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CARDIOLOGY Page 13

Tavi's unsung Danish hero



INTENSIVE CARE Page 33

Pre-operative risk stratification



Acute hospital care in England could be on the verge of collapse

Around 65% of in-patients are over 65 years old

Report: Mark Nicholls

With growing bed shortages and increased demand on clinical services, the Royal College of Physicians (RCP) says that the country's National Health Service (NHS) is approaching the point where acute care cannot keep pace in its current form.

Figures contained in the college's hard-hitting report *'Hospitals on the edge?'* show there are a third fewer general and acute beds in the NHS today than there were 25 years ago, but there has been a 37% rise in admissions over the last decade.

According to RCP President Sir Richard Thompson, 'It is difficult to measure how close we are to collapse but a lot of hospitals are only just managing at the moment so any major unforeseen emergency could tip them over the edge and see them close to acute admissions.'

Treating patients with dignity

The fall in bed numbers is coupled with more older people being admitted to hospital. Some 65% of people admitted are aged over 65, with a significant number over 85. An increasing number are frail with hospital buildings, services and staff often not equipped to deal with people with multiple, complex needs including dementia, diabetes, stroke and urinary tract infections.

'It is a very complex mix of patients coming in,' Sir Richard explained. 'We do not have a good social care structure out in the community, nor good primary care, so these patients come into hospital because there is nowhere else for them to be looked after.'

'We have noticed the situation getting worse, year on year. The number of A&E attendances and admissions to acute beds goes up each year, while there has been a continuing reduction of acute beds across the country.'

That progressive reduction has been to save money with the hope that better community care will reduce admissions but at the moment it is not doing that.'

A survey of RCP members showed their biggest concern was a lack of continuity of care with hospitals particularly failing to look after patients properly at evenings and weekends.

It is not uncommon for patients, particularly older patients, to be moved four or five times during a hospital stay because of a shortage of beds and often with incomplete notes and no formal handover.

'As a medical profession we have to look at how we are handling acute patients in the hospital - the fact so many are moved beds at night or having blood tests at night is appalling and that is the sort of thing we are going to have to resolve,' he added.

Additionally, the RCP report said that hospital staff often see the elderly as 'unwelcome' and think they 'shouldn't be there', even though they make up two thirds of patients. 'One doctor told me that his Trust does not function well at night or at the weekend and he is 'relieved' that nothing catastrophic has happened when he arrives at work on Monday morning,' Sir Richard said. 'This is no way to run a health service. Excellent care must be available to patients at all times of the day and night. We call on government, the medical profession and the wider NHS to work together to address these problems.'

To help tackle the looming crisis, the RCP is calling for: all health professionals to promote patient-centred care and to treat all patients with dignity at all times; the redesign of services to better meet patients'

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Does Germany top Europe in unnecessary diagnostics?

Statistics show significant increase in scans and left heart catheterisations

Report: Susanne Werner

When it comes to the number of individual medical examinations, Germany among Europe's frontrunners, according to statistics from the scientific institute of the AOK (WIdO). Heart catheterisations are carried out far more frequently there than in Austria or Switzerland.

Uwe Deh, Head of the Federal Association of the AOK, is indignant. He speculates that financial interests rather than medical reasons are behind this increase. However,

representatives of medical societies argue otherwise. For instance, Professor Michael Forsting, President of the German Radiological Society (DRG) and Director of the Institute of Diagnostic and Interventional Radiology and Neuroradiology at Essen University Hospital, emphasises that these increases are founded in medical advances.

The data to which Uwe Deh refers come from the 'Quality Assurance with Routine Data' (QSR), a procedure developed by the WIdO with other partners, including hospitals.

According to this data, hospital use of imaging diagnostics has increased by more than 50% between 2006 and 2010 and, since 1990, the number of left heart catheterisations in Germany more than tripled. In 2010 it was around 70% higher in this country than in Austria, and 98% higher than in Switzerland. 'The QSR procedure is recognised across Europe,' explained Christian Günster, WIdO Head of Research. Its particular feature is the assessment of

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The new Evris Exera III in practice

Higher quality images, pre-freeze and several other advances promise a rise in diagnostic and treatment standards in endoscopy

Dual Focus, brighter Narrow Band Imaging (NBI), and pre-freeze are key breakthroughs of the new generation of endoscopy devices – and new features such as these, embodied in the new Evris Exera III, open up a bundle of opportunities for endoscopy-based diagnoses and treatments, says Olympus. How might they benefit hospitals? EUROPEAN HOSPITAL spoke with expert user, Paul Fockens, Professor and Chair of Gastroenterology & Hepatology at the renowned Academic Medical Centre (AMC), University of Amsterdam, which provides endoscopic services as a tertiary centre.

As chair of gastroenterology and



Paul Fockens is Professor of Gastroenterology & Hepatology at the Academic Medical Centre, University of Amsterdam, and Chair of the AMC's gastroenterology and hepatology department. He is also President elect of the European Society of Gastrointestinal Endoscopy (ESGE).

hepatology at the AMC, Professor Fockens manages the department and combines clinical routine, education and academic research. 'In patient care, my focus is on advanced therapeutic endoscopy as well as some advanced diagnostics of the stomach, small bowel, large bowel and pancreas. To a large extent my cases are large colonic polyps and colonic mucosal resections, endoscopic ultrasound with drainage pancreatic fluid collections, ERCP as well as most interventions in the upper gastrointestinal tract.

'Roughly 50 percent of my cases are referrals after radiology with a requirement for interventional endoscopy, and another 50 percent are sent from other endoscopists requiring high-level endoscopic intervention at a tertiary centre. For top-quality therapeutics of these organs and regions, you need a very good diagnostic workup; neoplastic lesions are a good case in point. We can only remove superficial lesions using endoscopy; MRI merely helps in cases of large-volume lesions, which are removed surgically.'

Asked to outline the main differences between the new Evris Exera III and its predecessor, Professor Fockens explained that the main advantages are in the system's diagnostic capabilities. 'In many cases the images we receive from referrers prove insufficient for the preparation of an intervention. The Evris Exera III gives us more detail and images are more in focus. We'd prefer our referrers to use the new system too,

in order to achieve better image quality. Currently, we invest about a third of our time in creating a more precise diagnosis; when we get really low-quality images from referrers, we schedule a diagnostic appointment first and go for therapy after our diagnosis.

'If every physician in the care chain were to use high quality endoscopic imaging such as the Evris Exera III, this would cut down the time we take to verify a diagnosis to around 20 seconds. Better images would also make planning of the individual interventions a lot more to the point, with less need to adapt, reducing scheduling risks – meaning a significant improvement for us and the patients.'

What form does interaction with other disciplines take?

'Patient cases are discussed, mostly after the procedure, within the tumour board. This measure partly serves quality assurance purposes and helps confirm follow-ups, and its interdisciplinary character ensures a competent therapeutic approach. For malignant tumours, going through the board is a must.'

What about the therapeutic benefits of the device?

'For therapeutic purposes, the improved image quality of the Evris Exera III is also significantly relevant. Being able to switch back and forth using NBI is very positive; knowing exactly where to execute a cut in the region of interest is one thing; better manoeuvrability is another asset. Better vision helps to ensure that



Enhanced image quality.

Clinical images courtesy of Roy Soetikno, MD/Tonya Kaltenbach, MD

the procedure has been properly performed. In addition, motor-driven jets allow the physician to spray fluids on the lesion, which is convenient.'

Is special training required?

'Well, handling endoscopes expertly has been and will continue to be largely dependent on endless routine hours spent using the instrument. Quality in what the physician does is totally tied to this expertise – and it will not change with the new instruments that have even more features.'

Where does hepatology come in?

'As far as endoscopy is concerned, portal hypertension is the key focus there. Patients with, for example, a long history of a liver disease, develop varices in the oesophagus or stomach, which tend to bleed. We treat them endoscopically using bands. Interventional radiologists will do TIPS procedures for long-term effects; these two techniques are becoming increasingly complementary today. We discuss cases with surgeons, interventional radiologists, and pathologists in



hepatology and inflammatory bowel disease meetings, also for benign conditions. In-house referrals from other specialties, such as surgeons, are frequent because, in the Netherlands, there is no financial competition between specialties.'

Are there additional notable advantages?

'Apparently, acquiring really good images of the upper gastrointestinal tract present difficulties to endoscopic devices; everything in the region is continuously moving, which is a challenge to video and still frame capture. But now, with the Evris Exera III, even physicians who are not good photographers can get good results thanks to the new Normal and Near imaging modes and Pre-Freeze. The latter

100 years of suture technology

We have known since the beginning of October who will receive the Nobel Prize for Physiology or Medicine in Stockholm, this December. Since 1901, according to Alfred Nobel's legacy, the award has been given to the person(s) who 'has made the most important discovery in the field of Physiology or Medicine' – this year Sir John Gurdon and Shinya Yamanaka share that great accolade for reprogramming adult cells. A hundred years ago, in 1912, it was French surgeon Alexis Carrel, who received a Nobel for the development of a procedure for the reconnection of blood vessels and his work on the transplantation of tissue and organs – Carrel paved the way for modern vascular surgery and organ transplantation.

The precipitating event was, as so often, emotional: In 1894 the then

French President Marie Francois Sad Carnot died as the result of an assassination attempt in the Silk City of Lyon – his portal vein had been severed and nobody was able to reconnect it. Carrel, aged 21 years and a licentiate of the University of Lyon, bought the finest needles and learnt the classic techniques of the Canut – the term for the respected local silk workers. He developed the Carrel suture for end-to-end and end-to-side anastomosis of blood vessels and was able to transplant thyroids and kidneys in animals, publishing his results in 1902 (Source: Lyon Med 98:859).

Today, vascular surgery is one of the youngest stand-alone medical disciplines and is characterised by high dynamics. Aortic surgery is one key focus. Aneurysms of the thoracic and abdominal aorta can be treated along with stenosis of the blood ves-

sels supplying the kidneys or carotid artery.

The suture materials of the previous century were not suitable for this. Catgut, for instance, developed in 1868 by the English surgeon and pioneer of antiseptics, Joseph Baron Lister, consisted of strings from sheep guts disinfected in carbolic acid. Although made durable by tanning, these were broken down in the body enzymatically and disintegrated over time.

With the discovery of the textile fibres Polyamide 6 and Polyamide 6.6, better known as Perlon and Nylon, it

was only a matter of time until these man-made fibres were also used for surgical sutures. In 1935 Synthofil AÖ, a suture made from polyvinyl alcohol, came on the market, followed in 1939 by SupramidÖ, a perlon suture especially developed for surgery. Not long after, other non-resorbable fibres made from polypropylene and polyester complemented the range. Through copolymerisation of the substances glycolic acid and lactic acid it was finally possible to develop a synthetic material (VicrylÖ) that is not broken down enzymatically like catgut, but by the body's own fluids.

Plaited and coated, this material is highly tear resistant and facilitates the use of finer sutures.

For other hollow organs anastomosis can only be created through sutures techniques with great difficulty, and often not at all – the leak rate would be just too high. Here, started in 1908 by the Hungarian Humer Hüttl, the staple suture technique was developed (see EH 2/2011 p. 4-5), which is actually what really made diabetic surgery possible (see EH 3/2011 p. 5-7).

A large part of suture materials is not used for the connection of tis-



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Tissue reconstruction and regeneration

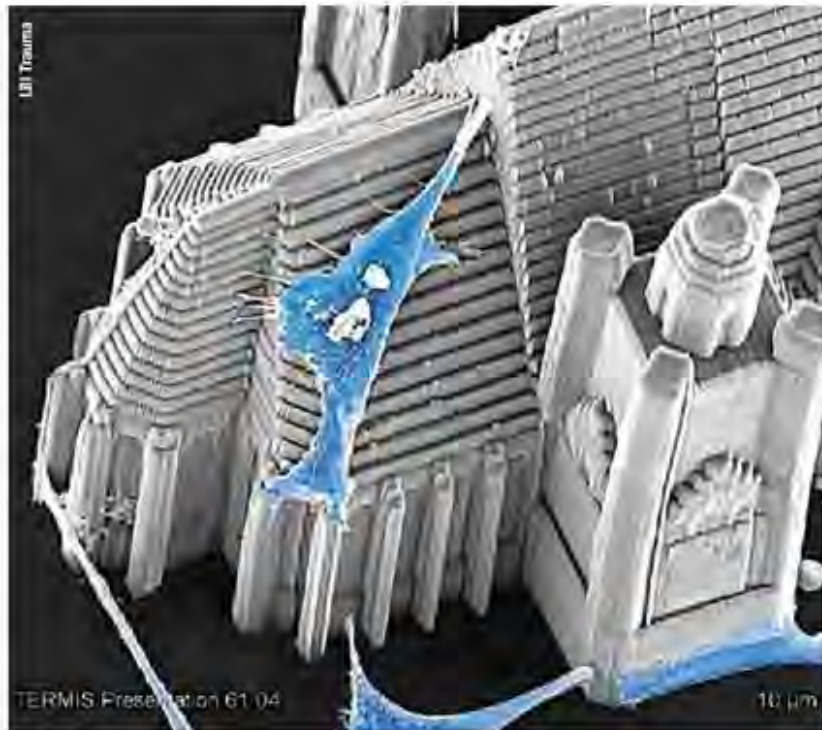
Embracing a nano-size silken promise

Report: Michael Krassnitzer

Artificial vascular trees, the growing of heart tissue, nerve regeneration: The World Congress of the Tissue Engineering and Regenerative Medicine International Society (TERMIS) held in Vienna this October offered an impressive display of current developments in tissue reconstruction and regeneration. The congress was also the venue for a meeting of the Who's Who in the field of silk fibroin, a protein obtained from – and one of the two components of – natural silk.



Dr Andreas Teuschl heads the City of Vienna Competence Team Tissue Engineering Bioreaktoren, Department of Biochemical Engineering, University of Applied Sciences Technikum Wien in Vienna. He studied biochemistry at the Technical University Vienna. His PhD thesis was on Silk Fibroin – a versatile and tunable biomaterial for tissue engineering and regenerative medicine. During his studies, he worked at the Ludwig Boltzmann Institute for Clinical and Experimental Traumatology in Vienna, which forms a research cluster with – among others – the Technical University and the Medical University of Vienna.



'Silk fibroin is the best material in the world, enthused Professor David Kaplan, Director of the Bioengineering and Biotechnology Centre at Tufts University in Massachusetts, USA, and a pioneer in this field. It was he who, in a paper published ten years ago, laid the foundations for the use of silk for tissue reconstruction and regeneration. Silk fibroin is not detected as foreign matter by the immune system and is therefore not rejected by the body; it grows into the body's own tissue without any problems and is only broken down slowly. Silk fibroin is harder than steel and is therefore also used in the production of bullet-proof vests. Above all, silk fibroin can be tuned into any desired form: fibres, gels, sponges or particles. At the Ludwig Boltzmann Institute for Clinical and Experimental Traumatology in

St. Stephen's Cathedral recreated in nano-size silk fibroin

Vienna, the St. Stephen's Cathedral – the famous landmark of the Austrian Capital – was reproduced in nano-size from silk fibroin and then colonised with cells (see images) especially for this congress.

In the future, silk protein is likely to be used in this way, as a material for pedestals used for tissue regeneration. A three-dimensional silk matrix is colonised with stem cells inside a bioreactor. Growth factors integrated into this construction ensure that the stem cells develop into the desired tissue type. 'About a year after the implantation the silk fibroin will have been broken down and been replaced by the body's own tissue,' explained Dr Andreas Teuschl, Head of the City of Vienna Competence Team Tissue

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Engineering at the University of Applied Sciences Technikum Wien.

The procedure is suitable for the regeneration of hard as well as soft tissue. Very promising preclinical results already indicate numerous opportunities for silk protein application, particularly in the musculoskeletal system. In the USA recently, the first silk-based medical product was licensed: a fibre mesh for soft tissue reconstruction.

Prof. Kaplan is convinced that silk fibroin nano-size particles could also be used for drug delivery or drug targeting: 'Through the design of the silk particles we could determine exactly what amount of a substance is released in which part of the body under what conditions and which cell type is the objective.' Due to its unique properties silk fibroin could serve as the basis of a 'new generation of high-tech medical products' with a range extending right down to fully implantable and degradable optical and electronic interfaces, he emphasised. The concentration of silk fibroin with various proteins could give the material additional biologically effective qualities, such as anti-inflammatory ones. 'With the help of protein chemistry,' he added, 'silk fibroin could be given fantastic new functions.'



Professor David Kaplan holds an Endowed Chair, the Stern Family Professor of Engineering, at Tufts University in Massachusetts. He is Professor and Chair of the Department of Biomedical Engineering and also holds faculty appointments in the Department of Chemical and Biological Engineering, Department of Chemistry, Tufts University School of Medicine and Tufts University School of Dental Medicine. His research focuses on biopolymer engineering to understand structure-function relationships, with emphasis on studies related to self-assembly, biomaterials engineering and functional tissue engineering. He has published more than 400 papers, edited eight books, serves on the editorial boards of numerous journals and is Associate Editor for the journal *Biomacromolecules*.

FOR YOUR DIARY: JANUARY 27-30, 2013

TERMIS-EU/Expertises Winterschool, Radstadt, Salzburg, Austria.
School Theme: "Vital/Vivo Preclinical Models and Imaging in Musculoskeletal Tissue Regeneration"

Surgical lighting

Starled 5 LED lamp for the operating room



Starled 5 is part of the ACEM Medical Company's Starled series, and, as the whole range is made with LED technology (light emitting diodes), the firm reports that this 'is an extraordinary light source which is becoming more and more popular for its reduced dimensions, duration in time, low energy consumption, high performance, lack of heat and excel-

lent colour rendering index.' The LED technology guarantees a light beam without IR (infrared) rays hence eliminating heat under the lamp and on surgeons' heads, ACEM adds. 'The 50 LEDs are circularly positioned around the handle, generating a light spot of 21 cm at one metre, with a high illumination level of 135.000 lux (160.000 lux optional) for a steady

life cycle of about 50.000 hours. Starled 5 guarantees a colour rendering index of 95 (cri) with a colour temperature of 4.900 °k. These two values allow reproduction of the exact chromatic scale of the colours of the human body.'

To achieve the necessary illumination of the surgical field, the light can produce a focused illumination as well as a uniform ambient one due to a manual focusing system in its central handle. A new light-up system (invented by ACEM), which has particular beams of light coming from the upper part of the lamp, offers perfect visualisation of the surgical field, making the lamp suitable for minimally invasive surgery, the firm adds.

Starled 5 also can be integrated with a video camera in the lamp's central handle (or on a separate arm). There are also various configurations available, according to needs. Details: www.acem.it

Mobile hybrid operating theatres

New offering includes C-arms and operating tables

Due to a new global distribution agreement, C-arms specialist Ziehm Imaging, of Nuremberg, can now supply hybrid operating theatres with surgical tables from the Swedish manufacturer Stille to complement its Ziehm Vision RFD Hybrid Edition. 'The Ziehm Vision RFD Hybrid Edition offers a cost-effective alternative to fixed installed systems in hybrid operating rooms – excellent image resolution, a powerful 20 kW generator and an active liquid cool-

ing system provide reliable intraoperative imaging even for complex procedures,' Ziehm reports, adding: 'The mobile C-arm and the Stille imagiQ2 OR table for vascular surgery, presented in April 2012, form a powerful duo for interventional surgery. The new OR table delivers maximum precision, reduces radiation exposure and, with its high level of flexibility, is ideal for use in hybrid operating rooms.'

