education and Training



EACTS Leadership Course

n April 2013, the second part of the inaugural EACTS Leadership Course took place at EACTS House, Windsor, UK. The aim of the course is to allow attendees to develop their leadership capabilities and skills, enabling them to improve their working relationships and become better mentors.

EACTS News talked to Toni Clarkson, Lead Trainer, Maguire Healthcare, who discussed the aims of the course and how understanding our personality type helps us to expand our

"The aims of the course are to help people understand what their leadership style is, to help them develop their leadership skills and enable them to lead other people and get them to achieve what they want to achieve," explained Clarkson

The course is not overly theoretical but includes a mix of pre- and post- programme activities. The intensive five-day programme is split into two parts with a three day initial training session (held in November 2012) followed by a further two days of training six months later (in April 2013).

The first part helps develop attendees leadership capability, the second part allows them to share their experiences and reflect on how they can improve and achieve more.

"We all lead in different ways and if you look at the research there is no one template that says this is the way to lead," she adds. "Just as each surgeon has a different style and specialism; your personality will give you a different leadership focus."

Clarkson explains that inside the operating theatre all surgeons generally lead well because it is clear what the mission is, it is clear what the task is, it is clear who contributes what, but where people are most unable to lead is outside the operating theatre.

Although surgeons may still carry the title, seniority and respect based on their position. they can find it difficult to effect change because outside of the theatre the lines of authority are less clear as the roles and objectives have changed.

"Surgeons want to effect change – and leadership is about effecting change – in order



Attendees at the Leadership Course with Toni Clarkson (seated, front row right)

to do that we really concentrate on personality type, because whatever your personality type is, it gives you some inherent strengths, as well as weaknesses."

She explained that over the years, she has worked with 100's of leaders from all walks of life and has only ever met one who admitted that he set out to annoy his staff.

"The amount of people who are annoyed and frustrated with their leader is huge, mainly because there is a misconception between what leaders think they are communicating and what they are actually communicating."

According to Clarkson, this is because we all have different personalities and different values and different communication styles.

'Quite often, the people with who we are most in conflict with have a personality type which is opposite to our own, so we do not recognise their value or their strengths, but instead attempt to squash their approach. This is an important part of leadership, understanding your team."

The primary focus on the course is to encourage surgeons to be more self-aware. think about other people and to action plan. They undergo psychometric testing and then they outline their aims for a particular task whether it is creating a new cardiac surgery department or improving standards – and they develop an action plan.

The group is separated into smaller groups where they present their leadership challenge to the team. The team then asks them questions about how they are going to achieve it, what challenges they will face etc. giving them an opportunity to refine their action plan.

In addition, the programme includes training sessions on listening, managing change, coaching, motivation, conflict and negotiation, with an emphasis on the importance of clarity and clearly expressing to people what you expect of them, what they can expect of you, providing effective feedback and how to clearly define endpoints.

The attendees now have the skills to implement their action plan at their institution.

'Six months later, they come back for the second part of the course and we examine what worked and what didn't work, what leadership skills they used and what they discovered about themselves and their colleagues," she explains. "Then, we provide

them with additional skills, such as how do you set people up to succeed, how do you motivate them? A lot of what surgeons do is mentoring and so we concentrate on expanding their 'coaching' skill set."

The second part of the course also focuses on leadership style and strategy, motivation and examines strategic leadership, types of leadership intelligence and key motivation theories, and concludes with understanding and managing conflict.

"Anybody who wants to lead other people outside of the operating theatre should attend a leadership course," she added, "If you want people to follow you, then you must acquire the skills to lead - as well as understand, mentor and motivate, and these are the skills we can provide you with on an EACTS Leadership Course."

The EACTS is organising a half-day 'taster' Leadership Course at the Annual Meeting in Vienna, where delegates can sample elements of the course such as personality types and gain an understand of the practicalities of leadership. Please look out for further announcements.



Attendees thoughts on the EACTS Leadership Course

Dr Fred A Crawford, Jr Chair of the Leadership Academy Board, of the American Association for Thoracic Surgery.

he American Association for Thoracic Surgery started a Leadership Course about four years ago and our course is quite different from the FACTS course

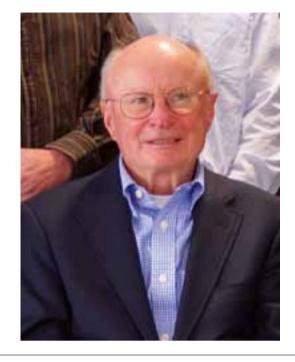
The EACTS course concentrates on the fundamentals of leadership and incorporates a lot of psychology. For example, it looks at what makes people tick and how people relate to each other - so it examines the foundation of leadership skills.

The AATS Course is much more pragmatic in that it places course attendees in certain situations and examines how they deal with those situations. The AATS Course is delivered by established leaders in the field of cardiothoracic surgery who have an expertise in a particular area.

So, instead of talking about the theory of negotiation, the speaker will outline what they have learnt in their career and how they approach negotiations.

The AATS Course is more to do with the practicalities of negotiations. Attendees can then go home and put into practice what they have learnt.

When I looked at the programme for the EACT Leadership Course I noticed that the course is longer – five days as opposed to two – and has a different focus to ours so I was interested to see whether there was anything that I could incorporate from the EACTS into ours.



One of the things that is quite different is that the delegates on the EACTS course are self-selected, whereas AATS attendees are picked as potential leaders of the future. The thought process behind this was that they would need to learn from established leaders.

I have found the EACTS course very useful and have particularly enjoyed some of the psychological concepts. What I have learned from the EACTS course is that you need to know about other people's personality and understand the psychological aspects of relationships and how people relate to each other. I have seen that this works first hand and it could become a valuable part of our course.

An exchange programme between the American, European and Asian Societies has been agreed so we can see the different approaches taken on Leadership Courses and to see whether we can learn from each other.

Interestingly, some of the EACTS attendees have said that they would like to see some more practical elements incorporated into the course and some of the our attendees have commented they would like to see more detail so obviously both courses have something to learn from each other.

I will certainly take some new ideas back from the EACTS course and have see how we can improve our AATS course."

Professor Ulrich von Oppell Lead Cardiac Surgeon, University Hospital of Wales, Cardiff, UK

felt a need to further my leadership knowledge and skills. I was previously the Chris Barnard Professor of Cardiac Surgery, in Cape Town, South Africa, and although I believed I managed well with the challenges at the time. I relocated to Wales eleven years ago and it took me time to adapt to working in a new environment and healthcare system.

There are many issues developing around cardiac surgery and they are becoming more important, therefore I believed now was the right time to develop some new skills.

The one aspect of the course I found particularly revealing was the Myers-Briggs personality profiling, which has given me insight into the strengths of previously perceived weaknesses of my own personality and an understanding of the

behaviour of other people as a result of their profile. A previously perceived irritation in a colleague, I now view as an asset for our team.

I also found the refining of negotiating skills useful, and the importance of the different situational leadership skills in developing staff and juniors in different situations.

The importance of first defining what you require from colleagues in order to facilitate later feedback was particularly valuable in terms of our relationships with junior staff. I think we all instinctively react to situations and this course has taught me to understand the importance of providing clarity of what is expected. We all presume colleagues know what we want and vice versa, but in fact this is a complete misconception and we should not criticise if we have not established the boundaries or our



expectations.

I think that the structure of the course being separated into two parts is beneficial. The two part separation gives one the space for reflection and when returning for the second part of the course re-enforces many of the ideas given in the first part of the

I would recommend the course to consultants who are early in their career because I think it will give you insight into your own personal behaviour and provide tools to interact with the organisation around you. Once you have settled in your career and find time to attend the course, it will give you insight into how to further develop relationships with colleagues, staff or departments, as well as empowering vou to deal with bureaucratic

Dr Anders Ahlsson Head of Division of Cardiology and Cardiothoracic Surgery, Örebro University Hospital, Sweden

hen I was appointed to a new position at my hospital I needed to develop further my leadership skills and I had heard that the EACTS was organising such a course so I visited the website to get more information.

In particular, I wanted to learn more about strategic leadership, economics, legal and healthcare issues. This course appealed to me as it was about leadership in my particular field and the other courses I looked at were more general and aimed at all kinds of healthcare leaders from all specialities.

I have found several aspects of the course interesting especially learning more about my personality type, and my strengths and weaknesses as a leader. The course made me identify both those traits and now I can return to my hospital fully aware of my weaknesses and I can adapt my behaviour, particularly when dealing with conflict.

A large proportion of my personal

satisfaction with the course was the social interaction with other attendees. Despite the disparities in the groups - in terms of training, healthcare system, language and other cultural differences – we have identified some very similar problems that we all experience on a daily occurrence. I have made many new friends during the course, and I do think that we will keep in contact after the course has

I think that is why it is a good idea that the course is delivered in two sessions because I was looking forward to returning to Windsor and discussing the experience I had implementing what I had learned some months earlier - and to meet the other attendees again.

I would recommend the course to those who are about to enter or have just been appointed to a leadership position, or have been identified as a future leadership



EACTS Academy Course

An impression of the left ventricular outflow tract aortic arch surgery two-day course on the 13 and 14 March 2013

William J Brawn

EACTS Congenital Heart Disease Domain Chair

very successful two-day course organised by the Congenital Disease Domain of EACTS took place on March 13 and 14 2013 at EACTS House in Windsor. There were 15 specialist delegates attending, all with a major interest in congenital heart disease. Whilst most were from Furone there were two from Costa Rica. The lecturers likewise came from all over Europe with one specialist speaker being flown in from San Francisco. The aim of

the programme was to provide an in depth teaching programme for congenital heart surgeons.

The course covered morphology of the left ventricular outflow tract and aortic arch, presented by Dr Andrew Cook from the Institute of Child Health in London. Jan Marek, Eero Jokinen and Rob Martin demonstrated the medical diagnosis and interventions currently available for left ventricular outflow tract and aortic arch. We were fortunate to have Professor Patrick McQuillen a specialist in brain development and cerebral protection, to give us a fascinating lecture on the subjects in relation to aortic arch surgery.

The surgical lecturers were Mark Hazekamp, Emre Belli, Tim Jones and myself and excellent presentations were given on surgery for aortic valve disease, coarctation of the aorta and interruption of the aortic arch. The final afternoon of the two days was given over to Wetlab UK, organised by Mr Kevin Austin. A detailed demonstration of the Ross and Ross Konno procedure was shown. The delegates were then able to perform these procedures with three specialist surgeons being available to demonstrate the techniques.

The two days were totally interactive with vigorous discussion and a great social evening was had



William Brawn

in the La Taverna restaurant where we had an opportunity to meet the delegates and the lecturers from all over the world

The initial feedback has been excellent and a further two day

course is to be organised for 2014. It is clear that there is a need for such courses, even though there are many workshops and meetings both at national and international levels. The facilities at the EACTS House in Windsor are wonderful with excellent lecture rooms on the ground floor, a social dining area and meeting room on the first floor and the business and administration areas on the second floor. The location of the centre close to Heathrow airport makes it easily accessible from all over Europe and from the rest of the world. The venue provides not only an excellent place for teaching and for specialist courses, but also a great environment to meet colleagues and to make friends from all over the world. We are very lucky to have such a facility as a European organisation, and the programmes at EACTS house are to be thoroughly recommended and supported.







First EACTS Minimal Invasive Techniques Course in Iran

rom 7–11 February 2013 the Surgical Training and Manpower Committee (STMP) of the EACTS, organised with the Shaheed Rajaei Cardiovascular Medical and Research Centre, a Minimally Invasive Techniques in Adult Surgery Course in Tehran (Iran).

The course focused on the technical aspects of different minimal invasive procedures and was designed to provide the participants with a platform and a basis for starting the same programme at their own institute. As the focus of the course was the technical aspects, these procedures were shown and explained through different presentations and live-in-box-surgery.

As the success of these new procedures depends on a teamwork approach cardiologists, perfusionists and anesthesiologists were also invited to present the technical aspects of their contribution to the procedures discussed. Also dry and wet labs were offered during this course. More than 260 participants attended the course

Dr M R Rezaei (cardiovascular surgeon in Tehran) on behalf of the local organizing committee, thanked the EACTS and Peyman Sardari Nia (EACTS-STMP and



course director) for their commitment and endless efforts in preparing and organizing this course. He also stated that the results of this new trend of EACTS courses will have a huge impact on the future of cardiac surgery in general and that it is one of the best ways to introduce new concepts and techniques to cardiothoracic and vascular surgery all over the world.

For more information about these and other courses that EACTS is organizing in 2013 and 2014 visit our website: www.eacts.org

Learning minimal invasive techniques on anatomic models: as real as it gets...

Robert A.F. de Lind van Wijngaarden MD PhD

t the end April 2013, cardiac surgeons and residents from across the globe gathered in a rainy Dutch city called Rotterdam. It was then and there in the Netherlands, where the first EACTS minimal invasive techniques wet lab was held. Early in the morning (and preferably after a good breakfast), functional and applied cardiac anatomy was studied both by lecture and in vivo. After this, delegates were put to work and had an elaborate chance of practising their skills on suturing with long-shafted instruments and knotting with the knot pusher within a box that simulates the minimal invasive surgical environment and that was made especially for this course. Endoscopic skills were developed further by using the Lapstar™ and Simendo™ simulation systems. After this dry lab session, it was time for some wetness, so people were taken to a historic Dutch restaurant over the Maas (not to be confused with MAZE) River, by speed boat.

The second morning began early (for some too early) with lectures on the 'mini-MAZE' and minimal invasive mitral valve surgery. Attendees were taught about how to perform these procedures and about their tricks and pitfalls.



EACTS course on minimal invasive techniques in adult cardiac surgery

In the following wet lab session moderated by Dr B van Putte (Nieuwegein, NL), participants had the opportunity to perform a minimal invasive MAZE procedure on deceased persons specially preserved, so that the tissue (and the blood) resembled real-life patients. The second surgery scheduled was the minimal invasive mitral valve repair, moderated by Dr T de Kroon (Nieuwegein, NL).

Judging from the reactions of the participants, the speakers, and the organizers of the course, this training method by combining lectures with 'real life' surgery on deceased persons was a successful one. We hope to organise courses with a similar design in the near future.



EACTS Events 2013

Dates	Title	EACTS Domain	Course	Location
27-28 Sept	Hypertrophic Cardiomyopathy & Pulmonary Endarterectomy from the surgical viewpoint	Acquired Cardiac Disease		Windsor, UK
2 Oct	Deadline: pre-registration 27th Annual Meeting			
5-9 Oct	27th Annual Meeting			
14-15 Oct	Extra Corporeal Membrane Oxygenation	Acquired Cardiac Disease		Windsor, UK
21-25 Oct	Advanced Module: Congenital Surgery	Congenital Heart Disease		Windsor, UK
4-8 Nov	Advanced Module: Heart Failure: State of the Art and Future Perspectives	Acquired Cardiac Disease		Windsor, UK
12-15 Nov	Leadership and Management Development for Cardiovascular and Thoracic Surgeons: Part I (Part II will take place 15-17 Aprill 2014)	General		Windsor, UK
27-29 Nov	Chest Wall Diseases	Thoracic Disease		Windsor, UK
3-6 Dec	Thoracic Surgery Part II	Thoracic Disease		Windsor, UK
9-11 Dec	2 nd EACTS Certified Course in Cardio-Thoracic Robotic Surgery Part 1 of 3	Thoracic Disease		Windsor, UK

Course codes:





Specialist Course



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Programme at a glance as of 15 August 2013 EACTS 2013 - 27th Annual Meeting

	Techno College	Saturday 5 October	Transcatheter and sutureless aortic valves Aortic surgery Percutaneous and endoscopic mitral valve surgery	Transplantation techniques and patient selection Mechanical support — outcome of destination therapy	from minimally to maximally invasive surgery			
			Plenary: Life is short and the art long					
	e e		Imaging mitral valve repair	Proximal thoracic aortic disease variations on a theme	Improving Perfusion	Double outlet right ventricle	Mediastinal masses	Moving borders
	Postgraduate Course	Sun 6 October	Imaging: Fusion imaging for TAVI	EACTS /STS Circulation management – temperature and neuroprotection	Safety in perfusion	Rheumatic and congenital mitral valve disease	Challenging infectious diseases	
•	Postg	<i>™</i>	Imaging for coronary artery surgery		Transplant/mechanical assist	Complex surgery	Hyperhidrosis	Non-surgical skills for teams in theatre
					Pro/Con: Use of Intra- aortic balloon support during ECMO/ECLS		Major complications after thoracic surgery	
			Controversies in coronary	How to handle the	Blood management	Arrhythmia I	ECMO-ECLS – Risk	
			artery surgery	ischemic mitral valve	Slood management	, , , , , , , , , , , , , , , , , , , ,	prediction salvage and bridging	
		Monday 7 October		Surgery for prognosis Part I – Mitral valve disease	Left ventricular assist devices I – improving outcome	Aortic valve replaceament long-term outcomes	Risk scores & outcome reporting	Percutaneous mitral valve repair: a standard of care for mitral regurgitation
		ıday 7	Presidential Address: Jose Luis Pomar, Barcelona "Talent or Training"					
		Mon	Coronary artery bypass graft I	Surgery for prognosis Part II- aortic valve disease	Reflections on aortic valve repair	Ventricular remodelling	Cardiopulmonary bypass – improving outcome in marginal patients	Aviation and cardiac surgery
	Scientific Programme		Hot news from on-going clinical trials	End-stage heart failure – long-term/permanent support	TAVI – expanding indications and techniques	Film 1	Cardiac pot pouri	Complications: Escape routes I
	iific P							
	Scient		Degenerative mitral disease	Acute support heart and lung	Arterial revascularation	Mastering concomitant valve procedures	Complications: Escape routes II	Heart transplantation
		tober	The biscuspid aortic valve and ventriular function	Atrial fibrillation	Coronary artery bypass graft II	Decision making in aortic valve repair	TAVI – the real world experience	LVAD II – long-term support
		/ 8 October	valve and ventriular function		bypass graft II		experience	support
		Tuesday 8 October	valve and ventriular function		bypass graft II	valve repair	experience	support
		Tuesday 8 October	valve and ventriular function Honoured Guest: Valentin	ı Fuster, New York "Evolvii	bypass graft II	valve repair scular field: technologica	experience I and non-technological a ECMO-ECLS, combining	support aspects" Everything you wanted to know about atrial
	Techniques	Tuesday 8 October	valve and ventriular function Honoured Guest: Valentin	Fuster, New York "Evolving Complex aortic surgery Mini invasive aortic valve	bypass graft II ng trends in the cardiovate The tricuspid enigma	valve repair scular field: technologica Unpopular problems	experience I and non-technological a ECMO-ECLS, combining with other devices	Everything you wanted to know about atrial transseptal puncture Looking after the heart in the sick and elderly: the gap between bench and

Vienna 2013: Acquired Cardiac Disease Domain programme

John Pepper

EACTS Acquired Cardiac Disease: Domain Chair

he Techno programme for acquired cardiac surgery is innovative and ground-breaking. New methods of helping patients with severe heart failure will be discussed through nine presentations, of which one is live surgery and four are live-in-a box video presentations. We know that implantable VADs are effective but expensive and labour-intensive. There are a range of new approaches which are cheaper but are they effective?

Transcatheter valve procedures are clearly here to stay but how can the results be improved and the complications minimised? There will be nine presentations and a further two on sutureless valves. A new session on transcutaneous mitral surgery has five innovative presentations, two of which will involve live surgery.

Postgraduate programme

The postgraduate programme starts with a forensic examination of cardiothoracic training in Europe. All is not well and we hope to find ways to improve the experience of trainees across Europe. In this general session there will be contributions from all of the Domains of EACTS. The Acquired Cardiac programme takes for its theme the



John Pepper

impact that modern imaging has had and continues to have on modern surgery. How does the surgeon get the best out of what is available from both established and new techniques? What is artefact and what is

real? Intraoperative transoesophageal echo has become the touchstone for quality control in valve surgery.

The main meeting opens on Monday with controversies in coronary surgery and is

followed by a session on how to handle the

Focus sessions

As in recent years we have a mixture of focussed sessions opened by an expert in the field and professional challenges mixed with abstracts. We have sought to provide ample time for discussion and have introduced some new topics. Patients in high risk professions are not always best served by their surgeons who may not be aware of the medical requirements for them to do their job. We therefore have a session on aviation medicine in which this and other concerns will be discussed by a panel of experts.

We have two new sessions on anatomy from the surgical viewpoint, sessions on how to get out of trouble – Escape routes I and II – as well as sessions discussing how to avoid trouble in the first place! Increasingly we are asked to treat asymptomatic patients based upon our knowledge of the natural history of their cardiac disease. How secure is our knowledge and how do we prevent morbidity in this group of patients? There will be a session on cardiovascular surgery in the emerging economies and hot news from recent clinical trials.

We hope you come away stimulated by this meeting and having made new friends.

Vienna 2013: Congenital Heart Disease Domain programme

William J Brawn

EACTS Congenital Heart Disease Domain Chair

t is difficult to think of new aspects and new approaches to the Annual Meeting to keep the Congenital Domain programme exciting. However, I hope we have succeeded for 2013

The programme starts with a Techno-College on Saturday October 5th 2013. The first session is on Transplantation Techniques and Patient Selection and we have an exciting international field of speakers, in particular highlighting the possibilities of increasing the donor pool by organ resuscitation. This session will be chaired by Professor Christian Schreiber from Munich and Professor Hakan Akinturk from Giessen. The second session of the Techno-College will cover the expanding field of mechanical support for cardiac failure. Again we have been fortunate in our international speakers and the chairs for the session will be Mr Asif Hasan from Newcastle, Professor Luca Di Chiere from Rome, and Dr Bart Meyers from Leuven.

On Sunday 6th October, the Congenital Domain Postgraduate day starts with a plenary session from 8:30am until 10.00am and then follows with a two hour session on the double outlet right ventricle, again with an international field of speakers. The chairs will be Professor Richard Jonas from Washington and Professor Bohdan Maruszewski from Warsaw. In the afternoon we cover the field of mitral valve disease ranging from rheumatic to congenital mitral valve problems. The chairs will be Dr Juan Comas from Madrid and Professor Christian Brizzard from Melbourne. This early afternoon session will be followed by films on complex congenital heart surgery. There will be six five-minute films

with 5 minutes for discussion of each film. These have always proved very popular in the past. The chairs will be Dr Emile Bacha from New York and Dr Olivier Ghez from London

The professional challenge covers the problems related to the tricuspid valve. In congenital heart surgery the tricuspid valve has not featured so highly in the past but now with new operations for Ebstein's anomaly, and the problem of the tricuspid valve as a systemic valve in the univentricular heart it seems important that we address these issues. The morphology of the tricuspid valve will be covered, four abstracts will be presented related to the tricuspid valve and surgical management of both Ebstein's valve and the tricuspid valve in the univentricular heart will be explained. The chairs will be Professor Emre Belli from Paris, Professor Giovanni Stellin from Padua, Professor Eero Jokinen from Finland and Professor Pedro del Nido from Boston.

Focus sessions

There are two focus sessions in which the congenital domain is involved. In the first we combine with our vascular domain colleagues, exploring the problems of the aorta. This will cover the embryogenesis of the aorta, the abnormalities of the aortic root, bicuspid aortic valve syndrome and the management of the adult with coarctation and recoarctation of the aorta. The chairs will be William Brawn from Birmingham and Martin Czerny from Berne.

The second focus session covers that contentious area of cardiopulmonary bypass methods and myocardial protection techniques. We have four exciting speakers, Professor Pascal Vouhe from Paris, Professor Bill Gaynor from Philadelphia, Dr David Chambers from London and Dr Patrick McQuillen



William Brawr

from San Francisco. The chairs will be Professor Mark Hazekamp, Dr Tim Jones and Professor Richard Jonas. We have left lots of time for discussion for this contentious area.

On Wednesday 9 October the advances technique session will cover the problems of valve sparing aortic root replacement and LVAD insertion techniques. This will be studied in the context of a wetlab. In addition there are four abstract sessions, covering miscellaneous problems, the univentricular heart and the aortic valve and left ventricular outflow tract.

All together I think this will prove to be an exciting and interesting week.

For more information regarding the programme at 27th EACTS Annual Meeting please visit: www.eacts.org/annual-meeting/programme-overview.aspx

Vienna 2013: Vascular Disease Domain programme

Martin Czerny

FACTS Vascular Disease Domain Chair

his year`s Postgraduate Programme will start with a glance on proximal thoracic aortic pathology starting with highly interesting new aspects of embryology, a summary of current valve and aortic guidelines and a specific focus on valve morphology and its context in acute type A aortic dissection and connective

The afternoon highlight will be the newly created EACTS/STS aortic session which will be an integral part of both Annual Meetings (EACTS and STS) in the future. This year, the focus will be on circulation management. temperature and neuroprotection. There will be invited lectures from well-known experts in the field as well as selected Abstractracts. A new award has also been created specifically for this combined session

Monday will start with a Focus session together with the Congenital Cardiac Domain where aortic disease in infancy and childhood will be discussed. The aim is to get a better understanding of cause and effect in aortic disease in different periods of life. This session will be followed by an Abstractract session on connective tissue disease.

Monday afternoon will start with an Abstractract session on proximal aortic surgery extending into the descending aorta. A plenary lecture will open this session focussing on paraplegia risk after frozen elephant trunk implantation. Monday afternoon finishes with an experimental



Martin Czerny

Tuesday morning will open with a Professional Challenges session focussing on late outcome after TEVAR. The central question here will be if late outcomes will justify or prevent a more liberal use of TEVAR. The second part of the Professional Challenges session will focus on infectious aortic complications and will critically discuss strategies to fix the problem.

Tuesday afternoon will start with an Abstractract session on thoracoabdominal aortic surgery- proven concepts and new strategies. Afterwards a Focus session will

highlight the unique experience of highly respected individuals in aortic surgery who will share their best case and their worst case in aortic medicine and how this influenced their future practice.

The Wednesday programme will focus on invasive and non-invasive milestones in optimizing outcome. Furthermore, a closure device course will be available where participants can actively train on different percutaneous closure devices for vascular

Due to the extremely positive feedback of

last year we are happy to be able to again offer TEVAR and EVAR simulator courses on Monday and Tuesday. In addition the Osirix course, where participants can learn to plan endovascular procedures, will be available. Registration for these courses will be announced in time.

We are confident that this year's programme will be an additional important step to share experience, augment knowledge and create new ideas

Vascular Domain Course

This year's Vascular Domain course took place in Windsor in mid-March, and we had the highest rate of attendance since the course was founded in 2008. The concept which we followed was a journey through the entire aorta from the root to the bifurcation addressing natural history, diagnostics, all treatment options available and long-term outcome.

This approach was very well received and the echo of the course was highly positive and supportive. Pre-case planning as well as simulation training was also available and was adopted enthusiastically by the speakers, who also had the opportunity to attend these courses. We see this as a mission to further expand our practical training opportunities in the future.

Summarising both, the Annual Meeting programme as well as the Vascular Domain's yearly course have been branded by continuing education, propagating innovation, addressing controversies. promoting discussions and reaching

Professional Development during the 27th EACTS Annual Meeting in Vienna 2013

Sunday 6th October

Non-surgical skills for teams in theatre

High performing teams in the operating room: introducing the role of human factors and non-technical skills to improve outcome and reduce error.

■ This three hour interactive workshop will use short lectures, small group discussions, video scenarios and an audience response system to discuss the role of Human factors in adverse events in the operating room. It will go on to show how improving the non-technical skills of the operating team can reduce errors and improve outcome.

Teach the Teacher

An important part of every Surgeon's life is the ability to take on the teaching role in a number of different capacities to support others to achieve and create a better service for their patients. Teaching others is a skill which many aspire to, but don't always fulfil. The aim of this programme is to give the tools and techniques to ensure teachers are competent to deliver first-class education in a practical way.

Learning Outcomes

By the end of this programme, delegates can:

- Describe the five stages of the teaching process
- Present their learning objectives with performance and measures
- Explain the need for texture and structure in teaching
- Deliver a validated learning session using at least three trainer behaviours

Before the course, each delegate will be asked to identify a topic they can use to deliver a five minute teaching session, or

alternatively bring along material for a session they currently teach but would like to approach in a different way.

The Programme will include:

- Introductions
- Who you are
- Your teaching experience
- What is your aims and objectives for the day

Know how people learn and how you can use this in

- Learning styles
- Overcoming barriers to learning

The Teaching Process

- Why learning objectives are important
- Designing your session to engage your learners
- Texture of content
- Delivering for optimal impact
- Your platform skills
- Measuring your teaching effectiveness validation

Teaching techniques

- A focussed structure: "KIM"
- Gaining learner interaction in groups
- Using questions
- The eight trainer behaviours

What have you learned?

- Short observed training sessions and facilitator feedback
- Actions for personal development

Monday 7th October

Non-technical skills for surgeons

Introducing the NOTSS (non-technical skills for surgeons) system for understanding, observing and rating surgeon's nontechnical skills in the operating room.

This 1.5 hour interactive session will introduce the NOTSS taxonomy of non-technical skills for surgeons and demonstrate how these skills can be observed, rated and used to provide constructive feedback.

The faculty are all part of the Royal College of Surgeons of Edinburgh 'NOTSS' training team Mr Simon Paterson-Brown

- Consultant General and Upper GI Surgeon, Royal Infirmary of Edinburgh, UK
- Chairman Patient Safety Board, Royal College of Surgeons of Edinburgh

Dr Nicola Maran

- Consultant Anasthetist, Royal Infirmary of Edinburgh, UK
- Past Director of the Scottish Simulation Centre
- Member Patient Safety Board, Royal College of Surgeons of Edinburgh

Mr Graham Sunderland

- Consultant General and Colorectal Surgeon, Southern General Hospital, Glasgow
- Clinical Director of Surgery Greater Glasgow and Clyde
- Member Patient Safety Board, Royal College of Surgeons of Edinburgh

Quality **Improvement Programme**

Elka Humphrys, OLJIP Project Manager

he Quality Improvement Programme (QUIP) has come a long way since its members first met at the 2012 Annual Meeting in Barcelona. The QUIP Strategic Board has been constituted, meeting for the first time in July, and four main QUIP areas have been established to support projects within the programme; the Network for Outcomes Research, Publishing Outcomes, Clinical

Consensus & Guidelines, and Education. With the support of FACTS members work now spans all four **EACTS** Domains and includes surgeons, perfusionists. and nurses working towards improving clinical outcomes for patients.

The Network for Outcomes Research has been working hard on updating procedures to ensure that EACTS data

greatest importance to guarantee the continued high quality data submission to the current EACTS Adult Cardiac Surgical Database and for the progression of future database projects. EACTS has also been working with Dendrite Clinical Systems Ltd to develop a new online software tool to simplify the process of submitting data. This will make it easier for individual. Cardio-Thoracic surgical centres and National Societies to contribute data, which should lead to increased contributions and a more robust dataset.

Within the Network, the Perfusion Group and Allied Professions Group have been contacting colleagues across Europe to establish working groups for their projects looking at supporting best practice and defining quality improvement initiatives. The groups have both received an extremely positive response to their proposed projects, and are now

moving forward with developing the work. Over the next few months we will be updating members about the projects, and how to get involved via the EACTS

In June, representatives from 16 National Societies met in Windsor to discuss a proposal from the Education Group to recommend common standards for a training programme in cardiothoracic and vascular surgery across Europe. The day provided an opportunity to discuss current training programmes and to establish a consensus on how to address the variation in training around Europe. The Education Group are now working on a draft document to progress with creating a set of European training standards.

The Publishing Outcomes Group is very pleased to announce a new collaboration with Euromacs, the European Registry for Patients with Mechanical Circulatory Support (MCS). Since 2009 Euromacs

> has been gathering scientific information about the longterm clinical outcomes of patients who undergo treatment with MCS. Analysis of the data enables information to be offered about the conditions for the optimal clinical management of patients with end-stage cardiac failure. Welcoming Euromacs as an EACTS Committee is a great

policies remain in line with current legislation. This is of opportunity for both organisations to build on the previous success of Euromacs and to ensure the growth and success of the Euromacs database in the future.

Quality Improvement

Programme

Last but by no means least, the Clinical Consensus & Guidelines group have identified various areas where consensus documents or guidelines would be beneficial. They are keen to recruit members to work on the projects, with the group expecting to release at least three documents per year as part of the Quality Improvement Programme. Further details will be announced via the website and at the Annual Meeting in Vienna.

This is the beginning of a new and exciting period for developments in cardio-thoracic surgery. and EACTS is dedicated to supporting quality improvement initiatives to raise educational and

EACTS Academy programme update 2013 and beyond!

he 2013 Academy programme is now well underway with seven completed courses and a further nine scheduled for the coming months.

Our hugely successful and comprehensive Foundation track courses have seen the introduction of wetlab sessions specifically in Fundamentals in Cardiac Surgery Part I and II. These cover various aspects of aortic and mitral valve surgery, an exercise on the tricuspid valve and a half day on the thoracic aorta, including dissection and the elephant trunk.

In addition, we have introduced new specialist courses, which we are sure will be of interest to EACTS members and non-members alike. We will also run Chest Wall Diseases for its second year in Windsor.

The following new specialist advanced Acquired Cardiac Surgery courses have also been announced:

Hypertrophic cardiomyopathy and pulmonary endarterectomy from the surgical viewpoint Friday 27 and Saturday 28 September Fees: EACTS Members €250 Non-Members €350

This course will cover: European Society of Cardiology Guidelines; Essential imaging with multiple examples and pre-op work-up; The many phenotypes and genotypes of Hypertrophic Cardiomyopathy; Surgical techniques, outcomes, pitfalls and limitations; The background of chronic thromboembolic pulmonary hypertension; Imaging for pulmonary endarterectomy; Detailed surgical techniques; contemporary outcome of surgery, in-hospital and long-term and Ask the Expert Q&A

Extra corporeal membrane oxygenation Monday 14 and Tuesday 15 October Fees: EACTS Members €300 Non-Members €375

ECMO is a well established technique which has come of age over the past 5 years. The safe use of this technology requires trained personnel, the correct kit and the agreed parameters which need to be closely monitored. All these details will be covered in this interactive course which will include hands-on simulation work.

Chest wall diseases Wednesday 27 -Friday 29 November Fees: EACTS Members €575 Non-Members €525

The main subjects that will be covered in the workshop are Congenital Chest Wall Deformities. Chest Wall Resection and Reconstruction, Thoracic Trauma and Sternal Dehiscence

Further Advanced Courses are being prepared for 2014, which will include Ischaemic Mitral Regurgitation and Hypoplastic Left Heart.

Fundamentals in Cardiac Surgery Part II

John Pepper

EACTS Acquired Cardiac Disease: Domain Chair

his second tier Fundamentals Course (3-7 June 2013) was targeted at trainees in cardiac surgery who had been in resident posts for at least two years. It explored more complex and controversial areas than were covered in the Fundamentals I Course held earlier in the year.

In congenital surgery, topics covered included left ventricular outflow tract obstruction, the bicuspid aortic valve, anomalous pulmonary and systemic venous connections. The rapidly expanding sub-speciality of adult congenital heart disease (GUCH) was also reviewed.

Adult cardiac

In adult cardiac, we covered mitral and tricuspid surgery, including transcutaneous



intervention, surgical treatment for atrial fibrillation, re-do operations and chest trauma. There were also several sessions on vascular surgery including aortic dissection, endovascular intervention and operations on the aortic arch. These interactive seminars were supplemented by a whole day in the wet-lab focusing on mitral valve repair and surgery of the thoracic aorta. Other more specialist areas covered included

transplantation and mechanical support of the circulation including ECMO and hypertrophic cardiomyopathy.

Additional topics

The Course also covered more general topics such as data collection, risk assessment and aspects of professionalism in cardiac surgery.

The intention was to make these five days a stimulating and collegiate experience with dinners on three of the four evenings providing attendees with the opportunity to network with their peers throughout Europe and have informal 1:1 conversations with some of the lecturers.

By the end of the week, delegates had a very broad idea of the scope of our speciality, as well as an appreciation of the limits of our knowledge, and the areas of growth and development.

Fundamentals I & II 2014 **Fundamentals I** 3-7 February **Fundamentals II** 2-6 June

Both courses will take place at EACTS House, Windsor, UK For further details please visit: www.eacts.org/academy/2013-programme

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third EACTS Meeting on Cardiac and **Pulmonary Regeneration**

ne third EACTS conference on cardiac and pulmonary regeneration was focused on presentations and discussions of latest developments in basic research and clinical translation. in the field of cardiovascular and pulmonary regeneration. Highranking scientists and renowned officials as well as young European researchers interactively discussed their results and new ideas. A total of 37 Abstractracts were submitted and accepted. These were split into 12 oral presentations and 25 poster presentations. The selection committee consisted of G. Steinhoff, U. Martin, R. Schmid, H.J. Ankersmit and G. Karoubi. 35 Abstractracts are published in the issue of Interactive CardioVascular and Thoracic Surgery (ICVTS) in February 2013¹. 16 key note speakers presented their latest results. The conference brought together international leading researchers as well as young European scientists. Of a total of nine sessions, the first one, an international science talk about clinical prospect of cardiovascular regeneration, took place in the famous Rudolf Virchow lecture hall ruin of the Charité.

Science talk - clinical prospect of cardiovascular regeneration

A main focus of the scientific debate was the selection of optimal cells for cardiac cell transplantation and necessary controls for method evaluation. Whereas the impact of paracrine factors from transplanted cells or cell-derived conditioned media was widely recognized. researchers had controversial views on the impact of undifferentiated cell application and on the necessary depth of characterization for therapeutic use.

Enhancement of therapeutic efficacy by cell pre-conditioning regimes was considered feasible but limited compared to the promise of genetic engineering; in any case: the need to clarify involved mechanisms was emphasized¹. Fruitful discussions developed on clinically applicable biopolymers and scaffolds for tissue engineering. The discussants emphasized improved test methods for tissue engineering constructs as well as promising data on large animal models and on the application of tissue engineered constructs generated from human cells; combination of this know-how may help to focus and speed up further studies in the field1-2. Discussions about evolving regulatory concerns revealed diverging practice in Europe and the US. The meeting provided excellent opportunities for basic



Talking about stem cell medicine: U. Martin, Hannover, Germany; J.P. Cooke, Stanford, USA; W. Sherman, New York, USA and G. Steinhoff, Rostock, Germany

and clinical researchers to gather information on clinical translation procedures and discuss their respective approaches together with regulatory affairs experts to make new therapies available to the

Cell programming was generally considered to be a highly promising approach for the future. A model may be provided by dedifferentiation preceding of cardiac regeneration in zebrafish. Therefore, scientific exchange focused on the impact of specific

researchers as the most valuable methodological advancement²⁻³ Data presented on reprogramming of cells from different sources led to fruitful discussions about nonviral transfection and cell selection approaches as well as labeling for non-invasive cell tracking^{1,4} Cell modification by small RNAs as well as cell-permeant peptides may allow for safer and gentler ways of reprogramming and were discovered to be connected to particular cellular pathways. New findings on the involvement



pathways on dedifferentiation (Hedgehog, IGF) and cardiac differentiation (MESP-1, TGF-beta, YY-1)³⁻⁶. First reports on selective generation of individual cardiac or pulmonary cell types (endothelial cells, pace maker cells, Clara cells) from pluripotent cells were given and discussed during the meeting¹.

Genetic recombination techniques employed for fatemapping, for cell-type specific cell destruction to generate optimal injury models, or for gene defect repair were considered by basic

of cellular innate immunity may be exploited for highly efficient reprogramming while eliminating the need of viral vectors7.

Basic science

Basic science aims to investigate cardiac regeneration mechanisms of the injured heart. One widely used model is the lower vertebrate zebrafish. This is special, as its heart muscle regeneration is achieved without stem cells, instead, mature heart muscle cells regress to a stem cell-like state and redifferentiate8.

Therefore it is important to evaluate the principles of underlying regenerative capacity.

Choi and coworkers employed fluorescent ubiquitylationbased cell cycle indicator (FUCCI) technology to identify several small molecules that increase or reduce cardiomyocyte proliferation during heart development³. Here signaling pathways via hedgehog, insulinlike growth factor or transforming growth ß are involved³ and can be pharmacologically modulated to manipulate cardiomyocyte proliferation during adult heart regeneration3.

Another important finding was presented by R. David. demonstrating that the earliest events initiating cardiogenesis are conserved between higher and lower vertebrates with MespA being the functional amphibian homolog to mammalian Mesp1 in

Stem cell science and technology

Stem cells are the basis for regeneration in medicine. differentiating into the required cell types. Therefore it is necessary to investigate differentiation potential of pluripotent and induced pluripotent stem (iPS) cells.

The group of R. Zweigerdt developed a forward programming protocol to obtain human pluripotent stem cells by conventional plasmid transfection without viral vectors. Here a combination of BAF60C, GATA4, and MESP1 or even of GATA4, and MESP1 transcription factors is sufficient to generate cardiomyocytes4. Therapeutic application of stem





cell technology requires large cell quantities generated under defined conditions. Thus upscaling procedures need to be established. 7weigerdt and coworkers developed a mini stirred bioreactor of 100 ml cell culture volume and could demonstrate the ability of cells to differentiate into derivates of all three germ layers and maintained expression of pluripotency markers in vitro10

Also, iPS cell derived cardiovascular progenitor cells have the capability to form myocardial cells and are therefore suitable for myocardial regenerative therapy. To prove their capacity to ameliorate cardiac function Rojas investigated murine iPSCderived cardiovascular progenitor population expressing the surface marker foetal liver kinase-1 (Flk-1) after acute myocardial infarction in mice11. Indeed iPS cell-derived Flk-1(pos) progenitor cells differentiate into cardiovascular lineages in vitro and in vivo and improve cardiac function11

Tissue engineering technology

A tissue engineered product contains or consists of engineered cells or tissues and is used in human beings to regenerate, repair or replace a human tissue. Thereby the purpose is to understand the principles of tissue growth and to implement this into humans to yield functional benefit^{12,13}.

Qian and coworkers could show in vivo that murine cardiac fibroblasts are directly reprogrammed in their native environment into cardiomyocytelike cells via the addition of Gata4, Mef2c and Tbx5. This demonstrated successful in vivo reprogramming for potential regenerative purposes in injured mouse hearts, resulting in reduced scar formation and improved cardiac function13.

The group of Zimmermann demonstrated a protocol for cardiac differentiation of human embryonic stem cells and the assembly of these cardiomyocytes into engineered heart muscle¹⁴. This protocol may easily be adapted to other stem cellderived cardiomyocytes, like iPSC14.

Another approach to regenerate ischemic damaged hearts was investigated by the group of G. Steinhoff, who used systemic delivery of adenoviral vectors

encoding human VEGF combined in plants and amphibians (e.g. with magnetic nanobeads in a rat myocardial infarction model under the control of an external magnetic field15. This increased VEGF expression in the infracted heart and lead to neovascularization and improved post-infarction recovery of LV function¹⁵. Thus, an improved gene therapy with the potential into clinical applications was revealed.

Lung regeneration

Lung regeneration due to disorders of the respiratory system is usually quite minimal. Therefore adequate therapies need to be established and latest research findings seem to be promising.

A. Perl et al. found out that crosstalk between epithelial and mesenchymal cells regulates the fibroblast phenotypes during alveolar septation. Further results indicate that induction of Peroxisome proliferatoractivated receptor- signaling and inhibition of Fibroplast Growth factor receptor 2 signaling changes the expression of genes being important for epithelialmesenchymal crosstalk during early development of the luna16

Cortes-Diercks and colleagues stated a paracrine-based antitumor effect of human lung MSC culture media in malignant pleural mesothelioma cell lines (MPM) based on the fact that cell proliferation and cell viability were significantly reduced in MPM. These findings may also indicate a potential therapeutic role in those tested cell lines1.

C. Mauritz et al. investigated the generation and differentiation process of human and murine pluripotent stem cells into airway epithelial cells. Among other findings it was shown that the application of key differentiation factors induced the appearance of airway epithelia cells in those cultures. Also these results might represent a further step towards the development of therapies for pulmonary diseases1.

Cardiovascular regeneration

Shortly after birth cardiac muscle cells almost exit the cell-division cycle and divide only rarely¹⁷. Heart attack leads to dying of a billion cardiomyocytes, with little capacity to regenerate these cells. Thus, heart function is compromised and may induce heart failure or even sudden death¹⁷. Therefore basic researchers and clinicians investigate the possibilities to induce cardiomyocyte regeneration.

The group of T. Braun investigates the phenomenon of dedifferentiation as a potential tool in cardiac regenerative processes, which is mostly known initiated replacement of lost body parts). Activation of the cytokine oncostatin M signaling pathway initiates dedifferentiation of cardiomyocytes both in vitro and in vivo and thereby protects the heart from acute myocardial ischemia¹⁸. However, continuous oncostatin M activation promotes dilative cardiomyopathy18. Thus, continuous activation or malfunctions of the cellular dedifferentiation machinery might contribute to different disease conditions

Kensah and coworkers revealed in a proof-of-concept study the use of iPS- and ES-cellderived cardiomyocytes to generate three-dimensional aggregates, which act as functional bioartificial tissue, so called cardiac bodies19. Direct fusion of these cardiac bodies resulted in structurally and functionally homogenous syncytium, which reguires the following factors: addition of fibroblasts, ascorbic acid supplementation and increased static stretch¹⁹. This system allows novel insight into cardiac tissue formation and maturation, with potential impact on new concepts for myocardial repair.

Cardiac regeneration is also enhanced by laser-based cell printing of human umbilical vein endothelial cells (HUVEC) and human MSC in a defined pattern on a Polyester urethane urea cardiac patch2. The group of Steinhoff demonstrated in vivo enhanced angiogenesis in the border zone of infarction and preserved cardiac functions after acute myocardial infarction2. This technology might improve wound healing and functional preservation.

Clinical translationregulatory framework and **GxP**

Clinical translation is an essential tool to transfer latest research findings into humans whereas again specific guestions may arise that need to be considered in laboratory experiments. Safety and efficacy of new therapeutic approaches need to be evaluated and strictly documented in clinical studies according to regulatory guidelines. Therefore Good Clinical Praxis (GCP) is a legal standard to perform these trials. S. Sethe, an expert in regulatory affairs for cell and tissue based therapies in Europe and the USA, gave a very clear and graspable introduction into the topic and among others he also pointed out non clinical research including animal experiments to be mandatory before starting clinical studies²⁰.

Furthermore A. Kaminski, surgeon and one of the investigators of the phase III trial PERFECT, stated his view of clinical aspects in the context of this crucial translation process

from bench to bedside. Besides general remarks to recent studies investigating safety and efficacy of stem cell therapy after myocardial infarction he also explained molecular cell mechanisms that occur while these events happen (e.g. fragmentation of gab iunctions between neighboring cells). Additionally U. Ruch, a translation manager, introduced a Cardiac Stem Cell Registry that is currently being tested and supposed to become an essential tool to establish high quality standards regarding all future heart stem cell applications in Germany/Europe²¹

Paracrine factors

J.H. Ankersmit presented data on peripheral blood mononuclear cells as easily accessible autologous source of regenerative factors. Cellfree supernatants generated in vitro from short-term cultivated monocytes promoted healing of cutaneous wounds in pigs. The freeze-dried secretome of apoptotic leukocytes, applied intramyocardially via a balloon catheter technique (NOGA), improved cardiac function in a porcine model of reperfused myocardial infarction²². Cellfree regenerative concentrates such as employed by Ankersmit and by Di Santo, who focus on factors secreted by endothelial progenitor cells for treatment of ischaemia, contain a multitude of proteins, peptides and possibly nucleic acids

Despite the fact that their composition has not yet been characterized in detail and factors responsible for the regenerative activity, first application in patients was performed and reported to be successful. Immunosuppression of apoptotic cell paracrine factors could be important for the effect; Lichtenauer et al. showed an increase in perfusion as well as reduced necrosis in infracted rat hearts after injection of anti-thymocyteglobulin as representative immunosuppressive agent²³.

Regenerative cardiovascular medicine update and future development

The group around E. Delyagina is using the polymer polyethylenimine (PEI) coated magnetic nanoparticle for plasmid DNA (pDNA) transfection in vitro and in vivo since 20081. With this technique a significantly higher transfection than with commercially available polyplexes could be shown in human mesenchymal stem cells. The results demonstrated a more rapid and efficient release of pDNA in the perinuclear region¹

Merkert and his team had succeeded the generation of patient specific iPS cells from endothelial cells of peripheral blood¹. For the introduction of target genes in the iPS cells, they established a zinc finger nucleases (7FN) based gene targeting protocol with transfection efficiency of up to 1%. With this approach, the aim of a functional correction be pursued in the CF disease1 Research approaches of Cooke et al. demonstrate efficient induction of pluripotency by viral or mRNA due to the toll-like receptor 3 (TLR3). TLR3 part of the innate immunity that's activation is of importance to successful nuclear reprogramming7.

Assessment of the results and impact of the event on the future directions of the field

During the third EACTS conference, cardiac and thoracic surgeons, basic. clinical and industrial scientists. as well as young European researches presented and interactively discussed their latest developments in the field of cardiovascular and pulmonary regeneration, supported by experts in regulatory affairs. This resulted in expanded knowledge in basic and applied science and translational medicine (GMP, GLP, GCP) for the development of new concepts in stem cell therapy for every participant. Moreover during the poster session and within the breaks there were lively and fruitful discussions about the presented topics regarding pharmacological. tissue engineering and stem cell therapy concepts in cardiac and pulmonary regeneration. These discussions lead to further cooperation and scientific exchange between the participants.

In cardiovascular and pulmonary medicine autologous stem cell therapy has already been performed for more than ten years. The field recently expanded on new research progress with ES and iPS cells. This was apparent at the conference, where several talks and poster presentations underlined the relevance of these cells in cardiac and pulmonary regeneration. The innovative potential of this new approach (turning mature cells into stem cells) is also emphasized by the Nobel Prize in physiology or medicine in 2012

Bringing innovative approaches into new therapies is subject to diverse regulatory requirements. This conference revealed the importance of considering clinical implementation and regulatory pathways, and translational aspects at the basic science level. This will be key to fast development and a crucial factor for clinical success.

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International Workshop on Thymus -Myasthenia Gravis - Thymectomy



Franca Melfi EACTS Thoracic Domain Chair

Thymic Working Group (EACTS)

n 15–16 March 2013, Padua (Italy) housed the "International Workshop on Thymus – Myasthenia Gravis – Thymectomy". This was organised by the Thymic Working Group of the European Association for Cardio-Thoracic Surgery (EACTS) which contributed with an Educational Grant Professor Federico Rea and Dr. Marco Lucchi were the Chairs of the Meeting. The workshop was hosted in the beautiful ancient University building (Palazzo del Bò) which gave a magical atmosphere to the scientific event.

The main focus of the workshop was on nonthymomatous and thymomatous Myasthenia Gravis with key issues on basic research and diagnostic and therapeutic controversies. The aim was to realize a multidisciplinary workshop with the contribution of several professional figures (neurologists, radiologists, pathologists, oncologists and surgeons) coming from all over the world, and with wellknown expertise in the basic research and in the complex clinical management of nonthymomatous and thymomatous Myasthenia Gravis, in order to cover all the aspects of this disease.

Lectures focused on the new biological

and molecular findings, the medical, radiological and pathological developments, the guidelines and indications for treatment of patients with Myasthenia Gravis, and the technical aspects of different surgical approaches, including pros and cons. A highly-qualified international panel of experts took part in the meeting guaranteeing the high quality of the workshop. The Faculty comprised 27 speakers from ten different

- Kalliopi Athanassiadi, MD. Athens Greece
- Sonia Berrih-Aknin, MD, Paris France
- Fiorella Calabrese, MD. Padua Italy
- Frank Detterbeck, MD. New Haven USA

- Paola Erba, MD. Pisa Italy
- Amelia Evoli, MD. Rome Italy
- Paolo Feltracco, MD. Padua Italy
- Nils Erik Gilhus, MD. Bergen Norway
- Pierluigi Granone, MD. Rome Italy
- Marco Lucchi, MD. Pisa Italy
- Renato Mantegazza, MD. Milan Italy
- Alexander Marx, MD. Mannheim Germany
- Giuseppe Marulli, MD. Padua Italy
- Franca Melfi, MD, Pisa Italy
- Meinoshin Okumura, MD. Osaka Japan
- Alberto Oliaro, MD. Turin Italy
- Elena Pegoraro, MD. Padua Italy
- Adriano Priola, MD. Orbassano Italy
- Federico Rea, MD. Padua Italy
- Jens C. Rückert, MD. Berlin Germany
- Berthold Schalke, MD. Regensburg –
- Ralph Schmid, MD. Bern Switzerland
- Joshua Sonett, MD. New York USA
- Philipp Ströbel, MD. Gottingen Germany
- Paul Van Schil, MD. Antwerp Belgium
- Gil I. Wolfe, MD. Buffalo USA
- Marcin Zielinski MD Zakopane Poland Although the workshop was focused on a relatively rare disease, it was a success in terms of attendance, scientific quality, interest and acceptance from participants. A total of 111 participants were recorded, with residents and specialists coming from 17 different countries: Italy, Japan, Greece, Romania, France, Israel, Croatia, Russia, Iran, Korea, USA, Sweden, Norway, Netherland, Germany, Switzerland and Belgium. The workshop also provided a dedicated space for featured Abstractracts. which were presented and discussed during

During the workshop the results of the EACTS thymic survey were discussed and some proposals for collaborative studies were formed.

EACTS robotic course in cardio-thoracic surgery

he advanced engineering technology on minimally invasive surgery makes it possible to overcome some of the technical difficulties which can occur during "conventional" minimally invasive surgery. Robotic-assisted surgery represents an extraordinary technological advance for a broad range of procedures traditionally requiring open surgery. By enabling surgeons to perform complex operations through small incisions, the robotic surgical system (Surgical Intuitive, Inc., Sunnyvale, CA) can be considered the most recent and advanced stage of this process thanks to its 3D vision and 7 degrees of freedom (7DOF) of its instrumentation, to replicate the human wrist.

The surgeon's hand movements are scaled and filtered to eliminate hand tremor, then translated into micro-movements of the proprietary instruments. The camera used in the system provides a true stereoscopic picture (3D) transmitted to a surgeon's console. These improved ergonomic conditions and instrument mobility at distal articulations seem beneficial in thoracic procedures.

In cardio-thoracic surgery there is not yet a standardised technique the surgeon can precisely follow, and even very experienced surgeons may have very limited robotic experience. To perform robotic surgery in a safe and straightforward manner, it is necessary to standardise procedures and establish operative schemes. EACTS plays an important role by promoting the educational opportunities for training surgeons in this hightechnology field.

COURSE OVERVIEW PART 1

EACTS House, Windsor, 9-11 December 2013

The course will cover important clinical aspects relating to the use of the robotic surgical system in a variety of cardiac and thoracic procedures. Our renowned faculty of surgeons will demonstrate OR configuration, system preparation, patient positioning, port placement, as well as pre-, intra- and postoperative techniques.

COURSE OVERVIEW PART 2

Ecole Europeene de Chirurgie, Paris, 2014

Part 2 will continue to build on the skills acquired in Part 1 in Windsor. The course is designed to cover important clinical aspects relating to the use of robotics in a variety of cardiac and thoracic procedures. Surgeon faculty and Intuitive Surgical® certified trainers will demonstrate OR configuration, system preparation, patient positioning, port placement, as well as pre-, intra- and post-operative techniques using the robotic surgical system. Cadaver models will be employed.

COURSE OVERVIEW PART 3

University of Pisa Medical School, Pisa, 2014

A highly qualified international panel of experts will take part in this course. Their presence will provide precious information in terms of indications and technical surgical sequences in order to avoid an inappropriate use of this new technique. We expect the attendees on this course to achieve improvement in surgical performance and reductions in operative times, with increasing

number of procedures, while obtaining results that conform to specific standards.

TARGET AUDIENCE

Surgeons who have access to the da Vinci system and are interested in learning robotic cardiothoracic surgery are highly recommended to join this course.

COURSE OBJECTIVES

After attending Parts 1 and 2 of this three part course, participants should be able to:

- Know the advantages and technical considerations associated with robotic surgical strategies in management of basic and complex thoracic disorders:
- Discuss the conduct of cardiothoracic robotic surgery through analysis and critique of videos;
- Explain the process by which technically advanced procedures may be incorporated into surgical practice;
- Discuss controversial issues, emerging techniques and future directions in robotic surgery.

At the end of all three parts of the course, participants will have improved their competency and will be able to:

- Utilise the device for appropriate surgical procedures for their own patients, based upon results presented;
- Develop emerging robotic surgical technique for complex procedures:
- Apply basic and clinical research methods to issues in robotic cardiothoracic surgery.

We are all aware that in the future there will be a great need for highly skilled surgeons in this field. We believe that this course will provide a great opportunity to train surgeons in the field of high-technology applied to surgery, embodying the mission of the EACTS "to promote and foster education and research in the field of cardiothoracic surgery...".

Trade exhibition in conjunction with the EACTS Annual Meeting

n conjunction with the Scientific Meeting, EACTS will host an exhibition for its industry partners. Companies will present the latest in cardiac, thoracic and vascular therapies, technologies and related services in an educational exhibition area.

All registered participants will have the opportunity to attend the exhibition and interact with medical experts on innovations in patient care.

In addition to their presence in the exhibition hall, industry partners will offer a wide range of educational sessions during the meeting. These sessions will complement the main scientific programme and are designed to offer key insights into the latest scientific developments for patient care.

Industry partners will also present intensive practical sessions in the training village. These sessions will allow participants to gain firsthand knowledge by learning from industry experts on device techniques relevant to their practice.

The exhibition will be open from Sunday 6 October to Tuesday 8 October. Details of the programme offered by industry partners will be on our website during the summer.

The EACTS Annual Meeting is 4.5 days and will consist of intense and consolidated coverage on a wide range on new technologies and techniques in cardiothoracic surgery. This event comprises a powerful agenda of scientific sessions. offering an opportunity to broaden your knowledge and expertise from both a hardware and scientific perspective.

Every year, EACTS brings together leading



edge thinkers, technology gurus and business experts in order for you to explore products

The Annual Meeting, EACTS' flagship event provides a forum where cardiothoracic professionals can explore current and emerging technical topics, meet respected industry leaders and network with peers from around the globe

- Test-drive the latest technologies hands-on. Roll up your sleeves and get involved with the latest systems and tools.
- Get up to speed on the latest product releases, trends, tips and techniques.
- Obtain, first hand, the information you need to make quick, intelligent business decisions
- Explore a wide selection of topics. Expand your skills in the area of your choice with a variety of elective sessions for every level. from new user to expert

With a packed agenda that will cover all of the above, we are sure that you will enjoy a memorable week of brilliant and varied education.

There are extensive opportunities for networking with both your peers and industry experts. In one global event, you are able to gain access and exposure to the full breadth of the latest technologies and experts.

No other conference offers a better investment of your time and resources than the EACTS Annual Meeting. In 2012 we had approximately 100 exhibitors from 16 countries spread over 2400 square metres.

Bringing cardio-thoracic expertise to a global forum; mark your calendar: 5-9 October 2013, Vienna, Austria

The EACTS acknowledges the valuable contribution of the following companies in the 27th Annual Meeting through their presence in the exhibition hall, organisation of satellite symposia and other sponsored sessions. (Valid at 9th August 2013)

3-D Matrix Europe SAS **A&E Medical Corporation** AATS - American Association for Thoracic Sugrery Abbott Vascular International **ACUTE Innovations**

Andocor NV APACVS-Associaton of Physician

Admedus

Advancis Surgical

Asanus Medizintechnik GmbH AtriCure Europe BV B Braun Surgical SA Baxter Healthcare SA Berlin Heart GmbH BioCer Entwicklungs-GmbH Biointegral Surgical, Inc Biomet Microfixation

C R Bard Cardia Innovation AB CardiaMed BV

BioVentrix Inc

Cardio Medical GmbH Carmat

CircuLite GmbH Clear Catheter Systems

Chase Medical

Cook Medical CorMatrix Cardiovascular Inc Cryolife Europa Ltd CTSNFT

De Soutter Medical Limited Delacroix-Chevalier

Dendrite Clinical Systems Ltd **EACTS** -Euromacs FACTS – The European

Association for Cardio-Thoracic Surgery Edwards Lifesciences

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Ethicon – Johnson & Johnson Medical S.p.A. **Eurosets SRL**

Fehling Instruments GmbH & Co KG

gebemed Deutschland GmbH Gebrueder Martin GmbH & Co KG

Geister Medizintechnik GmbH Genesee BioMedical Inc GEOMED Medizin-Technik

GmbH & Co Gunze Limited

Hamamatsu Photonics Deutschland GmbH Heart and Health Foundation

Heart Hugger / General Cardiac Technology

HeartWare Inc. ImaCor Inc

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ISMICS-International Society for Minimally Invasive Cardiothoracic Surgery

Jena Valve Technology GmbH JOTEC GmbH

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Rumex International Co. Scanlan International Inc Siemens AG, Healthcare Sector Smartcanula LLC

Sorin Group Italia SRL St Jude Medical

Starch Medical Inc STS-The Society Of Thoracic

Sunshine Heart Symetis SA

Terumo Europe Cardiovascular Systems (TECVS)

The Society for Heart Valve Disease

Thoratec Corporation Tianjin Plastics Research Institute

Co Ltd (TPRI) Tianjin Welcome Medical Equipment Co Ltd

Transonic Europe ValveXchange Inc.

Vivostat A/S

Wake Forest Innovations/ **Preclinical Translational Services**

Wexler Surgical Inc. Wisepress Online Bookshop WL Gore & Associates GmbH

WolfVision GmbH WSPCHS-World Society for Pediatric and Congenital Heart

Surgery

If you are interested in exhibiting at 27th **Annual Meeting of** the EACTS, please contact:

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