Adapting to a changing environment in research, education and technology

WITH MEDICINE at a cross-roads for education and technology environment in research, adapting to a changing used to be,’ said Professor Vardas. medicine the attractive career choice it makers of the need to make academic promote our values and persuade policy behind that of clinicians. ‘It’s important to has suffered setbacks in recent years, leading to a Master’s degree. Management in Cardiovascular Sciences in Health Economics, Outcomes and ESC satellite institutes in Brussels, will ESC should seek to establish channels of communication with the large digital technology players who offer the potential to provide new streams of revenue,’ said Professor Vardas, who steps down as ESC President on Tuesday. Postgraduate education and professional development, areas once dominated by universities and scientific societies, have been targeted recently by for-profit organisations operating over the internet. ‘Faced with these evolving realities, medical associations should collaborate with selected academic institutes,’ said Professor Vardas. He announced that the European Heart Academy, one of the three new ESC satellite institutes in Brussels, will collaborate with the London School of Economics to develop a two-year course in Health Economics, Outcomes and Management in Cardiovascular Sciences leading to a Master’s degree. The standing of academic medicine has suffered setbacks in recent years, with remuneration of academics falling behind that of clinicians. ‘It’s important to promote our values and persuade policy makers of the need to make academic medicine the attractive career choice it used to be,’ said Professor Vardas. On healthcare systems, Professor Vardas warned that heterogeneity leads to inequalities. The ESC, he said, was not only creating guidelines but developing initiatives, such as the Atlas of Cardiovascular Health Care Systems, to address such inequalities. He noted that the demystification of healthcare information is calming the move for patients to become partners in their treatment. ‘It seems that consumers will dominate healthcare and any healthcare institution ignoring this trend does so at its peril,’ said Professor Vardas. While medical innovations have extended the life expectancy of cardiovascular patients by eight to ten years, the field has become a ‘victim of its own success’. As a result of patent loss, Professor Vardas explained, the compound annual growth rate in pharmaceutical companies currently stands at -10%. ‘Such decline can prove disastrous for research and jeopardise the future of our medical associations, which largely depend on industry support,’ he said. ‘We need to go to the next level of innovation, in stems cells, tissue engineering and nanotechnology.’ By placing its spotlight on innovation, ESC Congress 2014 hopes to further stimulate research in cardiovascular science. Professor Vardas paid tribute to this year’s ESC Gold Medallists Sir Rory Collins, Petr Widimsky and Alain Carpentier. ‘Their innovations in science. Professor Vardas paid tribute to this year’s ESC Gold Medallists Sir Rory Collins, Petr Widimsky and Alain Carpentier. ‘Their innovations in their treatment. ‘It seems that consumers will dominate healthcare and any healthcare institution ignoring this trend does so at its peril,’ said Professor Vardas. While medical innovations have extended the life expectancy of cardiovascular patients by eight to ten years, the field has become a ‘victim of its own success’. As a result of patent loss, Professor Vardas explained, the compound annual growth rate in pharmaceutical companies currently stands at -10%. ‘Such decline can prove disastrous for research and jeopardise the future of our medical associations, which largely depend on industry support,’ he said. ‘We need to go to the next level of innovation, in stems cells, tissue engineering and nanotechnology.’ By placing its spotlight on innovation, ESC Congress 2014 hopes to further stimulate research in cardiovascular science. Professor Vardas paid tribute to this year’s ESC Gold Medallists Sir Rory Collins, Petr Widimsky and Alain Carpentier. ‘Their innovations in science. Professor Vardas paid tribute to this year’s ESC Gold Medallists Sir Rory Collins, Petr Widimsky and Alain Carpentier. ‘Their innovations in
It is now more than a decade since the first results of the Heart Protection Study were published in The Lancet showing that lowering levels of LDL-cholesterol in a wide range of patients with pre-existing vascular disease or diabetes, irrespective of their starting cholesterol level, would lower their risk of subsequent cardiovascular events, results subsequently confirmed by the Cholesterol Treatment Trialists’ collaborative meta-analyses from the major statin trials. The leader of these two projects is the recipient of an ESC Gold Medal this year, the Oxford epidemiologist Professor Sir Rory Collins.

‘The Heart Protection Study helped revolutionise the way cholesterol-lowering drugs are used,’ says Collins, who was knighted in 2011 for his services to science, ‘Until then, the benefits of statins were thought likely to be restricted to those with elevated cholesterol levels. But the Heart Protection Study showed that the risks of heart attacks and strokes could be reduced with statin therapy even in patients with cholesterol levels in the “normal” range. That really changed the landscape.’

Controversy this year has centred on extending statin therapy to those at a lower risk of CVD, and the balance of side effects and benefit in such individuals as a result. For example, the National Institute for Health and Care Excellence (NICE) in the UK proposed reducing the threshold for statin therapy from a 20% risk over ten years to a 10% risk. The evidence that NICE’s position, notably in two reports in the BMJ which included claims that statin side effects occur in as many as one out of six of patients, pointed out a serious error in that particular claim to the editor of the journal and, after a six month delay, the authors of the two papers were required to withdraw it. The two papers were not withdrawn by the journal.

Professors Sir Rory Collins, Petr Widimsky and Alain Carpentier receive ESC honours

Three ESC gold medallists for 2014

It was while doing his surgical residency in 1964 that Carpentier began research on biological heart valves. A few weeks after implanting the Starr-Edwards valve (a silicone ball enclosed in a cage), a clot formed on the device from which his patient suffered a stroke. Pledging to solve the problem of clot formation, Carpentier acquired training in chemistry (obtaining his Chemistry PhD in 1975) which allowed him to demonstrate that treatment of animal tissue with glutaraldehyde reduced immunogenicity.

Aiming to create tissue devices which could be inserted as simply as mechanical valves, Carpentier went on to mount his porcine tissue valves in Teflon-coated metallic frames, coined the term ‘bioprosthesis’. Implanting the first patient with his ‘home made device’ in March 1968, he later worked with the Edwards laboratory, which would commercialise the product.

Next Carpentier became convinced that, in the mitochondrial, surgical techniques preserving the native valve were superior to valve replacement. His key innovation, detailed in his landmark ‘French Correction’ paper, was the Carpentier-Edwards ring, which stabilises and reshapes the structure holding the valve, allowing patients to keep their own valves. The advance has been widely credited with ushering in the modern era of valve reconstruction.

Carpentier’s current endeavour is to develop a bioprosthetic artificial heart as a permanent implant and not just a ‘bridge’ to transplant. The CARMAT device (representing a contraction of Carpentier and the manufacturer Matra) combines animal tissue with sensor technology adapted from guided missiles. The device, which can be totally implanted within the patient’s pericardial sac, has sensors to detect increased pressure, allowing internal control systems to adjust blood flow during exercise.

The first human implantation was performed by Carpentier together with Christian Latrémouille and Daniel Duveau in a 55-year-old patient suffering from end-stage heart disease in December 2013. Although initially successfully, the patient died two and a half months later from failure of an electronic product.

Carpentier, who has just celebrated his 55th birthday, is the recipient of dozens of awards and prizes, from the American Academy of Artificial Organs in 1997 to the L’Oréal-UNESCO Gold Medal for Women and Science in 2010, and the ESC Gold Medal this year. Over his career, he has been involved in more than 50,000 implantations.

The ESC Gold Medal represents the height of my professional career,’ he says. ‘But it isn’t just a personal honour - the award acknowledges the achievements of a great many co-workers who took part in the PRAGUE-studies.’

This recognition from the ESC is also particularly special for Widimsky, whose father Jiri Widimsky was an ESC Board member and Vice-President.

Now, there is an element of nostalgia in his return to Barcelona, for it was here at the ESC Congress in 1999 that Widimsky presented his landmark PRAGUE 1 study showing the superiority of primary PCI over thrombolysis in acute MI patients. ‘With the great expansion of cardiology services in the Czech Republic, we had the advantage of a young workforce willing to get up in the night to perform angioplasty,’ recalls Widimsky, then as now from Charles University Hospital in Prague.

When PRAGUE 2 confirmed the results in 850 patients from 51 participating hospitals this fully convinced Czech health providers of the benefits of a primary PCI programme throughout the whole country. A dramatic decline in STEMI mortality followed, which in turn encouraged the Czech Society of Cardiology to publish the first guidelines in 2002 and define primary PCI as the default perfusion strategy.

The idea of the ‘Stent for Life’ initiative, which Widimsky launched with William Jixps in 2008, was to encourage equal access to PCI interventions throughout Europe and bring everyone up to the high standards set by the Czech Republic. A survey had shown that the use of primary PCI ranged from as high as 92% of MI’s in some countries to as low as 5% in others. The project identified barriers to guideline implementation, and provided bespoke plans to meet the specific needs of different countries.

A later survey showed a doubling between 2007 and 2011 in use of PCI in six target countries (Bulgaria, France, Greece, Serbia, Spain and Turkey). ‘But there’s no room for complacency,’ said Widimsky. ‘We’re now looking to reduce time delays across Europe and beyond.’

Following the success of PRAGUE 1 and 2, Widimsky realised that the same efficient infrastructure might be used to answer other investigator-led questions in cardiology. To date 19 different PRAGUE studies have been launched, 12 completed and two more (PRAGUE 20 and 21) are currently in planning. Taken together, it means that Widimsky should be presenting PRAGUE data in ESC Hot Line sessions for many years to come.
MYOCARDIAL revascularisation – by percutaneous coronary intervention (PCI) or surgical placement of coronary artery bypass grafts (CABG) – is one of the most important treatment principles in cardiology. However, both the identification of patients who require revascularisation and selection of the method to achieve restored blood flow must be carefully performed in order to maximise benefit and avoid procedures that do more harm than good.

This is also an area undergoing tremendous research and development efforts. New data are continuously generated and published as diagnostic and therapeutic methods are refined. Thus, it is increasingly recognised that lesion-specific ischaemia must be considered very strongly when selecting revascularisation targets, surgical procedures can be performed at lower risk, and newer stent generations have demonstrated improved outcome over earlier ones.

For this reason, the new Guidelines on Myocardial Revascularisation, jointly developed and published by the ESC and European Association for Cardio-Thoracic Surgery (EACTS) under the leadership of Stephan Windecker and Philippe Kolh, are particularly relevant and will heavily influence care throughout Europe and beyond.

The 2014 guidelines build on the previous version published in 2010 and cover the selection of patients who require revascularisation, the methods recommended in the SYNTAX trial (up to five years, with no mortality difference between patients treated by CABG and patients treated by PCI in most subgroups) and that more evidence has become available for new generation drug-eluting stents (which have thinner struts, polymers and antiproliferative medication than earlier stents). Consequently, PCI is now regarded as equivalent to CABG in several lesion subsets which previously were recommended as preferably treated by surgery. This includes single- and two-vessel disease with proximal LAD involvement, as well as left main disease and triple vessel disease, provided the SYNTAX score is ≤22. Both CABG and PCI now have a Class I recommendation in these situations.

It remains important to point out that complete revascularisation should be achieved in multi-vessel disease, so that PCI is not recommended (Class III) if anatomy is complex and complete revascularisation cannot be achieved.

The new guidelines also cover in great detail adjunctive pharmacotherapy and medical treatment after revascularisation. This includes those clinically challenging patients in whom dual antiplatelet therapy may be required in addition to oral anticoagulation. For example, in patients with high bleeding risk the guidelines make a Class IIa – Level C recommendation to limit triple therapy to one month, followed by a combination of oral anticoagulation plus either ASA or clopidogrel, both after BMS and DES.

The guidelines cover other specific clinical situations in great detail and offer invaluable help for decisions on the care of patients considered for revascularisation.

The Task Force and their chairmen have performed a marvellous job in this central subject of cardiac care, and the 2014 joint ESC/EACTS guidelines will certainly be most welcome and heavily used by cardiologists and cardiovascular surgeons in Europe and around the globe.

On the selection of individuals who require revascularisation in stable CAD, heavy emphasis is placed on the documentation of ischaemia; FFR measurement carries a Class I recommendation if non-invasive proof of ischemia is not available. For prognostic reasons, revascularisation of left main stenoses, proximal LAD stenoses, stenoses in two- or triple-vessel disease with impaired LV function is recommended, provided there is lesion-specific evidence for ischaemia by FFR or non-invasive testing for lesions that measure less than 90% diameter stenosis. Revascularisation is also recommended for any other stenoses causing ischaemia of 10% or more of the left ventricle.

Finally, revascularisation for symptoms is recommended for all stenoses which cause ischaemia and symptoms which cannot be relieved by medical therapy.

There are substantial changes from the previous version on the method of revascularisation. This is mainly because of the longer-term outcome data generated by the SYNTAX trial and that reintervention for any other stenoses causing ischaemia of 10% or more of the left ventricle carries a Class I recommendation if non-invasive proof of ischemia is not available. For prognostic reasons, revascularisation of left main stenoses, proximal LAD stenoses, stenoses in two- or triple-vessel disease with impaired LV function is recommended, provided there is lesion-specific evidence for ischaemia by FFR or non-invasive testing for lesions that measure less than 90% diameter stenosis. Revascularisation is also recommended for any other stenoses causing ischaemia of 10% or more of the left ventricle.
New in Barcelona: a battery-free pacemaker, local anaesthesia in TAVI, and mapping AEDs

**DRAWING ON THEIR clock-making heritage, Swiss scientists are adapting technology from automatic watches to power pacemakers with nothing more than the motion of the heart. Thus, attaching a pacemaker to the epicardium would allow the same system to be directly exposed to the accelerations of myocardial muscle. The motion of the heart winds a spring which accumulates mechanical energy.**

In today’s study the harvesting device was extracted from an automatic wrist watch and encased in plastic housing with eyelets to allow suture to the epicardium of a 60 kg pig. Results showed that the device generated a mean output power of 52 microwatts - the energy consumption of modern pacemakers is known to be around 10 microwatts.

**This answers our core question that heart motion can be converted into electrical energy that exceeds power requirements of modern pacemakers,** said Zurbuchen, whose group now plans to reduce the size and weight of the prototype to make it more sensitive to heart motion. Zurbuchen added that the technology has potential for use in a multitude of devices, including defibrillators, loop recorders and drug delivery pumps.

**LOCAL ANAESTHESIA (LA) is as safe and effective for TAVI as general anaesthesia (GA), according to new registry results. Initially TAVI procedures were cautiously performed under GA, but, with growing experience, more heart teams are switching to LA. This is considered suitable for the transfemoral route, but not for transapical and transaortic routes, which require mini thoracotomy and sternotomy.**

In a study to be presented on Tuesday, Remain Chopard and colleagues recorded outcomes for 2871 consecutive patients undergoing TAVI in 34 French centres in the FRANCE 2 registry between January 2010 and December 2011. They showed that implantation was considered ‘successful’ in 97% of patients receiving LA and 97.6% receiving GA (p=0.12); immediate mortality occurred in 3.6% of patients in the LA group and 2.8% in the GA group (p=0.30); and the duration of hospital stay was 9.8 days in the GA group and 8.8 days in the LA group (p=0.001). Over time there was a progressive increase in the use of LA, which rose from 32% of registry procedures in the first six months to almost 50% in the last six months.

‘The advantages of performing TAVI under local anaesthetic includes more accurate clinical assessments of patients during the procedure, optimisation of the TAVI process and enhanced patient recovery,’ said Chopard, from University Hospital of Besancon, France. ‘Our results would argue in favour of considering wider use of LA, even high risk patients undergoing TAVI with transfemoral access.’

After the Mediterranean diet, now try a Nordic diet

**THE NEW NORDIC DIET, specially created to bridge the sometimes conflicting interests of health, gastronomy and sustainability, offers the potential to help weight control and reduce blood pressure, according to a study reporting today at a Symposium on cardiovascular prevention.**

The diet, Thomas Meinert Larsen will explain, was first developed after Danes described difficulties integrating a Mediterranean diet into their regular eating habits. Thus, the OPUS project was devised to create a healthier and more sustainable food environment for Denmark, with emphasis on palatability and gastronomic potential. The dietary components of the Nordic diet recipes were developed by chefs from the acclaimed Copenhagen restaurant Noma (now designated the best restaurant in the world), who were selected because of their distinct Nordic identity and their consideration for the environment.

The diet comprises 15 food groups: fruit and vegetables (especially berries, cabbages, root vegetables and legumes), potatoes, fresh herbs, plants and mushrooms gathered from the wild, nuts, whole grains, meats from livestock and game, fish, shellfish and seaweed. Typical recipes include baked cod with celery, sweet water pike grilled with summer cabbage and tuber or in breadcrumbs.

‘Our view is that eating foods in accordance with the seasons makes us less dependent on transportation,’ said Meinert Larsen, from the University of Copenhagen. ‘There’s particular emphasis on foraged foods because they taste better, and usually contain greater amounts of vitamins and minerals than conventionally grown plants.’

In the Shop in OPUS (SHOPUS) study 181 men and women with central obesity (defined as waist circumferences >94 cm for men and >80cm for women) were randomised for 26 weeks to the Nordic diet (n=113) or the average Danish diet (n=68), whose macronutrient composition was designed to match diets commonly eaten by adult Danish populations as defined by the latest survey of dietary habits in Denmark.

Those randomised to the Nordic diet received a cookbook with 180 recipes with three menu plans for each season, while those randomised to the Danish diet received a cookbook with 99 recipes but no menu plans - since seasonal variation was not important. ‘One innovative aspect of the study was that all ingredients were provided free of charge at a special shop,’ said Meinert Larsen told Congress News. Results showed that the mean weight change was a loss of 4.7 (±0.5) kg for the Nordic diet group and a loss of 1.5 (±0.5) kg for the Danish diet group (P=0.001). Furthermore, the Nordic diet produced greater reductions in systolic (-5.1 mm Hg) and diastolic blood pressure (-3.2 mmHg) than the Danish diet.

At the population level such reductions are likely to be important,’ said Meinert Larsen, since even small long-term blood pressure reductions will reduce cardiovascular mortality. The concept of a healthy, regional, sustainable, seasonal and highly palatable diet, he added, could in principle be applied anywhere in the world, not just Nordic countries.

31 August, 8:30-10:00
Berlin - Village 8
Cardiovascular prevention – the role of diet and weight control

‘GEOGRAPHIC OPTIMISATION modelling’ can be used for identifying the best locations for automatic external defibrillators (AEDs), according to French investigators. ‘Systematic placement in well known and accessible public facilities accompanied by public information campaigns would make lay rescuers much more aware of AED locations,’ said Benjamin Dahan, from Paris Sudden Death Expertise Center, INSERM.

Currently, there is no standardised approach for optimal placement of AEDs. North American guidelines recommend sites with a ‘high likelihood of witnessed cardiac arrest’, European guidelines suggest locations where out-of-hospital cardiac arrests (OHCAs) occur at least once every two years.

In their study reported yesterday in an Abstract Session, Dahan and colleagues identified all the OHCAs managed by the Paris Emergency Medical Services between 2000 and 2010, and calculated median distances between the events and a range of different potential locations for AEDs.

Results showed that, of the 4176 OHCAs recorded, 1415 (34%) took place outside the home; 1355 had identifiable geographic co-ordinates amenable to mapping in geographic information systems. The median distance between OBCA and different locations was 324 metres for post offices, 239 metres for subway stations, 137 metres for bike-sharing stations and 142 metres for pharmacies.

‘Despite the high number of pharmacies in Paris, their irregular distribution doesn’t make them the best candidates for AEDs,’ said Dahan. ‘Instead we preferred public facilities like metro stations or bike-sharing stations. They also have the advantage of good visibility and public accessibility at night and during weekends.’

2 September, 11:00-12:30
Valetta (The Hub) - Central Village
Safety and efficacy of local versus general anaesthesia in patients undergoing transcatheter aortic valve implantation using a transfemoral approach: VARC-defined outcomes in the FRANCE 2 registry.

31 August, 11:00-12:30
Villahermosa - Village 9
Batteryless cardiac pacemaker powered by cardiac motion

Thomas Meinert Larsen: recipes developed by chefs from the acclaimed Noma restaurant.

### Contacts

**ESC Congress 31 August - 4 September, 2014**

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However, according to the fourth report from the National Health and Nutrition Examination Survey (NHANES), obesity in adulthood, so evidence is growing that blood pressure in childhood predicts blood pressure in adulthood.

The difference, of course, is that the one is much more evident than the other.

Thus, hypertension in children is now defined as systolic and diastolic BPs less than the 90th percentile. Hypertension is, as we do in adults, 'the problem of childhood hypertension is already with us, and it continues to grow."

Empar Lurbe, Professor of Pediatrics at the University of Valencia, who will speak this morning at a Symposium on hypertension in the young. 'This makes it impossible to use a single blood pressure level to define hypertension, as we do in adults.'

Blood pressure in children increases with age and body size,' explains Empar Lurbe, Professor of Pediatrics at the University of Valencia, who will speak this morning at a Symposium on hypertension in the young. 'This makes it impossible to use a single blood pressure level to define hypertension, as we do in adults.'

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Thus, hypertension in children is now defined as systolic and/or diastolic BPs persistently higher than or equal to the 95th percentile specific for age, sex and height, measured on at least three separate occasions. Normal BP is defined as systolic and diastolic BPs less than the 90th percentile.

Children with an average systolic or diastolic BP of the 90th percentile or more but less than the 95th percentile are classified as having high-normal blood pressure.

During this morning’s Symposium Lurbe will call for greater efforts in identifying and treating children and adolescents with high blood pressure - and treatment, she will claim, requires specific approaches dependent on circumstances, target BPs, and the presence of characteristic mechanisms likely to benefit from particular antihypertensive agents. Chronic kidney disease, diabetes mellitus, metabolic syndrome and heart failure are among the most common.

Most cases of high-normal BP and hypertension in childhood are not cases of secondary hypertension to be detected and treated specifically, but rather the result of lifestyle. 'Being overweight is probably the most important of the conditions associated with elevated BP in childhood,' says Lurbe, 'and accounts for more than half the risk for developing hypertension. First, we should understand these conditions in order to return blood pressure to within the normal range and prevent high levels in youth developing into full hypertension in adulthood.' Any intervention that reduces energy intake and increases physical activity in these children is likely to be helpful in lowering their BP.

Because cardiovascular endpoints such as MI, stroke, renal insufficiency or heart failure are extremely uncommon in childhood, their rarity has so far prevented event-based randomised therapeutic trials. However, ‘clinical experience’ suggests to Lurbe that a reduction of high BP in life-threatening conditions, such as acute heart failure, hypertensive encephalopathy or malignant hypertension, does improve survival and reduce sequelae in children.

Lurbe advises that any pharmacological treatment should be started with a single drug. ‘When blood pressure does not respond adequately or significant side effects occur,’ she says, ‘switching to another antihypertensive drug of a different class is recommended.

This procedure allows detection of the patient’s best individual response to the drug in terms of efficacy and tolerability. As the response rate is often not sufficient in single-drug treatment, particularly in moderate or severe hypertension, combination therapy is often necessary.’

The ‘problem’ of childhood hypertension is already with us, says Lurbe, and it continues to grow. Estimates suggest that around 3% of those aged between 3 and 18 years have high-normal BP, and around 3% are hypertensive. Moreover, one study from 2007 estimated that the combined prevalence of ‘prehypertension’ and hypertension in obese adolescents was above 30% in boys and 23-30% in girls. With high blood pressure in childhood now directly linked to hypertension in adulthood, and adult hypertension the leading cause of premature death around the world, the case for BP vigilance in children seems stronger than ever.
Stress and natural disasters may pose high risks for coronary artery spasm

William Harvey lecture today on research in coronary spasm

IN THE WILLIAM HARVEY Lecture this morning Hiroaki Shimokawa will urge cardiologists to pay more attention to coronary artery spasm. The condition, he says, can sometimes be overlooked by cardiologists in the West, who are often cautious about provocation tests. ‘We used to think the incidence of coronary cardiologists in the West, who are often overlooked by this morning Hiroaki Shimokawa will

IN THE WILLIAM HARVEY Lecture on basic sciences

The increased risk for late stent thrombosis with drug eluting stents seems to be the price paid for the dramatic reductions in restenosis,’ says Kastrati, Professor of Cardiology at the Deutsches Herzzentrum, Technische Universität, Munich.

Through the ISAR series of studies, which he now directs, Kastrati has made significant contributions to improving stent technology. The Intra coronary Stenting and Anti thrombosis (ISAR) Research group, launched in 1994, has undertaken more than 50 randomised controlled studies involving more than 45,000 patients with an overall objective of defining optimal treatment strategies in PCI. ‘Three main principles characterise these trials,’ explains Kastrati. ‘First, simplicity - one question one answer; second, a focus on issues that are relevant for practice; and third, a strong spirit of performing industry-independent studies.’

The first ISAR trial designed by Professor Albert Schömig (Kastrati’s mentor) demonstrated that safety of stenting procedures can be improved by replacing oral anticoagulation with clopidogrel. ‘This was a seminal step that led to the first generation DES,’ says Kastrati. ‘We are now witness to the last DES in this generation, the drug eluting balloon (DEB) DES, which is usually placed after a balloon angioplasty, which is followed by manual inflation and is frequently used for the treatment of in-stent restenosis.’

In search of the best treatment strategies in PCI

Today’s Andreas Gruentzig lecture to review recent stent trials

IN TODAY’S Andreas Gruentzig lecture Adnan Kastrati will recall his contributions to improving safety and efficacy in restenosis and late stent thrombosis. ‘The increased risk for late stent thrombosis with drug eluting stents seems to be the price paid for the dramatic reductions in restenosis,’ says Kastrati, Professor of Cardiology at the Deutsches Herzzentrum, Technische Universität, Munich.

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Professor Adnan Kastrati: ‘New generation DES have been developed with excellent efficacy and improved safety compared to first generation DES.’

A number of new DES are now available and some have already been approved for use in Europe and the United States. ‘These DES have been developed with excellent efficacy compared to first generation DES,’ says Kastrati. ‘They are also associated with a lower risk of late stent thrombosis.’

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A paradigm of translational medicine
Laennec lecture: The genetic basis of arrhythmogenic cardiomyopathy

IN TODAY’S Rene Laennec lecture Gaetano Thiene will recall the translational research odyssey which led him from studying arrhythmogenic right ventricular cardiomyopathy (ARVC) at autopsy to the discovery of culprit genes encoding proteins at cell junctions.

‘In the era of clinical imaging I’ll show that pathology is not an old fashioned, useless discipline,’ says Thiene, Professor of Cardiovascular Pathology at the University of Padua. It was here that he qualified in 1972 and worked first as a cardiologist and then pathologist. But he was motivated to train as a cardiopathologist after two of his nieces were born with congenital heart defects.

One of Thiene’s early achievements was establishing a registry of 2000 specimens from patients with congenital heart disease in most of whom surgery had failed. ‘At postmortem we were able to relate failures of surgery to the anatomical variations we found,’ he says.

Working with his wife, the pathologist Marialuisa Valente, Thiene discovered that a reaction between calcium and phosphorus which occurs in valve cusps was the main cause of porcine bioprosthetic valve failure. Through the introduction of anti-calcification treatments, the durability of bioprosthetic valves increased two-fold.

Thiene’s first fateful encounter with ARVC came in May 1979 when he performed the postmortem of a young doctor who had died suddenly on the tennis court. On autopsy he observed fibro fatty tissue in the RV-free wall, but at time there was no appreciation in pathology that aberrant cardiac electricity could be a cause of death.

Then, as in so many medical breakthroughs, serendipity intervened. The doctor’s girlfriend brought to his attention a note in the deceased’s diary - ‘ventricular tachycardia intervened. The doctor’s girlfriend brought to his attention a note in the deceased’s diary - ‘ventricular tachycardia.’ Unearthing a note in the deceased’s diary - ‘ventricular tachycardia intervened. The doctor’s girlfriend brought to his attention a note in the deceased’s diary - ‘ventricular tachycardia.’

The observation motivated Thiene to keep careful records of the autopsies of young people who died suddenly in the Veneto region of north-eastern Italy. From 1979 to 1986 Thiene did postmortem studies on 60 consecutive young sudden deaths and found that 12 showed the same morphological features and ECG pattern as the original subject. ECGs had been compulsory in Italy since 1982 for anyone involved in competitive sports. The resulting paper in 1988 in the New England Journal of Medicine led to the establishment of ARVC as a major cause of sudden death in he young, which they believed to be familial.

Such observations, he adds, raise the possibility of finding treatments for children which prevent onset of disease. Indeed, since 10-20% of young people who die suddenly present with normal hearts, says Thiene, molecular autopsy must be performed in these cases. ‘Cardiovascular pathologists are needed to take a systematic approach to molecular genetics, to ensure that all mutations are screened for. This provides the critical information to save the lives of relatives at risk of similar fates,’ says Thiene.

Inspiration to solve the genetic puzzle came from the island of Naxos, where clinicians Nikos Protonotarios and Adalena Tsatsopoulou observed a cardiac malignant disease consisting of both cutaneous and cardiac manifestations.

This led to the eventual association of ARVC with desmosomal (cell junction) protein abnormalities, and the identification of molecular defects in the desmosome proteins, including deletion of plakoglobin (found in the recessive Naxos disease) and mutations in desmoplakin (found in the dominant Venetian disease).

Thus, both dominant and recessive variants of AC were eventually identified as cell junction diseases. ‘Desmosomes maintain attachment of cardiomyocytes during diastole and systole,’ explained Thiene. ‘Cardiomyocytes which are not firmly attached in ARVC results in cell death and their replacement by fibro-fatty tissue, which interferes with electrical impulses.’

The discovery of defective genes opened new avenues of research, including experiments in mice models. ‘It was fascinating to find mice hearts appear normal at birth, but with the phenomenon of progressive cell death and ventricular fibrillation occurring after a few weeks,’ says Thiene.

Hilary, 65 years old: Low body weight

Hilary, 65 years old: Renal dysfunction

George, 67 years old: Stroke or cerebral infection

John, 70 years old: Hypertension

Susan, 64 years old: Hypertension

Michael, 80 years old: Hypertension

Henry, 61 years old: Renal dysfunction

Harry, 81 years old: Use of concomitant medications

Every AF patient is different. Oral anticoagulants need to address this.

References:

Affiliation: Academic Cardiologist

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Passion for Innovation. Compassion for Patients.”

#ESCcongress
For me the biggest boom in cardiology has been the introduction of primary angioplasty for patients with acute MI. Since the introduction of primary angioplasty we have seen mortality rates for acute MI in my city going down by 25 to 30%. Primary PCI overcomes the complications of thrombolytic drugs such as haemorrhagic stroke and also means that patients don’t have to undergo debilitating bypass surgery. I believe that because we are treating patients so promptly they’re less likely to go on to develop long-term complications, such as heart failure. Ultimately this could lead to even greater gains in survival.

Suvankar Ghosh
Interventional cardiologist
Baroda, Vadodara, India

For me it’s the development of treatments for heart failure and better management of the condition since the introduction of biomarkers. There’s also the use of ICDs, VADs and pacemakers. A decade ago these were not available as they are now - nor as advanced or modern. They can also bridge the gap for patients waiting for heart transplants - temporarily or even long-term, given the length of waiting lists for organs. Some people are able to continue their lives on these devices. We’ve also got better at assessing heart transplant suitability in patients with chronic heart failure and at identifying risk factors.

Raghid Khatib
Cardiologist between jobs
Sweden

Novel oral anticoagulants for atrial fibrillation for me have had the most impact for patients. Before, we relied on beta blockers, but they weren’t ideal and you had to be selective about their use. AF is a big issue in Nigeria, mainly because of poor access to treatment for rheumatic heart disease. The benefit of the new anticoagulants is that they don’t need monitoring and their safety profile for non-valvular AF is good - we’ve not had patients with bleeding. Now what we hope for is the same indication for valvular disease, to improve the lives of even more patients.

Akpa Maclean
Cardiologist from University of Port Harcourt Hospital, Port Harcourt, Nigeria

For me it has to be imaging. Advances in imaging technology, such as 3D echo and computed tomography, are providing vital information to help prevent some patients from having some interventional procedures. Computed tomography measures the calcium content of vessels. This means that cardiologists can identify those patients at greatest risk of MI who can be referred for angiography investigations. Others can be treated medically. Another area is valve surgery where 3D echocardiography is being used to produce images of malfunctioning valves. This can help surgeons plan their operations.

Egle Prascience
Third year cardiology resident
Kaunas, Lithuania

For me the best innovation in cardiology in the last decade?

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