EACTS Daily News
European Association For Cardio-Thoracic Surgery
The official newspaper of the 28th EACTS Annual Meeting 2014
Sunday 12 October

In this issue

MIMVR simulator wins 2014 EACTS Techno-College Innovation Award

***EACTS Daily News* is pleased to announce the 2014 EACTS Techno College Innovation Award was won by Dr Peyman Sardari Nia (Maastricht University Medical Center (MUMC), Maastricht, The Netherlands), for the 'Minimally invasive mitral valve repair (MIMVR) simulator ', which was developed with the help of the Instrument Development Engineering & Evaluation department (IDEE) at the Maastricht MUMC.**

"I developed and designed the minimally invasive mitral valve simulator, in conjunction with colleagues from the IDEE, to enable residents, fellows and surgeons to develop skills in MIMVR and practice those skills endlessly," Dr Sardari Nia told *EACTS Daily News*. "We believe the MIMVR simulator provides users with an objective, reproducible way to practice and train skills instead of developing skills in patients."

MIMVR simulator

The simulator can be used for the following surgical approaches:

- MIMVR endoscopically
- MIMVR through direct vision
- MIMVR with robotic-assistance using the available ports
- Conventional mitral valve repair by opening the thorax

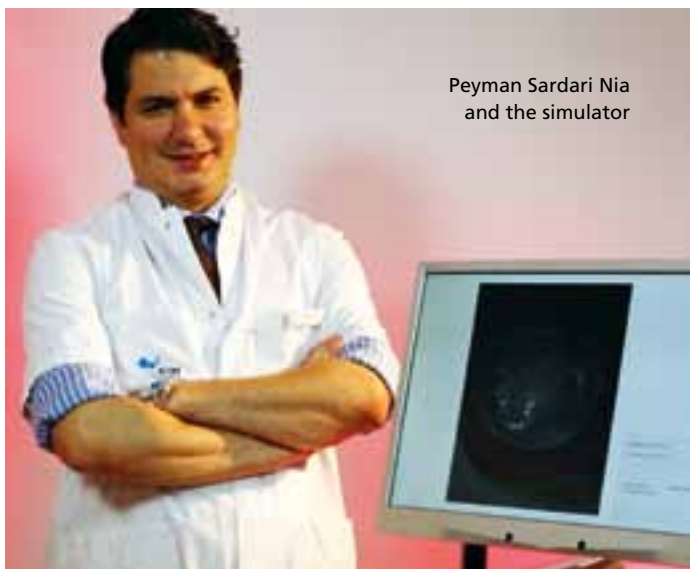
The mitral valve component is disposable and developed from special material that mimics the tissue characteristics of the mitral valve so that a true suturing experience can be created. The simulator also gives feedback about the exact depth and length of each suture, and provides a picture of each suture.

The depth and length of each suture attempts can be pre-setted and the simulator will provide feedback about the suture attempts with regard to pre-setted values. In addition, the disposable papillary muscles for suturing the neochordae are available.

The disposable mitral valve can theoretically be replaced by 3D-printed mitral valve of an individual patient for pre-operative practice and pre-planning of complex mitral valve repair.

The simulator, which was successfully tested for the first time during the EACTS Academy Minimally Invasive Techniques in Adult Cardiac Surgery course (Maastricht, June 2014), will also be available during the meeting in Milan.

"During the 28th EACTS Annual Meeting we have organised six drylabs where participants can develop insights into the skills needed to for starting a MIMVR programme," he added. "Participants will work with long-shafted instruments for developing suturing techniques, placement of annuloplasty ring and neochordae. I look forward to welcoming delegates to the drylabs during the meeting."


Peyman Sardari Nia and the simulator

Nurse, Practioners and Physician Assistants Amber 5

Warm to the core

A quantitative study of the effect of prewarming on inadvertent perioperative hypothermia

Charlotte Rosenkilde
Odense University Hospital, Odense, Denmark

Cold is not cool for surgical patients:
"To keep the air he breathes as pure as the external air, without chilling him".
Florence Nightingale (1820 -1910).

Keeping the patient warm during surgery is still a challenge in the 21st century. Research estimates that 50% to 90% of surgical patients experience inadvertent perioperative hypothermia during surgery. Inadvertent perioperative hypothermia often occurs as a result of impaired thermoregulation induced by anesthesia and by exposure to a cool environment such as an operating theatre. Even mild hypothermia (core temperature

Continued on page 2

Coronary Gold Room

Revascularization in left main disease: changing concepts

David Taggart *University of Oxford, UK*

For more than half a century it has been widely accepted by both surgeons and physicians that coronary artery bypass grafting (CABG) was the 'gold standard' treatment in patients with left main stem disease who required revascularization. Indeed, until a few years ago both in European and North American guidelines CABG had a Class I recommendation for all types of left main disease while stenting had a Class III recommendation (ie contraindicated as potentially harmful or dangerous) except in patients who were deemed ineligible for CABG.

The results of two randomized trials (PRECOMBAT and SYNTAX) as well as

Continued on page 2

Sunday 12 October

Plenary Session:

Delivering value in healthcare: A vision for innovation

Gold Room

Moderators: D. Pagano, Birmingham; P.E. Van Schil, Antwerp

08:30	From paternalism to partnership	*Jeffrey Rich*
09:10	Leadership	*Douglas Wood*
09:30	Innovation and industry: a new understanding	*Alexandra Lansky*

Postgraduate Course

Nurses session 1

Amber 5

Moderators: C. Bannister, Southampton; T. Bartley, Birmingham; D. Bordinggaard, Odense; M. Brunott, Rotterdam; L.L. Haus, Odense

10:15	Welcome and opening	*Jose Luis Pomar*
10:20	Warm to the core; a quantitative study of the effect of pre-warming on inadvertent perioperative hypothermia	*Charlotte Rosenkilde*
10:45	Mesothelioma: options and challenges	*Alexander Maat*
11:10	BiPAP versus optiflow in hypoxemic patients after Cardiothoracic surgery (the BiPOP study)	*Francois Stephan*
11:35	The Columbia model: The physician assistant procurement surgeon	*Joseph Costa*

Complex venous anomalies

Amber 1&2

Moderators: A. Carotti, Rome; M. Kostolny, London

10:30	Morphology of cardiac venous anomalies	*Andrew Cook*
10:50	Surgical Repair of total anomalous pulmonary venous drainage	*Lorenzo Galletti*
11:10	Management of scimitar veins	*Vladimiro Vida*
11:30	Management of pulmonary vein stenosis	*Francois Lacour-Gayet*

Interactive session on management of lung cancer staging – clinical implications

Brown 2

Moderators: R.A. Schmid, Berne; L. Spaggiari, Milan

10:30	RB (or BM)	*Michael Dusmet*
11:00	Illustrative case tba	*Godehard Friedel*
11:30	Difficult EBUS-TBNA interpretation cases	*Marcelo Jimenez*

Different patterns of bicuspid aortic valve associated proximal aortopathy: RESECT or RESPECT?

Brown 1

Moderators: D. Cameron, Baltimore; T. Carrel, Berne; F. Kari, Freiburg

10:30	How to classify aortopathy and bicuspid aortic valves?	*Alessandro Della Corte*
10:45	The genomic view on aortic valve disease	*Adriana Gittenberger-de Groot*
11:00	A practical clinical guide for the extent of resection in bicuspid aortopathy	*Ruggero De Paulis*
11:15	The arch issue in bicuspid aortopathy – RESECT or RESPECT?	*Thoralf Sundt*

Improving perfusion Part 1

Raphael

Moderators: F. Merkle, Berlin; A. Wahba, Trondheim

10:30	Venous drainage during coronary pulmonary bypass: common problems and innovative solution	*Ludwig Von Segesser*
11:00	Oxidative stress during extra-corporeal circulation – theory and practical consequences	*Gianni Angelini*
11:20	Arterial cannula design and aortic wall stress	*Alexander Assmann*
11:40	Communication in extra-corporeal circulation	*Alexander Wahba*

Antimicrobial peptides and tissue engineering

Amber 6

Moderators: M. Mildner, Vienna; K. Wollert, Hannover

11:00	Biofabrication in cardiovascular surgery	*Axel Haverich*
11:30	Bioreactor and tissue-engineered trachea – From bench to bedside: The Wuerzburg experience	*Maria Steinke*

Continued on page 4

Warm to the core

Continued from page 1

less than 36.0°C) can be dangerous for the patient, consequently leading to increased blood loss and transfusion requirement, surgical wound infection, and prolonged hospitalization and recovery. Consequently, nurses working with the surgical patient must proactively implement nursing initiatives to prevent or reduce the incidence of unintended perioperative hypothermia.

Prewarming for a minimum of 30 minutes with Forced Air Warming (BairHugger) is a method that is proven to prevent hypothermia. Further research is needed regarding other prewarming methods. Therefore, the aim of this study was to determine the efficacy of a self-warming blanket in reducing the occurrence of inadvertent perioperative hypothermia in patients undergoing either a total hip or a knee arthroplasty.

The results are compelling, and they will be presented at the EACTS on Sunday, October 12, 2014.

Revascularization in left main disease: changing concepts

Continued from page 1

several meta-analyses have dramatically changed the dogma that CABG is the only effective revascularization strategy for all left main stem disease. The PRECOMBAT Trial by Dr SJ Park and colleagues in South Korea, of 600 patients with left main disease randomized to PCI or CABG, reported no difference in death, myocardial infarction and stroke between CABG and PCI at three years but that CABG was more effective in reducing repeat revascularisation. Now, the five year outcomes in the SYNTAX Trial for the 705 patients with left main disease report that stenting with drug-eluting stents is equally effective as CABG regarding mortality and myocardial infarction but with a lower risk of stroke and a higher risk of repeat revascularisation. Indeed it was only in patients with more complex left main disease (ie those with SYNTAX scores >32, and largely indicating involvement of two or more epicardial coronary arteries) who had significantly better outcomes with surgery. The overall results for left main disease are in marked contrast to those in the 1,100 SYNTAX patients with three vessel coronary artery disease where CABG significantly reduced overall mortality allied to a marked reduction in cardiac death, myocardial infarction and the need for repeat revascularisation. And in contrast to patients with left main disease there was no increase in the risk of stroke.

Why the difference in outcomes between left main and three vessel coronary artery disease? The most likely explanation is that in isolated left main disease, especially if ostial or mid shaft and without additional proximal coronary artery disease, that there is too much competitive flow for bypass grafts.

European and North American guidelines have already changed to 'upgrade' recommendations for certain anatomical classes of left main disease. A definitive answer to optimal revascularization of left main disease will await the outcomes of the EXCEL and NOBLE trials which together will randomize over 3,000 patients with left main disease to surgery or stenting.

Basic Science Programme Amber 6

Bioreactor and tissue-engineered trachea

From bench to bedside; the Würzburg experience

Maria Steinke *University Hospital, Würzburg, Germany*

Tissue Engineering was coined as a new therapeutic concept in 1993 and until today holds the promise to overcome the shortage of donor organs in organ transplantation. Significant research efforts have been spent in all surgical subspecialties including cardiothoracic surgery. While engineering complete organs for organ transplantation still represents a scientific utopia, engineered tissues such has heart valves or airways have been implemented successfully in individual patients and are currently tested in the first clinical trials.

In our group, we apply the concept of tissue engineering as illustrated in Figure 1, we isolate different cell types from patient biopsies, expand them and seed them on a biological vascularized scaffold (BioVaSc). After maturation in specific bioreactors, the tissue-engineered products can be used as autologous implants or as 3D in vitro test systems for research applications.

The talk entitled "Airway tissue engineering: From bench to bedside; the Würzburg experience" will focus on the evolution of a unique airway tissue engineering approach spanning from a versatile biological scaffold over new bioreactor designs to governmental process authorisation. Above that an additional airway tissue engineering application other than transplantation in current and future biomedical research will be outlined: our group succeeded in generating a 3D in vitro tissue model for the human airway mucosa with high in vitro – *in vivo* – correlation. Besides fully differentiated primary airway epithelial cells the tissue model consists of fibroblasts that maintain the surrounding connective tissue and play an important role in basement membrane formation. Since morphology and barrier characteristics resemble the natural situation, this test system appears to be highly suitable for different applications.

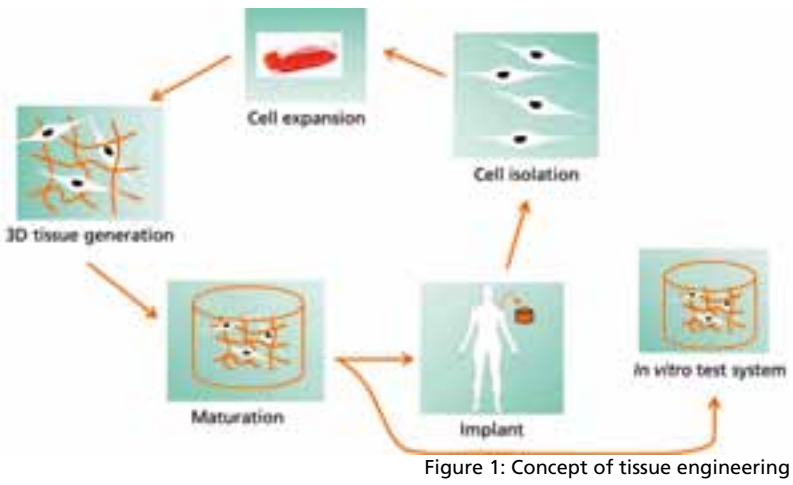


Figure 1: Concept of tissue engineering

We are especially interested in analysing virulence mechanisms of airway pathogens such as *Bordetella pertussis*. A major research problem with *B. pertussis* is the fact that they are obligate human pathogens. Due to the lack of good animal models and cell culture model systems which most closely resemble the natural situation, the real impact of these factors for infection and disease remains in part speculative. Using our 3D tissue-engineered human airway mucosa model, we performed infection experiments with supernatants of different pertussis cultures. Our current data will be presented during the talk.

Owing to Würzburg´s interdisciplinary team consisting of surgeons, biologists and engineers we successfully translated an airway tissue engineering approach from bench to bedside. In future, this concept will be applied to improve strategies in research and clinical implementation.

Aortic Valve Repair Gold Room

Aortic valve replacement

Early surgery, better outcome?

Rafa Sadaba
Hospital de Navarra, Pamplona, Spain

Aortic stenosis (AS) is the most common valvular heart disease in Europe and North America. It is present in 2–7% of people above 65 years of age and it is severe in 3% of the population over the age of 75. It is a progressive disease and it is characterized by a long latent period during which the patient remains asymptomatic. Once symptoms appear, prognosis is poor and five-year survival is as low as 15%. Current guidelines recommend treatment in the form of aortic valve replacement (AVR) once symptoms (or ventricular dysfunction), typically dyspnea, angina or syncope, appear.

The optimal management and timing of surgery in asymptomatic patients with preserved LV function is far from settled. Those who support a strategy of watchful waiting, argue that the mortality associated to AVR (2-4%) is higher than the risk of sudden death in the asymptomatic patient (<1%). On the other hand, those in favor of early surgery argue that this is a heterogeneous group of patients, some of them with poor prognosis and with a risk of developing non-reversible myocardial changes which can negatively affect surgical and long term results. In the few retrospective studies published, early surgery appears to carry benefits in terms of outcomes. Nevertheless, these potential benefits associated with early AVR must be further established in more robust studies.

One of the debated issues is that relaying on symptoms as the main indication for surgical treatment may not be appropriate. The absence or presence of symptoms in this group of patients must be evaluated with caution. The prevalence of severe aortic stenosis is highest in the elderly, and so the potential symptoms could be disguised by an adaptation of these patients to their actual physical capabilities. In this context, an abnormal exercise test, can help to unmask the apparent lack of symptoms. Similarly, an elevation of plasma levels of natriuretic peptides represent a more objective measurement of functional status and therefore both have a role in the decision making process.

The analysis of myocardial fibrosis has emerged as another tool to assess the status of the disease. In severe AS, the degree of myocardial fibrosis represents a transition from well-compensated hypertrophy to overt heart failure and risk of sudden cardiac death. Recent published data suggests that late gadolinium enhancement in cardiac magnetic resonance (CMR), which represents myocardial replacement fibrosis, can be an earlier marker of more advanced disease in this group of patients. The value of myocardial extracellular volume measured bycmR T1 mapping for the assessment of diffuse myocardial fibrosis in severe AS is a matter of current research.

Rafa Sadaba

The debate on the best timing for AVR in patients with severe AS is still open. Because of the high prevalence of the disease in the ageing western population, achieving a consensus is important. Tools to discriminate between those asymptomatic patients with severe AS who would benefit from early surgery must be further developed and evaluated.

Edwards SAPIEN 3 Transcatheter Heart Valve

DESIGNING THE FUTURE OF TAVI

Low rates of complications with the Edwards SAPIEN 3 valve[1]

2.1%
ALL-CAUSE MORTALITY

1.0%
ALL-STROKE

2.6%
MODERATE/SEVERE PARAVALVULAR LEAK

30-day CE Mark Study data, transfemoral population
All-cause mortality and all-stroke, as-treated population (n=96)
Core lab assessed paravalvular leak, valve implanted population (n=77)

REFERENCE: 1. Webb J, on behalf of the SAPIEN 3 investigators. 30-day outcomes from the SAPIEN 3 trial. Paper presented at: EuroPCR 2014 meeting; May 20-23, 2014; Paris, France.

For professional use. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions, and adverse events.

Edwards Lifesciences | edwards.com
Route de l'Etraz 70, 1260 | Nyon, Switzerland
USA | Japan | China | Brazil | Australia | India

Edwards

Continued from page 2

Coronary – Better decisions better outcome

Gold Room

Moderators: V. Falk, Zurich; R. Yadav, London

10:30	**Summarizing the recent evidence**	*Stuart Head*
10:40	**Case 1: What would you do? – Three vessel disease with intermediate syntax score**	*Thomas Modine*
11:05	**Case 2: What would you do? – Unprotected left main**	*David Taggart*
11:30	**Lesion based or functional based decision making**	*Filip Casselman*
11:40	**Graft selection, configuration**	*David Glineur*
12:00	**Anniversary lecture: 50 years first LIMA bypass operation – a tribute to V.I. Kolesov**	*Alexander Nemkov*

Oligometastatic diseases

Brown 2

Moderators: F. De Marinis, Milan; D.J. Mathisen, Boston

12:30	**Illustrative cases tba**	*Peter B Licht*
13:00	**Synchronous bilateral lung neoplasm with liver metastases: the case for surgical treatment**	*Giuseppe Cardillo*
13:30	**Long-term follow-up after resection of lung cancer with a femoral bone metastasis**	*Paul Van Schil*

Nurses session 2

Amber 5

Moderators: C. Bannister, Southampton; T. Bartley, Birmingham; D. Bordinggaard, Odense; M. Brunott, Rotterdam; L.L. Haus, Odense

13:20	**Endoscopic vein harvesting**	*Rianne de Jong*

Aortic valve repair – Replacement early surgery better outcome

Gold Room

Moderators: M. Borger, Leipzig; A. Vahanian, Paris

13:00	**Case 1: Asymptomatic aortic stenosis**	*Rafael Sádaba*
13:05	**Operating for B-type natiuretic peptide and fibrosis in aortic stenosis?**	*Sanjay Prasad*
13:20	**The role of exercise testing in aortic stenosis**	*Patrizio Lancellotti*
13:35	**The zero tolerance approach for aortic valve replacement**	*Manuel Antunes*
13:50	**Decreasing invasiveness in aortic valve surgery**	*Mattia Glauber*
14:05	**Repair of the bicuspid valve**	*Gebrine El Khoury*

Re-operation techniques

Amber 1&2

Moderators: P. Del Nido, Boston; G. Stellin, Padua

13:00	**Technical aspects of re-operation**	*David Barron*
13:20	**Management of recurrent left ventricular outflow tract obstruction**	*Viktor Hraska*
13:40	**Re – operation after the Norwood procedure**	*Christian Pizarro*
14:00	**Re-operation after repair of transposition**	*Pascal Vouhe*

EACTS/ STS aortic session – Controversies in treating the distal aorta with and without previous proximal repair: Wire or knife

Brown 1

Moderators: C.A. Mestres, Barcelona; E. Roselli, Cleveland; B. Rylski, Freiburg

13:00	**The treatment of the chronically dissected arch and the descending aorta after previous type A repair – the European approach – indications, timing, strategy and pathophysiological implications**	*Davide Pacini*
13:15	**Aortic remodelling in aortic dissection after frozen elephant trunk**	*Daniel Dohle*
13:30	**Aortic arch surgery after previous type A dissection repair: Early to mid-term results**	*Pietro Bajona*
13:45	**The treatment of the chronically dissected arch and the descending aorta after previous type A repair – the US perspective**	*Joseph Bavaria*
14:00	**Early and mid-term outcome of secondary interventions after thoracic endovascular aortic repair**	*Michal Nozdrzykowski*
14:15	**Impact of surgical experience on outcome in surgery of acute type A aortic dissection**	*Paul Urbanski*

Continued on page 6

50 years since the first LIMA bypass operation

A tribute to V I Kolesov

Alexander Nemkov
St Petersberg Pavlov State Medical University, Russia

Cardiovascular pathologies are the major cause contributing the mortality rate of the adult population, and the most wide spread among them is the ischemic heart disease. In the 20th Century many therapists and surgeons made a lot of effort to combat the disease. They were surgeons from different countries – Alexis Carrel at the beginning of the century in USA, Vladimir Demichov in USSR and Gordon Murrey in Canada in the 1950s laid the foundation for experimental studies on dogs for restoration of coronary flow using system arteries.

On the 2 May 1960 in New York Robert H. Goetz was the first one to anastomose the right internal mammary artery and the right coronary artery on a patient using tantalum rings. As a result of sharp criticism from his colleagues R.Goetz never performed such an operation again.

Professor Vasilii Kolesov in Leningrad (Russia) studied all previous experience of non direct revascularization and performed a lot of experiments on dogs to optimize the technique of direct anastomosis between left internal mammary artery (LIMA) and coronary arteries. After nine years of experiments Professor Kolesov finally had approved that direct LIMA CABG is feasible at the site of non-damaged part of coronary artery: the left circumflex artery (LCx) or the left anterior descending (LAD) artery.

On February 25 1964 Professor Kolesov successfully performed the first sutured anastomosis between the left internal mammary artery (LIMA) and the left circumflex artery. It was the beginning of the new era of coronary by-pass: operations started to be carried out on a regular basis to re-establish coronary flow in case of the ischemic heart disease. Twenty years later this operation in combination with the Rene Favaloro's method of using the saphenous vein in coronary surgery (1967, Cleveland, USA) became the most commonly performed surgical procedure in the world.

Nowadays there is hardly any clinic exists in the world that does not perform Professor Kolesov's operation – the coronary artery bypass grafting (CABG) procedure using LIMA for LAD anastomosis. The best option of the anastomosis (LIMA-LAD) is the suture anastomosis just as it was 50 years ago. A least invasive access and off-pump operation reduces the post-off trauma and can be an option in case of the LAD occlusions. These are the ideas which Professor Kolesov massively promoted in his book *The Coronary Artery Surgery* (1977) which summarizes the first period of coronary surgery developments. Its efficiency and long-term implementation have been proven by decades of its use. The fact that Professor Kolesov's principles of using the LIMA in case of coronary artery bypass are still up-to-date after 50 years of their first implementation is an evidence of the great importance of his personality in the coronary surgery development.

Vasilii Kolesov

BE PART OF THE

GoPro SURGICAL CHALLENGE

WITH DuraGraft®

Vascular Conduit Solution

Discover the 1 solution for CABG and vascular surgery success.

DuraGraft is the first Endothelial Damage Inhibitor (EDI) developed to address vascular conduit handling and storage—the pivotal step in bypass and vascular surgery.

Stop by Somahlution's booth at the **EACTS Annual Meeting** to learn how you can use a GoPro camera to become part of this exciting breakthrough.

See more details at Booth #22
or online at Somahlution.com

somahlution

Advancing Human Health

Continued from page 4

Improving perfusion Part 2

Raphael

Moderators: B.H. Walpoth, Geneva; T. Gudbjartsson, Reykjavik

13:00 **Prediction of mortality following extra corporeal membrane oxygenation** *Tone Bull Enger*

13:20 **The challenges of open heart surgery in developing countries** *Bode Falase*

13:40 **The use of antibiotics in extra-corporeal circulation: pharmacokinetics and practical consequences** *Gunther Wiesner*

14:00 **Treatment of hypothermia with extra-corporeal circulation ? the international hypothermia regulatory** *Beat Walpoth*

The paracrine option of stem cells and mononuclear cells: from bench to bedside

Amber 6

Moderators: A. Haverich, Hannover; M. Pavone-Gyöngyösi, Vienna

13:00 **Paracrine mechanisms: a paradigm shift in cell therapy for heart disease** *Massimiliano Gnecchi*

13:30 **Secretome of stressed mononuclear cells is effective in acute experimental infarction and chronic ischemic left ventricular dysfunction: from porcine acute myocardial infarction model to molecular biology** *Mariann Pavone-Gyöngyösi*

14:00 **Secretome of stressed mononuclear cells augment wound healing: from bench to general medical practice production to phase I** *Hendrik Jan Ankersmit*

Circulating viewpoints – Paternalism to partnership: sharing the responsibility

Brown 3

Moderators: A.P. Kappetein, Rotterdam; J. Pepper, London

13:00 **Low mortality or failure to rescue** *Stephen Westaby*

13:30 **Success from the patient point of view** *Tal Goldsworthy*

14:00 **Doctor please explain the treatment** *Bertie Leigh*

14:30 **The risk of high risk surgery** *Friedrich-Wilhelm Mohr*

Nurses session 3

Amber 5

Moderators: C. Bannister, Southampton; T. Bartley, Birmingham; D. Bordinggaard, Odense; M. Brunott, Rotterdam; L.L. Haus, Odense

14:40 **An evaluation of a frailty tool for pre-op patient and the patients conceptualation of their own frailty** *Mike Roberts*

Intraoperative complications

Brown 2

Moderators: M. Dusmet, London; E.A. Rendina, Rome

14:50 **Suddenly I can't ventilate this patient and the blood pressure is dropping!** *David Waller*

15:10 **Lung cancer and pleural empyema** *Cliff K C Choong*

15:30 **A big, bad case of intraoperative air leak** *Alan Sihoe*

Mitral valve repair – Replacement – better surgery, better outcome

Gold Room

Moderators: J.F. Obadia, Lyon; P.P. Punjabi, London

14:30 **Introductory lecture** *Joerg Seeburger*

14:40 **Case 1: Ischemic mitral regurgitation** *Rashmi Yadav*

14:45 **Mitral regurgitation surgery in patients with ischemic cardiomyopathy and ischemic mitral regurgitation: factors that influence survival** *Ottavio Alfieri*

15:10 **Case 2: Anterior leaflet prolapse** *Jolanda Kluin*

15:15 **It's all about the chords** *Ludwig Mueller*

15:35 **How to preserve a calcified mitral valve** *Christoph Huber*

15:40 **The rocky mitral valve** *Taweesak Chotivatanapong*

16:00 **Case 4: Paravalvular leakage never happens to me** *Rafael Sádaba*

16:05 **Better management of paravalvular leakage** *Francesco Maisano*

Transplantation and organ assist

Raphael

Moderators: J. Horisberger, Le Mont Sur Lausanne; B. Meyns, Leuven

14:45 **Ex vivo lung perfusion from concept to current practice** *Stig Steen*

15:05 **Donation following circulatory determination of death ? more lungs available for transplantation?** *John Dark*

15:25 **Mechanical circulatory support in acute myocardial infarction.** *Bart Meyns*

15:45 **VAD implantation with or without extra-corporeal circulation** *Thomas Krabatsch*

Continued on page 8

Complex Venus Anomalies Amber 1&2

Management of pulmonary veins stenosis

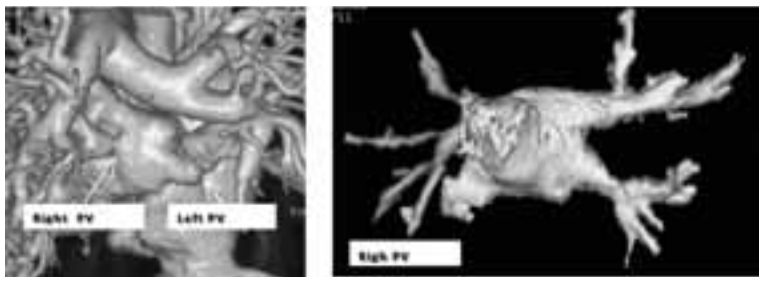
Francois Lacour-Gayet
Imperial College. London, UK

There are two different forms of pulmonary venous stenosis (PVS). Primary "congenital" PVS, which is isolated or associated with congenital heart diseases, has a severe prognosis. Acquired or secondary PVS, which occurs most commonly after repair of total anomalous pulmonary venous return (TAPVR), fosters a better prognosis. PVS following radiofrequency ablation of atrial fibrillation is seen in the adult population.

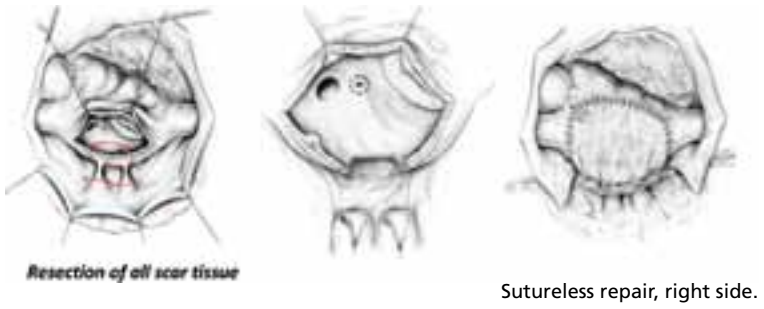
Surgical management has evolved over the past two decades, with traditional patch enlargement techniques eventually replaced by the sutureless repair technique in many centers. In a recent multicentric study of 107 patients with PV stenosis, from the ECHSA, the sutureless repair showed significant better outcomes for mortality and recurrence (35.9%) than the traditional techniques and catheterization (55.8%) p: 0.01. Low birth weight, prematurity, bilateral forms and high severity PV score are significant increasing factors for mortality.

Interventional cardiology procedures have not provided better results and are predominantly used in recurrent PVS. New pharmacologic agents that may prevent the progression of the pulmonary venous obstructive disease are currently under investigation.

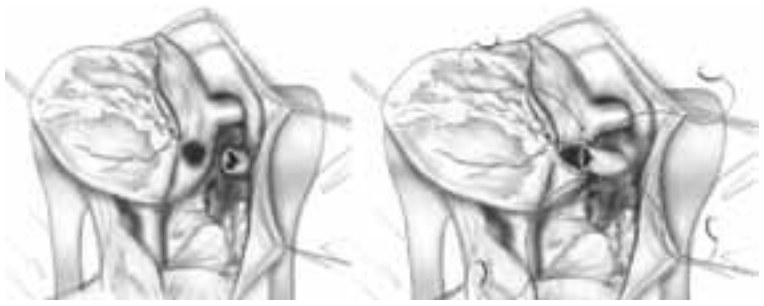
Pulmonary venous stenosis is a rare, challenging and often lethal condition among pediatric heart diseases, with a guarded prognosis and elevated risk of recurrence. The pathophysiology is poorly understood, and the search for an effective treatment remains a source of frustration.



CT scan. Posterior (left) and anterior views



Sutureless repair, right side.



Sutureless repair, left side (from the outside) with atrio-pericardial suture (right)

Interactive Session on the Management of Lung Cancer Staging – Clinical Implications Brown 2

Long-term follow-up after resection of lung cancer with a femoral bone metastasis

Paul Van Schil *Antwerp University Hospital, Belgium*

Generally accepted indications for lung cancer resection include patients with stage I-II non-small cell lung cancer (NSCLC) who otherwise have no cardiopulmonary contra-indications for a major surgical procedure. Stages IIIA and IIIB NSCLC still remain investigational and resection can only be recommended in selected cases after discussion within a multidisciplinary team. Patients with single or multiple metastases are classified as stage IV disease and surgery is only performed in exceptional cases. Examples include patients with a single brain or adrenal metastasis who are treated by a dedicated and experienced multidisciplinary team.

Recently, the concept of oligometastatic disease has arisen defined as patients with a limited burden of metastatic disease. For this patient category no specific guidelines exist at the present time. However, several reports show that a reasonable long-term survival can be obtained when patients with one to three metastases are treated with radical multimodality therapy including surgery. However, precise timing of surgery within combined modality therapy and its precise extent remain to be determined.

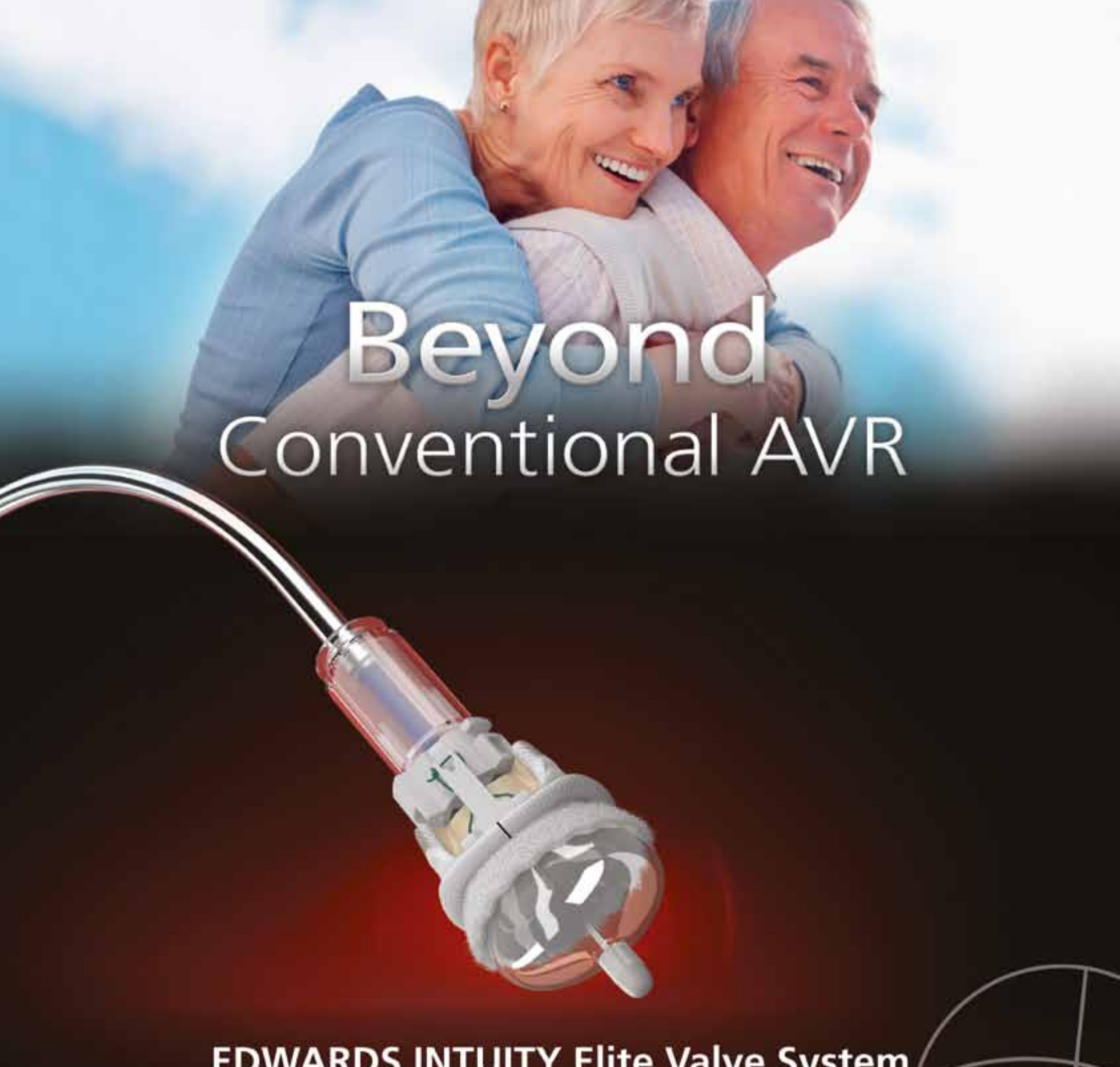
We present a case of a 50-year-old patient who presented with a femoral bone metastasis from a primary right upper lobe lung cancer in 2006. There were no other metastatic sites. Initially, patient was treated with chemoradiotherapy for the primary lung cancer and bone metastasis which was also stabilized by plate osteosynthesis (figure 1). Two years later the primary tumour started growing again and so-called "salvage surgery" was performed with lobectomy of the right upper lobe together with a systematic nodal dissection[1]. Current follow-up extends to five years without signs of local or distant recurrence. Several other cases will be presented illustrating that oligometastatic disease represents a specific entity for which aggressive multimodality therapy may result in long-term survival in carefully selected patients.[2]

Osteosynthesis of left femur for a single bone metastasis of a right upper lobe lung cancer which was treated two years later by 'salvage surgery'

References:

1. Van Schil P. Salvage surgery after stereotactic radiotherapy: a new challenge for thoracic surgeons. J Thorac Oncology 2010; 5:1881-2

2. Van Schil P. Surgery for oligometastatic disease in non-small cell lung cancer. Exp Review Anticancer Ther 2008; 8:1931-8



EDWARDS INTUITY Elite Valve System

TRUSTED PLATFORM | RAPID DEPLOYMENT | SMALLER INCISIONS

For professional use. See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.

Edwards Lifesciences devices placed on the European market meeting the essential requirements referred to in Article 3 of the Medical Device Directive 93/42/EEC bear the CE marking of conformity.

Edwards Lifesciences | edwards.com
USA | Switzerland | Japan | China | Brazil | Australia | India

Edwards

Continued from page 6

EACTS/ STS aortic session – How to treat type B aortic dissection: One question, many answers, which solution?

Brown 1

Moderators: J.E. Bavaria, Philadelphia; H.G. Jakob, Essen; F. Schoenhoff, Berne

14:45	The European approach	*Martin Grabenwöger*
15:00	Distal aortic reintervention after surgery for acute Type A aortic dissection: Open versus EVAR	*Bartosz Rylski*
15:15	The perspective of the US	*Eric Roselli*
15:30	Stentgraft first staged repair of type 2 TAA: The endovascular elephant trunk	*Alessandro Vivacqua*
15:45	Is pathophysiology and treatment different in Japan?	*Yukata Okita*
16:00	Impact of entry site on late outcome in acute Stanford type B aortic dissection	*Tadashi Kitamura*

Preconditions for healing ischaemic tissue: an introduction to clinical reality

Amber 6

Moderators: H.J. Ankersmit, Vienna; D.J. Chambers, London

14:45	How to communicate applied science to the media	*Sharon Barbour*
15:10	Myocardial infarction, inflammation, and therapy: from cell based therapy to single molecule	*Kai Wollert*
15:40	Microvascular obstruction, reperfusion injury and inflammation: the culprit lesion	*David Chambers*
16:05	Patient-specific induced pluripotent stem cells for heart regeneration and disease modelling	*Kaomei Guan*

Surgical film session

Amber 1&2

Moderators: C. Brizard, Melbourne; J.V. Comas, Madrid

15:00	Valve sparing – a method of repair	*Domenico Mazzitelli*
15:10	Arterial switch	*Emre Belli*
15:20	Truncus arteriosus	*Mark Hazekamp*
15:30	Norwood I procedure	*Christian Pizarro*
15:40	Left ventricular assist device implantation	*Massimo Griselli*
15:50	The Fontan completion	*Thomas Spray*

Nurses session 4

Amber 5

Moderators: C. Bannister, Southampton; T. Bartley, Birmingham; D. Bordinggaard, Odense; M. Brunott, Rotterdam; L.L. Haus, Odense

15:00	Cardiopulmonary resuscitation after cardiac surgery, theory and practice	*Joel Dunning*

Improving Perfusion, Part 2 Raphael

Extracorporeal rewarming of deep accidental hypothermia victims

The role of the International Hypothermia Registry

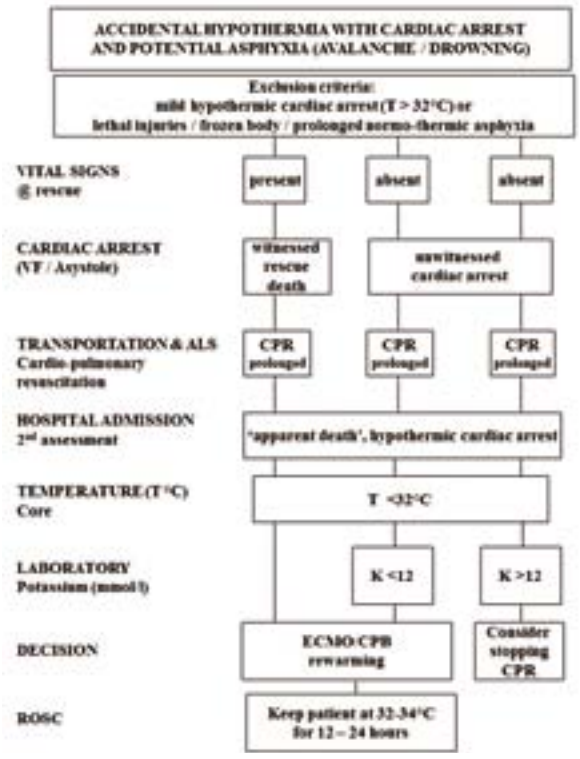
Beat Walpath *Geneva University Hospital, Switzerland*

Deep hypothermia, with or without cardiac arrest, takes the lives of otherwise healthy adults and children each year. The population at risk is considerable due to increasing outdoor leisure activities by inexperienced persons. Furthermore, persons working daily in cold environments such as fishermen, military, construction workers are particularly vulnerable.

Mild therapeutic hypothermia has become a treatment option for cardiac arrest or stroke patients but should not be considered for our Registry. Non-accidental deep hypothermia is frequently induced for cardiovascular surgery and is fairly well managed. On the contrary, accidental moderate to deep hypothermia (body temperature less than 32°C) is less frequent and its management remains a real challenge for medical and scientific teams worldwide, mainly due to lack of outcome predictors, consensus and guidelines.

Cases of successful treatment of accidental deep hypothermia, using extracorporal rewarming by CPB or ECMO with little to no sequelae are sporadically reported such as a case treated at the University Hospital in Geneva in 2007 of a 65-year-old woman with witnessed cardiac arrest due to hypothermia after antidepressant drug abuse outdoors in the snow. Lowest core temperature was 20.8°C. After continuous manual CPR for 288 minutes, she underwent 232 minutes of invasive rewarming by Cardiopulmonary Bypass (CPB). Cardiac function was restored at 30°C by defibrillation which enabled CPB weaning at 36°C after 520 minutes (8h 40') of mechanical circulatory support. Five years later, a cardiac echography proved complete recovery of the left ventricular dysfunction she had suffered as a post rewarming complication. This case is the longest reported hypothermic cardiac arrest with an excellent long-term survival[1].

Even though long-term survival rates of 47% have been reported, many patients die from post-rewarming complications that are inevitable.[2] Negative outcomes are rarely published and the majority of positive outcomes are under-reported, but much could be learned from them. Several treatment algorithms have been published (see Table, Walpoth BH et al, 2nd edition, *Handbook of Drowning*) which should help the emergency team in the decision making. Studying these rare and fascinating cases is then only possible through international networking and gathering of standardized data in a registry.



The International Hypothermia Registry (IHR): We therefore created the web-based Registry to collect and analyze relevant information about accidental hypothermia in the hope of establishing guidelines for prevention, treatment and outcome of such victims. The IHR is open to all rescue, emergency organizations, hospitals as well as governmental and non-governmental organizations dealing with hypothermia victims. The internet-based Registry is hosted on a highly secured server of the University hospital of Geneva and patients' information is anonymized. Inclusion criteria are accidental hypothermia with a core body temperature lower than 32°C from any cause, with or without survival. The Registry is composed of three parts, namely a) pre-hospital: divided in accident and medical features; b) hospital: divided in pre-warming management of the patient, data on rewarming and intensive care after rewarming; c) outcome: on a yearly basis until full recovery. Data retrieval, analysis and publication can only be made by the International Working Group on Accidental Hypothermia (IWAH). However, each centre is free to publish its own data.

Data for the IHR are collected worldwide (over 50 centres from all five continents are actively entering cases) and a peer-reviewed analysis by the IWAH will establish new consensus guidelines for the treatment of accidental hypothermia victims.

Acknowledgement

- The IHR team of the University Hospital in Geneva, comprises the following members:
- Beat H. Walpoth, Marie Meyer, Philippe Baumann, Christian Lovis, Patrick Myers, Marc Licker, Yvan Gasche, Afksendiyos Kalangos and the data retrieval is made on behalf of:
- The International Working Group on Accidental Hypothermia (IWAH)

References:

1 Meyer M, Pelurson N, Khabiri E, Siegenthaler N, Walpoth BH. Sequela-free long-term survival of a 65-year-old woman after 8 hours and 40 minutes of cardiac arrest from deep accidental hypothermia. J Thorac Cardiovasc Surg. 2014 Jan;147(1).

2 Walpoth BH, et al: Outcome of survivors of accidental deep hypothermia and circulatory arrest treated with extracorporeal blood warming. N Eng J Med, 1997;337:1500-5.

SORIN GROUP

Why an Elastic Stent? Less Trauma and Excellent Performance

As a consequence of the quick growth in acceptance and use of sutureless technology, the questions around the performance, advantages and durability of sutureless valves have become of utmost interest. Several authors have shown how the implantation of Perceval is associated with easier procedures and excellent results both in the short and mid-term with no evidence of early prosthetic valve degeneration.

One key differentiating feature is that the two sheets of bovine pericardium, platform with long-term proven performance,[1,2] are attached to a super elastic alloy stent that, thanks to its mechanical properties, provides a stress reduction effect at the comminsures level at each cardiac cycle. "It is interesting to see how the in vitro performance is mirrored in patients' CT scans (Picture 1). The stent elasticity allows it to adapt to the movement of the aorta, allowing for a perfect fit within the annulus anatomy without forcing its geometry"

Picture 1

explains Dr. Hanke from University Hospital of Lübeck, Germany.

In addition to reducing the stress on the patient's annulus, the mechanical properties of the stent and the absence of a suturing ring also allow for an optimization of the blood flow.

Although several studies (eg Table 1[3]) demonstrated its good hemodynamic performances, until recently no data were available on the performance of Perceval in response to stress. "The preliminary results look encouraging" says Prof. Santarpino, from Klinikum Nürnberg, Paracelsus Medical University Nuremberg, Germany. "In the subgroup of patients able to undergo exercise stress echocardiography, we could confirm a very good performance of the prosthetic valve in response to stress, with an increase in aortic gradients and EOA" (Table 2).

These new aspects add to the growing literature about Perceval, describing its advantages for the surgeon and for the patient. It has in fact been shown that, beyond simplifying the implantation technique, Perceval allows for a reduction of the ischemic time[4,5] with less blood transfusion and consequent reduced operative trauma, facilitates faster patient recovery (shorter ICU stay, hospital stay, intubation time) and demonstrates lower incidence of postoperative complications, with related resource optimization for the hospital[1]. This in addition to granting a perfect fit within the aortic root with low stress on the annulus and on the leaflets and demonstrating very good hemodynamics under exercise.

Table 1

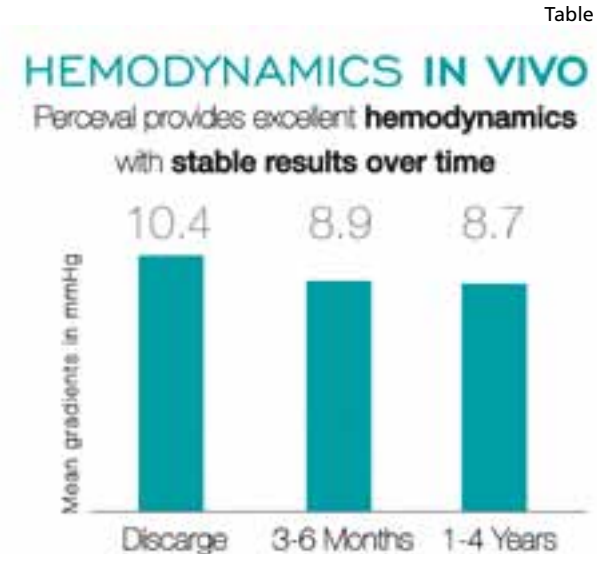
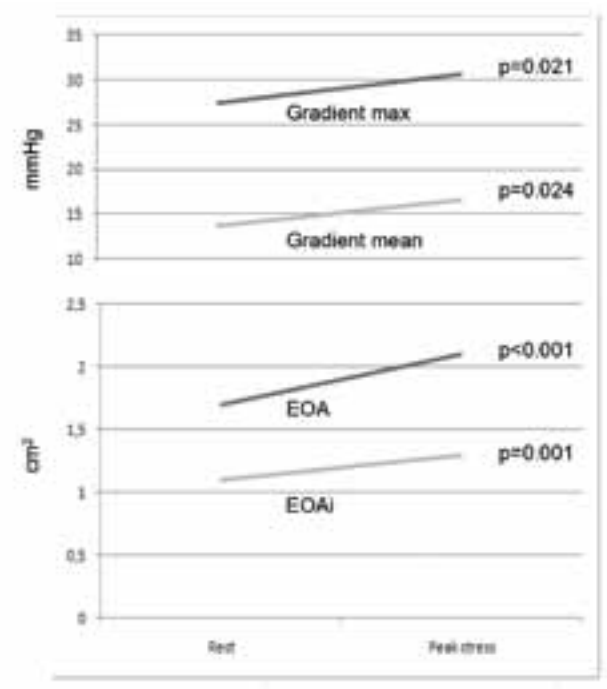


Table 2



References:

1 Folliguet et al. *Ann Thorac Surg*. 2001 May;71(5 Suppl):S289-92.
2 D'Onofrio et al. – *J Thorac Cardiovasc Surg*. 2007 Aug;134(2):491-5
3 Folliguet et al. – *Ann Thorac Surg*, 2012; 93:1483– 8
4 Flameng et al. – *J Thorac Cardiovasc Surg*; 2011 Volume 142, Number 6, 1453-7
5 Santarpino et al. – *Interact Cardiovasc Thorac Surg*; 0 (2012) 1–4

PATIENTS LIVE INNOVATION

FLEXIBLE STRUCTURES, FOR SOLID RESULTS

EQUIPPED TO PERFORM

A cardiac operation can be stressful for both the patients' heart and their life. Sorin Group Perceval, a totally sutureless aortic valve built around a super-elastic stent, is aimed at reducing this stress. Through an innovative, flexible and adaptable structure, created to provide shock absorption, enhance durability and facilitate good hemodynamics.
This, among other Sorin Group innovative solutions, aims at improving patients' outcomes as well as their life.

SORIN | PERCEVAL

IM-00289 A

CARDIAC SURGERY SOLUTIONS

www.sorin.com
info.cardiacsurgery@sorin.com

SORIN GROUP
AT THE HEART OF MEDICAL TECHNOLOGY

EACTS/STS Aortic Session 1 Brown 1

Impact of surgical experience on outcome in surgery of acute type A aortic dissection

Paul P Urbanski
Cardiovascular Clinic Bad Neustadt, Germany

Despite current progress in aortic surgery, the mortality and neurological morbidity in the surgery of acute aortic dissection have not changed considerably for decades and still average about 15 to 25%, especially in multicenter reports. On the other hand, there are also reports demonstrating excellent results with an exceptionally high rate of early survival, regardless of the surgical method used or the extent of surgery. Yet, the latter very often have one characteristic in common – they reveal that only one or very few surgeons performed all procedures, which indicates that surgical experience and performance could have a decisive impact on surgical outcome.

Between August 2002 and March 2013, 162 consecutive patients (mean age 63±14 years) underwent surgery for acute type A aortic dissection at our center. All patients were operated on by one of the clinic's attending surgeons with wide experience in cardiac surgery (at least 2,000 procedures performed personally), however about one-half of the patients (75 patients, 46%) was operated by the aortic team (AT) surgeons with profound experience in complex aortic pathologies. All perioperative data were collected prospectively and retrospective statistical analysis was performed using uni- and multi-variate logistic regression models to identify predictors for surgical adverse outcome (AO) containing in-hospital and/or 90-day mortality and new permanent neurological and organ dysfunctions.

AO was observed in 36 patients (22.2%) including in-hospital mortality in 22 (13.6%). Multivariate logistic regression analysis identified surgery not performed by the AT as a strongest predictor for AO (OR 14.1; 95% confidence interval, 3.5-55.6; p<0.0001) followed by any malperfusion, myocardial infarction, and creatinine level. Two groups were built according to the surgery performed by the AT (Group AT) or by the surgeons not on the AT (Group No-AT). The comparison of the groups showed no differences regarding the preoperative characteristics, especially compromised consciousness, malperfusion and extent of dissection. Yet, the outcomes in Group AT vs. No-AT were significantly different presenting AO: 8.0% vs. 34.5% (p<0.0001), in-hospital mortality: 4.0% vs. and 21.8% (p<0.001), new permanent neurological deficit: 2.7% vs. 11.5% (p=0.03), even if valve-sparing repairs and complete arch replacements were much more frequent in Group AT. The groups also differentiated significantly in regard to cannulation and perfusion management, which might play a decisive role in surgical outcome.

In our opinion, the key for optimal surgical outcome in acute aortic dissection is a very individual, patient-tailored operative strategy as opposed to a standardized approach. Special experience in aortic surgery does help in choosing an optimal operative strategy and to perform it properly, and therefore, the surgeon's experience plays a decisive role in outcome.

The basis for optimal strategy is CT-angiography, which translates to only a few minutes of delay on the way to the operating theatre and is a prerequisite for choosing an optimal surgical strategy. We believe that neither cannulation site nor the extent of aortic repair is a remedy for successful surgery of acute aortic dissection. Certainly, the cannulation technique and perfusion strategy are also very important aspects of dissection surgery, and there are several situations in which the proper execution of these techniques can be critical for patient survival. An overall improvement of surgical results in the surgery of acute aortic dissection can be achieved, however, by improving results in challenging cases, especially those presented with any malperfusion. The best way for reaching this aim is the surgical flexibility combined with a well-considered strategy and surgical experience, rather than a generalized standard approach.

Paul Urbanski

Improving Perfusion, Part 1 Raphael

Prediction of mortality following veno-venous extracorporeal membrane oxygenation

Tone Bull Enger *Norwegian University of Science and Technology, Trondheim, Norway*

Veno-venus extracorporeal membrane oxygenation (VV ECMO) has become increasingly recognised as a therapeutic option in patients with severe accute lung faliure refractory to conventional treatment strateies. ECMO can be applied in critically ill patients as a bridge to recovery, further diagnostics or transplantation. However, given its invasive character, high costs and resource use ECMO shold neither be initiated nr continued once started unless there is a "reasonable expectaion of good outcome".[1]

Thus, parallel to the increasing interest and use of ECMO over the last decade, a growing need for risk prediction tools that objectively supplement clinical decision-making and assure an ethical and fair use of hospital resources has arisen.

In our recent study including 304 VV ECMO cases[1], we found that advanced age, an immunosuppressed state, high minute ventilation, as well as poor organ function and functional reserves were of prognostic importance. At the University Medical Center of Regensburg (UKR), a broad spectrum of clinical, laboratory and cardiovascular parameters are routinely registered in our ECMO database, permitting use of biological as well as clinical data for mortality risk prediction. Our pre-ECMO and Day-1 prediction models indicated that inclusion of biological data as markers of underlying function and illness increased the predictive accuracy. Addition of data from the 1st day of ECMO support improved the ability to discriminate between low-risk patients with high regenerative capacity and reversible disease, and those with poor health condition, reduced functional reserves and intractable illness. However, up to date, few other ECMO centers have routinely been registering biological data. Thus, we have not yet found a suitable external validation cohort for the UKR scores.

Over the last two years, five different risk prediction models have been presented, all aiming to improve mortality prediction above that of general intensive care unit-scoring systems. These models vary with respect to the final number of items included, involvement of biological data, size of the study population, number of centers involved, application of up-to-date statistical methods and verification in external ECMOcenters.

The RESPscore[2] was a large multi-center trial based on patient data (n=2,355) from the international Extracorporeal Life Support Organization (ELSO). They did not have the opportunity to include biological parameters, which perhaps might improve prediction. Furthermore, their models were developed in patients receiving either VV or veno-arterial ECMO, and 28% of the patients were encoded with lung infection without further details. However, the RESPscore showed excellent performance in a French validation cohort of 140 patients.

In general, the models agree that the severity of the respiratory state before initiation of ECMO is of low prognostic value. While patients with primary lung failure, for example due to trauma or influenza, seem to benefit from ECMO support, patients with underlying extra-pulmonary sepsis and who seem to be systemically exhausted, should be evaluated even more carefully before initiating ECMO. But the question we all still try to answer is; how can we do this with the highest accuracy?

Tone Bull Enger

Patient supported with VV ECMO

In our opinion, time has come where we need to put our heads and forces together. The next step from here should be to summarize what available data tell us about factors that determine patient outcome, and assess whether results have been reproducible. A major challenge with research on ECMO patients is the heterogeneity in underlying diagnoses and clinical pictures. Furthermore, we have still not reached an international consensus on the indications for VV ECMO support. Thus, we need to evaluate whether the published prediction tools are generalizable for all ECMO indications.

As an important first step onwards, further validation of published models is strongly warranted. Both the RESPscore and the UKR models have been made easily available on internet. We encourage centers practicing ECMO to start registering the included variables and evaluate the performance of these prediction tools in their populations. This will contribute to resolving unanswered questions regarding validity, and can help to improve ECMO practice locally and on an international level. Furthermore, we hope that we can continue building bridges between centers and researchers at the upcoming Euro-ELSO meeting in Regensburg May 2015.

References

1 Fan E, Pham T: Extracorporeal membrane oxygenation for severe acute respiratory failure: yes we can! (But should we?). Am J Respir Crit Care Med 2014, 189:1293-1295.
2 Enger TB, Philipp A, Videm V, Lubnow M, Wahba A, Fischer M, Schmid C, Bein T, Muller T: Prediction of mortality in adult patients with severe acute lung failure receiving veno-venous extracorporeal membrane oxygenation: a prospective observational study. Crit Care 2014, 18:R67. Available as an online calculator at https://vev.medisin.ntnu.no/risikokalk/index.php?lang=en.
3 Schmidt M, Bailey M, Sheldrake J, Hodgson C, Aubron C, Rycus PT, Scheinkestel C, Cooper DJ, Brodie D, Pellegrino V, Combes A, Pilcher D: Predicting survival after extracorporeal membrane oxygenation for severe acute respiratory failure. The Respiratory Extracorporeal Membrane Oxygenation Survival Prediction (RESP) score. Am J Respir Crit Care Med 2014, 189:1374-1382. Available as an online calculator at www.respscore.com.

JOTEC®

PURE EXPERIENCE

E-vita OPEN PLUS

The proven hybrid stent graft system that combines surgical reconstruction with aortic stenting for successful single-stage repair of complex disease of the thoracic aorta.

Lunch Symposium:
„E-vita OPEN PLUS – Experiences and Latest Techniques in the Treatment of Complex Aortic Disease"
Monday, 13th October 2014, 12:45–14:00h, Amber Room 8

Visit us at the JOTEC booth

SOLUTIONS FOR VASCULAR DISEASE

Basic Science Programme Amber 6

Paracrine mechanisms

A paradigm shift in cell therapy for heart disease

Massimilino Gnecchi *University of Pavia, Italy*

Despite major advances in our understanding, as well as improvements in treatment of coronary artery disease, acute myocardial infarction (AMI) still represents a significant cause of mortality and morbidity worldwide. Indeed, following AMI, cardiomyocytes begin to die, and if the blood supply is not quickly restored, all of the cardiac tissue served by the related infarcted artery undergoes necrosis or apoptosis, leading to chronic sequelae of ischemic cardiomyopathy and congestive heart failure. The endogenous regenerative capacity of the heart seems unable to replenish a significant loss of tissue such as that resulting from AMI. However, the recent discovery of resident cardiac stem cells (CSCs), together with the demonstration of bone marrow (BM)-derived stem cells able to home in the heart and transdifferentiate into cardiomyocytes, has suggested the fascinating possibility that therapeutic myocardial regeneration might be achieved using adult stem cells (ASCs). Over the past several years, ASC therapy of the heart has generated significant interest in clinical and basic scientific communities.

To date, the majority of animal and preliminary human studies of ASC therapy following AMI have demonstrated an overall improvement in cardiac function.

Myocardial and vascular regeneration were initially proposed as mechanisms of stem cell action. However, in many cases, the frequency of stem cell engraftment and the number of newly generated cardiomyocytes and vascular cells, either by transdifferentiation or cell fusion, appear too low to explain the significant cardiac improvement observed.

Instead, there is a growing body of evidence supporting the hypothesis that paracrine mechanisms mediated by factors released by the ASCs play an essential role in the reparative process observed after stem cell injection into infarcted hearts. It has been shown that ASCs, particularly mesenchymal stromal cells (MSCs), produce and secrete a broad variety of cytokines, chemokines, and growth factors that are involved in cardiac repair. The paracrine factors influence adjacent cells and exert their actions via several mechanisms. Myocardial protection and neovascularization are the most extensively studied. Furthermore, the postinfarction inflammatory and fibrogenic processes, cardiac metabolism, cardiac contractility, and/or endogenous cardiac regeneration may also be positively influenced in a paracrine fashion. It is likely that the paracrine mediators are expressed/released in a temporal and spatial manner exerting different effects depending on the microenvironment after injury. In addition, these released factors may exert autocrine actions on the stem cells themselves. Thus, the paracrine/autocrine hypothesis broadens the traditional concept of stem cell niche to include the influence of stem cell released factors on the microenvironment which in turn modulate stem cell biology and tissue responses.

Massimilino Gnecchi

EACTS/STS Aortic Session 2 Brown 1

Distal aortic reintervention after surgery for acute DeBakey type I or II aortic dissection: open versus endovascular repair

Bartosz Rylski *Heart Centre Freiburg University, Freiburg, Germany, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania*

In most acute ascending aortic dissection patients, the dissection process extends beyond the left subclavian artery and emergency proximal aortic repair does not eliminate all dissected aortic segments. The residually-dissected distal aorta grows and some, especially younger, survivors develop later dissected aortic aneurysm requiring secondary intervention. Within recent decades, endovascular techniques have been widely adopted to treat even complicated thoracic and abdominal aortic disease. However, since currently available stent-grafts were designed for aortic aneurysm and not dissection repair, much controversy exists over the role of endovascular treatment among patients presenting a chronic dissection process. Our aim was to examine the outcomes of open versus endovascular reinterventions on distal aortic pathologies after surgery for acute ascending aortic dissection.

We pooled databases from Heart Centre Freiburg University and Hospital of the University of Pennsylvania in Philadelphia covering 14 years of aortic interventions. One hundred and forty one consecutive patients underwent 152 distal reinterventions after previous DeBakey type I or II dissection repair. Among them, 87 patients underwent open (20 hemiarch, 32 total arch, 39 descending aortic repairs) and 54 endovascular reinterventions (four hybrid arch, 50 descending aortic repairs; Figure 1). Median time between acute aortic dissection repair and distal reintervention was longer in the open group (3.8 vs. 0.7 years, P<0.001). There was one irreversible spinal ischemia and one stroke in the open group, and one stroke in the endovascular group. Seven patients in the open and none in the endovascular group required re-exploration for bleeding. Seven open and four endovascular patients required more than one distal reintervention (8% vs. 7%, P = 0.853). Open-repair patients experienced higher in-hospital mortality (13% vs. 2%, P = 0.055) and lower survival at 1 and 5 years (85 ± 4% vs. 94 ± 3%, 76 ± 5% vs. 90 ± 5%, P=0.043, respectively; Figure 2).

We think that open surgical repair is the gold standard for treating aortic events. However, we are now observing a shift in the paradigm for distal aortic dissections in favor of endovascular therapy over open surgery. This study is the first evaluation of open vs. endovascular procedures in patients with distal aortic pathologies following proximal repair for acute type I or II dissection. Endovascular intervention in experienced hands offers a benefit when treating late aortic complications after ascending aortic dissection repair. Endovascular repair is associated with lower in-hospital mortality and better survival, and does not increase the likelihood of later reinterventions at mid-term follow-up.

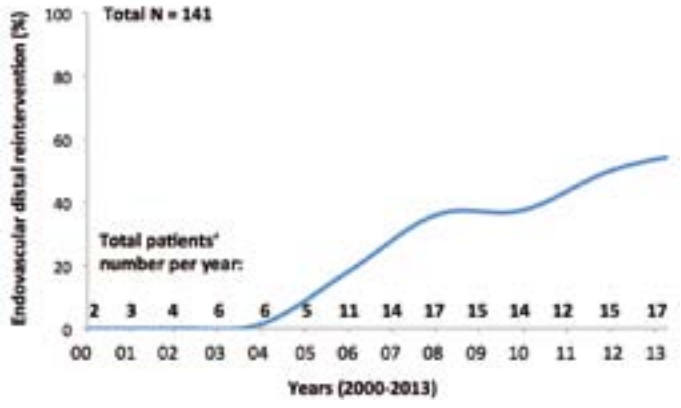


Figure 1. Rate of endovascular distal aortic reinterventions per year throughout the study period

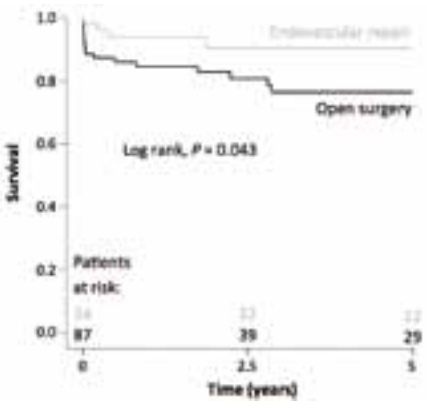


Figure 2. Survival after distal aortic reintervention in patients with history of type I or II dissection repair

Bartosz Rylski

Nurse, Practioners and Physician Assistants Amber 5

An evaluation of a frailty tool for preoperative trans-catheter aortic valve implantation (TAVI) patients

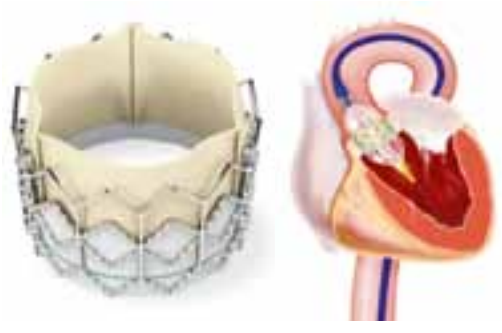
And the patient's conceptualisation of their own frailty

M. Roberts, Dr C Toolan, Mr M Kuduvalli, Dr M. Desmond, Mr A Oo.
Liverpool Heart and Chest Hospital, United Kingdom

TAVI was first developed in the human, adult population in 2002 (Criber et al 2002) where the aortic valve is replaced using a percutaneous, surgical option (Burgazli et al, 2012). The prevalence and incidence of heart failure increases with the person's age and has become a serious public health concern (Murad & Kitzman, 2012).

Currently patients are scored using the European System for Cardiac Operative Risk Evaluation (Euro SCORE II) (Nashef et al, 2012) and the Society of Thoracic Surgeons (STS) scores (Sunderman et al, 2011).

Frailty was first defined as a clinical phenotype, a 'failure to thrive' (Khandelual et al, 2012) while current medical literature states that frailty is defined as a reduction of a person's natural reserve, with the human body being unable to compensate (McClure & Cohn 2012). In this study a variation of the Edmonton Frailty Scale (Partridge, 2012), a validated measure of frailty was used.



Aims of the Study

1. To investigate the usefulness of a frailty tool in assessing the pre-operative TAVI patient.
2. To explore the patient's conceptualisation of their own frailty compared to what the frailty tool measures and the clinicians view.

Method

A qualitative methodology was used and a sample of seven, pre-operative, TAVI patients interviewed utilising a semi-structured format.

The first part of the interview was the frailty score

while the second part focused on the following five questions:

- In general how would you describe your health?
- Do you still work and if so what do you do?
- Do you care for someone else?
- How do you fill your day?
- Who do you socialise with?

The final part focused on the comparative analysis of the medical practitioners' perspectives, the participants' views of their own frailty and the frailty scores.

Results

1. An Analysis of the Frailty Tool Results

The frailty scores made reference to functional capacity and frailty as a potential progression in life.

2. An analysis of the five discussion questions
   - Autonomy is often associated with the ageing process
   - A strong sense of not giving up on life
   - A positive attitude and a need for drive / to carry on.
   - A pride that they had worked in their lives.
   - Forming social networks, regaining independence and engaging in physical / mental exercise.
3. Comparison of Participant and Medical Practitioners' Perception of Frailty

Decisions were based on clinical judgement rather than by choice of procedure.

Conclusion

There was some evidence that the frailty test did not adopt the correct format for these patients and that the participants were deluded with their own views of themselves, with the researcher expecting higher scores due their own associations with previous TAVI patients. However, evaluation of the frailty tool through the exploration of the patient's conceptualisation of their own frailty was successful.

References

1 K. Burgazli et al (2002) 'Transcatheter Aortic Valve Implantation: Our Experience and Review of the Literature' Balkan Medical Journal 29 pp.118-23
2 A. Criber et al (2002) 'Percutaneous transcatheter implantation of an aortic valve prosthesis for calcific aortic stenosis: first human case description' Circulation 106 pp. 3006-3008.
3 D. Khandelual et al (2012)' Frailty is associated with longer hospital stay and increased mortality in hospitalised older patients' Journal of Nutrition Health and Ageing 16 (8) pp. 732-735.
4 R. McClure & L. Cohn (2012) 'Minimally invasive surgery for aortic stenosis in the geriatric patient: where are they know?' Ageing Health 8 (1) pp.17-30
5 K. Murad & D. Kitzman (2012) 'Frailty and multiple co-morbidities in the elderly patient with heart failure: implications for management' Heart Failure Review 17 pp. 581-588
6 S.Nashef et al (2012) 'European System for Cardiac Operative Risk Evaluation' European Journal of Cardiothoracic Surgery 41 pp. 1-2
7 J. Partridge (2012) 'Frailty in the older surgical patient: a review' Age and Ageing 4 pp. 142-147.
8 S. Sundermann et al (2011) 'Comprehensive assessment of frailty for elderly high-risk patients undergoing cardiac surgery' European Journal of Cardio-thoracic Surgery 39 pp. 33-37.

EACTS/STS Aortic Session 1 Brown 1

Aortic arch surgery after previous Type A dissection repair Early to midterm results

Pietro Bajona, Eduard Quintana, Hartzell Schaff, Richard Daly, Joseph Dearani, Kevin Greason, Alberto Pochettino *Mayo Clinic, Rochester, Minnesota, US*

Primary repair of acute type A aortic dissection exclusion of the intimal tear forms the basic principle of the surgical repair.

Dissecting disease can evolve and different mechanisms are responsible for possible reoperations in the future such as increasing aortic valve regurgitation, progressive dilatation of the aortic root and/or of the distal segments of the native aorta, pseudoaneurysm' development and malperfusion syndromes. Open aortic arch surgery in patients who have undergone previous type A repair can be not only technically challenging but also affected by a higher mortality and morbidity rate.

We sought to review our experience for this particular patient population. In particular we looked at causes for reoperation, indications for redo procedures and surgical strategies.

From 2000 to 2014, we identified 55 patients that required aortic arch surgery after a previous type A dissection repair. Medical records were available for review including CT angiograms, cerebral protection strategies and follow up.

The mean interval from previous type A dissection repair to aortic arch surgery was 5.7 ± 5.4 years. At reoperation 36 patients (65.4 %) had total arch replacement and 19 (34.6%) had hemi-arch replacement. Indications for reoperations were: enlarging aneurysm in 27 (49%), impending rupture in 12 (21.8%), chronic dissection in 10 (18.1%) and mycotic aneurysms in six (10.9%). Arterial peripheral cannulation was used in 80% of patients. Selective antegrade cerebral perfusion was used in 35 patients (63.6%) and retrograde perfusion in 2 (3.6%). There were three perioperative deaths (5.5%) and four permanent stroke (7.3%). Survival was 90.3%, 84.8% and 77.3% at one, three and five-years follow-up, respectively. Five-year survival was 10% lower than that of an age and sex matched population (p<0.001). The only predictor of follow-up mortality was older age (OR 1.07, 95% CI 1.02-1.13, p=0.007).

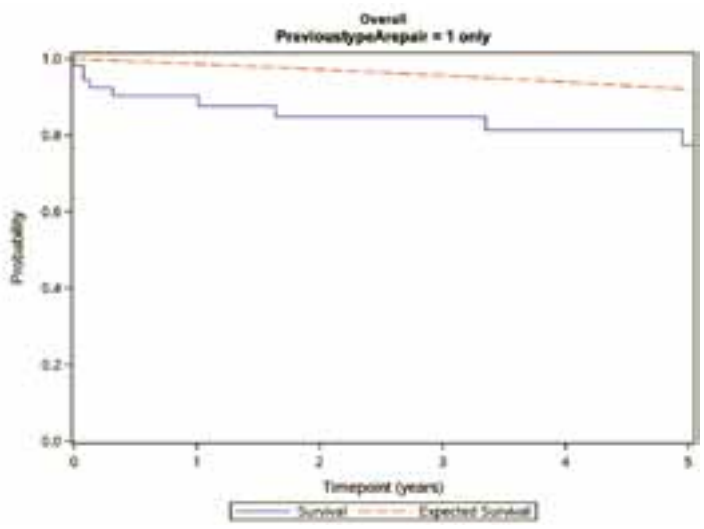


Figure. When compared to an age and gender matched population patients undergoing arch surgery after previous type A dissection repair had less survival at five years (p<0.001).

Our results show that reoperation after acute dissection repair can be accomplished, safely guaranteeing an acceptable long-term prognosis. Cerebral perfusion strategies likely contribute to positive outcomes. Favorable mid-term survival justifies performing such difficult reoperations. Life-long routine imaging and clinical follow-up are mandatory for an early reveal of complications and to evaluate the unresected aortic segments. A redo procedure for a previously repaired type A dissection should be referred to highly specialized centers in order to assure the good prognosis of this patient population.

Surgical indications and operative data	
Variable	**Value**
Indications for surgery	
Aneurysm	27 (49 %)
Impending rupture	12 (21.8 %)
Chronic dissection	10 (18.1 %)
Mycotic aneurysm	6 (10.9 %)
Type of aortic arch reconstruction	
Total arch	36 (65.4%)
Hemiarch	19 (34.6%)
Emergent	3 (5.5 %)
Urgent	4 (7.3 %)
Perfusion data	
Cardiopulmonary bypass (min)	219.9 ± 60.8
Cardiac ischemia (min)	120.9 ± 59.2
Circulatory arrest body (min)	52.2 ± 30.6
Circulatory arrest brain (min)	19.8 ± 14.2
Lower Temperature (core) achieved (Celsius)	19.2 ± 10
Arterial cannulation	
Aorta	11 (20 %)
Axillary	38 (69.1%)
Femoral	6 (10.9 %)
Venous return	
Central	43 (78.2 %)
Femoral vein	12 (21.8 %)
Concomitant cardiac procedures	
Bentall	22 (40 %)
CABG	10 (18.2 %)
Aortic valve replacement	6 (10.9 %)
Redo root replacement	4 (7.3 %)
Homograft implantation	3 (5.4 %)
Valve sparing root replacement	2 (3.6 %)
Mitral valve repair	1 (1.8 %)
Tricuspid valve surgery	1 (1.8%)

Data shown as n (%) or mean ± SD

Abbreviations: CABG, coronary artery bypass graft.

Postoperative outcomes and complications	
Outcomes	**Value**
Operative mortality	3 (5.4%)
Follow up mortality	15 (27.7%)
ICU length of stay (days)	2.5 ± 3.3
Hospital length of stay (days)	9.5 ± 5.7
Complications	
Stroke (permanent)	4 (7.3 %)
Stroke (temporary)	2 (3.6 %)
Spinal cord deficit	1 (1.8 %)
Reoperation for bleeding	6 (3.3 %)
Tamponade	2 (3.6 %)
Low cardiac output syndrome	2 (3.6 %)
Myocardial infarction	1 (1.8 %)
Renal failure dialysis	3 (5.4 %)
Respiratory (pneumonia/atelectasis/pleural effusion)	6 (10.9 %)
Mesenteric (ischemia/hemorrhage)	1 (1.8 %)
Sepsis	1 (1.8 %)
Wound complication (infection/dehiscence)	2 (3.6 %)
Laryngeal nerve injury	5 (9 %)

Data shown as n (%) or mean ± SD

Abbreviations: ECMO, extracorporeal membrane oxygenation; IABP, intra-aortic balloon pump; ICU, intensive care unit

Mitral Valve Repair Gold Room

Mitral regurgitation surgery in PTS with ischemic cardiomyopathy and ischemic mitral regurgitation

Factors that influence survival

Ottavio Alfieri
S.Raffaele University Hospital, Milan, Italy


Ottavio Alfieri

Mitral regurgitation (MR) in patients with ischemic cardiomyopathy is essentially due to changes in LV geometry, producing dislocation of the papillary muscles, and leaflet tethering. Annular dilatation is almost invariably present. Dissynchrony in contraction and decreased closing forces secondary to severe LV dysfunction may contribute to MR. Under these circumstances, the surgical risk is not negligible. Old age, comorbidities and frialty, are factors incrementing the operative mortality, when present.

According to a recent meta-analysis, mitral valve repair with undersized annuloplasty is associated with an advantage in short- and long-term survival compared with valve replacement. Improvement in symptoms and LV reverse remodeling are often obtained following annuloplasty.

However, mitral repair carried out in this clinical scenario can be associated with recurrence of MR in a high proportion of patients, as reported in a recent prospective randomized study comparing mitral valve repair and replacement in severe ischemic MR. Recurrence of MR, which occurs when LV reverse remodeling is not obtained, is strongly negatively affecting survival in the follow-up.

To improve the overall results, it is important to identify patients in whom undersized annuloplasty is not expected to offer an effective and durable repair.

First of all, it is unlikely that patients with advanced LV remodeling (excessively dilated ventricle with a sphericity index more than 0.7 and a very low ejection fraction) and long-lasting congestive heart failure can have a benefit from annuloplasty. In addition,many other well defined predictors of poor outcome following annuloplasty can be identified with echocardiography: systolic tenting area > 2.5 sqcm, coaptation distance > 10mm, posterior leaflet-annular plane angle in systole > 45°, distal anterior leaflet-annular plane angle in systole >25°, end systolic interpapillary muscle distance > 20mm. When these predictors of unfavorable outcome are present, mitral valve repair using annuloplasty should be avoided and valve replacement should be the preferred option. Under special circumstances, other procedures (like ventricular wall resection/ plication, secondary chordae cutting, leaflet extension, papillary muscles sling or relocation,etc.) can be added to annuloplasty in order to enhance effectiveness and durability of mitral valve repair.

In conclusion:

a) old age, comorbidities, and poor LV function are associted with lower short and long term survival in patients submitted to mitral valve surgery in the context of ischemic cardiomyopathy
b) mitral valve repair with undersized annuloplasty, when effective and durable, is offering a better survival (early and late), compared to valve replacement.
c) predictors of recurrent MR following mitral repair can be identified preoperatively
d) recurrence of MR following mitral repair is negatively affecting the survival in the follow-up
e) valve replacement should be reserved to patients in whom recurrence of MR is expected
f) when surgery is too risky, percutaneous methods to correct MR should be considered.

Basic Science Programme Amber 6

Secretome of stressed mononuclear cells is effective in acute experimental infarction and chronic ischemic left ventricular dysfunction: from porcine AMI model to molecular biology

Mariann Gyöngyösi
Medical University of Vienna, Austria

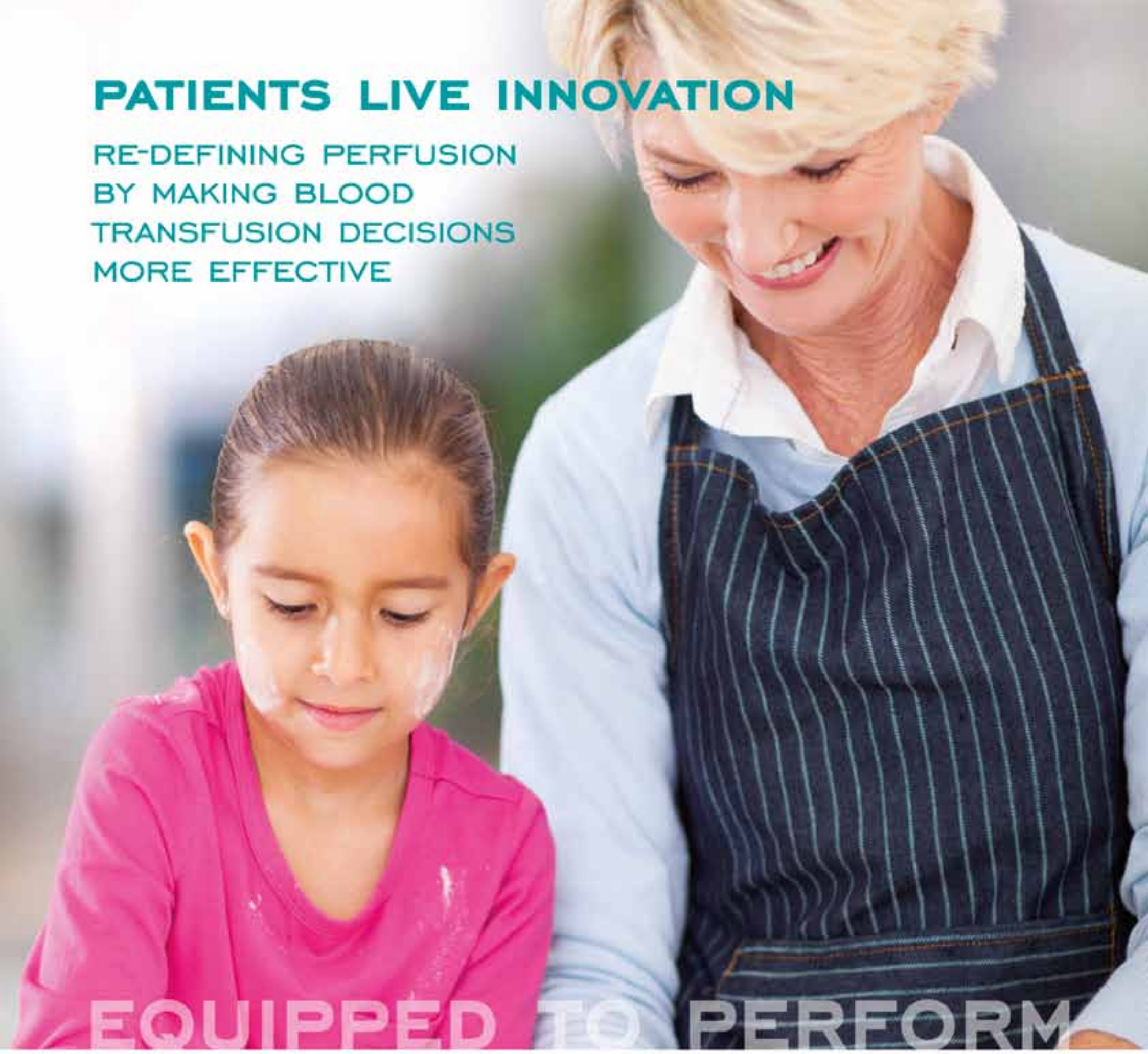
Intravenous injection of secretome of irradiated apoptotic peripheral blood mononuclear cell (PBMC) suspensions restored cardiac dysfunction in a rat acute myocardial infarction (AMI) model. Cell culture supernatants derived from irradiated apoptotic PBMC (APOSEC) were collected from pigs and prepared for intravasal and intramyocardial injections. Closed-chest reperfused AMI was induced in pigs. APOSEC was injected either: 1) intravenously as a single infusion dose during the coronary occlusion phase of AMI, or 2) percutaneously intramyocardially in the border zone of AMI in a chronic phase of LV dysfunction, during the remodeling process of the left ventricle. Ad 1) Single intravenous dose of APOSEC resulted in a reduction of scar tissue formation, and higher values of ejection fraction (57.0 vs. 40.5%, $p < 0.01$) and cardiac output (4.0 vs. 2.4 l/min, $p < 0.001$) and a reduced extent of infarction size (12.6 vs. 6.9%, $p < 0.02$) as determined by magnet resonance imaging (MRI). Ad 2) In chronic AMI model, injection of APOSEC significantly decreased infarct size ($p < 0.05$) and improved cardiac index and myocardial viability compared to controls. Gene expression analysis revealed significant downregulation of caspase-1, tumor necrosis factor and other inflammatory genes in APOSEC-treated areas. Real time PCR showed higher expression of myogenic factor Mefc2 ($p < 0.05$) and downregulated caspase genes ($p < 0.05$) in APOSEC-affected areas. Altered gene expression one-month post-APOSEC treatment proved the long-acting effects of cell-free therapy with paracrine factors.

In conclusion, intravenous or intramyocardial injection of APOSEC attenuates myocardial remodelling in experimental acute or chronic AMI models. This effect is probably due to the activation of pro-survival signalling cascades in the ischemic-injured cardiomyocytes.


Mariann Gyöngyösi

PATIENTS LIVE INNOVATION

RE-DEFINING PERFUSION BY MAKING BLOOD TRANSFUSION DECISIONS MORE EFFECTIVE



Access to homologous blood transfusion can be made more effective by the Sorin cardiac surgery solutions.
This is possible by combining the use of Inspire low Dynamic Operating Volume (DOV) oxygenators to minimize impact on hemodilution, Inspire Dual chamber reservoir for the segregation of activated suction blood, and XTRA autotransfusion system for the treatment of the separated blood.
Connect and GDP Monitor can then provide information to make homologous transfusions only when really needed.

IM-002985 A

CARDIAC SURGERY SOLUTIONS

www.sorin.com
info.cardiacsurgery@sorin.com

SORIN GROUP
AT THE HEART OF MEDICAL TECHNOLOGY

smartcanula

NEW 24F Smartcanula® ST designed for MICS and ECMO provides superior collateral venous drainage at all levels!

Traditional percutaneous cannulas used for peripheral cannulation oblige the blood flow from the collateral iliac veins, the renal veins, and the hepatic veins to travel towards the right atrium prior to entering the cannula lumen. In contrast, the new meshed 24F Smartcanulas® ST developed for minimally invasive cardiac surgery (MICS) and extra-corporeal membrane oxygenation (ECMO) allow for direct venous drainage at all levels of the caval axis, which in turn improves flow rate due to both, a simplified flow path and a larger relative drainage lumen within the meshed cannula.

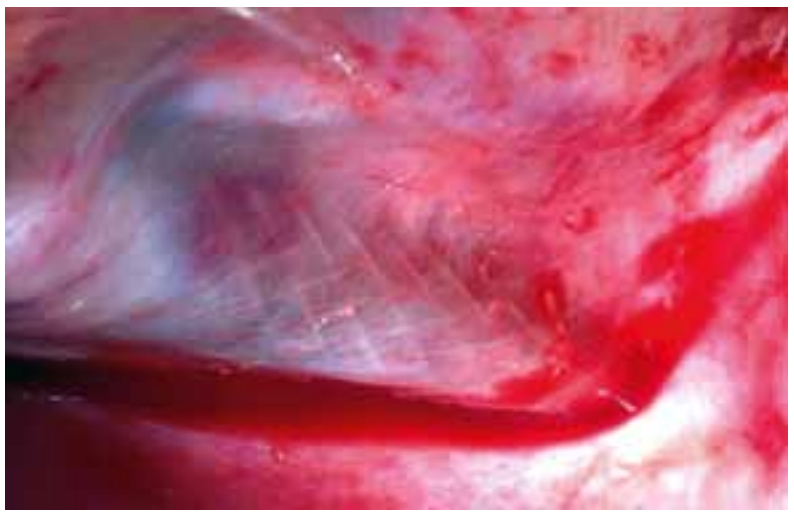
This can be demonstrated for simulated collateral venous drainage during cardiopulmonary bypass (CPB) over the caval axis by comparison of the new meshed 24F Smartcanulas® ST which are designed for use with augmented venous drainage and constricted to 23F versus percutaneous control 23F cannulas (Biomedicus®) in vitro. Flow (Q) is measured sequentially for simulated right atrial + hepatic + renal + iliac drainage using a centrifugal pump in an experimental bench set-up and a flexible caval substitute for an after load of 60mmHg. It comes to no surprise, that the meshed cannula designed for use in combination with augmented venous drainage provides better drainage at a fraction of the negative pressure required for traditional percutaneous cannulas. The superior performance of the new 24F Smartcanula® ST is also evident in vivo.

36F Smartcanula® S For drainage with gravity

24F Smartcanula® ST For augmented drainage

Ludwig K. von Segesser

Traditional percutaneous cannula with evident cannula orifice obstruction due to augmented venous drainage



The new 24F Smartcanula® ST designed for augmentation provides more efficient direct venous drainage at all levels

BETTER BLOOD BALANCE™

Now manage INR at 1.5–2.0 for reduced bleeding risk and improved quality of life.

1.5

Only the On-X® Plus 1.5™ Aortic Heart Valve reduces bleeding risk by 60% without increasing thrombotic events and provides the reassuring longevity of a mechanical valve with lower warfarin dosage.[1]

Visit booth #107 to learn more.

On-X heart valves
product group of On-X Life Technologies, Inc.™

1. Puskas J, Gerdisch M, Nichols D, et al. Reduced anticoagulation after mechanical aortic valve replacement: Interim results from the Prospective Randomized On-X® Valve Anticoagulation Clinical Trial randomized Food and Drug Administration investigational device exemption trial. *J Thorac Cardiovasc Surg.* 2014;147(4):1202-11.

The approval of a lower INR recommendation through the EU regulatory process applies only within that jurisdiction and others that accept EU review. This therapy is not approved in the US or other countries that have reviews independent of the EU. In these countries On-X Life Technologies, Inc., continues to recommend standard anticoagulation therapy as presently prescribed by various professional societies for the On-X valve.

EACTS
European Association For Cardio-Thoracic Surgery

EACTS Academy Programme 2014	
Advanced Module: Congenital Surgery	27-31 October
Advanced Module: Heart Failure: State of the Art and Future Perspectives	10-14 November
Thoracic Surgery: Part II	2-5 December
Extra Corporeal Membrane Oxygenation	20-21 October
Advanced Course on the Mitrai and Tricuspid Valve	19-21 November, Munich, Germany
Valve Sparing Aortic Root Replacement and Aortic Valve Repair	28-29 November
4th EACTS Meeting on Cardiac and Pulmonary Regeneration and Stem Cell Technology	12-13 December, Bern, Switzerland

EACTS Academy Programme 2015	
Fundamentals in Cardiac Surgery: Part I	2-6 February
Advanced Module: Open and Endovascular Aortic Therapy	17-20 March
Thoracic Surgery: Part I	13-17 April
Fundamentals in Cardiac Surgery: Part II	8-12 June
Advanced Module: Congenital Surgery	26-30 October
Advanced Module: Heart Failure: State of the Art and Future Perspectives	9-13 November
Thoracic Surgery: Part II	7-11 December
Functional Mitral and Tricuspid Regurgitation	20-21 February
Transcatheter Aortic Valve Implantation	25-27 February
Ventricular Assist Device Coordinator Educational Course	26-28 March, Berlin, Germany
Modern Perspectives on Atrial Fibrilation Surgery	7-8 May
Perioperative Skills in Cardiac Surgery	22-23 June
Infection in Cardiac Surgery	2-3 July
Advanced Aortic and Mitral Valve Reconstructive Surgery	10-11 July
Heart and Lung Transplantation	7-8 September
Chest Wall Diseases	2-4 December

All courses to take place at EACTS House in Windsor, UK, unless stated otherwise.

Foundation Courses Specialist Courses

Raising Standards Through Education and Training

www.eacts.org

Valve Sparing Aortic Root Replacement and Aortic Valve Repair Course

In 28-29 November this year, the EACTS will host the Valve Sparing Aortic Root Replacement and Aortic Valve Repair Course at EACTS House, Windsor, UK. We talked to one of the course directors, Dr Emmanuel Lansac, about the importance of the course…

"The objective of this highly-focused course is to provide a dedicated teaching platform on surgery for aortic insufficiency and/or aortic root aneurysm, particularly examining the role of valve repair," stated Dr Lansac. "The course will provide a standardised approach to management of these patients from their pre-operative analysis to select good candidates for valve repair, to surgical technique. Aim of the course is that attendees learn a step-by-step, systematic approach to valve sparing root replacement and aortic valve repair surgery, in order to spread diffusion of these techniques to all teams who want to offer it to their patients".

He said that course delegates could include cardiac surgeons and echo cardiographers (cardiologists and anaesthesiologists) who are willing to start or are already part of a valve sparing aortic root replacement and aortic valve repair programme. He added that the appeal of the course reflects the multi-disciplinary aspect of aortic root replacement and aortic valve repair.

The programme will begin with an examination of the functional anatomy of the aortic valve and the rationales of aortic annuloplasty for a standardised aortic valve repair, which will include all the important parameters which need to be taken into account when considering aortic valve repair.

Dr Lansac explained that the course will include presenters from different schools of aortic valve repair such as Diana Aicher (Homburg), Dr Laurent De Kerchove (Brussels) and Alain Berrebi (Paris), among others.

The course will also feature "live on tape" case studies focusing technical detail for valve sparing root replacement, aortic valve repair and ring annuloplasty technique.

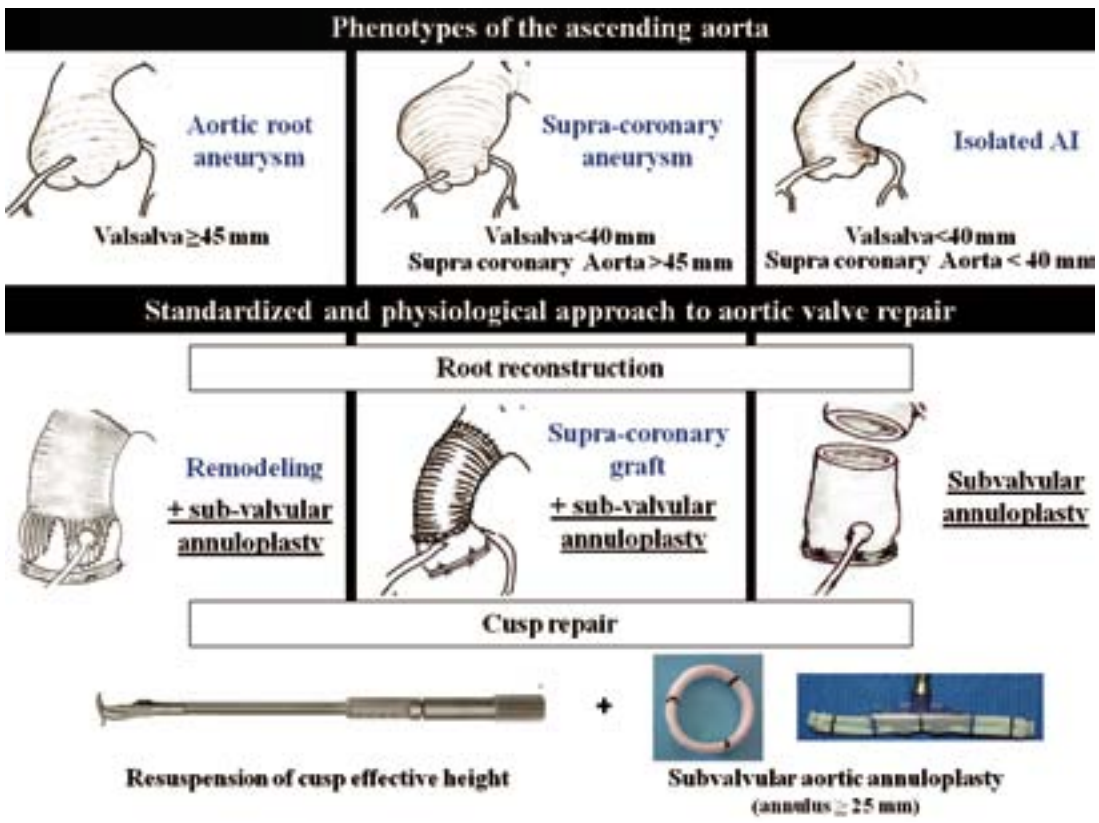
"Each video will clearly demonstrate to attendees the various surgical techniques in a step-by-step approach depending on the phenotype of the ascending aorta such as aortic root aneurysm, supra coronary and isolated aortic insufficiency" he added. "The videos will show common cases and more complex cases for both tricuspid and bicuspid aortic valve."

The programme will also include a failure session, in which attendees will discuss the case from echo analysis to surgical repair, and learn how to identify predictors of repair failure and bailout technique in such conditions.

The course will end with a Wetlab bringing together the theoretical knowledge with a practical application. This will include an analysis of the anatomy of the aortic root, valve assessment including measurement of cusp effective height, valve sparing root replacement and annuloplasty technique.

"Right now, the question regarding aortic valve surgery is no longer 'can we do aortic valve repair?', because we know it is feasible with satisfying long-term results thanks to the work of pioneering surgeons such as Magdi Yacoub, Tirone David, Gebrine El Khoury and Joachim Schaffer among others," he added. "Now we are asking, 'how can we standardise the technique in order to ease its widespread use among every team?' Aside the ones who advocate remodelling of the aortic root or who support re-implantation of the aortic valve, we know now that the more physiologic the root reconstruction, the better.

"Moreover, the need of cusp effective height resuspension and aortic annuloplasty are now recognised as key component for a predictable and durable repair. Standardisation of both the root reconstruction and valve repair is the aim of this course. Dr Rafael Sádaba, who is the co-director of the session, and myself are looking forward to the first edition in November where we will discuss and debate all these fascinating aspects of aortic root and valve repair surgery."



Standardized and physiological approach to aortic valve repair according to each phenotype of ascending aorta

The full programme and registration: www.eacts.org/academy/specialist-courses/valve-sparing-aortic-root-replacement-and-aortic-valve-repair/

Scientific programme of the STMP during the Annual Meeting in Milan

Peyman Sardari Nia *Maastricht, the Netherlands, Chairman of STMP Committee*

On behalf of Surgical Training and Manpower (STMP) Committee:

Committee Members:

- Peyman Sardari Nia, Maastricht, the Netherlands
- Lucio Careddu, Bologna, Italy
- Ikka Ilonen, Helsinki, Finland
- Raili Ermel, Tartu, Estonia
- Fabian Kari, Freiburg, Germany
- Eduard Quintana, Barcelona, Spain
- Marco Scarci, Cambridge, UK
- Joerg Seeburger, Leipzig, Germany
- Matthias Siepe, Freiburg, Germany

I am honored and pleased to announce the scientific programme for the Annual Meeting in Milan. In 2008, the Surgical Training and Manpower committee was in charge of organizing a single session called "the residents meeting" outside the main programme of the Annual Meeting. Today the STMP committee has a full programme dedicated to training and novel techniques.

As our Association has changed from an exclusive club of European surgeons to the most inclusive international society in cardiothoracic surgery, the STMP committee has changed with it, and is now at the forefront of activities dedicated to training, research and innovation.

We represent the views of young surgeons and residents, the future of our specialty and we embrace the future with all its fullness. We believe that training, research and innovation are the fundamentals of our practice and future of our specialty.

We believe that excellence in training, research and innovation should be recognised, pursued and applauded. And we have supported and initiated this by awarding each year different prizes for research (Young Investigators Awards), for training (Leonardo DaVinci award for excellence in surgical training) and for innovation. We organise courses on new procedures, and have introduced new initiatives such as a minimally invasive courses in adult cardiac surgery and drylab trainings.

During the forthcoming Annual Meeting in Milan you will have the opportunity of joining us for a number of activities.

On Monday we will have our yearly session titled "Work in progress abstract session". Although there is enough room during our Annual Meetings to present data regarding the individual studies, less opportunity exists to discuss ongoing research projects. Therefore, three years ago we introduced a new session for our young colleagues to present their preliminary results. The idea is to give an opportunity to innovative work and thinking, and create a medium whereby new ideas could be exchanged and new cooperations created. The focus is on the project as a whole, possible implications for our specialty and future perspectives.

Also on Monday we will organise a new session titled "Pro and Cons debates". During this session prominent surgeons are invited to clash intellectually with each other regarding contemporary subjects within cardiac surgery. The session is designed to broaden one's perspectives and remind all of us that there are no axioms in medicine.

Another session on Monday is "Nightmares in cardiothoracic surgery". This session was so packed last year that we could not accommodate dozens of participants willing to enter the room. During this session cardiothoracic surgeons present their nightmares and difficult cases in an interactive manner. The idea is to simulate discussion about the process of decision-making and problem solving.

On Tuesday we are organizing a completely new session with a new concept, "Meet the Experts". We have identified four subjects within thoracic, adult cardiac, congenital and vascular surgery and invited a panel of experts for each subject. The participants have been invited to submit case reports. During this session case reports sent by delegates will be discussed with the expert panel and the audience. The idea is to stimulate discussion on difficult cases and dissect the problems in detail with the expert panel.

Peyman Sardari Nia

We are also organizing our yearly session on training, "Training in minimally invasive cardiothoracic surgery". We will explore the necessities for starting the minimally invasive training programme, the ways to incorporate it when training residents and the ways that the industry can help the education in new techniques.

Also on Tuesday we are organizing the "residents luncheon" for the fourth time. The subject and title of this year's luncheon is "The Clash of the Titans returns!". The luncheon consists of seven tables, each having been designated a specific subject within cardiothoracic surgery. Prominent surgeons with expertise in related subjects are invited to moderate at each table. Residents can register at the Annual Meeting on-site to attend the luncheon. Questions can be sent in advance and will be compiled in envelopes to be opened at tables to facilitate discussions and interaction.

Another new initiative on Tuesday is "Pitfalls and trouble shooting in minimally invasive surgery". This session is dedicated to pitfalls and problems occurring during minimally invasive procedures. As most of the sessions during the Annual Meeting are focused on the positive results or how to do certain things, the focus of this session is what are the pitfalls and nightmares and how one can avoid them.

On Wednesday we will have our yearly session titled "How to do it: Live in-box": This session is fully dedicated to techniques in adult cardiac surgery. Live-in-a-box videos of different techniques are presented. The emphasis is on the technical aspects of each procedure and pitfalls related to these techniques. The aim of this session is to stimulate discussions, exchange ideas and give the young surgeons a stimulating introduction to the challenging techniques.

This year from Monday to Wednesday we are also organizing six drylabs on minimally invasive mitral valve repair (MIMVR) on high-fidelity simulators. Dexterity of open surgery is insufficient for starting a MIMVR and new dexterity should be developed in endoscopy and working with long shafted instruments. Most critical technical steps are working with long shafted instruments endoscopically and placing sutures on mitral valve annulus. Therefore, the learning curve of MIMVS is steep and unfortunately still being underutilised in patients. These drylab sessions will enable residents, fellows and surgeons to develop skills in MIMVR and practice those skills endlessly on the simulators.

We as the representatives of the STMP committee hope that the proposed activities serve the surgeons. Much energy was put into these innovative sessions and a prominent faculty is involved in it. We are sure that the format of the sessions and quality of the faculty will create a highly-instructive atmosphere. We look forward to seeing you in Milan.

Programme details:

Work in progress
Day/Date: Monday, October 13, 2014
Session Time: 08:15 – 09:45
Room: Amber 6

Pro and Cons debates
Day/Date: Monday, October 13, 2014
Session Time: 10:15 – 11:45
Room: Amber 6

Nightmares in cardiothoracic surgery
Day/Date: Monday, October 13, 2014
Session Time: 14:15 – 15:45
Room: Amber 6

Meet the experts
Day/Date: Tuesday, October 14, 2014
Session Time: 08:15 – 09:45
Room: Amber 6

Training in minimally invasive cardiothoracic surgery
Day/Date: Tuesday, October 14, 2014
Session Time: 10:15 – 11:45
Room: Amber 6

Luncheon:
The clash of the titans returns!
Day/Date: Tuesday, October 14, 2014
Session Time: 12:45 – 14:15
Room: Amber 3

Pitfalls and trouble shooting in minimally invasive surgery
Day/Date: Tuesday, October 14, 2014
Session Time: 14:15 – 15:45
Room: Amber 6

How to do it: with live in a box
Day/Date: Wednesday, October 15, 2014
Session Time: 09:00 – 12:00
Room: Brown 1

Endoscopic port-access mitral valve repair drylab training using high-fidelity simulators
Dates and times

- Six drylabs from Monday to Wednesday, 13–15 October 2014
- 90-minute session during the main programme.

Fourth Allied Profession PostGraduate Course

This year the Fourth Allied Profession PostGraduate Course will be held during EACTS 28th Annual Meeting. The goal of this PostGraduate Course is to enhance the knowledge and professional standards of those involved in cardio-thoracic surgery. The audience will consist of nurse practitioners, physician assistants, nurses, physical therapists and others who are involved in the team of the cardio-thoracic surgeon.

The programme this year offers an array of subjects of interest to the delegates. In the field of cardiac surgery, physician assistant Rianne de Jong, will offer an insight to the current standards of endoscopic vein harvesting addressing the advantages and limitations. Surgeon Bart van Putte will give an oversight in the field of treatment of lone atrial fibrillation via surgical ablation. There will be a presentation on ECMO from Ms Jo Fowles from Papworth hospital, UK. Furthermore new guidelines in advanced cardiac life support after cardiac surgery will be presented and demonstrations will be given.

In the field of thoracic surgery, surgeon Lex Maat will deliver a lecture on the current insights on treatment of mesothelioma. Physician Joe Costa will present on his work and research in organ harvesting in the lung transplant programme.

We also offer a platform for allied professionals to present their scientific work. Abstracts will be presented on analgesic treatment for patients undergoing VATS, assessing frailty in patients and avoiding inadvertent perioperative hypothermia.

We cordially invite allied professionals to join us in beautiful city of Milan and ask members of EACTS to help make it possible for these colleagues to attend this PostGraduate Course. We all strive to deliver excellent care and know the result of successful cardio-thoracic surgery is determined not only by the quality of the surgeon but also the talent and quality of multidisciplinary team to enhance the patient experience and outcome.

Dorthe Bordinggaard (Denmark), Richard van Valen (The Netherlands), Tara Bartley (UK)

FEHLING INSTRUMENTS

Simulation of video-assisted minimal invasive mitral valve surgery – A new device for training programs

Professor Dr. med. Ingo Kutschka
Otto-von-Guericke-Universität Magdeburg


Ingo Kutschka

Suitable simulation is an appealing approach to improve surgical skills outside the operating room. Our aim was to build a cost-effective compact size device for training and education in minimal invasive mitral valve surgery.

The device consists of an aluminium pipe with a sliding drawer on which two panels can be mounted. One panel simulates the mitral valve composed of two layers of disposable microfiber membranes. The first layer simulates the annulus and the atrial tissue, the second layer simulates the anterior and posterior leaflet. The second panel is mounted behind the first one and contains the papillary muscle dummies made from replaceable foam rubber. Both panels can be adjusted in different distances from the access at the front of the pipe, which provides several levels of difficulty for the user. At the front of the pipe you find the access opening of 6cm diameter, which holds acrylic glass inserts of various size to simulate the access through the chest wall. An USB Camera with LED light source is integrated for video assisted surgery. The USB camera can be connected to any available computer which offers the opportunity to practice video-assisted surgery in various locations at work or at home. The device is designed to mount all required instruments and disposables inside the aluminium housing to make it easy for storage and transportation. A handle bar helps to carry the device and to adjust angle and height of the device during surgical practice. For teaching purposes the simulator can be used with open lid to provide a good view for the mentor, while the trainee is practising the minimal invasive approach through the front access. Closing of the lid and using the camera, perfectly simulates the reality of minimal invasive, video-assisted surgery. The device comes optionally with suitable economically priced training instruments. To further improve the sense of realism special mitral valve dummies made of silicon are available and can be mounted in the device.

In conclusion, this portable simulator provides suitable education and training options in the field of mitral valve surgery. Since it covers a wide range of current techniques such as annuloplasty, sliding plasty, leaflet resection, placement of neochordae or valve replacement, it may significantly contribute to improve training programs and learning curves.

EACTS Course preview 10–14 November

Heart Failure
State of the Art and Future Perspectives

In November 2014, the EACTS will host its third Advanced Module: Heart Failure – State of the Art and Future Perspectives course at EACTS House in Windsor, UK. *EACTS News* talked to one of the course directors, Professor Gino Gerosa (Padua, Italy), about the course…

"In the third Heart Failure Course we will again try to incorporate all aspects of heart failure from diagnosis and epidemiology, imaging and biomarkers, to advanced therapies such as LVADs, tissue engineering and the total artificial heart," said Gerosa. "The aim to provide a comprehensive overview of the current status of the available treatments for heart failure patients."

The course, which is aimed at residents and experienced cardiac surgeons with an interest in the heart failure field, will include a world-class faculty of heart failure experts including cardiac and congenital surgeons, cardiologists and scientists.

The course will begin with two presentations by pathologist Professor Angelini (Padua), who will explain the development of heart failure, why certain diseases lead to heart failure and the diagnosis of the condition. Professor Feltrin (Padua) will then examine the role of biomarkers in heart failure and Dr Osswald (Bad Oeynhausen, Germany) will then assess the current alternatives to medical therapy such as implantable cardioverter-defibrillator resynchronisation therapy and biventricular pacemakers.

Dr Schulze (New York) will then discuss optimal medical therapy and provide a cardiologist's point of view by evaluating the current medical therapies available for treating heart failure.

"We will also examine the surgical options for heart failure including mitral valve repair and replacement, as well as myocardial revascularisation," added Gerosa. "It is important that all the current therapies and treatment options are explained, discussed and understood. Heart failure is a highly complex condition and one that has multiple solutions, choosing the right solution is key."

Case reports

"We will again be presenting some case reports and asking the group for their opinion, allowing the group to discuss different treatment options and take part in the decision-making process," explained Gerosa. "The case reports discussions provide delegates with an opportunity to see how treatments options are evaluated depending on the conditions of the heart failure patient. The discussions from this session are always very interesting."


Gino Gerosa

The course will then discuss heart transplantation and specifically the issues surrounding donor shortage.

In many countries the availability of donor hearts is decreasing as fewer people with healthy hearts are dying early, as a result there is a real concern regarding the shortage of donor hearts, explained Gerosa. One solution could be found in tissue engineering, and during this year's course the 'Organ factory' session will discuss regenerative medicine and the possibilities it can offer the heart failure patient.

"It took almost 40 years from when mankind made the first transatlantic flight to when we took our first step on the moon," said Professor Gerosa. "Now, almost 40 years on from the first heart transplant, we are close to realising a similar dream – the bioengineered heart."

Wetlab

The course will also include the ever popular wetlab, sponsored by Thoratec. This is a hands-on session that allows attendees to implant Thoratec's HeartMate device.

"The wetlab session gives delegates an opportunity to apply their knowledge in a practical setting," he added. "It gives them the chance to assess and improve their surgical technique, as well as receive one-to-one advice from world renowned experts."

The course will also include a session on mechanical circulatory support with an assessment of short-term assist devices options and total artificial hearts.

The final day of the course is dedicated to industry presentations and allows companies to showcase their devices, giving the attendees the opportunity to see the latest technological advances and ask questions regarding patient selection, implantation and modification techniques.

"Overall, this course provides attendees with the opportunity to spend five days talking directly to heart failure specialists," concluded Gerosa. "I would strongly advocate that colleagues who are part of a heart failure programme attend this course."

For further information, please visit the EACTS website: www.eacts.org.

COURSE Programme

The course will run from 10-14 November 2014

MONDAY 10 NOVEMBER

08:00	**Arrivals and registration**	
08:30	**Epidemiology and pathological substrates of heart failure Part I**	*A Angelini, Padua*
09:30	**Epidemiology and pathological substrates of heart failure Part II**	*A Angelini, Padua*
10:30	**Break**	
11:00	**New diagnostic biomarkers and imaging modalities in heart failure Part I**	*G Feltrin, Padua*
12:00	**Alternative to medical therapy: implantable cardioverter defibrillators resynchronisation**	*B Osswald, Bad Oeynhausen*
13:00	**Lunch**	
14:00	**Optimal medical therapy**	*C Schulze, New York*
15:00	**Post-operative monitoring of the surgical patient – new imaging modalities**	*to be announced*
16:00	**Break**	
16:15	**Management of heart failure patients: outpatients clinic/frequent flyers/ moving towards mechanical circulatory support**	*C Schulze, New York & B Osswald, Bad Oeynhausen*
17:15	**Close**	

TUESDAY 11 NOVEMBER

08:30	**Cardiac Surgery for heart faliure Part I: mitral valve repair/replacement**	*A Parolari, Milan & V Spadotto, London*
09:30	**Cardiac Surgery for heart faliure Part II: myocardial revascularisation**	*A Parolari, Milan & V Spadotto, London*
10:30	**Break**	
11:00	**Heart transplantation Part I: indications and patient selection**	*M Morshuis, Bad Oeynhausen*
12:00	**Lunch**	
13:00	**Heart transplantation Part II: surgical techniques: the donor/the recipient**	*M Morshuis, Bad Oeynhausen*
14:00	**Heart transplantation Part III: long term results**	*S Tsui, Cambridge*
15:00	**Break**	
15:15	**Heart transplantation Part IV: shortage of organ donors: chasing the marginals (new technologies and future perspectives)**	*S Tsui, Cambridge & A Simon, Harefield*
16:15	**Close**	

WEDNESDAY 12 NOVEMBER

08:30	**Heart transplantation in paediatric population: indications, surgical techniques and results**	*M Griselli, Newcastle Upon Tyne*
09:30	**Mechanical circulatory support in paediatric population: indications, surgical techniques and results**	*M Griselli, Newcastle Upon Tyne*
10:30	**Break**	
11:00	**Regenerative medicine for heart failure: the organs' factory. The bioengineered heart**	*L Iop, Padua*
12:00	**The significance of Euromacs**	*T De By, Germany*
12:30	**Lunch**	
13:30	**Wetlab generously sponsored by Thoratec**	*Thoratec*
18:00	**Close**	

THURSDAY 13 NOVEMBER

08:30	**Mechanical circulatory support: Impella, short term ventricular assist devices, extra corporeal membrane oxygenation**	*G Gerosa, Padua*
09:30	**Mechanical circulatory support: left ventricular assist device, biventricular assist device**	*M Struber, Leipzig*
10:30	**Break**	
11:00	**Mechanical circulatory support: total artifical heart**	*G Gerosa, Padua*
11:30	**Less invasive techniques for left ventricular assist device implantation**	*T Bottio, Padua*
12:00	**Which device for which patients, management of the right ventricle**	*G Wieselthaler, San Francisco*
13:00	**Lunch**	
14:00	**Myocardial recovery: fact, fiction and future directions**	*M Slaughter, Louisville*
14:30	**Post-operative care, out of hospital patient management**	*M Morshuis, Bad Oeynhausen & VAD-coordinator: D Roefe*
15:00	**Heart transplant post-ventricular assist device or without ventricular assist device**	*G Wieselthaler, San Francisco*
16:00	**Break**	
16:15	**Trouble shooting. Case reports: residents have to form groups and solve problems**	*All Faculty*
17:15	**Close**	

FRIDAY 14 NOVEMBER

08:30	**Presentation generously sponsored by Heartware Inc.**	*Heartware*
09:00	**Presentation generously sponsored by Berlin Heart**	*Berlin Heart*
09:30	**Break**	
10:00	**Company presentation**	
10:30	**Left ventricular reconstruction**	*G Gerosa, Padua*
12:15	**Summary and close**	
12:30	**Lunch and Depart**	

EACTS Daily News

EACTS European Association For Cardio-Thoracic Surgery

Publisher
Dendrite Clinical Systems

Editor in Chief
Pieter Kappetein

Managing Editor
Owen Haskins
owen.haskins@e-dendrite.com

Industry Liaison
Martin Twycross
martin.twycross@e-dendrite.com

Design and layout
Peter Williams
williams_peter@me.com

Managing Director
Peter K H Walton
peter.walton@e-dendrite.com

Head Office
The Hub
Station Road
Henley-on-Thames,
RG9 1AY, United Kingdom
Tel +44 (0) 1491 411 288
Fax +44 (0) 1491 411 399
Website www.e-dendrite.com

EACTS Course preview
28–29 November

Advanced course on the mitral and tricuspid valve

This progressive course brings together world leading figures in mitral valve disease to discuss the interdisciplinary approach to evolving information around diagnostics and advanced imaging of mitral valve disease, state of the art mitral valve repair techniques, minimally invasive and interventional approaches, and long term outcomes.

Focusing on the technical aspects of mitral surgery and interventions, the course will emphasise the success of teamwork through demonstration of six challenging live cases; debates around controversial areas of mitral and tricuspid management and the future of mitral valve repair.

Cardiac surgeons and cardiologists will have the opportunity to collaborate and determine the optimal approach and timing for mitral and tricuspid valve disease and discuss the clinical data supporting management of functional and degenerative mitral valve disease as well as participate in wetlabs.


Rüdiger Lange

This two-day interactive course will be conducted at the Munich Heart Centre on 19-21 November with Rüdiger Lange, MD, serving as Course Director. For more information please visit the EACTS website at www.eacts.org/academy. The Advanced Course on the Mitral and Tricuspid Valve is part of the EACTS Skills Programme.

Medtronic

The 3f Enable valve shows excellent results @ 5 years: the longest sutureless valve paper published

A snapshot from the interview released by Dr Englberger to the Confluence Journal

Could you tell us a little bit about Enable and what makes it unique and different from other valves available?

The uniqueness of Enable is that it is first of all made of equine pericardium, which is a good tissue, comparable to bovine pericardium. In addition, the platform of the Enable development is a stentless biological valve, which has shown good clinical results, the so-called "3f" valve (Medtronic Inc.). Despite good clinical results, the only problem with the 3f valve was, as for other stentless valves, that you have to implant it in the aortic root in an exact geometric fashion. It was, therefore, a good step to combine the 3f with a nitinol frame which keeps the geometry of the leaflets in a perfect position ensuring optimal performance of the valve.

Why are long term data important for such valves?

Traditional surgical aortic valve replacement procedures deliver excellent results and, therefore, new valve technologies must be at least at this level. This means that when you create or introduce a new valve in clinical practice, it must meet a number of requirements. Firstly, it has to be easy to be implanted and the introduction process itself should not be complicated. Secondly, the occurrence of paravalvular leaks should not be accepted. Thirdly, we must consider the durability of the valve. Patients who undergo surgical valve replacement tend to be younger and at lower risk compared with TAVI patients, the valves need to last longer

Can you tell us about the 5-year data for Enable?

The 5-year follow-up of the first patients implanted with the Enable valve has recently been published in the Journal of Thoracic and Cardiovascular Surgery[1]. These data show excellent results from both haemodynamic (single digit gradients at 5 years) and durability standpoints (94% Freedom from valve related mortality at 5 years). We expected this though, because the platform of the Enable is the 3f stentless valve, which has also shown good haemodynamic results. In the initial patients, we saw some paravalvular leakage, however, these problems were overcome after a learning curve.The five year data gives us confidence in the valve.

As I said, a new sutureless valve should not have disadvantages not normally seen with the placement of sutured valves. The Enable valve fulfils the expectations. If the sutureless placement of a valve is quick, safe and reproducible without a higher rate of paravalvular leakage compared to standard implant techniques, the sutureless valves, will really replace the conventional sutured biologic valves types in the future.

Reference

1. Englberger et al, Clinical performance of a sutureless aortic bioprosthesis: Five-year results of the 3f Enable long-term follow-up study. J Thorac Cardiovasc Surg 2014; 1-7

EACTS
European Association For Cardio-Thoracic Surgery

29th EACTS Annual Meeting

Amsterdam, The Netherlands

3 - 7 October 2015

Abstract deadline 30 April 2015

To find out more or to register for the event visit:

www.eacts.org

Raising Standards through Education and Training

Floor plan

Exhibition opening times

Saturday: Closed. **Sunday: 15:00–19:00**. Monday: 09:00–17:00. **Tuesday: 09:00–17:00**. Wenesday: Closed.

47	A&E Medical
15	AATS American Association for Thoracic Surgery
6	Abbott Vascular
123	Admedus
5	Advancis Surgical
95	Andocor
3	AngioDynamics
10	Argentum Medical
92, 93	Asanus Medizintechnik
77	ATMOS MedizinTechnik
105	AtriCure
108	B Braun Surgical
106	Bard
127–8	Baxter Healthcare
109	Berlin Heart
71	BioCer Entwicklungs
62	Biointegral Surgical
7	Cardia Innovation
88, 89	CardiaMed
21	Cardio Medical & Sengewald Klinikprodukte
23, 24	CareFusion International
75, 76	Carmat
80	Cook Medical
42	CorMatrix Cardiovascular
33, 34	Covidien
104	Cryolife Europa
12	CTSNet
61	CytoSorbents Europe
64	De Soutter Medical
90, 91	Delacroix-Chevalier
73	Dendrite Clinical Systems
18	DGM/Global Intercepts
124	EACTS The European Association for Cardio-Thoracic Surgery
101	Edwards Lifesciences
113	Eurosets
85, 86	Fehling Instruments
57	G+N MEDICAL
126	gebemed medical systems
81, 82	Gebrueder Martin & KLS Martin Group
117	Geister Medizintechnik
35	Genesee BioMedical
48	GEOMED Medizin-Technik
52	GUNZE
125	Hamamatsu Photonics Deutschland
26	Heart and Health Foundation
39	Heart Hugger / General Cardiac Technology
103	HeartWare
84	HMT Medizintechnik
53	ImaCor
78	Integra
16	ISMICS International Society for Minimally Invasive Cardiothoracic Surgery
116	Jena Valve Technology
36–8	Johnson & Johnson Medical
96, 97	JOTEC
30, 31	Karl Storz
43, 44	Lepu Medical Technology (Beijing) & Comed
28	Linde AG-Linde Healthcare
63	PEMCO Medical
40, 41	Peters Surgical
29	Posthorax
8	Praesidia
72	Qualiteam
99, 100	Redax
25	RTI Surgical
83	Rumex International
58–60	Scanlan International
121	Siemens
98	Smartcanula
22	Somahlution
112	Sorin Group
122	Spectrum Medical
119	St Jude Medical
32	Starch Medical
2	stroke2prevent
13	STS The Society of Thoracic Surgeons
115	Symetis
46	SynCardia Systems
120	Terumo Europe Cardiovascular Systems
14	The Heart Valve Society
4	The Medicines Company
114	Thoratec
49	Tianjin Plastics Research Institute
94	Tianjin Welcome
74	Transonic Europe
87	Vascular Graft Solutions
9	VYGON
54	Wetlabs
67, 68	Wexler Surgical
19, 20	Wisepress
79	WL Gore

Prescriptive Oxygenation™

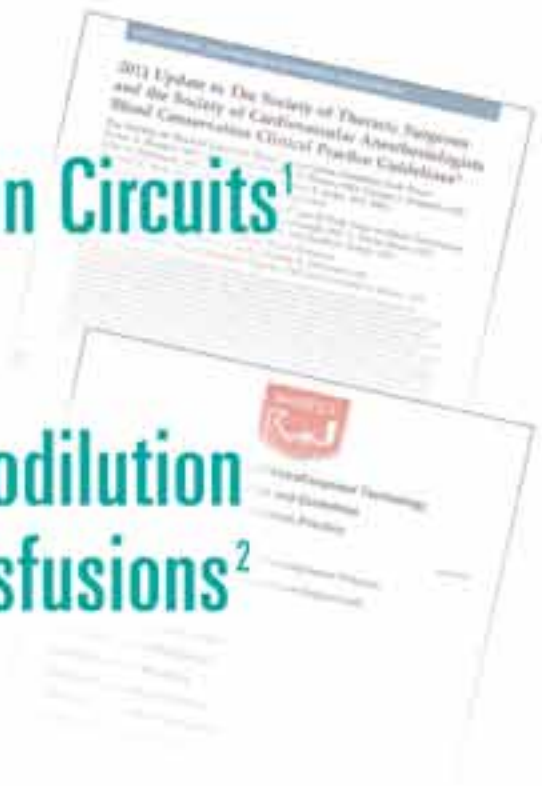
When Your Perfusion Team is Focused on

IMPROVING PATIENT OUTCOMES

DECREASING HOSPITAL COSTS

...Use the Evidence to Point the Way

Right Size Your Perfusion Circuits[1]



Improve Patient Outcomes[3]

Reduce Hemodilution & Blood Transfusions[2]

Decrease Hospital Costs[4]

References

1. Ferraris, V., et al. (2011). 2011 Update to The Society of Thoracic Surgeons and the Society of Cardiovascular Anesthesiologists Blood Conservation Clinical Practice Guidelines.
2. Baker, R., et al. (2013). American Society of ExtraCorporeal Technology Standards and Guidelines For Perfusion Practice.
3. Lahanas, T., et al. (2013). A retrospective comparison of blood transfusion requirements during cardiopulmonary bypass with two different small adult oxygenators. Perfusion. July 2013; 28 (4).
4. Bronson, S., et al. Prescriptive Patient Extracorporeal Circuit and Oxygenator Sizing Reduces Hemodilution and Allogeneic Blood Product Transfusion during Adult Cardiac Surgery. JECT. 2013;45:167-72.

For more information on Prescriptive Oxygenation™, please visit us at EACTS, booth # 120.

Terumo Cardiovascular Group *Ann Arbor, Michigan USA 734.663.4145 800.521.2818*
Terumo Corporation *Tokyo, Japan 81.3.3374.8111* | ***Terumo Europe N.V. Cardiovascular Division*** *Eschborn, Germany 49.61.96.9023.0*

TERUMO®

Medtronic

3f Enable® Aortic Bioprosthesis

Simply Sutureless.

Seize Simplicity with the only repositionable sutureless valve designed to facilitate a less invasive implantation.

The study findings are the longest published to date for any sutureless technology and demonstrate positive long-term clinical results.

High survival

3f Enable® demonstrated freedom from valve related mortality of **94 ± 5% at 5 years**

Excellent Hemodynamics

3f Enable® showed **single digit** gradients at 5 years across all valve sizes[1].

Attend one of our **3f Enable® Aortic Bioprosthesis workshops** in the **Medtronic Experience Center**

1. Englberger et al, Clinical performance of a sutureless aortic bioprosthesis: Five-year results of the 3f Enable® long-term follow-up study. J Thorac Cardiovasc Surg 2014; 1-7