EUROPEAN HOSPITAL

THE EUROPEAN FORUM FOR THOSE IN THE BUSINESS OF MAKING HEALTHCARE WORK

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LAB-CULTURED CARDIAC CELLS

Three types of human heart cells have been grown from cultures derived from embryonic stem cells, by a team of Canadian, US and UK scientists. During the research, when a mix of the cells was transplanted into mice with simulated heart disease, the animals' heart function was significantly improved, according to research published in the journal Nature.

The embryonic stem cell cultures were carefully supplied with a staged cocktail of growth factors and other molecules involved in development, and grew into immature versions of cardiomyocytes, endothelial cells and vascular smooth muscle cells, each important constituents of heart muscle. 'This development means that we can efficiently and accurately make different types of human heart cells for use in both basic and clinical research, said researcher Dr Gordon Keller, of the McEwen Centre for Regenerative Medicine in Toronto. 'The immediate impact of this is significant, as we now have an unlimited supply of these cells to study how they develop, how they function and how they respond to different drugs. In the future, the cells may also be very effective in developing new strategies for repairing damaged hearts, following a heart attack.'

Surgeons urged to 'think twice' before giving blood transfusions

New research reveals potential harm

Brenda Marsh reports

Hospitals are urged to tighten up on blood transfusions, following a growing number of reports on unrecognised risks from blood transfusions – and these are *not* the generally-known infection risks, such as HIV. Researchers point to risks presented by the *lack* of oxygen delivered to key organs, which can result in stroke or adverse cardiac events.

It has now been suggested that perhaps up to 60% of blood transfusions are *not* good for patients.

Although blood transfusions are commonly given during various surgical procedures, e.g. orthopaedic, concern about the risk in blood transfusions for cardiac surgery patients has been particularly highlighted. In one study, published in November by the journal *Circulation*, researchers at Bristol University and the Bristol Heart Institute, followed 8,500 cardiac surgery patients for an eight-year period and found that red blood cell transfusions increased the risks of heart attack or stroke three-fold – and, in the month after surgery patients were six times more likely to die than patients who did not receive donated blood.

The risks associated with blood transfusion occurred regardless of haemoglobin levels, age, or level of patient disability at the time of transfusion, the researchers point out. The finding, which implicates the cause being lack of oxygen to key organs, has knocked the widespread belief that red cell transfusion improves oxygen delivery to tissues, and that surgical patients are helped by a 'top up' of red cells.

The USA's National Institutes of Health aims to review blood transfusion safety

In the UK, for example, over 50% of all cardiac surgery patients receive transfusions, yet only about 3% are given due to life-threatening bleeding. The rest are usually given on the basis of a low haemoglobin level, disregarding whether the patient has physical symptoms to suggest they need blood.

Along with danger to patients, hospital costs increase due to adverse events. 'The study demonstrates the cost implications of our current transfusion practice. This is important, particularly in modern health systems where resources are finite, and should encourage the sort of research that will address the major health issues raised in the study,' said the study's lead author Gavin Murphy of Walport Consultant Senior Lecturer in Cardiac Surgery at the University of Bristol.

The researchers aim to undertake a larger study to ascertain whether changing transfusion guidelines could improve patient outcomes. Presently the suggestion is that surgeons should think twice before giving blood transfusions.

In March, the *New England Journal of Medicine* found that patients who received blood that was more than two weeks old were up to 70% more likely to die within a year than patients who received fresher blood.

The question of how red cell transfusions may affect immunity or tissue oxygenation needs further study, as does the question of how the safety of donor blood storage could be improved.

Demands for greater supervision of alternative medicine practitioners

The Netherlands - The prosecution of two doctors and a faith healer has been ordered by the Dutch appeal court, due to their treatment of a patient who died seven years ago. The woman, well-known actor/comedian Sylvia Millecam, died of untreated breast cancer, having chosen alternative medicine as a therapy, perhaps persuaded that her illness was due to bacterial infection. However, although the public prosecution service had previously dismissed the case against three of the people involved in her treatment, a Dutch Healthcare Inspectorate investigation found that 'various individual carers' had offered such irresponsible care, based on 'unfounded methods of treatment', that disciplinary action or prosecution were likely.

The inspectorate now wants the law changed to ensure greater supervision of alternative practitioners and that all such practitioners have to be registered. It also wants it made illegal for anyone other than a trained doctor to be allowed to make a medical diagnosis. The Royal Dutch Medical Association supports the proposals.

(Full report: BMJ 2008;336:853 (19 April), doi:10.1136/bmj.39549.636586.DB)

** In many European countries, 'alternative' medicine has increased in popularity. When asked, for consumer surveys, about 60% of the public in the Netherlands and Belgium stated they would pay extra health insurance premiums for complementary treatments, and 74% of the British public thought they should be available from the country's National Health Service. The Dutch population seeking treatments from alternative medicine practitioners was reported to be 6.4% in 1981, but this had increased to 15.7% in 1990 and, in France, 16% of the population visited practitioners in 1982, but the figure rose to 36% in 1992.*

A danger to patients' security and privacy?

Implantable medical devices

Unexpected risks my result from today's medical devices, such as implantable cardiac defibrillators and pacemakers, if they are equipped with wireless technology to enable remote device checks. According to researchers **Tadayoshi Kohno**, assistant professor of computer science and engineering at Washington University working with **Kevin E Fu**, assistant professor of computer science at UMass Amherst, and cardiologist **William H Maisel MD**, director of the Medical Device Safety Institute at Beth Israel Deaconess Medical Centre and Harvard Medical School, patients' private medical data could be extracted and their devices reprogrammed without the patients' authorisation or knowledge.

Tadayoshi Kohno

Kevin E Fu

The study was designed to identify and prevent future problems, they emphasis; no case of a patient with an implantable cardiac defibrillator or pacemaker has been targeted by hackers. It was pointed out that the study required a high level of technical expertise, and the published paper omits certain method details to prevent the findings being adversely used. 'One of the purposes of this research is to encourage the medical device industry to think more carefully about the security and privacy of patient information, particularly as wireless communication becomes more common. Dr Maisel explained: Fortunately, there are some safeguards already in place, but device manufacturers can do better.'

The team expects this issue to take on greater importance as implantable cardiac defibrillators operate wirelessly at greater distances. These devices typically receive short-range wireless signals over several feet, but new technologies are expanding that reach even farther, creating the potential for information to be intercepted en route. 'We hope our research is a wake-up call for the industry,' said Tadayoshi Kohno. 'In the 1970s, the Bionic Woman was a dream, but modern technology is making it a reality. People

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contents

Hospital IT director builds in-house HIS

Telemed system remarkably beats commercial IT prices

Spain - The Torrevieja Salud Hospital, in southern Valencia, serves a population of 200,000 – but this swells to 600,000 in holiday periods. To meet demand **Luis Barcia Albacar**, General Director of Torrevieja Salud UTE, faced the challenge of creating a modern, versatile and efficient hospital that could also provide the benefits of top technology.

In early planning, it was decided that the hospital would have its own computer platform, and would also become paper-less. The hospital's in-house IT staff subsequently built a robust, end-to-end hospital information system using commodity, off-the-shelf developer tools, software, and technologies from Microsoft. The resulting system has been created for a fraction of what most hospitals spend on commercially produced IT solutions.

'*Florence* – the name of our processing and management tool – includes everything,' Luis Barcia Albacar pointed out. The system allows all of a patient's medical care information to be seen by the specialist and family doctor. Florence is focused on three essential points, improved provision of medical care for patients, as is the case of SMS with the word URGENCIAS, which offers patients a waiting time according to different emergencies; the SMS informs the user of a free appointment; or the day and time of a test he has asked his doctor for, or the automatic appointment reader, which reads the health card, informs the doctor that the patient is waiting to be seen.'

The system also enables teleradiology and teledermatology. Physicians on duty at home can receive urgent requests and send back reports. 'Recently we have the *surf-table* – a mobile laptop computer with incorporated washable and resistant screen, which allows access to data by a surgeon in the operating theatre. It can also be used by a patient as an entertainment station. The same versatility is provided by the *PC Tablet*, another innovative mobile device that is compact and light, washable and resistant to blows and which, in emergencies, means we can see patients in different cubicles at the same time, and check their clinic history, change it, ask for tests, and so on.'

'Florence also brings potential for resources, throw the information at the control panel about emergency waiting times, surgical rates, appointments, tests, entrees, discharges, medical stays, etc, all allows making decisions to keep improving healthcare.'

Our technology's heart

Florence was born with the Torrevieja Hospital, Luis Barcia Albacar proudly points out. 'The computer system was created by our Systems Director, using Microsoft tools, at low cost, very below other programmes on the market. Besides being created here, for total synchronization it is also constantly adapted for organizational needs and the software of the other companies that provide the hospital with equipment.'

** The hospital was built on public grounds by a Private Finance Initiative (PFI), which will also provide healthcare services to the area for 15 years. However, after five years, according to an administrative concession, the hospital will be owned by the Health Department of the Valencia Community Government, and the PFI will be managing public funding.*

TopClinica

11-13 June Stuttgart, Germany

The TopClinica, an international trade fair and congress focused on medical equipment and solutions is a new event on the calendar. 'It was established with the Baden-Württemberg Ministry of Economic Affairs and market leaders from the medical industry who no longer felt adequately represented at existing trade fairs,' explained **Ulrich Kromer**, Managing Director of Messe Stuttgart. 'This new platform for decision-makers in clinics was therefore developed jointly by numerous partners and industry leaders, and will be presented to international visitors at Europe's most modern trade fair centre. These are outstanding conditions for a successful premiere.'

Focusing on what it calls the 'Clinic Principle', the organisers expect to draw in over 150 exhibitors and 7,500 visitors. Exhibitors include: Erbe Elektromedizin, Gebrüder Martin, Karl Storz, Richard Wolf, Rudolf Medical, Wilhelm Julius Teufel, and Trumpf Kreuzer Medizin Systeme. Thieme Congress, a division of Thieme Publishing Group, will partner the congress, which will focus on management and financial management, medicine, quality management, health policy, e-health and marketing.

Details: www.topclinica.de

The global Research and Development Centre for Life Science

Olympus, which recently opened the global Research and Development Centre for Life Science in Munich, will invest around €15m in this project. By 2009, the centre will employ an estimated 450 people, bringing together a highly-qualified team from many fields for interdisciplinary work. **Dr Helmut Köhler**, Executive Managing Director of Olympus Life Science Europa GmbH and Olympus Life Science Research Europa GmbH, said that, in addition to early disease detection, the company's objective is individualised disease prevention, analysis and prevention along with follow-up treatment. The Munich centre will focus on taking in vitro diagnostics, laboratory automation, molecular biology, digital image processing and microscopy applications to the next level.

Over the last four years, in the European life sciences sector, Olympus has achieved growth rates averaging 15.8% in microscopy and 10.4% in diagnostics, placing the firm as one of the leading companies in these markets. **Tsuyoshi Kikukawa**, President of the Olympus Corporation, added: 'With our new global Research and Development Centre in Munich we have created the foundation for future sustained grown in this business segment.'

ISRAEL The hospital protocol for dealing with terrorism

By **Cynthia E Keen**

From 2000 to 2007, Israeli hospitals have treated the victims of 148 terrorist attacks. At ECR 2008, radiologist Dr Ahuva Engel described the protocol developed to deal with such emergencies at the Rambam Medical Centre in Haifa.

When a suicide bombing or other multiple casualty incidents occur, more than 50% of the injured arrive at the hospital within five to 20 minutes. Immediately on notification, the Ramban Medical Centre cancels all scheduled radiology procedures. Portable X-ray machines and ultrasound machines are moved to the emergency department, as well as mobile PACS diagnostic workstations.

The medical staff identifies two distinct phases in dealing with victims. First, the emergency physicians and staff, radiologists and surgeons identify the most critically injured. Next, they treat non-life threatening injuries. Both stages require heavy use of diagnostic imaging equipment.

At the Centre, at least two radiologists go to work within the emergency department, along with as many radiographers needed to operate the portable diagnostic equipment.

All front-line staff and physicians use walkie talkies for rapid communication. The objective is to determine who needs the most urgent care – particularly surgery. Chest radiography and focused abdominal ultrasound are the most commonly used imaging procedures in the emergency department. Computed tomography is also used to assess the abdominal injuries of more stable victims and to evaluate shrapnel localisation and detect unsuspected injuries. The most critically injured patients bypass X-rays in lieu of CT examinations.

CT angiography (CTA) helps radiologists and cardiologists to more accurately evaluate the vessels. Approximately 25% of the victims undergo this procedure, which reveals vessel stenosis, dilation, and pseudo-aneurysms. Conventional angiography is used if endovascular treatment is necessary.

According to Dr Engel, the most common injuries from explosions are damage to air containing organs (lungs or bowels). Victims thrown into the air, or hit by debris, may have a variety of broken bones and other orthopaedic injuries, cervical spinal injuries, or incur closed head injuries.

Penetrating wounds from numerous fragments of shrapnel are imaged to determine which may be life-threatening. For victims with numerous shrapnel pieces embedded, there is no way that all can be surgically removed during the initial frantic period. Their removal may need surgery over a period of weeks.

PACS workstations enable multiple physicians to evaluate examination results. The simultaneous availability of images has expedited surgery and treatment, because radiologists and surgeons can make their clinical assessments simultaneously. The use of 3-D reconstruction software helps surgeons to determine life threatening fragments.

'Planning and practice of protocols to deal with mass casualties are critical for a hospital to respond effectively,' Dr Engel emphasised. 'No amount of medical experience prepares you for the chaos. Anticipating the worst case scenarios will help all medical staff to prepare for the aftermath of terrorism.'

** A large number of X-rays and CT scans of victims of terrorist attacks, obtained from two Jerusalem hospitals, have been compiled as an art exhibition currently touring galleries in the USA. These may be viewed online at: www.x-rayproject.org*

A danger to patients' security & privacy? *continued from page 1*

will have sophisticated computers with wireless capabilities in their bodies. Our goal is to make sure those devices are secure, private, safe and effective.'

Kevin E Fu noted that the study developed three prototype defences that require no battery power, making them potentially easy to incorporate in the devices without extensive redesigning.

The researchers used an implantable cardiac defibrillator containing computers and radios that allow healthcare practitioners to diagnose patients, read and write private medical information and adjust the device's therapy settings wirelessly. They also used an inexpensive software radio to intercept and capture signals sent from the implantable device. Accordingly, they obtained detailed information about a hypothetical patient, including name, diagnosis, date of birth and medical ID number. They also determined the device make and model, accessed real-time electrocardiogram results and data on heart rate and cardiac activity.

They then mounted several attacks — and could turn off the therapy settings stored in the implantable device, rendering it incapable of responding to dangerous cardiac events. Additional commands were delivered, resulting in the delivery of a shock that could induce ventricular fibrillation, a potentially lethal arrhythmia.

Because the team studied one common model of implantable cardiac defibrillator, the susceptibility of similar devices to privacy and security risks is uncertain. The team believes future studies are needed to assess potential risks associated with other implantable devices equipped with wireless technology. They also strongly advise that nothing in their report should deter patients from receiving such life-saving devices when medically recommended.

Their peer-reviewed report will be presented in May and published at the *Institute of Electrical and Electronic Engineers Symposium* on Security and Privacy in Oakland, California.

Details: www.secure-medicine.org
Source: http://www.uwnews.org/

Kiosk Europe Expo 2008-04-24

6-8 May Essen Germany

Self-service can cut patient services costs, says **Anne Warner**, who reports for the trade publication *Kiosk Europe*. 'Self-service solutions are helping to streamline customer service and save costs wherever customer service is crucial. Airports have installed check-in kiosks, supermarkets are adding self-checkout terminals, and so on. How can self-service help to provide better patient services in hospitals?

'In an industry where confidentiality and trust is key, the self-service kiosk can play a major role in providing a trustworthy and highly secure means of transmitting information between the patient and their doctor or healthcare advisor, without the need to go via a third party,' she points out, adding that it also enables patients to access information and that surgeries and hospitals can have automated check-in procedures. 'It even cuts down on the paperwork!'

Some examples of the solutions offered by kiosks for healthcare include automated arrival terminals, where patients can check in without queuing at reception; appointment booking kiosks, where patients can make appointments or view available timeslots; health check terminals providing basic checks such as blood pressure, without seeing a nurse or doctor, and healthcare information terminals to make general health information available on request, she points out.

'In Germany, plans are in place to install kiosks that will provide functions to holders of the new electronic health card. Soon, insured patients will be able to look up health information and medical documents at kiosks installed throughout the country. Though still on paper, prescriptions in Germany will be created digitally in future, allowing insurers to view them at an eKiosk then release them to a pharmacy. Later on, patients will be actively involved in handling their health data with a view to increasing responsibility for their own health.' For this, eKiosks are envisaged as the medium.

In-patient with terminal and doctor. terminal and German electronic health card

In the UK,' she observes, 'self-service touch screen kiosks are being provided to the medical industry to enhance medical record access and surgery check-in procedures for patients throughout the country.' Rather than queuing, on arrival, patients who register with the self-service system can scan in a fingerprint to check-in. 'The kiosks can also be used by patients wishing to check their medical records, as well as allowing them to access patient information leaflets containing information on commonly diagnosed illnesses.'

In summary, she concludes: 'Kiosks can improve the patient's experience and help to reduce costs, while maintaining confidentiality at all times.'

Presentations on self-service for the medical sector will be held on 8 May.
Details: www.kioskeurope-expo.com

GLOBAL PERSPECTIVES ON DIABETES

Despite *Hurricane Amma* storming over Prague, hundreds of medical specialists paid little attention when they attended the 1st International Conference on Advanced Technologists and Treatments for Diabetes (ATTD), observed our Russian correspondent *Olga Ostrovskaya*, reporting on the International Conference on Advanced Technologies & Treatments for Diabetes (ATTD) in Prague (ATTD) held in Prague.

'Our meeting aims to bring together developers of new technologies to treat diabetes, from the academic world and industry, and diabetes professionals,' said **Professor Tadej Battelino**, renowned endocrinologist from Slovenia. He added that the conference would hopefully acquaint clinicians and researchers working on diabetes, endocrinology and metabolism with techniques for new treatments.

Tadej Battellino

'These technologies are used by American specialists more widely than European,' he said, and it's not right. The conference was his idea, and he chaired it with **Professor Moshe Phillip** (Israel).

Lectures on global perspectives of technology and nanomedicine in diabetes research were aired to stimulate debate about insulin analogues. Pro their use was **Professor T Danne** (Hanover, Germany), who said that shot-acting insulin analogues are safe and more comfortable for patients. Against, was **Professor F Holleman** (The Netherlands), who, underlined the contra-indications. 'Use analogues? Only incidentally!' he exclaimed.

During our attendance, European Hospital interviewed **Dr Thorsten Petruschke**, Director of Medical, Clinical and Scientific Affairs, Bayer HealthCare Diabetes Care Europe, about the firm's latest developments. He pointed out Bayer's *Contour Link* blood glucose meter that wirelessly transmits the patient's current blood glucose data to a Medtronic insulin pump, which then calculates the bolus insulin dose. In addition, the blood glucose values are used to calibrate continuous glucose measurement with the Medtronic system, which determines the glucose content in the intercellular fluid, he added. 'Any system for blood glucose measuring has to meet extremely high safety standards,' he stressed. 'Bayer Healthcare invests over €30 million a year in Diabetes Care research and development to further improve the precision and safety of blood glucose measurement. Just a few months ago, our new R&D Centre, in Tarrytown, New York, came on stream, providing state-of-the-art conditions to work on these topics.'

Dr Thorsten Petruschke

Asked whether some developments are only technical gadgetry, Dr Petruschke pointed out that, in the medical market the safety of diabetics is always top priority. 'What may look like a technical gadget can represent a significant factor in making daily life easier for diabetics. Take, for example, blood glucose meters such as our Contour or Breeze 2 with No Coding technology: a study conducted by Raine in the USA has shown that one in six diabetics codes his or her blood glucose meter incorrectly. So something that looks like a small additional benefit can actually be of crucial importance for individual patients when it comes to avoiding hypoglycaemia.'

Indeed, patient training was a big topic in Prague. 'We [Bayer] are intensively involved in patient training. In this, it is impossible to overstate the importance of diabetes nurses. They are important contacts for diabetics and are not only trained in the use of medical technology but also play a key role in motivation and compliance, which is why we support, for example, the Federation of European Nurses in Diabetes (FEND). ' Bayer, he said, holds discussion forums for an international exchange of information. The company also frequently establishes direct contact with diabetics to ensure its developments actually meet their needs.

In his opinion, the development of telemedicine for diabetics provides an interesting additional benefit for patients and doctors. 'Real-time transfer of the measured data to a central server makes it possible for the attending doctor to adapt the treatment and provide better care for patients. Interesting results from a pilot project were presented in Prague.' Home-caring offers many options, he added, which is still in early development. 'What direction it will take will naturally depend not only on the technical possibilities but also many other factors, including healthcare policies.'

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Do you attend congresses or similar meetings for your speciality? ☐ Yes ☐ No

This information will be used only in an analysis for European Hospital, Theodor-Althoff-Str. 39, 45133 Essen, Germany, and for the mailing out of future issues.

EH 2/08

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European Hospital and Philips Speech Processing have linked to provide our readers with another excellent competition. This month, three lucky winners will each receive a Digital Voice Tracer 7890

Philips has developed dictation and speech technology for over 50 years. The sophistication of today's machines would surprise the users of early speech equipment, for no one could have imagined their voice recognition abilities – for example the *Philips SpeechMike* – a USB-microphone directly connected to a PC. As Philips points out: 'This is well-established in the medical sector and geared towards enabling customers to benefit from greater ease of use, ergonomic design and unique functionality. The device seamlessly integrates with workflow systems such as radiology information systems, hospital information systems or legal case management systems, thus ensuring efficient dictation workflows, high documentation accuracy and optimum data security.'

Products also include the new *Digital Pocket Memo Series* – Philips professional mobile dictation devices – with the world first LAN Docking Station is designed to improve the professional lives of those involved in the documentation process, in the easiest possible manner, Philips adds. 'The Digital Pocket Memo 9600 Series sets the highest security standards in mobile dictation, focusing in particular on data confidentiality and transcription accuracy. Voice files can be password protected on the device itself. DSS Pro file compression, an enhancement of the industry's DSS standard, guaranteeing crystal-clear sound quality for highly accurate manual transcription and optimised speech recognition results facilitates real-time file encryption. The DPM 9600 has received the IF Product Design award 2007 for its outstanding ergonomics and innovative functionality.

'A streamlined workflow and improved productivity are the key benefits of combing digital dictation with suitable dictation and transcription software. The software provides authors with easy-to-use functionality for organising recordings clearly and efficiently. Transcribers have advanced professional transcription features and accessories at their fingertips, while IT managers benefit from the reduced strain on financial and human resources. Sensitive patient or client data are protected by file encryption, preventing unauthorised users from accessing restricted dictations.'

The firm's consumer-oriented range for note-taking is covered by the Digital Voice Tracers. 'This lifestyle product combines note taking with playback of MP3 music files. As a unique feature, the high-end Digital Voice Tracer 7890 also allows for direct MP3 stereo recording – even from the integrated FM radio. The sleek and futuristic design makes the Digital Voice Tracer both an extremely handy and highly stylish accessory for the modern user. Space is at a premium when you're recording interviews, lectures or just personal notes. The expanded storage capacity of up to 576 hours of recording time gives users much greater freedom and flexibility. If connected to a notebook, the USB-powered device requires neither a battery nor any other additional equipment and enables fast file transfer by e-mail.'

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- NB: The prizes are as shown, and not exchangeable for cash.
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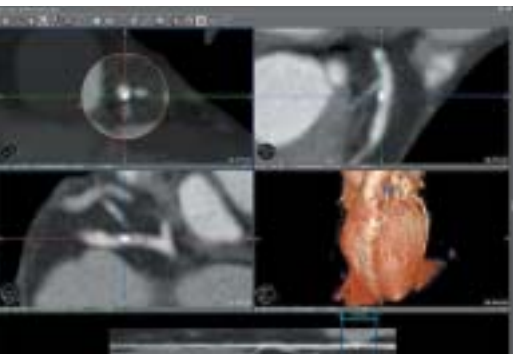
Cardiac software launched for CS Thin Client



Visage Imaging has launched its Cardiac Analysis software for the Visage CS Thin Client, which offers 'advanced visualisation and quantitative analysis for cardiac CT studies, such as calcium scoring, coronary artery analysis and left ventricle analysis,' the firm reports. 'The Visage CS Thin Client/Server is a scalable advanced visualisation solution that provides fast and consistent access to all patient images, anywhere inside and outside the hospital, across multiple interconnected sites, and through the internet.'

The cardiac software tools are fully integrated into the workflow and technology platform so that it can be accessed on all client computers – a dedicated cardiac workstation is not necessary. Visage CS Cardiac Analysis allows viewing and post-processing of even the largest multi-phase cardiac CT studies at the click of a mouse, Visage reports.

'Visage Thin Client solutions, like the cardiac one, enhance the entire clinical workflow, with advanced tools for 2-D, 3-D and 4-D image review and interpretation, post-processing, data management and image distribution. The original CT and cardiac CT data from multiple potential sources can be managed and archived consistently in a single system across the entire hospital enterprise. That is why we are talking about a cost-effective visualisation tool that optimises workflow not only within one department but over the boundaries e.g. of radiology and cardiology,' explained Colin Murphy, Vice President of Sales & Marketing at Visage Imaging.

The new software provides, for example for left ventricle analysis, automatic short/long axis reformatting, segmentation of left ventricle with a few clicks, a global and by segment presented ejection fraction and wall motion analysis by segment. And, Visage adds, 'For coronary artery analysis new features include automatic tracing with only a few clicks, a powerful vessel visualisation, an easy to use cross-sectional measurement and stenosis calculation, as well as a curved reformatting for efficient assessment of vessel lumen and adjacent structures.'

Image processing

Speedy quality image accessibility via inter- or intranet

***dicom**PACS*, developed by the German manufacturer OR Technology in partnership with medical specialists, is now installed in 5,000 workstations globally, because, 'It is set apart by a very clear and user friendly structure,' OR points out. The company has also set up an international competence network for ***dicom**PACS* with over 30 authorised, trained local partners to support users.

'AxRecon leverages the processing power of GPUs to speed-up CT scanner workflow'

The solution has also been certified in accordance with the EU guideline 93/42/EEC Annex II (CE 0482) and its 510(k) (no. K070618) has been cleared by the FDA.

Along with features such as *perfect memory*, parallel compilation of diagnostic reports and individual customisation of the user interface, the current version 5.2 includes several new features and modules. 'The newly developed web server allows fast image accessibility in original quality (DICOM) via internet or intranet and the new prosthesis module documentation allows the planning of operations with digital templates. ***dicom**PACS* can be extended by a number of modules, e.g. patient CD module, report module, video module etc. Another option is the processing of CT and MRT series incl. MIP and MPR functions.'

OR Technology, which has worked on imaging technology internationally for 16 years, deals exclusively with digital image processing and is certified according to the ISO 13485 quality management norm. The company provides system solutions for hospitals and specialists' surgeries. Apart from its own product dicomPACS the solutions include digital X-ray systems with CR and DR, conventional X-ray technology, portable and mobile X-ray technology and computer systems for operating theatres.

For a free dicomPACS 5.2 demo version, or further information, contact:
info@or-technology.com
Also: www.or-technology.com

OSIRIX

Radiologists Osman Ratib (left) and Antoine Rosset

NEW

THE 64-BIT MULTIMODALITY VIEWER ON THE MAC PRO 8-CORE WORKSTATION

Designed by a team of radiologists, the latest release of OsiriX 3.0.1 on the Mac Pro 8-core was demonstrated for the first time at the recent European Congress of Radiology (ECR). OsiriX – a powerful image processing software dedicated to DICOM images (.dcm / DCM extension) produced by imaging equipment (MRI, CT, PET, PET-CT etc.) and confocal microscopy (LSM and BioRAD-PIC format) – a multidimensional image display and analysis platform that supports peer-to-peer communication technology as an alternative to conventional PACS architecture, allowing wider access to images across medical enterprises.

The 64-bit programme can handle new generation imaging modalities combining anatomical and metabolic images (MRI, PET, CT, ultrasound, and angiographic images). It also provides dynamic display for time-varying images such as cardiac motion or metabolic functional studies.

The OsiriX creators say it provides an intuitive and user-friendly user interface tailored for physicians who are not familiar with complex image processing and manipulation techniques.

When *Meike Lerner*, of *European Hospital*, spoke with one of its developers, **Osman Ratib MD PhD FAHA**, Professor and Chair of Radiology of the Dept. of Medical Imaging and Information Sciences and Head of Nuclear Medicine Division at the University Hospital of Geneva, Switzerland, he explained that the idea to create OsiriX was born at UCLA in 2004, when he became annoyed that no known industry software could handle the huge amount of data produced by PET/CT scanners including 3-D dynamic images. He began to develop an open-source software with radiologist **Antoine Rosset**, who had a research grant to study at UCLA at that time. Their intention was for the free use of this new software by anyone who might need to modify it, which, he pointed out, would also mean the solution could benefit from large contributions. 'That would be something way beyond what the industry had managed to do. Four years later, it worked much better than anticipated. 25,000 people around the world now use it. It has all the 3-D analysis and viewing tools that you can find on any commercial platform.'

The team chose to create the software only for Apple Mac, due to that system's powerful graphics abilities. 'However, even Apple wasn't good enough. We had to put in some special video boards. But, we made that risky choice. We are very happy that Apple is now doing very well in that field, because we benefit from it. The machines are now so powerful that we don't need any special graphic boards anymore. The software runs on any Mac. Yes, the fact that there are not many Apple users is a problem, but it turns out to be an advantage, because many physicians are actually looking for a reason to use a Mac. Hospitals may not want it, but the physicians, the radiologists, want it. In many hospitals the Mac platform is slowly making its way in addition to the existing Windows machine. The IT departments are usually very reluctant, and Apple is very aware of that. Essentially there are no technical problems, especially now that Apple can run Windows applications at a much better cost and much faster. But yes, IT departments in hospitals are reluctant to integrate – I experienced this first hand when I was head of IT at UCLA, so I've been struggling to demonstrate that a hybrid environment is possible. We really see an advantage for users in terms of rapid adoption. We have had presentations at various hospitals, when OsiriX was integrated. The average training time is in the range of 60 to 90 minutes, then the users are not heard from again; they don't ask questions; they are usually capable of using the software by themselves. That's usually not the case with other platforms.

'We have identified 25,000 users who use OsiriX on a regular base, and these numbers come from machines that have visible unique IP addresses outside firewall and are visible. Other users are behind firewalls in hospitals and we don't know about them. So we think there is double this number of users out there. Also, there are commercial companies that provide FDA and CE certified versions of the software.

'In current multicore Apple machines, OsiriX provides real time rendering and visualisation of 3-D and 4-D images dynamically with extremely high performance. Users and radiologists can navigate through very large 3-D data sets in real time with a performance that matches very high-end commercial workstations.

'There have been a lot of requests and attempts to move the software on Windows platform. Since the programme is Open Source, the source is available for free and can be copied. However, the effort to move to Windows platform is significant and to achieve the same graphic performance is very challenging. Several groups have attempted to do it but so far there is no evidence that it is any closer to being done. In a large National Cancer Institute (NCI) project a decision was made to integrate Windows applications with OsiriX on the Mac platform instead of trying to import OsiriX to the Windows platform. Besides, OsiriX uses a lot of basic tools and core technologies that are imbedded in the Apple platform that don't exist on the Windows platform. This includes all the powerful graphic capabilities of the Mac platform that are the reason for the success of the Macs in the graphic and editing industry, but also core technologies such as iChat, embedded databases and communication tools.

'The Open Source option that we adopted is a new challenge. There are thousand of Open Source programmes out there, but only a few are successful. To be adopted by the user community an Open Source programme must be good. It is not enough just to be free. A programme that does not provide advanced tools and functions and is not robust enough, or crashes all the time, will be rapidly abandoned by users. The success of OsiriX resides in its design, done by radiologists for radiologists, and the robustness of its code, which makes it a very stable product for use in clinical and research applications. It is also a good development platform for programmers and researchers who want to add their own tools for image analysis.'

Indeed, OsiriX use has already broadened into research in biology, astronomy, molecular imaging and archaeology. It is a generic image display and rendering that can be used in many other areas than medicine.

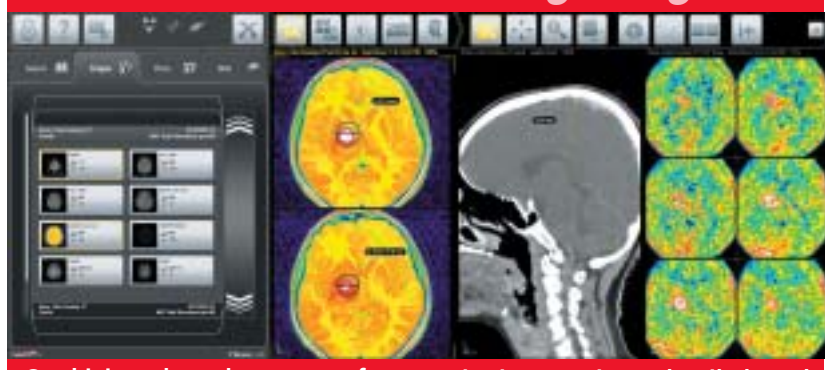
'Fully leveraging the Leopard operating system and the Mac user interface, the 64-bit OsiriX programme offers functionality comparable with, or better than, the most advanced scanner consoles on the market. It's also extremely fast and easy to use,' Professor Ratib concluded.

Radiologist Dr Will Adair, at the Leicester Royal Infirmary, UK, another user of OsiriX, on his MacBook, added: 'The combined OsiriX and Mac proposition has the potential to completely change the way we work by providing easy access to affordable, commercial-level image processing solutions with exceptional 3-D and 4-D capabilities.'

Further information:
www.osirix-viewer.com/

ACCESSING AND MANIPULATING PATIENT DATA

The Digital Lightbox



Combining the advantages of a traditional hospital light box with the features of computer workstations, BrainLAB has produced the *Digital Lightbox* – which is certainly unlike the usual light box. The Digital Lightbox integrates with a hospital's Picture Archive and Communications System (PACS) enabling physicians working in almost any location to access MRI, CT, PET and X-ray images. The device also provides a wide range of DICOM viewing functions and advanced functionality, such as automatic image fusion in combination with an intuitive touch screen, making image navigation and modification easy, the manufacturer points out. 'Digital Lightbox transforms traditional static images into detailed and dynamic views with its multimodality image and data system, allowing users to extract more value from data.'

The wall-mounted multi-touch controlled device not only connects to PACS servers but also the BrainLAB treatment planning system iPlan Net, for fast image and treatment plan review. 'Treatment plans for surgery and radiation therapy can easily be accessed, altered or confirmed for treatment,' the firm points out. 'Data can be retrieved in multiple formats including DICOM, jpg, bmp, tif, png, avi, wmv and BrainLAB proprietary image formats.'

** FDA clearance pending. This product will be available shortly.*

SYSTEM SPEEDS UP CT RECONSTRUCTIONS

During ECR 2008, the Canada-based Acceleware Corporation, which develops acceleration solutions for high-performance computing, demonstrated its new AxRecon image reconstruction solution for medical imaging, security, and non-destructive testing. 'Image reconstruction for computed tomography (CT) scanners often takes hours of processing time and represents a major barrier to efficiency for many organisations. Acceleware's solution reduces the time required to complete this work from hours to minutes,' the firm reported. 'AxRecon works with existing cone beam CT scanners to eliminate bottlenecks by significantly speeding up filtered back projection computations. This enables medical and commercial users to accelerate the reconstruction of their data and improve the quality of their images without disrupting their current workflow.'

NEW

AxRecon combines Acceleware's proprietary software acceleration libraries with the massive parallel processing power of NVIDIA Graphic Processing Units (GPUs).

David Holdsworth of Robarts Imaging, based in Canada, added: 'In biomedical micro-computed tomography applications, the volume dimensions of our reconstructions have increased dramatically over the past few years. During the same period, scan times have also been reduced; this makes cone-beam CT reconstruction time the bottleneck that limits workflow in some situations. GPU-based reconstruction is a cost-effective solution for this task, and we have found that Acceleware's AxRecon product can provide 3-D reconstructions up to 50 times faster than a single-CPU.'

Acceleware also emphasised that the software seamlessly integrates with existing CT scanners with minimal setup.

Sean Krakiwsky, CEO of Acceleware, added: 'The benefits of higher throughput and image quality already being realised by early customers of AxRecon will help us drive adoption of this product within the broader imaging market.'

Further details:
www.acceleware.com/solutions/imaging/imagingintegrator.cfm.

MARKETING: AGFA HEALTHCARE

Strengthening portfolios and customer relationships

Christian Reinaudo, President of Agfa HealthCare, speaking with European Hospital representative Gabriela Eriksen

After Agfa split its core business units to form three legal entities under the Agfa-Gevaert Group, in January this year, **Christian Reinaudo** became President of Agfa HealthCare. Speaking with *European Hospital* representative *Gabriela Eriksen*, he explained the implications of the business split and future aims for the division he now heads. 'We remain an integral part of the Agfa-Gevaert Group, but have more legal independence as a division, allowing the organisation to take a number of specific decisions on a more autonomous basis.'

For the future, Agfa Healthcare needs to continue to fuel its profits, he pointed out. 'The best way to achieve that is to offer unique, modern and innovative products that meet the demands of the market. Agfa has a good relationship with its customers who appreciate and believe in our solutions that clearly differentiate from those of our competitors. We really have all the ingredients necessary for success, including the know-how, image, reputation, the right people and excellent products and solutions. My target now is to strengthen certain areas that I feel are most promising for the future. One of those fields is, of course, IT. However, we must also ensure we maintain a strong focus on our imaging capabilities, which form an integral and core part of our business.'

In terms of strengths, he said that Agfa Healthcare has been an integrator for the healthcare environment. 'It is one of our core skills and we apply these on two levels. First, our solutions consider the different requirements and expectations of our customers. This is, for example, the concept behind our new series of IMPAX Suites that were launched successfully in Europe at this year's ECR. Simply said, our customers in orthopaedics have different needs than those in radiology, so what IMPAX does is to provide the same platform, but for different clinical use cases with different key targets. One obvious benefit is that, because they use the same platform, different hospital departments can work in an integrated manner.

'This automatically leads me to the second level of integration. The challenge is to connect different users, from a single department to multiple departments, a hospital or even a multi-site centre by bringing together different systems, often from diverse vendors, or maybe even alternative PACS solutions. Our strengths in this field are well known, and we should, as Agfa HealthCare, ensure that we continue to build our business on this expertise.

'So the goal is to ensure we continue to deliver high quality imaging solutions and at the same time expand the IT front to meet the needs of specific segments and reach a scalability of integration at different levels.'

What of the need for consultancy, to help hospitals to integrate systems? 'Well we provide a kind of consultancy; years of experience in healthcare play an important role in our daily work with clients. What our customers want is a complete solution that fits in their healthcare surroundings. This demands different needs and capabilities, from country to country and hospital to hospital. In this business you need to be very specific. The delivery of state-of-the-art software and applications are only one part of the equation; being able to comply with national organisation requirements and customer needs is often the core challenge, and yes, our advice and knowledge do play a critical role here. We need to provide the best solution for each country and each hospital, and our extensive portfolio of solutions, from film, print and CR to healthcare enterprise IT systems are very well positioned to offer this.

'Looking at geographic differences specifically, there are countries like Germany, Switzerland and Austria where

continued pn page 8

continued from page 7

we are well established as an Enterprise IT solution provider, while in other markets, such as the USA, we primarily intervene in the imaging informatics markets and have only started our ORBIS roll-out. So our task as a company is to find the right people, the right third party partnerships and the right way to integrate all applications, including legacy systems, which will enable us to deliver the right solutions to meet the needs of our customers. This is what plays along our core competencies.

'A huge part of our business is global in terms of technology and applications. In addition, in terms of hospitals there is global vision: They will need to have all relevant information at the same place and make it accessible to everybody involved in a patient's care.

'Today, different people work with different systems, writing on different papers and working at different monitors. But if you want to treat diseases, all this information should be available every time, everywhere and from every participant. This challenge is being tackled, for example, by our IMPAX Data Centre, our scalable and fault tolerant DICOM archive solution designed to store clinical DICOM data objects. The system consolidates data of disparate storage systems onto a single point of storage. It caters for the needs of enterprise storage for large, multi-site and multi-facility healthcare domains.'

In the near future, he added, Agfa Healthcare's aim is to strengthen some of its product portfolios, such as imaging and IT solutions, and continue to improve customer relationships. 'Of course there will be innovations, but our primary goal is to ensure we deliver according to the expectations of our customers around the world. We have the solutions, the credibility, the right people and the right attitude to achieve this.'

FUJIFILM'S DIGITAL MAMMO GOES MOBILE

Fujifilm Medical Systems USA, based in Stamford, Connecticut, reports that it's CR for mammography (FCRm), a full-field digital mammography system, is now available for use in mobile mammography environments.

The first two installations of Mobile FCRm systems were in mobile units operated by the Harris County Hospital District in Houston, Texas, and St. Joseph's Hospital of Atlanta, Georgia.

Fujifilm reports that more than 400 mobile mammography units are in use today throughout the US – and the majority use analogue film systems; only about 10-15% of existing mobile coaches have converted to digital mammography. Thus the mobile environment lags behind traditional breast imaging facilities.

The digital imaging solution, including FCRm, Synapse PACS and Synapse Managed Services, enables mobile mammography providers to concentrate on the delivery of care while also managing the IT infrastructure, Fujifilm adds. With the option of Managed PACS, by connecting Mobile FCRm to a secure wireless broadband connection, images acquired in mobile units can be transmitted to the user's reading location and directly to its data centre.

Fully digital X-ray based 3-D imaging drives MIS

In recent years, intra-operative 3-D C-arm imaging has revolutionised orthopaedics and trauma surgery. In particular using the images created during an operation, C-arms with 3-D capability can produce 3-D views of a quality effectively on a par with those of a CT scan. They allow improved intra-operative monitoring for the repositioning of complex fractures and insertion of implants. 3-D C-arms with flat panel detectors providing highly dynamic, distortion-free imaging have been on the market for barely two years. The image information is read out directly from the detector and becomes available in digital form immediately after acquisition. The use of digital flat panel detectors in mobile X-ray machines has significantly improved image quality and is opening up new fields of application in minimally invasive surgery (MIS).

Ziehm Imaging reports that it is leading the way in flat panel technology for mobile C-arms. In 2006, the company launched the Vision FD, the world's first mobile C-arm with fully digital imaging. Furthermore, Ziehm's flat panel technology has been implemented within the Ziehm Vision RFD mobile *Intervention Suite* and the Ziehm Vision FD Vario 3D. Vision RFD is particularly suitable for procedures in interventional radiology, neurosurgery, vascular surgery and cardiology, while *Vision FD Vario 3D* offers major advantages for traumatology, orthopaedics and brachytherapy. Using flat panel technology and a variable isocentre, the C-arm provides distortion-free intra-operative 3-D imaging which delivers critical additional information particularly for assessing complex fractures or during spinal operations.

The mobile C-arm Ziehm Vision FD Vario 3D provides high image quality and efficient workflow

Integrated navigation for greater operating theatre efficiency

New horizons in terms of precision and image quality are being opened up particularly by combining flat panel technology with navigation systems or Computer Assisted Surgery (CAS). Through direct connection to a navigation system, the intra-operative image data can be used directly for computer-assisted interventions.

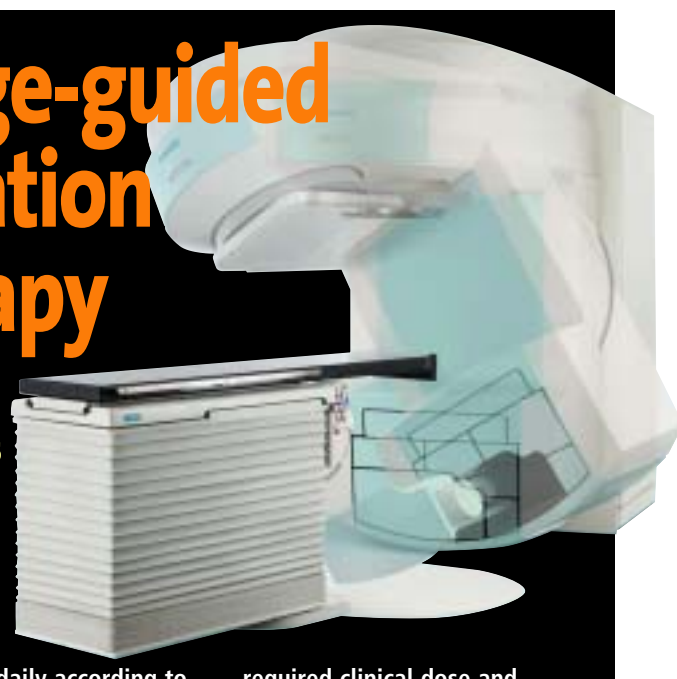
Experience with using Ziehm Imaging's flat panel technology has already been gained at the first orthopaedic spinal centre in Thiene (Vicenza) in north-eastern Italy, where trauma surgeons have been using the mobile C-arm Vision FD Vario 3D since December 2007. 'We have used the C-arm as an intra-operative data source with good results. The system produces high quality images with high contrast resolution,' said Dr. Balsano, head of the orthopaedic department. 'Comprehensive 3-D imaging makes it easier to position implants, screws and osteosynthesis material accurately and also allows much more precise setting of fractures and reconstruction of joint surfaces compared with two-dimensional imaging methods. This enables surgical interventions to be carried out more precisely – particularly for complex intra-articular fracture setting and osteosynthesis in the hip and spinal areas.'

The integration of intra-operative 3-D X-ray imaging and navigation also increases operating room efficiency. Intra-operative monitoring of results enables the number of subsequent corrective interventions and radiological check-ups to be reduced, Ziehm adds. 'Patients benefit from quicker recovery times and pressure on hospital budgets can be reduced on a continuing basis. For example, a study carried out by the Department of Trauma Surgery at the Hanover Medical School showed that after an intra-operative 3-D scan, repeats are unnecessary in 16 per cent of cases.

'Because of the many advantages of this equipment, the use of mobile 3-D C-arms has increased in recent years. The consistent refinement of C-arms and the optimisation of image quality with the introduction of flat panel detector technology make them versatile performers in clinical settings such as interventional radiology, vascular surgery or cardiology. Particularly in the case of complex, minimally invasive interventional procedures, both physicians and patients benefit from enhanced spatial orientation and increased precision.'

Source: Ziehm Imaging

Image-guided radiation therapy



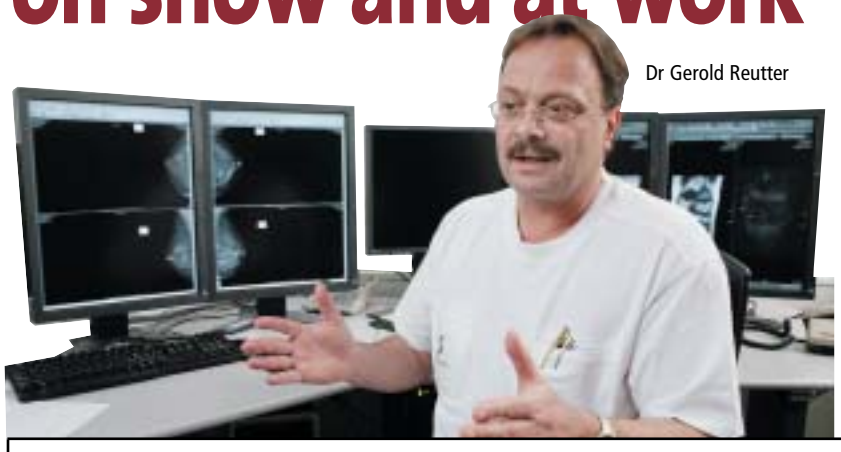
Artiste takes centre stage for debut clinical use

Artiste **is a linear accelerator and CT scanner combined. At the German Cancer Research Centre, a team of scientists led by Professors Wolfgang Schlegel and Uwe Oelfke of the Medical Physics in Radiation Oncology division, contributed substantially to the technical development of the Artiste platform. They report that users will be able to observe and correct the actual position, extension and potential movements of a tumour during radiation therapy.**

The first Artiste system, produced and marketed by Siemens Healthcare, has now been installed at the Centre and is ready for its first actual cancer treatment. 'The patient is suffering from an inoperable oesophagus tumour; the treatment demands very complicated radiotherapy approach,' explained Professor Peter Huber MD, head of Radiation Oncology in the Clinical Cooperation Unit. 'To achieve the clinically required accuracy we must determine the actual position of the tumour prior to each of the 30 fractions with the utmost precision.' Anatomically this is necessary because the tumour shifts daily according to the stomach content. 'With today's treatment technology we can aim at the tumour with millimetre accuracy; however, this enormous potential can hardly be used if the tumour has moved significantly from the position determined at the time of diagnosis,' he pointed out. Using Artiste, an observed shift in the target position can be automatically corrected while the tumour still receives the required clinical dose and surrounding healthy tissue is spared from radiation.

Further so-called adaptive therapy approaches are currently under investigation at the German Cancer Research Centre. Artiste will hopefully help to track the movement of lung or intestinal tumours so that physicians will be able to initiate radiation therapy after determination that the tumour is located at the pre-calculated position.

Carestream products on show and at work



Dr Gerold Reutter

Volker Keller

At the DRK Congress (Deutscher Röntgenkongress, 30 April - 3 May, in Berlin, Carestream Healthcare will introduce its new digital radiography and computed radiography systems, including the DirectView DR 9500 System, the DR 3500 System, as well as its latest single-cassette CR products, DirectView CR Elite and the new Kodak Point-of-Care CR 360.

Also on show will be the company's IT solutions including enhancements to its RIS/PACS platform, and the latest version of Carestream Information Management Solutions.

Carestream's rapidly expanding digital mammography portfolio, including computer-aided detection (CAD) software and new CR software that delivers enhanced exchange of information with other vendors' digital mammography and RIS/PACS systems, was also highlighted. The CarestreamHealth digital mammography portfolio includes multi-modality breast imaging workstations, CR-based mammography systems, computer-aided detection for CR and film-based mammography, special functionality for its RIS/PACS platforms, and laser imagers.

***Volker Keller**, Carestream Health Regional Market Communication Manager for Europe North, points out many benefits of digital technology, adding: 'On the clinical side, we see great opportunities for the implementation of healthcare IT systems. Smaller hospitals and clinics will benefit from an all-digital workflow. We have several initiatives underway to provide comprehensive but affordable solutions to the unique challenges of delivering healthcare to rural markets in developing countries.'*

Digital mammography and computer-aided detection (CAD) in action

As a centre of excellence for mammography, the Fontana Women's Hospital in Chur, Switzerland, has a reputation stretching far beyond Swiss borders. Manned by **Dr Gerold Reutter MD**, the local mammography centre has used Kodak's digital system from Carestream Health since 2007.

A workstation, including two high resolution monitors, is downstream from the imaging devices: a Kodak DirectView CR 975 Image plate system and a high performance laser Kodak DryView 8900 printer with maximum resolution of 650 dpi.

The monitors display full field digital images of the breast. To demonstrate the CAD system at work, Dr Reutter moved the cursor on the left monitor over several triangular and star shaped symbols. 'With these tags, the CAD system shows me points of potential interest. The triangles clearly indicate the micro calcifications; the star shaped marks indicate denser soft tissue relative to the surrounding tissue structure. We know there is a high correlation between the preliminary stages of carcinoma and the formation of a micro calcium group of five calcifications/cm^2. Such a group is highlighted by the CAD system from Carestream Health and this helps in our diagnoses. The accuracy of findings is very high.'

Dr Reutter mentioned additional advantages in the digital CAD system. 'Foremost is vastly better image quality. If you compare conventional images with the digital images, you will see what I mean: the differences in contrast, detail and resolution are obvious – the conventional images have a blurred, dull effect.'

Adjusting image brightness and contrast – both not possible with traditional imaging technology, he clicked the mouse to enlarge part of the image marked by the CAD system (the once indispensable magnifying lens is no longer needed). 'The Carestream CAD system has proved to be of considerable help because it can make valid pre-selections by itself and mark them accordingly. So it is a significant milestone on the road to more reliable breast cancer diagnoses. However, as with all diagnostic benefits,' Dr Reutter emphasised, 'the final decision is given by an experienced consulting physician. Leaving an examination to a physician's assistant is not ethical.' Staff responsibility at the hospital has not decreased since the CAD introduction. Two observers still carry out the standard assessment procedure, and even the slightest doubt in mammographic findings results in ultrasound confirmation and consultation with other physicians and specialists.

Dr Reutter also described other benefits of digital mammography. The integrated speech recognition system enables direct reporting and automatic conversion into written text. All downloaded, archived image data can be instantly recalled. Hard copy films are no longer stored. Electronic image data also can be printed on films, as well as e-mailed.

'My experience is that the Carestream CAD system is a significant step forward in the diagnosis of breast cancer,' Dr Reutter concluded. 'The digital mammograms clearly outclass traditional images in terms of detail resolution, making our findings more reliable. It is also a well developed system and, through regular updates, keeps pace with changes and remains state-of-the-art technology.'

For the second in his series of articles for *European Hospital*, **Professor Stefan Schönberg** of the Institute of Clinical Radiology and Nuclear Medicine (IKRN), University Hospital Mannheim, Medical Faculty Mannheim, University of Heidelberg, invited colleagues from the Nijmegen University Medical Centre (UMC St Radboud) for a roundtable discussion on:

Radiation treatment decisions in patients with prostate cancer and suspected lymph node metastasis based on USPIO-MRI

Prostate cancer is the most frequent cancer in men with about 49,000 newly diagnosed cancers in Germany and 6,000 in the Netherlands, annually. Important treatment options for local prostate cancer are radical prostatectomy (RPx) and radiation therapy (RT). Currently, after initially performed transrectal ultrasound, multimodality high resolution MR imaging is the preferred method for accurately assessing the local disease stage and is performed to guide decision making for optimal treatment choice. Multimodality MR imaging includes multiplanar T2-weighted images to show morphologic attributes, chemical shift spectroscopy with further mapping of the Choline/Citrate ratios for measurement of alteration in metabolism, dynamic sequences for delineation of typical cancer hypervascularisation and diffusion-weighted sequences to show restriction in the Brownian movement of the water molecules. Image quality and spatial resolution are improved by utilising a balloon type endorectal coil. In an innovative procedure, an endorectal balloon is also used for CT imaging and during radiotherapy. Thereby, the prostate will have similar shape and the rectal tissue will be protected from radiation damage because it is displaced away.

Another important field in prostate imaging is lymph node staging. This comprises measurement of pelvic lymph node sizes by CT or MRI and stratifying patients in risk groups for possible lymph node metastasis according to the Partin or Narayan tables. These depend on Gleason-Score (histological grading) and PSA value. However, conventional CT and MRI can miss metastases in small, non-enlarged lymph nodes. Furthermore, in patients at low risk for nodal metastases based on these tables, no additional nodal diagnostic imaging is performed.

Recently, diagnostic imaging techniques have become available which enable improved lymph node staging. At present, the most accurate method is MR lymphography with ultra-small super paramagnetic iron oxide particles (USPIO, Sinerem). Using a 3T scanner, metastases in nodes measuring 2-3 mm can be detected. Up to now no serious side-effects have been reported. Regrettably, this promising technique, using Sinerem contrast, is not yet commercially available.

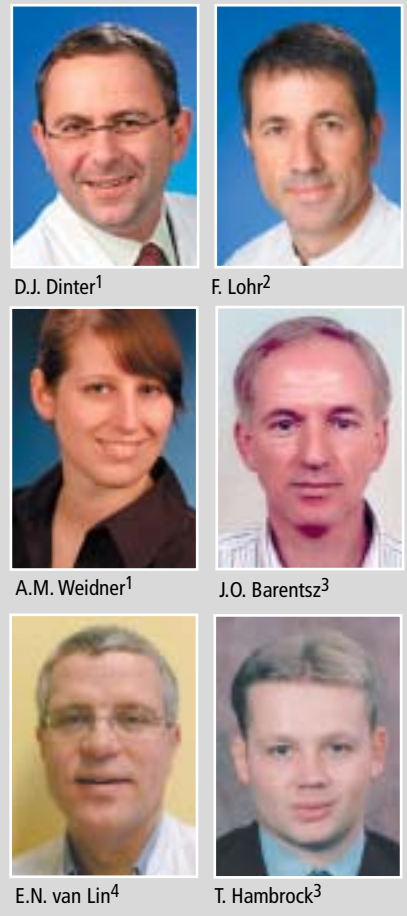
Currently, the extension of radiation fields depends on the risk for lymph node metastasis. This risk is calculated according to the Roach formula. Patients at low risk (<15%) undergo irradiation of the prostate only, whereas patients with high risk (>15%) may benefit from radiation of the whole pelvis, including the lymph nodes. Moreover, it has been demonstrated that radiation therapy is more effective at a higher dose. This requires an exact delineation of both tumour and metastases. Following this, improved radiation techniques, like intensity-modulated radiation therapy (IMRT), are needed for patients to benefit from the advanced imaging. In a new concept, the 'dominant intraprostatic lesion' (DIL) is irradiated with a higher dose than the rest of the prostate. A similar procedure is planned for the concept of 'MR guided lymph node IMRT' (MGL-IMRT).

Currently, the above-mentioned multimodality MR imaging, as well as the USPIO-MRI for the lymph nodes, is only available at specialised centres and universities. To further assess the value of these techniques, for improvement and routine implementation, a collaboration has been set up between the Departments of Radiology and Radiation Oncology in both, the University Medical Centre St. Radboud, in Nijmegen, and the University Hospital in Mannheim. These two centres will closely work together on MR-imaging of the prostate to perform bi-centre trials and to facilitate further multicentre trials.

In this way the potential of improved prostate imaging to enable a more effective therapy will be optimally explored. As a consequence of this, it is envisioned that disease-free survival of patients with prostate cancer can be prolonged and side-effects and costs caused by not stage adapted treatment can be reduced.

Additionally, we would like to invite you to the newly established transatlantic meeting ACSI, which will take place on 20-21 June 2008 in Mannheim, Germany.

Details: www.mr-pet-ct.com



D.J. Dinter[1] F. Lohr[2]
A.M. Weidner[1] J.O. Barentsz[3]
E.N. van Lin[4] T. Hambrock[3]

Meet the experts

D.J. Dinter[1], J.O. Barentsz[3], F. Lohr[2], E.N. van Lin[4], A.M. Weidner[1], T. Hambrock[3], N. Schnitzer[1], F. Wenz[2], S.O. Schönberg[1]

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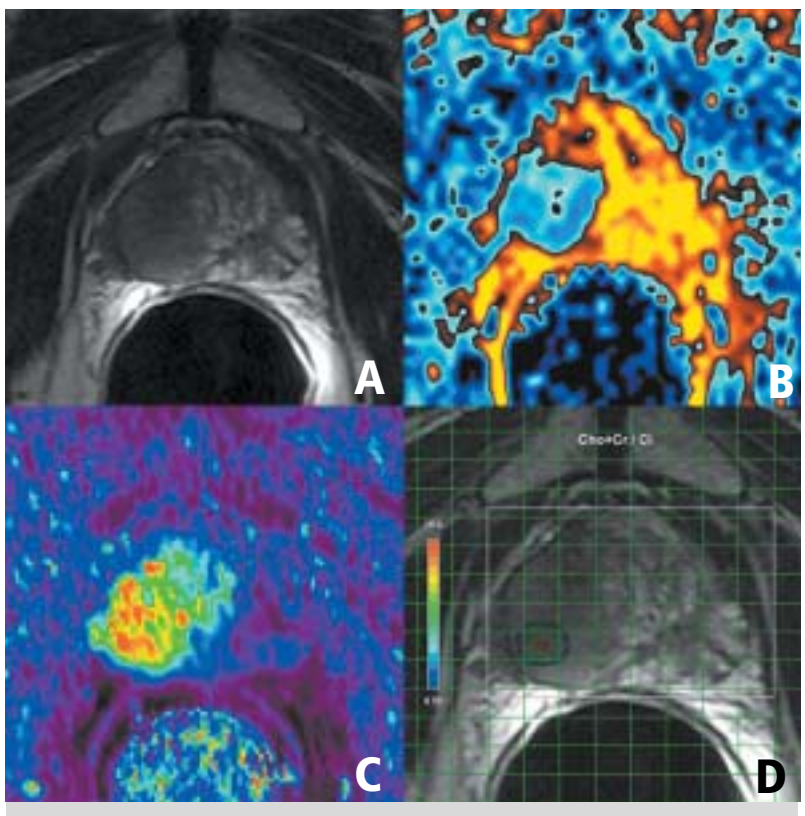
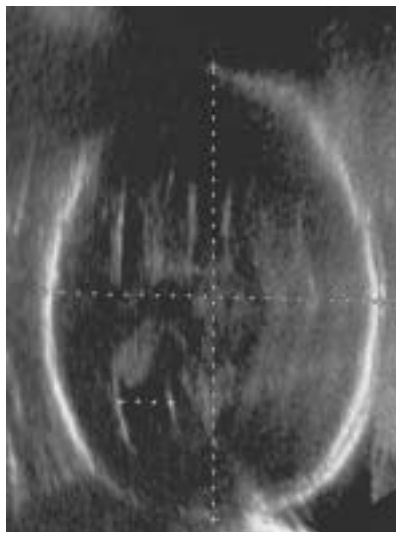
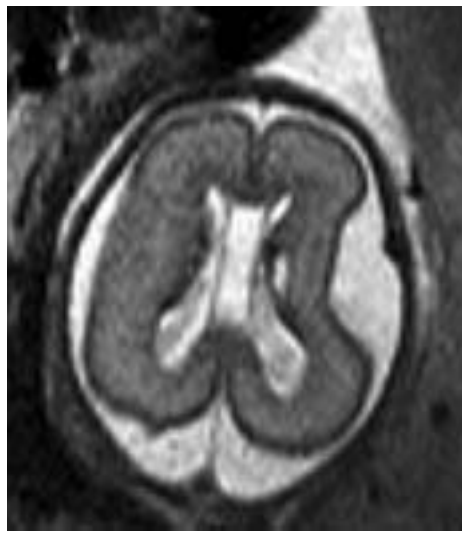
2 *Department of Radiation Oncology, University Hospital Mannheim, Medical Faculty Mannheim, University of Heidelberg, Germany*
3 *Department of Radiology, University Medical Centre Nijmegen, The Netherlands*
4 *Department of Radiation Oncology, University Medical Centre Nijmegen, The Netherlands*



A: T2-weighted axial image of the prostate. In the right central and peripheral zone a hypointense area is visualised, a prostate cancer with extracapsular extension.
B: ADC-map calculated from the diffusion-weighted images showing restriction in the Brownian movement of water molecules within the cancerous area.
C: Parametric map of plasma flow, determined from dynamic contrast enhanced T1 images, obtained after bolus injection of a Gadolinium-based contrast agent. The tumour shows an increased plasma flow.
D: Metabolic map of a chemical shift spectroscopy image showing an increased Choline/Citrate ratio in the central area of the prostate cancer tissue.

High speed MRI devices gain use in foetal evaluation





Left: Survivor of a twin pregnancy, gestational week 25+4, sent to MRI for screening for brain abnormalities after ultrasound examination showing slight asymmetric ventriculomegaly

Right: MRI revealed germinolytic cystic lesions on both sides and an irregular cortical plate on one side, in the occipital region

Cynthia E Keen reports

Magnetic resonance imaging is gaining increasing importance as a second imaging process in prenatal diagnosis in addition to ultrasound examination, according to **Dr Daniela Prayer**, a paediatric radiologist at the University Clinic for Radiological Diagnostics at Vienna University Hospital.

Speaking at a press conference at the ECR, she said that, used in conjunction with 3-D ultrasound and Doppler or colour-Doppler ultrasound, MRI could establish itself as the means by which gynaecological, gastrointestinal, urological and possibly oncological processes in foetuses with potential abnormalities could be imaged. MRI has historically been used when ultrasound examinations were impaired by a lack of amniotic fluid, unfavourable foetus position and/or excessive obesity of the mother. Both ultrasound and MRI are non-invasive, non-radiation emitting diagnostic procedures.

Use of high speed sequences in MRI now enables radiologists to obtain interference-free imaging. Almost all foetal body parts, such as the face, neck, thorax and abdominal organs, as well as the mother's tissue can be reliably and precisely visualized. Brain development can be assessed with almost histological precision. Surplus kidneys can be detected and renal tissue can be superbly visualized. It is also possible to detect intrinsic movements of organs in real time. 'These developments make precise and detailed diagnoses easier,' Dr Prayer explained.

Vienna University Hospital has been using MRI for prenatal diagnostics since 1998. When a foetal abnormality is suspected in an ultrasound examination, MRI is used as an effective additional examination method. About 50% of pregnant women whose foetuses are suspected of having irregularities in the central nervous system and lungs have an MRI performed at Vienna University Hospital. Dr Prayer said that, in Austria, the cost to perform a specialized 3-D ultrasound procedure and an MRI are comparable. 'In comparison with older MRI systems, the high speed systems allow the visualization of moving processes,' she pointed out. 'If a foetus with a stenosis in its oesophagus has problems swallowing amniotic fluid, this can be detected in the gradient echo sequence. This enables obstetricians to plan for possible post-birth surgical procedures.'

Dr Prayer said that the possible risks of an MRI procedure include the warming of the mother and foetus and the fact that the examination may cause stress to both the mother and the foetus. The foetus may also be exposed to vibrations and noise. There is no indication that this causes harm, but this fact has not been ruled out either.

'We believe that the benefit to the mother and her developing foetus is far greater from a clinical perspective than the risks we can identify,' she concluded.

The contrast media controversy

Recently, nephrogenic systemic fibrosis (NSF), a rare kidney disease, has been associated with the administration of gadolinium-containing contrast media, particularly gadodiamide, marketed by GE Healthcare under the name Omniscan.

European Hospital asked **Dr Christoph U. Herborn**, (right) Associate Professor of Radiology and Director of MRI at the Medical Prevention Centre Hamburg (MPCH) at the University Medical Centre Hamburg-Eppendorf, about the possible connection between gadolinium and NSF

Before discussing a possible connection between gadolinium and nephrogenic systemic fibrosis (NSF), Dr Herborn offered a brief background: 'In MRI imaging we use two types of contrast media — paramagnetic and superparamagnetic. Paramagnetic contrast media contain the rare earth Gadolinium, which is also contained in Omniscan. As a disease, NSF was first documented in 1997. It is only found in patients with terminal kidney insufficiency – and surprisingly also in patients undergoing dialysis. The possible connection between contrast media containing gadolinium and NSF was described for the first time in 2006.'

If Omniscan is one of many gadolinium-containing contrast media, why is it the only one being implicated?

'It is undoubtedly related to the data we have available. The data on contrast media and NSF relate to the two contrast media that are mostly in use worldwide. One of these is Omniscan, which has particularly widespread use in the USA – and it's from there that we receive the most data regarding contrast media containing Gadolinium and NSF, because data collation is most advanced in the US. However, in principle all contrast media containing gadolinium bear this risk. As free gadolinium is toxic we build chemical ligands around the gadolinium-ion, called chelate complexes, which make these compounds stable. There are standardised chemical procedures to test this stability. However, we do not know for sure whether the stability or instability respectively of paramagnetic contrast media really does play a role in the development of NSF.

'There have only been about 300 cases of NSF so far. Since 1988 around 200 million people have been injected with contrast media containing gadolinium, and now we have a serious problem — which must not be underestimated — but only in 300 patients. There is no doubt that it is a catastrophe if patients already suffering kidney disease also develop NSF. Despite this, I would advise that this subject should be approached in a scientific rather than an emotional manner. We are not sure how this terrible disease develops and what the actual causes are. In my view there can be no doubt that gadolinium is associated with the development of NSF, be it as a trigger factor or an accelerator or maybe even as the actual underlying cause of the disease.'

How may these findings influence the use of MRI contrast media?

'In the last few years we have been promoting MRI imaging with contrast media because it is well tolerated, the applied doses are relatively small and we have assumed that dialysis filters out the contrast media after the examination. These were clear advantages compared with the X-ray contrast media known to be nephrotoxic. But it looks as if things are not actually that simple. Now we have a problem with patients suffering renal insufficiency who may have been injected with contrast media containing gadolinium for MRI examinations over many years, because we thought that we could carry out MRI imaging with these contrast media without any problems. Not using contrast media at all for these patients cannot be an option. Rather, we should develop guidelines stating, for example, that patients with renal insufficiency from stage IV should ideally not be given gadolinium.

'Even more important: As radiologists, we must emerge from our dark rooms where we carry out the diagnosis and take a closer look at the patients before carrying out examinations. We must not carry out standard procedures along the lines of "*0.3mmol contrast medium per kilogram of body weight for an MR angiography*", but we should evaluate whether certain types of examinations and procedures should be used for certain patients who may be better off having less or no contrast media injected.

'These new procedures do exist: We can, for instance, carry out arterial vascular imaging with steady-state free precession sequences, or whole body and/or organ diffusion imaging where the Brownian motion (molecular movement) is being shown. These are procedures that deliver outstanding results without the use of contrast media. This will not work for all patients, but we should still consider how we can integrate these alternatives into our workflow.

The radiologist should be right next to the equipment and ensure that all high risk patients receive the optimum examination. Not all our patients, of course, are at high risk: 99% of them can be examined with standard procedures. But for our risk patients we definitely have to get out of our dark rooms.

MR Angiography: A future without contrast media?

By **Stefan G Ruehm MD PhD**, Associate Professor of Radiology at the David Geffen School of Medicine, UCLA, California, and Director of Diagnostic Cardiovascular Imaging, CT, UCLA Radiological Sciences

Developments in MRI over the last few years have revolutionized the diagnosis and therapy of cardiovascular diseases. Contrast-enhanced MR angiography has established itself as a non-invasive, standard procedure for the diagnosis of vascular diseases in the thorax, abdomen and periphery. It is characterized by fast acquisition times and lack of invasiveness. The three-dimensional display of data sets is similar to that achieved with conventional angiographic images and radiologists and clinicians are familiar with it. The paramagnetic contrast medium based on Gadolonium (Gd) is normally very well tolerated. Side effects such as allergic reactions are extremely rare. Unlike with iodine containing contrast media, if the maximum dose is adhered to there is no nephrotoxicity

However, the safe image of contrast-enhanced MR examinations has been questioned with recent reports about a link between the systemic and incurable disease nephrogenic systemic fibrosis (NSF) and the administration of contrast media containing Gadolinium. So far the occurrence of the disease appears to be limited to patients with severely limited kidney function. Ironically, it is often patients with increasingly deteriorating kidney function for whom an MR angiography is particularly indicated to eliminate a possible renal artery stenosis. In the past it was quite common for patients to be given twice or even triple the usual dose of contrast medium for this examination. Renal artery stenoses mostly develop because of arteriosclerotic changes. The systemic disease pattern of arteriosclerosis and associated diseases, such as high blood pressure and strokes, often require clarification in several vascular territories for the elimination of vascular pathologies. In the past, whole-body MR angiography was successfully used as an efficient screening procedure. All in all, it would appear sensible to reduce the total dose of contrast media because of the imminent risk of NSF. Whole-body MR angiography offers advantages here. It allows for more efficient use of the dose of contrast media administered compared with conventional protocols limited to a single vascular area. This makes it possible to reduce the amount of contrast media administered compared with the conventional procedure where separate doses of contrast media are injected for the different vascular territories to be displayed.

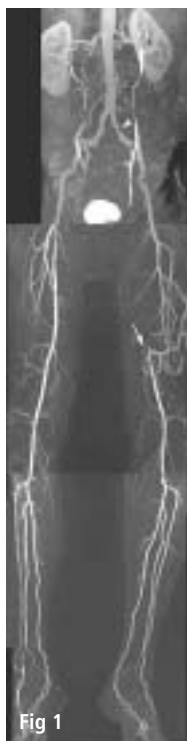


Fig 1

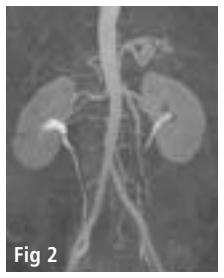


Fig 2

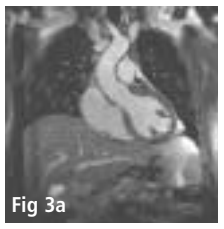


Fig 3a

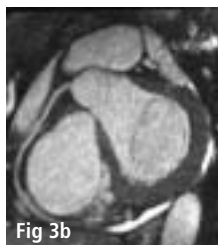


Fig 3b

1. Contrast-enhanced MR angiography (Hybrid protocol) in abdomen and periphery (3T) after bolus injection of only 14 ml Gd-DTPA. Stenoses and occlusion of the left pelvis- and leg vessels
2. Contrast-enhanced MR angiography of the abdomen (3T) after bolus injection of only 7 ml Gd-DTPA (single dose).
3. Navigator SSFP MR-Angiography of the aorta and coronary arteries without injection of contrast media with 1.5T. Image of the Aorta ascendens and the ventricle system without motion artefacts as advantage compared with contrast-enhanced MRI sequences.

Recently published studies have proved that the use of the most up-to-date technology, particularly scanners with higher field strength (3-T), allows a significant reduction of the dose of contrast media required. Studies in our own institute confirmed that the use of the single dose Gd (0.1mmol/kg) definitely allows for combined MR angiography of the abdomen and the lower extremities without any sacrifices in quality (Pic. 1). In the past it was not uncommon to use double or even triple doses. Half an individual dose (0.05mmol/kg) appears diagnostically sufficient for the MR angiography of an individual vascular area (Pic. 2). A further reduction of the Gd dose could be achieved through the use of contrast media with higher relaxivity, such as binding of the Gd complex to albumin.

Despite promising strategies for the reduction of contrast media, examinations completely without contrast media would be desirable, particularly for patients with limited kidney function or for general risk and cost reduction purposes, such as screening protocols. Where in the past, and based on individual indication, native sequences such as Time of Flight (TOF) or PC MR angiography, which are still used today, were only of limited use as an alternative to contrast-enhanced MR angiography procedures because of motion artifacts, saturation effects and prohibitively long acquisition times for large vascular areas, state-free precession (SSFP) sequences are becoming increasingly important as an alternative.

Promising results have been achieved with Navigator SSFP sequences for the screening of high-grade renal artery stenosis, with sensitivities and specificities of 100% and 84% respectively. Our own research has shown that contrast media enhanced MR angiography definitely matches the diagnostic accuracy of SSFP sequences for the detection of pathologies of the aorta and thorax veins. Due to the ECG-synchronous data acquisition, native SSFP-MRI was actually superior to contrast-enhanced MR angiography for the display of the ascending aorta because of the lack of motion artifacts (Pic. 3). Although it is not yet clinically established, SSFP MR angiography currently appears to be the preferred procedure for the display of coronary arteries. However, it does have disadvantages compared with contrast-enhanced MR angiography for the display of smaller vessels. Moreover, the data acquisition times in thorax and abdomen, depending on the spatial resolution desired and other factors, such as breathing rhythm and cooperation of the patient, are often much longer. Additionally, SSFP MR angiography does not deliver functional information such as can be achieved with contrast-enhanced MR angiography with chronological data acquisition during injection of the contrast medium. Despite several limits of the sequence protocols for native MR angiography that are currently available, examinations entirely without Gd-containing contrast media appear to have advantages that must not be misconceived. It seems justified, dependent on the indication for patients with limited kidney function, to primarily use native MR angiography sequences and only to proceed to using contrast media enhanced sequences when the initial results appear unclear.

For patients with normal kidney function, we should weigh up the advantages of the potential gain of additional information resulting from contrast-enhanced examination protocols against the risk reduction achieved through foregoing the administration of contrast media, along with other aspects such as acceptance among patients and cost factors.

Contrast-enhanced MR angiography is sure to retain its outstanding significance in non-invasive vascular diagnostics in the future. However, in the interest of a general cost and risk reduction, careful assessment of individual indication along with selective use of protocols with reduced doses of contrast media or of protocols without contrast media is mandatory.

HYPERPOLARISED HELIUM MRI OF THE LUNGS

Andrea Martini and **Joerg Larsen**, of the Institute for Roentgendiagnostics, Braunschweig Teaching Hospitals, Germany, present an introduction to the pulmonary ventilation and diffusion imaging by MRI

Only few imaging modalities lend themselves to imaging of the lungs. Conventional chest radiography is the most commonly used tool in the investigation of pulmonary pathology but yields the perhaps most difficult, plain radiographs to interpret. Given the inherent density differences in lung parenchyma, computed tomography (CT) permits high contrast resolution in lung imaging, although the assessment of very peripheral airways remains limited. In contrast, scintigraphy techniques allow imaging of ventilation and perfusion, but lack spatial resolution. All of the aforementioned techniques also carry a radiation penalty. However, the possibility to combine imaging of both structure and function in a non-invasive magnetic resonance imaging (MRI) examination, as performed anywhere else in the body, is hindered by the lack of free water, which renders the lungs signal deficient on conventional proton MRI. In addition, the innumerable air-soft tissue interfaces in pulmonary parenchyma do cause considerable susceptibility artefacts.

Nonetheless, while hydrogen is the most frequently imaged nucleus in MRI, due to its great abundance in virtually all other biological tissues, any nucleus with a net nuclear spin may principally be explored by MRI. The non-radioactive noble gas isotopes ^{3}Helium (He) and ^{129}Xenon, for example, may be inhaled and serve as contrast media in the determination of air space distribution within the lungs. While the nuclear density of these gases in their unprocessed state is too low to produce a useful signal, polarisation techniques can increase nuclear spin polarisation by 4-5 orders of magnitude, yielding a proportionally spectacular signal on dedicated MRI examination. This allows fast breath hold imaging and holds the promise of enhanced sensitivity and contrast in pulmonary imaging, a new technique that was first experimentally explored by US researchers in guinea pigs (Middleton H et al., Magn Reson Med 1995;33:271-5).

Polarisation using so-called optical pumping methods produces spin alignments, i.e. the spins of the gas atoms, which act as small dipoles, align into one direction, causing 'macroscopic' magnetisation. Polarisation is transferred from polarised laser light when Helium principally absorbs the polarised light. The resulting gas may be compressed, making it storable in low gradient magnetic fields for several hours (up to six days), also allowing transporting it to remote sites for imaging applications.

MR system requirements for He-lung MR imaging (He-MRI) include a broadband radio-frequency system, such as that used in MR spectroscopy applications and dedicated receiver coils operating at the He-frequency. Owing to the decay characteristics of the polarised gas, as well as the need to consider cardiac pulsation and respiratory motion artefacts, fast low flip-angle (gradient echo) sequences (fast 3-D coronal FLASH, dynamic transverse-axial 2-D FLASH) are employed.

While Xenon has known anaesthetic properties due to its significant solubility in biological tissues, Helium is chemically inert and absorbed only in negligible quantities. No adverse effects have thus been reported with its use.

There are three particular approaches to the use of hyperpolarised helium imaging. First, pulmonary Helium content may simply be quantified, a test that is no different from a gadolinium enhanced MRI- or iodine enhanced CT-scan. The patient inhales the agent and a cross-sectional scan is performed, usually in the axial or coronal planes (see above). The distribution of Helium then equates to the pulmonary ventilation. Second, the diffusion capacity of the lungs may be measured. In a healthy lung, the branching of the bronchial tree results in a reduction in airway size towards the lung periphery. Ultimately, in the alveoli, where gas exchange takes place, diffusion capacity is limited. In contrast, in many chronic pulmonary diseases, such as emphysema, the peripheral airways are widened, resulting in a loss of restricted diffusion, which can be accurately assessed on apparent diffusion coefficient mapping. Finally, polarised Helium degrades when in contact with oxygen, with consequent loss of its MRI signal properties. This fact may be exploited, permitting an indirect measurement of oxygen concentration through repeated scanning in short intervals when signal decrease can be monitored.

Consequently, clinical applications for these techniques are plentiful. Being able to consider the homogeneity of ventilation is priceless in the investigation and management of patients with COPD, asthma as well as cystic fibrosis and other paediatric chronic lung disease in particular. Asthma and COPD are the commonest airway diseases and associated with considerable morbidity and mortality. The desire to consider their progression has long been hampered by the lack of sensitivity of current techniques and further impeded by the need to use ionising radiation. More frequent follow-up examinations, now possible through the introduction of He-MRI, may become integral to the evaluation of new treatment regimes, also permitting post-treatment examinations, even in the very short term e.g. after physiotherapy. The methods may also be useful before and after lung transplantation and in the evaluation prior to volume reducing lung surgery. However, such MRI examinations require patient compliance, consequently making them more difficult to undertake in babies and small children.

In this context, two seminal studies have provided crucial evidence of the worth of MRI using noble gases as contrast agents: Salerno and co-workers could demonstrate that He-MRI correlates with spirometric indexes in patients with established emphysema (Radiology 2001;222:252-60), while Fain et al. have since shown that He-MRI may even detect early emphysematous changes in asymptomatic smokers (Radiology 2006;239:875-83).

Clinical pulmonary function tests provide overall information on lung function, i.e. they consider both lungs together. Current lung imaging suffers limited spatial resolution and carries a radiation penalty. Hyperpolarised Helium MRI is an emerging technique that may overcome these difficulties, a notion that is reflected by a rise in scientific publications on this subject in recent years. However, hyperpolarised gases are not commercially available and produced by only a few centres worldwide. The logistics of production and delivery to imaging sites, together with the costs of agents, therefore limit the general usefulness of the technique for the foreseeable future (Kauczor HU, Br J Radiol 1998;71:701-3). Nonetheless, when these difficulties can be overcome such as recently at Sheffield's Children's Hospital (UK), very considerable benefits are to be gained, specifically for patients with chronic lung disease.

A referenced version of this article is available upon request by contacting J Larsen MD FRCR, Consultant Radiologist, at j.larsen@klinikum-braunschweig.de.

Breaking news... breaking news...

Radiologists are set to gain new control of images

Is this the end of contrast agents?

CMIV has a new patent-pending technology that is set to radically change the way and speed at which radiologists work. The system could produce earlier diagnoses of certain disease, according to scientist **Anders Persson MD PhD**, Director and Member of the Board of the *Centre for Medical Imaging Science and Visualisation* (CMIV), at Linköping University, Sweden. CMIV has worked in close cooperation with the industry-leading PACS supplier Sectra

Meeting with *Meike Lerner* of *European Hospital*, Dr Persson spoke of 'synthetic MRI', new software that enables the radiologist to do a single MR scan without changing scanner settings – and more. 'A lot of MRI control parameters on the scanner – such as repetition time TR, the echo time TE or the application of pre-pulses, can be transferred to the PACS. Usually, a technician sets the scanner parameters and the radiologist has to accept the images he receives. The new software means you can change TR and TE at will, generating any T1 or T2-weighted image, after the actual scan is performed. Even a FLAIR image (FLuid Attenuated Inversion Recovery) or fat suppression can be generated as a post-processing step. All these contrast controls, which are usually on the scanner, are now transferred to the radiologist, so he can check his own best optimal contrast settings. This may save a lot of time, because he will have all his preferred images based on a single scan.'

Showing a whole-head 25-slice scan, he pointed out that it was obtained in just five minutes. The software enables this and the radiologist can use his own personal optimization. 'If he wants to look at T2 weighted images in this way, he gets it this way. It is easy to teach the staff, and you also have only one data set to send,' he pointed out. 'MR imaging usually takes from 30 minutes to an hour. I can't claim I can do an hour in five minutes, but you can probably save quite some time — probably 30%. So, for every three patients now, you could have an extra patient.

The advantage of the technique is that it is based on quantitative values. Each tissue has a characteristic set of MR parameters such as T1 and T2 relaxation and Proton Density (PD). If part of an image contains these values you can directly classify the tissue. On the whole head image he indicated 'healthy' reference numbers for white matter, grey matter and cerebro-spinal fluid (CSF). 'If your measured values correspond to these reference values you can be considered healthy. It may be that the image pixels contain more than one single tissue (partial volume); in that case the measured values should lie on a line in between these reference values. If you are outside these healthy areas you are probably looking at a pathology. Multiple Sclerosis lesions, for example, have completely different values for T1, T2 and PD than any normal brain tissue

Could MS automatically be recognised? 'It is not implemented yet, but you can see that it is more or less easy to calculate the percentage white matter and grey matter, and you can actually get out partial volume and show an image that is tissue specific: an image that contains only white matter or an image that contains only grey matter on a scale of 0-100%. The next step is then, obviously, to take the whole brain and then remove the grey and the white matter and the CSF, then you would only have the disease left. If you are healthy it would be a black image. If not, those areas would show up brightly.'

A volume estimation is also obtainable, he added. 'It is a simple subtraction of the volume of the whole brain minus the healthy areas. What is left is the volume of the pathology. So instead of trying to grey scale the contrast images to find MS lesions, you get real answers that are independent of thresholding or grey scaling.' So the radiologist can make a safer diagnosis? 'You see an absolute match — it's not your eyes or how you set the image to look at. You can get an automatic indication of where the computer found values that are not normal. Of course the radiologist is still needed to decide whether the software was right or not,

> Multi-slice CT scanners will soon provide datasets up to a terabyte for single radiology examinations

but it may save him a lot of time. Especially important is also that if a patient has a uniform change throughout the brain, you cannot know, with a contrast image, what you are looking at. You have the same change everywhere, and so it looks normal again. Using synthetic MRI, however, this change will be found. I suspect if you have a MS patient with normal appearing white matter this technique is better than the conventional method

Could early-stage Alzheimer's be detected in this way? 'We don't know yet. Hopefully, yes. We have started to apply this method on various patients and the results are not yet analysed. Anyhow, here you can see the benefits of MR quantification. You can see in this little window down here that all the tissue – CSF, grey matter and white matter — always end up in the same place. So each tissue has its own characteristic values, the same combination of T1, T2 and PD. Hence it does not float like a normal contrast image. It is just a value that is fixed.'

But what if a radiologist needs to use contrast agents? 'Yes, you could do a scan before and after contrast. That's a possibility. But maybe the scanning is so good that you don't need any contrasting anymore, because you have all the contrast images. Or you could do it before the actual scan. You only take a quantified image after the contrast medium injection, which saves more time.'

Couldn't this destroy the whole contrast agents industry?

'Yes,' he replied.

Adaptability for various MRI scanners

In principle, Dr Persson explained, if a scanner has rapid quantification, the software will be compatible. 'The whole thing is based on quantification. The three MR parameters are T1 and T2 relaxation and proton density PD. Nobody does quantification that well – it is there, but hardly applied because other quantification methods take so much time. That is why everyone reverts to contrast imaging. You make a contrast image and that is the image you get, you can't change it anymore. The whole concept here is that you do this single quantification scan, you know the T1, T2, and PD, then you can calculate how an image would look with certain scanner settings. In principle, it is precisely like a Hounsfield unit on CT, it is really a quantified measure, but in our case we have three outfield units simultaneously, we have T1, T2 and PD.'

Asked what would happen if 1.5T or 3T were in use, he pointed out that more signal would be gained on 3-Tesla: 'That's why it can be even faster. This is a five minute scan for 1.5 Tesla. On a 3-T scanner, it would only take two minutes, after which you have all of the T1- and T2 weighted images.'

During the two-year development of this software a specific implementation was made for cardiac examinations, for the so-called Late Gadolinium Enhancement. This has already been in use for a more than a year. Based on a single scan of 20 seconds LGE images can be generated that cover the complete heart and show any desired inversion delay. Here again, the optimal contrast can be set after the actual scan, full control for the user. 'All the clinicians insist this is fantastic. They said: *We want this*. Because they have control; they light up like, *Wow, of course!* It's really nice. People come from other universities to see it.

Sectra customers will have the option to receive this new software as a plug in. 'Of course, the software needs to match the hospital's particular model. But theoretically there is no problem with any scanner.'

This is not simply new software — it is a completely new tool, he pointed out. Apart from its clinical validation for quantification, progress will now come from learning further uses. 'We are doing a lot of autopsies on corpses. That is our real gold standard for heart examinations. We can do the histology to compare our results. We can save a lot of time that way. It's also good for research, because we can develop and test the software. There is a lot of validation. At this year's ISMRM in Toronto there will be several presentations regarding this new system from CMIV. Although the system is not yet marketed, many people now work with it. Everyone has jumped at this.'

CMIV is running seven projects involving autopsy. As autopsy is forbidden in many countries; additionally many families often do not want their deceased to be touched, there is worldwide demand for this, Dr Persson, who is working to develop virtual autopsy, using this new system. 'We can do this single quantification scan of the person and the study results can be produced an hour later.'

continued on page 14

IN FOCUS: Interventional radiology

30 April - 4 May Berlin, Germany

It's diversified but precise

Along with paediatric radiology, interventional radiology will have a high profile at the 89th German Radiology Congress and 5th Joint Congress with the Austrian Radiology Society. During a discussion with *Meike Lerner* of *European Hospital* congress president **Professor Dierk Vorwerk** (above) outlined what's on the agenda for the expected 6,900 visitors.

Training, he pointed out, will aim at those preparing to specialise in radiology. 'In addition, we'd like to familiarise non-radiologists (e.g. general practitioners) with radiological results.'

International exchange will also be promoted; guests at this year's congress will come from France, Korea and Turkey.

Asked about recent developments in interventional radiology, Prof. Vorwerk observed that the field is split into two areas: vascular and non-vascular intervention. 'In the first, there has been particular progress in therapy for vessels of the lower leg. We can now intervene right down to the ankle. Initially, the problem was how to cover the long distance with a catheter, and also the vessels are very thin there. New developments now allow us to treat these indications with a high rate of success and, as the case may be, prevent amputation.

'Developments in neuro-intervention in the invasive therapy for strokes, where we can significantly reduce the severity of an event, are also worth particular mention. There have always been efforts to keep the damaged brain areas as small as possible, which used to be done exclusively with medication – requiring a certain amount of treatment time. Now, we have mechanical procedures, intravascular and angiographic, to reduce a thrombus. Interventional therapy is usually combined with subsequent lysis therapy. Therefore, we can treat a stroke much faster and, as the case may be, more successfully. All in all these innovations in the vascular field are based on the development of new, more stable and thinner materials,' he concluded.

Interventional oncology

In the non-vascular field, another topic of interest is interventional oncology, which is also partly carried out through the vessels. 'In interventional oncology there is no surgery, or systemic chemotherapy to shrink and destroy a tumour. Currently, this therapy is focused on the liver, but increasingly also on the lungs, kidney and adrenal gland. Tumours on these organs are treated with physical media, with access through the skin. What we mean by physical media are particularly heat and cold; both can destroy tumours. We generate heat through microwaves, but primarily through radiofrequency ablation.

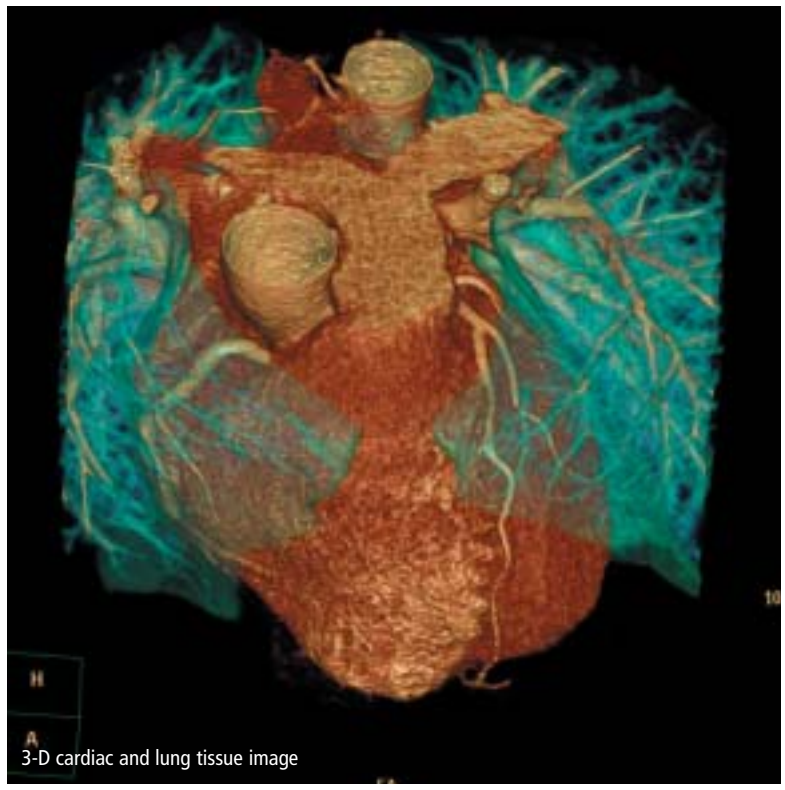
'This treatment can be combined with medical therapy, where small "submarines" take chemotherapeutics to tumour locations, so systemic chemotherapy is not needed, and the effect is exclusively directed at a tumour. We can also treat a tumour radioactively in this way, so that its routes of supply are interrupted and the carcinoma is destroyed through radiation. This is called SIRT therapy, which is now covered by medical insurers.

'With these procedures it remains to be seen how often they can be used and which kinds of tumour should be treated. Several studies are aiming to find answers to these questions.'

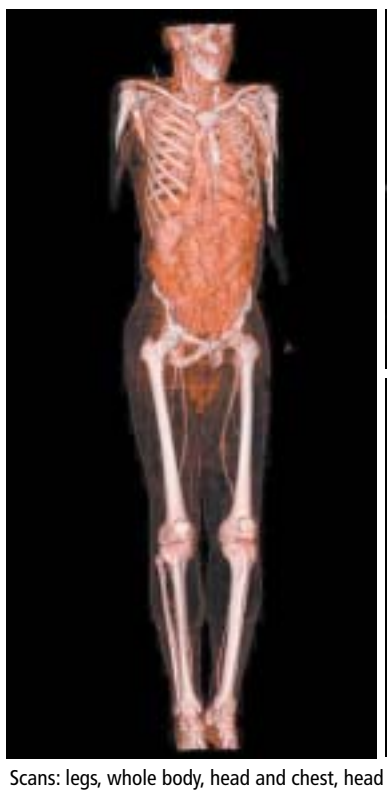
At the congress, the professor said radiologists and vascular surgeons will discuss ways to optimise vascular disease therapies, e.g. by setting up vascular treatment centres. 'As radiologists we see our main task is in the diagnosis of these diseases and in providing minimally invasive therapy. Surgeons undertake difficult vascular surgery, which is becoming increasingly challenging. Vascular surgery must keep up with the increasing demand, and meet it comprehensively. The entire field of interventional radiology will remain exciting and the congress offers a forum where the current state of affairs and future developments will be discussed.'

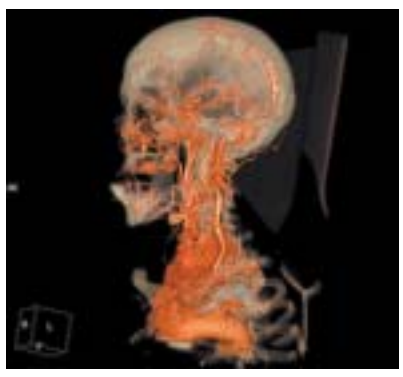
FROM HEAD TO TOE

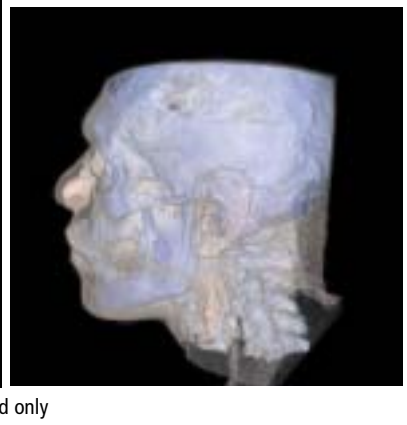
Philips high performance CT opens up new possibilities in diagnostics



3-D cardiac and lung tissue image







Scans: legs, whole body, head and chest, head only

The new Philips 256-slice Brilliance iCT came in to use recently at the University Hospital in Ulm. The system produces quick, high-res scans with 80% less radiation. The pin-sharp images promise new possibilities for cardiac diagnosis and treatment, as well as research into severe cardiac disease. 'We now have state-of-the-art technology that will open up new opportunities in the clinical field as well as in research,' said Professor Hans-Jürgen Brambs.

'The 256-slice will be primarily a cardiac scanner for us,' explained Dr Martin Hofmann, head of the hospital's radiology department. 'Speed and resolution are of equal importance for the quality of examination results. These two components will enable us to achieve fast, reliable diagnoses.'

As the heart moves continuously, an examination scan used to be carried out during the 'quiet' phase, based on ECG readings, which prevented motion artefacts on the images. However, cardiac image acquisition is now so fast that good clinical results at the lowest possible dose can be achieved even at high cardiac rates. In the future, the accurate display of unprecedented details of the coronary vessels will be possible — and it will even be possible to recognise the circulatory phases of the myocardial tissue.

With the Brilliance iCT scanner radiation exposure for the patient is up to 80% lower than with systems used today. This is possible, among other reasons, due to the high speed of the equipment, so the patient is exposed for much shorter periods of time, and because of the highly sensitive detector, which is better able to record image data and can process them at lower doses.

To meet the increasingly complex clinical specifications, Philips engineers completely redesigned the CT platform. This included a novel type of X-ray tube, a specially developed

Radiologists are set to gain new control of images

continued from page 13

This has aroused enormous interest, including the making of a Discovery Channel programme, and visits to the university by all international TV companies. Following a visit to Washington, to present the software to the Bush administration (described as *bringing autopsies to life*) this research has gained a big grant. 'There's worldwide demand for this,' said Dr Persson, 'and it's coming.'

'But imagine if you have your CT and someone says to you: *We are going to skip the Hounsfield unit; we are going to make it into a floating scale that can be anything*. You would be outraged. But really, using MRI it can be anything you are looking at; the images have no absolute value. A lot of people tried to do this, it was really popular in the '80s, but it failed because nothing was fast enough. We have found a method that is fast enough.

'There's already a lot here, but I can't wait to get more,' he continued. 'We want to use it on the spine, the knee and so on. Look at this cardiac sequence from hospital imaging. The healthy myocardium should be black. That means that you have to set your scanner precisely so that it becomes black, which is very difficult; it depends on a patient's weight, how much contrast media you actually put in it, how long you waited between contrast injection and the scan, and so on. So a lot of people struggle to get their inversion time, this parameter, right. With synthetic MRI you can automatically get the optimal inversion time; I just point at the area in the image that I want to be black and the software automatically recalculates the corresponding optimal inversion time that makes it black. Look, I take this little square and I place it somewhere that I want to be black — this is black blood, this is black myocardium. You can see there is a big pathology here, lighting up. This means that, based on a single scan, you always have the optimal result, and you don't have to test your way forward, which is currently the usual case. That is about four or five scans. In our institute we tracked the reduction of examination time and on average it was 7 minutes 45 per patient. And that directly saves money. This is only a very simple application for the heart – and the patient only holds his breath one time. It is also safer, particularly for MRI for children, because their parameters change – particularly if very young. The newborn look completely different than a one year old. It is really hard to optimize your sequences. But with this system, you can do it afterwards, with the brain sequence, for example, and get your optimum settings. And instead of ten different specs, you only have to look at one. It's easier to compare the old study with the new study. So it becomes faster and safer for the patient; you can never forget an image. With the absolute numbers it is easier to compare a patient over time or to send the data to another hospital with completely different software and completely different scanners, and have the same results.'

In clinical use, radiologists have seen patients' examinations double in numbers, which of course, he pointed out, has led them to say they have more work to do. 'But we can also help them a lot by pre-processing. We provide all these numbers and warning images for diseases. If it says zero, all the images were black, for example. If it says 20 percent then you know there's something there. We can even try to code clustering and then try to assign some sort of illness before you actually see the image. There are a lot of possibilities. This is the future. I think we will integrate plug ins, because you should have all of the possibilities to change everything on the PACS viewer, but not change your scanner.'

Sectra's next-generation PACS

Dr Persson divides his time 50-50 between medical and technical research. He is very involved in the development of Sectra's next-generation PACS, IDS7, a web-based PACS system that presents a new way to handle very large data sets. Thanks to a fresh approach in image content and transfer, radiologists can review images in a matter of seconds. This whole solution is built with the data explosion in mind. Even when images eventually reach terabyte-size, only relevant information will be transmitted.

Before this, these large datasets could only be viewed on modality workstations. With Sectra's patent-pending technology transferring the volumes to the usual PACS workstation is no longer an issue. . 'Now, you don't need to "shake hands" with every slice that comes over the network. You do it once, then the whole volume loads. If you want to see the skeleton, you can only pick that up from the archive. It saves a lot of time. We have worked with this for a very long time. The system is being used by several customers, including Telemedicine Clinic in Barcelona and Södertälje Hospital in Sweden.'

** Initiated by Linköpings University, Landstinget i Östergötland and Sectra AB, the multidisciplinary Centre for Medical Image Science and Visualisation (CMIV) conducts research to provide methods and tools to meet future clinical needs in image analysis and visualisation. (http://www.cmiv.liu.se/)*

The new Philips 256-slice CT scanner Brilliance iCT


Hans-Jürgen Brambs Martin Hofmann Gerald Poetzsch

detector and unique, pneumatic suspension technology for the imaging components that rotate around the patient. 'The specifically developed suspension technology can be compared with that used in hovercrafts,' explained Dr Gerald Poetzsch, who heads the CT business sector at Philips. 'This is the only technology that allows the gantry, which weighs several tons, to rotate around the patient four times per second. The resulting centrifugal forces, which affect the individual components, are enormous. At this high speed of rotation, one ton of weight turns into 35 tons – comparable with the weight of a large truck.'

Thanks to the combination of these new developments it is now possible to achieve detailed and clear images of an entire organ within seconds, including those of the heart and brain, and long-term mutations can also be detected at a very early stage. Apart from cardiac examinations, the iCT in Ulm will also be used for clinical research on other organs. 'The combination of morphological, angiographic, dynamic and functional imaging opens up new possibilities,' said Dr Hoffman. 'We hope that the system will facilitate significant progress in the fast diagnosis of strokes and in the highly sensitive detection of internal bleeding in seriously injured accident victims.'

The 89th German Radiology Congress and the Joint Radiology Congress of the German and Austrian Radiological Societies

30 April - 4 May Berlin, Germany

In a pre-congress discussion with *European Hospital*, Joint Congress President **Professor Richard Fotter** (right) explained why paediatric radiology will be a subject of special interest at the event. 'One of the topics will be the fluent transition from paediatric radiology to adult radiology. Due to outstanding medical care, patients with severe and complex congenital diseases now have life expectancies that often go far beyond middle age. This means that adult radiology is confronted with medical issues that differ significantly from the usual issues and diseases in adult radiology,' explained Prof. Fotter. 'The first generation of those children who underwent highly complex corrective heart surgery are now of adult age. They currently make up 80% of patients who present with conditions after Fallot's Tetralogy. Paediatric radiologists therefore do not exclusively care for children and adolescents but also adults, i.e. those with congenital diseases and their secondary complications.

'MRI and CT have become invaluable tools for the follow-up and planning of further corrective surgery, along with ultrasound scanning,' he pointed out. 'As paediatric radiology is familiar with pathology, pathophysiology and corrective surgery, by way of its special qualifications it is increasingly assuming responsibility for the imaging requirements of these adult patients. This means that paediatric radiology needs to be partly redefined. The German Radiology Congress will pick up on this issue of changing definitions and responsibilities.'

Asked what technological advances for paediatric radiology are of particular interest, Prof. Fotter said that it is important to point out that paediatric radiology does not define itself via equipment and technology as is often and increasingly happening in adult radiology. 'Paediatric radiology is defined through the perceived requirements of children and adolescents whose inviolacy is of outstanding importance. New technologies and procedures must be seen as instruments to be used according to requirements. The basis of each use of established or new imaging procedures is optimisation with regards to exposure to radiation and invasiveness. The quality of results must be adapted to the respective medical issue. Ultrasound, MRI, CT and digital imaging procedures are in the foreground of developments. We are at the brink of the clinical introduction of the first 320-slice CTs. The volume acquisition promises significant advantages for the examination of children and adolescents. The acquisition of large volumes with a single rotation will allow us to achieve outstanding image quality and three-dimensional reconstructions of the highest quality with a lower dose compared with Spiral-CT.

'In MRI, apart from whole-body MRI, which is due to be combined with diffusion technology, we need to mention MRI of the heart and the large vessels, foetal MRI and MRI of the urinary tract in the newborn, children and adolescents. The latter will replace nuclear medical procedures in the medium term and will make IV urography and CT examinations, for this purpose, obsolete. We should also mention MRI in children combined with ultrasound procedures, because these provide an almost complete alternative to the invasive DSA [digital subtraction angiography]. However, fMRI to capture addictive behaviour in adolescents with eating disorders, and Advanced MRI for the musculoskeletal system, are also of particular importance. Particular emphasis here is on diffusion- and perfusion imaging for certain diseases such as Perthes disease.'

The remote-controlled table with digital flat panel detector

NEW

Apelem has launched the *BACCARA dRF43* remote controlled table, featuring a fully digital two-in-one flat panel detector. This combines high spatial resolution and fine detail for general radiographic and skeletal examinations and has the capacity to acquire fluoroscopic sequences with a rate of up to 30 frames per second for GI procedures and DSA applications, the manufacturer reports. 'By drawing on our experience in the domain of flat panel detectors, first with the Paladio (world's first full field flat panel detector with dynamic images) and more recently with the Rad Flat Panel detectors featured in our Da Vinci product range, Apelem has developed a full integration of each element included in the *BACCARA dRF 43* system, which greatly reduces the number of steps required to obtain a successful procedure.

All the parameters on both the Magnum generator and the Baccara table are automatically set according to the appropriate examination programme selected from the RIS code.

The system provides real time fluoroscopy, up to 30fps; up to 18 fps in full field fluoroscopy (43 x 43cm); up to 12 fps in radiography; high QDE and extended dynamic (16 bits) detector. In addition, the Thales Pixium detector presents significant dose reduction.

GE's portable ultrasound systems check USA's Olympic athletes

As the opening of the Beijing 2008 Olympic Games nears, the US Olympic Committee (USOC) and the General Electric Company (a Worldwide Partner of the Olympic Games) are running two research programmes aimed at demonstrating that health monitoring and early intervention leads to injury prevention and enhanced health and sports performances for athletes.

These studies are continuations from research at the Torino 2006 Olympic Winter Games. The first is to focus on cardiac clinical research, involving the USA's Olympic athletes and hopefuls in men's rowing and the weightlifting teams. The second will monitor the musculoskeletal health of USA athletes competing in weightlifting, boxing, wrestling and in the Women's National Soccer Team.

'Every day an Olympic athlete spends in rehab is a day lost in training, making earlier injury diagnosis and real-time recovery monitoring crucial for elite performance,' explained Dr Michael Reed, US Olympic Committee Medical Director in the Performance Services Division. 'As a National Olympic Committee, it's important to have the most innovative tools to help predict, diagnose, treat and monitor sports injuries earlier and ensure a quick return to play. It's my belief that GE's ultrasound technology will become a standard tool in healthcare for athletes.'

The Cardiac Research Programme

Led by Malissa Wood, of the Massachusetts General Hospital Heart Centre (MGH) in Boston, the research team is using GE's Vivid i – an advanced, miniaturised cardiovascular ultrasound system – to examine athletes' hearts pre- and post- rowing and weightlifting competitions, to learn more about the function and performance of highly-conditioned hearts.

For Dr Wood, the programme is ongoing; she partnered with the USOC and GE Healthcare to study the hearts of the USA's short track speed skaters for the Olympic Winter Games in Torino. So far, study results have indicated specific changes in heart function that correlate to different levels of training. According to Dr Wood and Dr Michael Picard from MGH, those Torino results proved '…participation by world-class speed skaters in a vigorous training regimen results in cardiovascular anatomic and physiologic adaptations. These changes, including cardiac chamber dilatation, enhanced ventricular diastolic function and attenuated resting right ventricle systolic function, are likely adaptive and allow for more efficient energy use at rest and a robust response to demands of exercise. In other words, these athletes had an enlargement of the cavities of the heart and better function of the heart compared with others of the same age and gender.'

To confirm Torino results, the current research programme will study athletes from the traditionally recognised high-intensity sports, and compare differences in heart function and energy use with endurance athletes, as well as from the general population.

Focus: point-of-injury diagnosis

The second clinical study, led by Drs. Marnix T van Holsbeeck, Tony Bouffard and Scott A. Dulchavsky of Henry Ford Hospital in Detroit, Mich., centres on improving the overall musculoskeletal health of athletes on the field.

The research will focus on hip, shoulder, ankle and knee regions and, similar to efforts in Torino (US women's hockey team) they will investigate whether taking healthy baseline scans of athletes helps to determine the extent of future sports injuries, quicker and more precisely. For the Beijing Olympics, the Henry Ford investigators want to assess whether changes in ligaments, cartilage and muscle seen before the Games may have an effect on the athletes performances during the Olympics.

According to Dr van Holsbeeck, ultrasound can highlight problems with structure and mobility of tissues that no other examination technique can show. The researchers are using GE's LOGIQ i, a lightweight, portable ultrasound system that enables real-time diagnosis. Designed for a modern, all-digital healthcare environment, LOGIQ i allows shared information for consultation and electronic archiving. 'Having a tool that can accurately and immediately determine the severity of an injury gives the sports physician the ability to determine if an athlete can continue to compete in time critical situations. It also can be used to guide training and rehabilitation after injuries,' Dr Dulchavsky pointed out. 'This study empowers athletes and doctors to take a proactive approach with their health, potentially preventing injuries before they even occur. Our ability to use this technology, and to stream the images across the World using the Internet, will be an extremely valuable tool in expanding healthcare capabilities not only during the Olympic Games, but to communities everywhere,' he added.

Initial results from both clinical studies are expected around the opening of the Beijing Olympics. GE also expects to conduct similar athlete research programmes in other countries.

Further details:
www.usolympicteam.com;
www.gehealthcare.com

Cardiology 'must be evidence-based' says ACC

The emphasis is on 'wiser healthcare spending'

Ian Mason reports from Chicago

Research by European cardiologists featured in presentations at this year's American College of Cardiology (ACC) meeting, held in Chicago. Many speakers gave a message equally relevant on both sides of the Atlantic: the need for wiser spending of healthcare budgets.

The ACC keynote opening session set the tone with a snipe at the blockbuster drug Vytorin (ezetimibe/simvastatin). An ACC expert panel recommended that Vytorin should be used only after other cholesterol-lowering drugs have failed. The ACC's broadside followed disappointing results from the ENHANCE study in which the addition of ezetimibe to simvastatin did not slow progression of atherosclerosis.

The take home message was simple: 'We need to turn back to statins,' said **Dr Harlan Krumholz**, Yale University School of Medicine, who argued that ENHANCE should change clinical practice by encouraging physicians to return to evidence-based medicine – which for him meant more use of statins and less use of ezetimibe.

Elsewhere at the ACC meeting positive evidence was forthcoming; results from the ONTARGET study add the angiotensin II receptor blocker telmisartan (Micardis) to the growing list of cardiovascular drugs with hard clinical end-point data.

Lead investigator **Professor Salim Yusuf**, McMaster University, Hamilton, Canada, said the results showed telmisartan (80mg/day) to be as effective as the 'gold standard' ACE inhibitor ramipril (10mg/day) in reducing the risk of cardiovascular death, myocardial infarction, stroke, and hospitalisation for congestive heart failure in the high risk population studied (over 55 years with coronary heart disease or diabetes).

ONTARGET also examined whether combining telmisartan with ramipril was superior to ramipril alone. Despite the combination lowering blood pressure more than ramipril, there was no additional benefit on the primary end-point, and a higher rate of hypotension-related side effects with the combination.

Treat elderly hypertensives

The Hypertension in the Very Elderly (HYVET) Trial gave a clear answer to the question of whether very elderly people with hypertension can expect the same benefits from blood pressure lowering as younger patients. Treatment with indapamide sustained release (SR) 1.5mg reduced deaths by 21%, fatal strokes by 64% and cardiovascular events by 34%. Lead Investigator **Professor Christopher Bulpitt**, Imperial College London said the results were good news in light of the growing numbers of people living beyond 80.

'Elderly individuals with sustained systolic blood pressures of 160 mmHg or more should now be appropriately assessed and treated in accordance with the new findings,' said **Dr Nigel Beckett**, the trial coordinator at Imperial College London.

There was further good news for elderly cardiac patients from a study by **Dr Nicolas Mansencal** and colleagues, Hôpital Universitaire Ambroise Paré, Boulogne, France. Their ten year study of patients aged 80 plus referred to a cath-lab for acute myocardial infarction (MI) showed that although these patients had an early increased risk of mortality, once this acute phase had passed, prognosis at one year was excellent and was comparable with younger patients (Abstract: 1024-78).

Hospital night shift risk to cardiac patients

The hospital night shift may be hazardous for coronary patients, according to a study of 1,650 patients in seven European countries performed by **Dr Zbigniew Siudak** and colleagues Department of Interventional Cardiology, Krakow, Poland. Their results showed that STelevation myocardial infarction (STEMI) patients treated by primary percutaneous coronary intervention (PPCI) during night hours were less likely to survive compared with identical patients treated during the day shift. Night shift admission was an independent predictor of in-hospital death in multivariate regression analysis model (OR 1.47, 95%CI 1.11-1.94, p=0.007) (Abstract: 1017-54).

Trends in the use of drug eluting stents

The publication of data about risk of late stent thrombosis associated with drug eluting stents (DES) and associated guidance from NICE (National Institute for Health and Clinical Excellence) has led to a significant fall in the use of DES in the UK, according to a study reported by **Dr Sunil Nadar** and colleagues Gregory Lip City Hospital, Birmingham, UK. However use of DES remains high for complicated lesions such as birfurcation lesions, and chronic total occlusions (Abstract: 1026-143).

Further reports from the ACC 57th Scientific Session . . . . . .

A five-year study of 516 participants with coronary artery disease showed that patients who reduced their anxiety levels or kept them steady were 60% less likely to have a heart attack or die compared with those who had increased anxiety levels.

The association between anxiety and heart attack remained after adjusting for other risk factors, such as age, gender, smoking, hypertension, diabetes, body mass and cholesterol, according to **Yinong Young-Xu PhD**, of the Lown Cardiovascular Research Foundation, Brookline, Mass. 'Pay attention to your emotional well-being. If you are having anxiety or depression, get treatment,' he stressed.

Another trial found that smoking is the greatest predictor of recurrent cardiac events. Young heart attack victims who continue to smoke are three times more likely to have a second heart attack as those who quit smoking, said John Lekakis MD, of the University General Hospital Attikon, in Athens, Greece.

The study of 135 patients under 35 years showed that ejection fraction and smoking were equal risk factors. 95% of the subjects were smokers. Of those, 50% continued to smoke after the first heart attack while the other 50% quit smoking. In the first group, 50% then had a second heart attack. Of those who quit, only 18% suffered a second heart attack. 'The persistence of smoking is the most powerful predictor of a heart attack,' Dr Lekakis said.

Other research shows that men are at greater risk than women for cardiovascular problems. That difference disappears when the subjects are morbidly obese, noted **Luigi Biasucci MD**, of the Catholic University in Rome.

A study of 71 healthy patients with no signs of diabetes or heart disease divided the subjects into two groups. Group 1 involved 48 patients with a body mass index (BMI) of 20 to 39.9. Group 2 had 23 obese patients with a BMI of 40. In group 1, carotid plaques and hypertension were significantly lower in females than in males. In group 2, no significant differences were found.

Vascular protection device evaluated

The Society of Cardiovascular Angiography and Intervention (SCAI) were holding its Annual Scientific Session in conjunction with the ACC congress. The late breaking clinical trials sessions presented studies related to acute myocardial infarction and percutaneous coronary intervention (PCI).

The Angioplasty Balloon-Associated Coronary Debris and the EZ FilterWire (A-F) study evaluated the use of a vascular protection device during PCI among patients with no ST-elevation acute coronary syndromes at high risk for embolisation. In this study, the use of the filter during PCI was not associated with any differences in in-hospital major adverse coronary events (MACE) or post-procedure markers of myocyte necrosis compared with conventional PCI without the filter.

PCI is associated with myonecrosis in about 25% of patients with acute coronary syndrome. Distal embolism of atherosclerotic plaques or thrombi is a frequent cause, said **Mark Webster MD**, from the cardiac catheterisation lab at Auckland City Hospital, New Zealand.

The high-risk clinical features of the patients included elevated troponin levels, angina at rest and dynamic ST or T waves. While 42% of the patients had emboli recovered by the device, the use of the filter did not significantly reduce in-hospital MACE (11.7% with the device v. 9.5% for the control group) or myocardial damage.

Several procedural factors are predictors of early stent thrombosis. The most important predictor is residual dissections, said **Stephan Windecker MD**, of Bern University Hospital, Switzerland. Other predictors include bifurcation stenting and longer stent length. Studies indicate that bifurcation stenting is associated with an increased risk of stent thrombosis. 'With each centimetre of stent length the risk of early thrombosis increases twofold to threefold,' he pointed out.

To avoid these procedural problems, he advises avoiding stent overlays because they are associated with increased inflammation. He also suggests using stent platforms that prevent bifurcation and using a variable stent that prevents implanting overly long stents.

Premature discontinuation of antiplatelet therapy is shown to place patients at high risk for stent thrombosis, he said. Deaths were likely to occur within the first 90 days of discontinuation of antiplatelet therapy.

Quality reporting

Young doctors' enthusiasm produces a valuable source of data on cardiac interventions

The German MRI Quality Register resulted from cooperation between the Department of Cardiology (headed by Professor Udo Sechtem) at the Robert Bosch Hospital in Stuttgart and the Elisabeth Hospital in Essen (Headed by Professor Georg Sabin). The Institute of Medical Informatics and Biomathematics at Heidelberg University in Ludwigshafen, collects the data, and **Heiko Mahrholdt MD**, in Stuttgart, and **Oliver Bruder MD**, in Essen, are responsible for keeping the register.

In an interview with *Daniela Zimmermann* of *European Hospital*, Dr Bruder explained that The Institute for Heart Attack Research at Heidelberg University, in Ludwigshafen, supervises cardiac studies all over Europe via a protected, online entry system for all participating centres, and then statistically evaluates all the collected data for the Cardio-MRI Quality Register. 'The main objective is to document who carries out what type of MRI in Germany in cardiology. There are further questions, such as what is the quality like, how safe is the procedure and which therapeutic consequences result from the findings of these examinations. What surprised us quite a lot was that, during the pilot phase, in the first year we already had 15 centres with more than 2,500 patients participating after only one e-mail request. This is remarkable because the number is significantly higher than for registers that are paid for per patient.'

Daniela Zimmermann and Dr Oliver Bruder

Asked who, apart from medical insurers, needs this information, Dr Bruder pointed out that the statutory medical insurers are 'only interested because the MRI working groups are all quite young, very active and very motivated. They are interested in the procedure itself, which is not something that can always be said for other registers. These young doctors enter the information in their spare time, they don't mind doing it. They want to know who carries out MRI, how it is done and what the results are. For instance, we can see how many cardiac catheterisations don't need to be carried out because of MRI diagnostics, and which additional type of diagnosis is required after MRI examinations. And we can also see if anything untoward happens. We work without exposure to radiation but use pharmacological stressors such as MRI contrast media for instance. This is an area where we are particularly interested in the safety aspect. We have realised that the acceptance of the register is high, that the safety is high and that the therapeutic consequences are very comprehensive: only a minority of examinations has no immediate benefit.

'In the second phase of the register we would like to transform the whole project into a prognostic register, having confirmed in phase one that MRI is being used sensibly across Germany. During this second phase we'd like to gain prognostic data and to find out if the clinical path, such as carrying out a stress-MRI, for example, and then not proceeding with a cardiac catheterisation if there are no suspect findings, or to proceed with it if the stress MRI shows up pathological results, is the right way of doing things. We will be able to do this as we should have data about the one-year prognosis by then, and much as with other methods, we should be in a position to gauge whether patients with inconspicuous stress-MRIs have a good prognosis or not. We think they do, but so far we have not been able to confirm this with large numbers of data.

'So the register will ensure that the procedure, which is already

for the *MRI Quality Register*

widespread, will be established within clinical routine even further. We will be able to deliver relevant data regarding safety. If, thanks to industry, we can increase the number of patients captured by the register to 10,000 and can then confirm that 9,000 of these had inconspicuous stress-MRI results with an excellent prognosis, this would be a clear reason why these patients should not have to undergo cardiac catheterisation. However, these data are currently not available for any of these examinations. Achieving this would constitute a real milestone, something that we have all been waiting for — and this can only be achieved through multi-centre studies, or registers, because they deliver the numbers and registers deliver the objectivity, because they are taken straight from daily, clinical experience.

'The results will have an impact on medical insurers, and others, but mainly on hospital management and on clinical pathways. This procedure is not so catchy and cannot be described with statements such as '*We will carry out fewer cardiac catheterisations*' or '*We have a machine that replaces all this*'. What we can say is that we have a system that can excellently carry out risk-stratification and can steer patients away from, or to, cardiac catheterisation in a much more controlled manner.'

For MRI, he said, from a scientific viewpoint they are mainly interested in two procedures: late enhancement, which can show the accumulation of contrast media within scar tissue of the myocardium. First studies have shown that imaging this scar tissue – possible in this way and with this type of spatial solution only with MRI – is far superior to other prognosis parameters, such as heart muscle function and impairments of myocardial wall motility. This is one aspect that we can now demonstrate on a grand scale: a scar is more important than function and is an independent prognostic parameter.'

The second interest is in ischaemic diagnostics using the stress-MRI. 'What we can show is that inconspicuous stress-MRI results constitute a good prognosis, and that those patients don't really need cardiac catheterisation, because their life expectancy is the same as for those with a healthy heart. Nuclear medicine has problems with radiation exposure; there is prognostic data for many patients from registers, which show what we are now trying to prove with MRI. But we can then offer a procedure that doesn't involve exposure to radiation, which we can repeat however often we want, without endangering the patient. This is a very important point. Also, nuclear medicine works with a spatial solution that is 30 to 40 times worse than ours. We are interested in the hard facts regarding circulation. What is the prognosis after one year – are there problems with circulation, yes or no. Is there a scar – yes or no. Large/small scar – yes or no.

These are very simple questions. But the difference is whether you are looking at 5,000 patients or just 100. This is the point. The register, unlike a study, shows *real world* conditions. Everyone is included, whether they are comparative or not. Most studies state something like, patients under the age of so-and-so, or over the age of so-and-so were excluded, obese patients were excluded, women are often excluded when studies involve radiation exposure and in the end conclusions are drawn for the general public from a very restricted pool of study participants. Registers are different, amongst other reasons because they are more objective and because there isn't anyone looking for and/or trying to engineer particular data. They are simply about total numbers. And it seems to be working, seeing how young doctors have enthusiastically got to work on it.'

First Czech heart/lung transplant

The Czech Republic's first cardiac transplant took place in 1984; now about 40 take place annually. The country's first lung transplants began ten years ago; to date around a hundred have been performed by Professor Pavel Pafko and colleagues at the Motol Faculty Hospital, in Prague.

Last November, Professor Jan Pirk and team, at the Institute of Clinical and Experimental Medicine (IKEM) in Prague, performed the country's first successful heart/lung transplant.

The 49-year-old female patient suffered serious lung damage due to an inherited heart disorder. By 2000, a heart/lung transplant was necessary — but not possible in the CR.

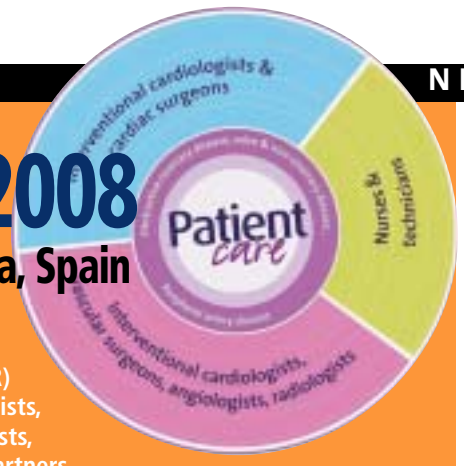
At the end of last year, due to extensive cooperation between Austrian specialists, IKEM and other selected physicians from the Thomayerova hospital, the Czech surgical team was present as residents when the Czech patient received her transplant in Austria. Surgery lasted about eight hours, without unexpected events or complications. Following a two-month in-patient stay, she was discharged in January this year, with advice to restrict visits to public places. She returned to the IKEM cardiac centre for weekly checkups.

At the time of going to press, the IKEM was preparing for its second heart/lung transplant. Estimates indicate that 2-3 patients annually will need this operation in the Czech Republic.

Source: http://www.ikem.cz/www/

EuroPCR 2008

13-14 May, Barcelona, Spain



The European Association for Percutaneous Cardiovascular Interventions Congress (EuroPCR) aims to draw together cardiologists, surgeons, radiologists, angiologists, industry and allied healthcare partners.

During a four-day course, covering coronary, peripheral, valve and non-coronary cardiac disease, cardiothoracic surgery and vascular surgery, cases will be transmitted live from 17 collaborating centres around the world.

The educational sessions will cover 'the fusion of the pedagogic skills of experienced practitioners and input from younger practitioners', the organisers report. 'These highly innovative and interactive sessions are based on a step-by-step decision-making process.' The focus will be on coronary, carotid and patent foramen ovale percutaneous intervention.

Also in the programme will be sessions on tools, techniques or technologies that may make their way into mainstream practice — CTO, bifurcation, new DES and imaging, all again with live case transmission.

DIABETICS AND DRUG-ELUTING STENTS

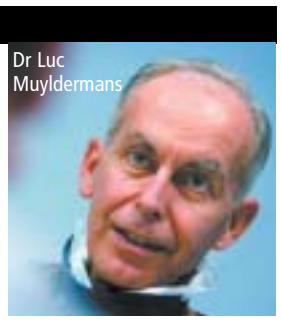
Boston Scientific Corporation has announced results from a pooled analysis of patients from its TAXUS IV and TAXUS V randomised clinical trials to compare the safety and efficacy of the TAXUS Express Paclitaxel-Eluting Coronary Stent System in diabetic versus non-diabetic patients.

The company reports that the results demonstrate that despite the known increased rates of mortality and restenosis for diabetics versus non-diabetics in patients with cardiovascular disease, the TAXUS Stent had comparable levels of late loss and target lesion revascularisation (TLR) across these patient populations. 'The study also showed no significant differences in target vessel revascularisation (TVR), stent thrombosis, or myocardial infarction (MI), after adjustments were made for differences in other baseline characteristics between patients with or without diabetes.' Analysis of the data was presented by Gregg W Stone MD, of the Columbia University Medical Centre, New York, at the SCAI Annual Scientific Sessions in Partnership with the ACC/i2 Summit in Chicago.

The pooled analysis included angiographic outcomes at nine months and clinical outcomes at three years among 338 diabetic patients and 901 non-diabetic patients treated with the TAXUS Stent from the TAXUS IV and V clinical trials. Nine-month angiographic outcomes showed equivalent in-segment late loss (0.27mm vs. 0.31mm, p=0.28) and binary restenosis (14.3% vs. 15.1%, p=0.83) in diabetics and non-diabetics, respectively.

'The TAXUS IV/V diabetic subset data indicated that the TAXUS Stent mitigated the impact of diabetes as a risk factor for restenosis following stenting procedures in the patients studied,' Dr Stone said. 'Diabetic patients treated with TAXUS Stents compared with bare-metal stents had significantly improved event-free survival, particularly important in high-risk patients with diabetes.'

AZ Sint-Jan AV Hospital in Bruges adapts to the new IMPAX Cardiovascular Suite


Dr Luc Muyldermans

Among its many specialties, the 909-bed AZ Sint-Jan AV Hospital in Bruges, Belgium, has a high level of expertise in cardiac catheterisations and electrophysiology.

One year after the installation of the IMPAX Cardiovascular Suite – an IMPAX Cardiovascular PACS and Information Management Solution from Agfa HealthCare, the hospital reports that it has been integrated with most of its information systems, including the HIS and IMPAX RIS/PACS. Next, the hospital will add ECG (electrocardiogram) waveforms to the IMPAX Cardiovascular Solution, which will take all its cardiovascular modalities into one overall solution. 'Another significant improvement to be implemented shortly is the complete automation of departmental stock management and invoice handling. The result will be a complete paper-free Cardiology department.'


AZ Sint-Jan AV Hospital in Bruges, Belgium


The HeartStation ECG management system

The cardiology department at the AZ Sint-Jan AV was reported to have the most technologically advanced equipment in the region. However, Dr Luc Muyldermans, Head of Cardiology, observed: 'Cardiology exams were stored on DVDs. So when clinicians needed to review a case, they had to walk to the storage room, find the right disk and take it back to their workstations. To tackle these storage and distribution problems, we decided to implement a Cardiology Picture Archiving and Communication System (CPACS) and Information Management solution.'

To give the Agfa HealthCare installation specialists the ability to thoroughly test the system, as well as allow the medical staff to get acquainted with it, the implementation was carried out in gradual steps. Early last year the IMPAX Cardiovascular Suite was installed to store images from cardiac catheterisation and angiography, which resulted in a strong efficiency boost. 'Introducing a structured image database makes the administration of images a lot simpler,' Dr Muyldermans now points out, adding that the web-deployment feature of the IMPAX Cardiovascular Suite also results in a better service between this central hospital and referring hospitals.

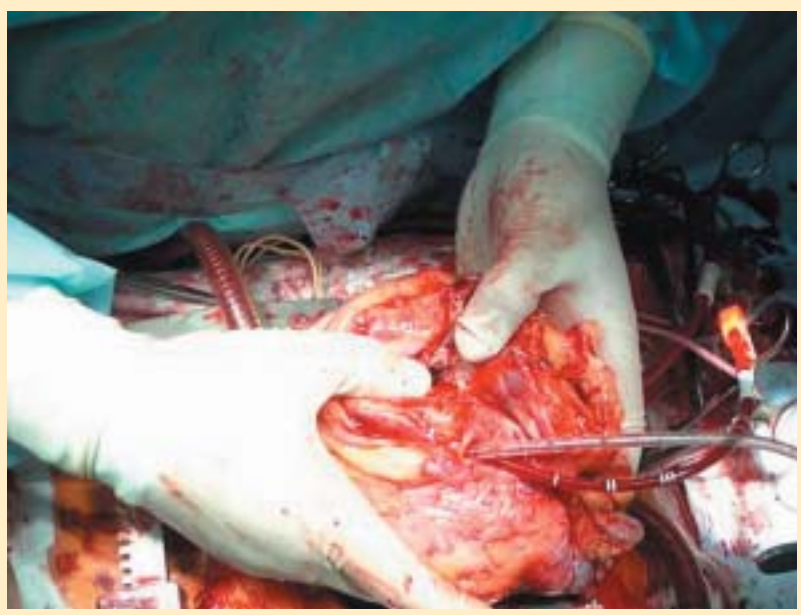
Russian surgeons perform cardiac autotransplantation to treat giant left atrium, severe mitral and tricuspid regurgitation

Arrythmogenic remodelling of the left atrium is a common complication of atrial fibrillation, leading to severe haemodynamic disturbances. Different methods of left atrium walls suture application are widely used as a surgical option for atriomegaly treatment and sinus rhythm recovery. These techniques may also be accomplished by Cox-Maze procedure. Unfortunately, these operations, sometimes, are not effective.

In such cases autotransplantation may be an alternative.

Since 1984, a 60-year-old female had severe thyrotoxic craw and persistent atrial fibrillation. Since 2003, she experienced shortness of breath after minimal physical activity and oedema. In December 2005, the patient was admitted for treatment at the Federal Almazov Centre in Saint-Petersburg, with severe congestive heart failure NYHA class IV. Massive combined therapy decreased NYHA class to III. Echocardiograph data revealed severe mitral, tricuspid regurgitation and dilatation of the cardiac chambers: LA – 106x110 mm, LA volume – 810 ml, LVEDD – 69 mm, LVESD – 38 mm, EF – 75%, mitral valve annulus – 50 mm, tricuspid valve annulus - 48 mm. PA pressure was 68 mmHg.

In May 2006, the patient was selected for cardiac auto-transplantation surgery. The



David Iosseliani, Director of Moscow City Centre of Interventional Cardiology and head of the Russian Scientific Society of Interventional Cardiologists

Kostas Spargias, of the Onassis Heart Centre in Greece

RUSSIAN INTERVENTIONAL CARDIOLOGISTS

REAL EXPERIENCE AND NEW OPPORTUNITIES

By **Olga Ostrovskaya**

The 3rd Russian Congress of Interventional Cardio-angiology, held in Moscow in March, showed a manifold increase in the number of diagnostic and therapeutic endovascular procedures on the heart and vessels; a significant improvement in their quality, and highlighted the opening of new Russian centres providing high-tech medical care.

'We meet every three years to evaluate our real experience and new opportunities,' said Professor David Iosseliani, director of the Moscow City Centre of Interventional Cardiology and head of the Russian Scientific Society of Interventional cardiologists. 'As you know, the new horizons are opening in Russian healthcare. Recently the government decided to create 25 new vascular centres in different Russian regions. This decision was explained by the terrible situation of high death rate (45% mortality caused by acute heart attack) but one that will present a big responsibility for our Russian physicians. Is interventional cardiology the new discipline for Russia yet? This area in cardiology developed very quickly in Russia in the last 10 years, but mainly in Moscow and in Saint-Petersburg. We had 20 centres in two capitals and 20 centres in the rest of Russian regions. Now this situation will be change, I hope.'

The Congress' organisers aimed at a broader introduction of new interventional cardiology achievements into clinical practice and at the establishment of closer contacts with foreign colleagues to reduce a certain isolation of our interventional cardiologists from the rest of the world.

The sphere of problems discussed by congress participants was very big, including the influence of patients' gender on restenoses development after coronary stenting for coronary heart disease; the influence of coronary stent implantation pressure on early and long-term results of percutaneous coronary interventions; the transplantation of allogenic cells to treat dilatational cardiomyopathy; the modern possibilities of helical computer tomography of vessels, and so on.

One of the main plenary lectures of the foreign specialists was devoted to the problem of selection of drug-eluting stents (Dr David Holmes). Cardiologist Kostas Spargias (Onassis Cardiac Surgery Centre, Greece) reported on that very complicated area in the modern cardiology – bifurcation lesion interventions. Most of these vessels (about 8-15% of PCI in leading centres) are complex (type C on ACC/AHA class) and require the use of more devices. He described the use of drug-eluting balloons and their potential in bifurcation.

At the end of the congress, the Russian Scientific Society of Interventional Cardiologists announced new, active Board Members.

Olga Ostrovskaya reports

bypass time was 194 minutes; cross clamp time - 164 minutes. The early postoperative period was stable and without complications.

'This case report demonstrates modern opportunities for surgical remodelling of left atrium,

Surgeon Mike Gordeev

complicated by valve disease. The success of this operation was achieved by all our surgical team, using anaesthesia and bypass guidelines, postoperative intensive care management and adequate surgical technique,' said lead surgeon Mike Gordeev at the Almazov Centre. 'After six months, this type of surgery was implemented here once again. Our team has prepared for auto-transplantation for several years. In my opinion this method is more complicated than usual heart transplantation. That's why we can now organise big heart transplantation in our centre.'

France: Smoking ban lowers cardiac emergency admissions by 15%

Jane McDougall reports

The French Health Authorities announced in February that the smoking ban — which began in February 2007 for communal buildings and work places, and was implemented in January 2008 with effect on bars, restaurants and hotels — has produced striking results.

Professor Bertrand Dautzenberg a thoracic specialist at the Pitié-Salpêtrière Hospital in Paris has followed the effects of the new smoking laws for the French Ministry of Health since November 2006. The project ImETS* measures the effects of passive smoking on health every month. They use 12 parameters, four for each section, to measure changes in the exposure to smoke (E), the evolution of tobacco use (T) and the effects of smoking on health (S). This results in an overall global score known as the ETS_{12} index.

In collaboration with occupational safety and health (médecin de santé du travail) figures have been compiled on the number of workplaces where smoking has been banned effectively from the premises. Since January 2007 the number of workplaces with no smoking has risen from 43 to 86%, interestingly only 75% of hospitals seem able to comply with this law while 98% of offices have succeeded.

The amount of air pollution from fine particles in different public areas is measured every month in exactly the same place. In January 2008 the amount of pollution in bars and restaurants was 75% less than that measured in January 2007.

The effects of passive smoking are calculated from the number of patients seen by the emergency services for myocardial infarction (heart attack) and the number of strokes in people aged 65 or under. The statistics are based on 100,000 admissions from a national panel of 32 large hospitals. Normally the number of admissions for heart attack and stroke in the under 65's follows a seasonal pattern. A clear reduction in the number of myocardial infarction of approximately 15% and for stroke 12% is seen when comparing the numbers in January and February 2008 with those from the two previous years.

That this effect is really due to the introduction of the smoking ban in bars and restaurants will need to be confirmed by follow-up over coming months. Further studies will be carried out all over France to confirm the strong decrease in smoking related deaths over time. However, these figures show a similar tendency to those observed in Italy, Ireland and Scotland when these countries introduced bans on tobacco.

The European Society of Cardiology together with other health institutions continuously informs the public of the overwhelming evidence of the adverse effect of smoking on cardiovascular health. The European Guidelines on CVD prevention warn that smoking is responsible for 50% of all avoidable deaths and that smoking causes heart attacks at any age. The fact that such a rapid improvement in public health can be seen following a smoking ban should encourage other countries to implement their own bans as soon as possible.

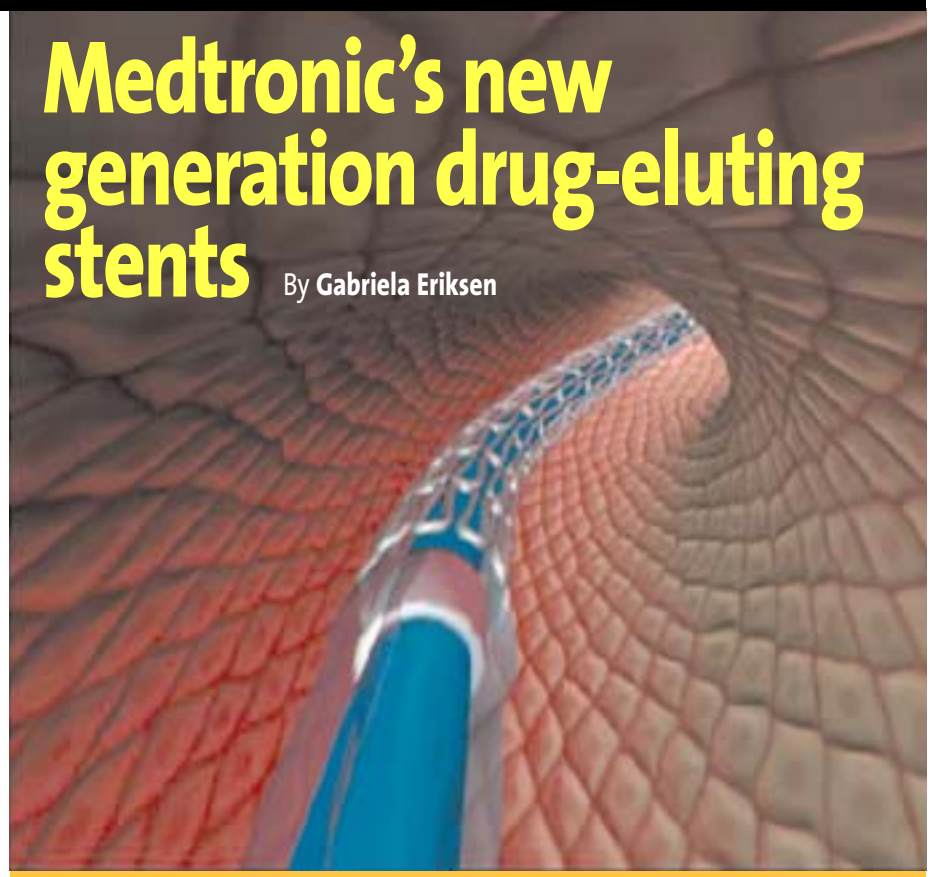
However as a note of caution: the overall sales for cigarettes in France have remained stable since 2005, the new precautions put in place are to protect non-smokers from the effects of passive smoking and have had no affect on the number of smokers. The figures for sales in January 2008 are no different from those in any other year.

The French are still smoking, but outdoors!

** indices mensuels tabagism passif: Exposition Tabagisme Santé*

Medtronic's new generation drug-eluting stents

By **Gabriela Eriksen**



Professor Sigmund Silber

At the German Congress of Cardiology, this March, **Professor Sigmund Silber**, of the Cardiology and Clinical Practice, in Munich, presented results from the Medtronic RESOLUTE clinical trial. The data indicated a low number of adverse cardiac events and no protocol-defined stent thrombosis. The next-generation Medtronic Endeavor Resolute drug-eluting stent system with new BioLinx polymer is designed to address the special needs of patients who have complex medical conditions and is engineered to match the duration of drug delivery with the longer healing duration often required by these patients.

In clinical results at nine months, the Endeavor RESOLUTE trial showed no target lesion revascularisation (TLR), no target vessel revascularisation (TVR) and a major adverse cardiac event (MACE) rate of just 7.0%. Of the trial's 130 patients, 129 (99.2%) received clinical follow-up, and 95 had angiographic follow-up. In-stent late lumen loss, the study's primary endpoint, was 0.22 mm, while in-segment late loss was 0.12 mm. In-stent angiographic binary restenosis (ABR) was 1.0% percent and in-segment ABR was 2.1%.

'What is most impressive about these results is that they occurred in a patient population with complex and challenging characteristics,' said **Professor Ian Meredith**, of Monash Medical Centre and Monash University Melbourne, Australia, who was principal investigator of the trial. He noted that the average lesion length in the RESOLUTE trial was 15.5 mm and nearly 82% of enrolled patients were classified as having challenging B2/C lesions. 'The RESOLUTE trial enrolled a high percentage of patients with lesions that are difficult to treat, including small vessels and long lesions, and these results are extremely promising. Zotarolimus continues to be a very potent drug in preventing restenosis while the new BioLinx polymer appears to be delivering the drug as intended.'

First bio-degradable implants repair cardiac defects in children

The Department for Paediatric Cardiology at the University Medical Centre, at Johannes Gutenberg University, in Mainz, has extended its range of services for lower impact treatment

According to the birth register in Mainz, an annual 1.26% of newborns are diagnosed with congenital heart defects, making these the most common malformation. Left untreated they lead to limited quality of life and shorter life expectancy. Up to a few years ago, the only remedy was complex surgery. However, today many congenital heart defects can be treated with minimally invasive, cardiac catheter technologies, most often with the help of implants. Since 2007, the Paediatric Cardiology Department at the University Medical Centre Mainz, has used the first biologically degradable implant system for this. Advantages result from the gentler, minimally invasive intervention, successful repair of the defect, and then the decomposition of the implant, when, at the same time, the body's natural healing response replaces the material with its own tissue.

Originally, implants available to repair cardiac septum defects were made from non-absorbable materials. Complete embedding into the body's own tissue achieved an occlusive function after only a few months and then made the implant itself redundant. However, as the material cannot degrade and remains in place, it can have side effects for the growing body, such as chronic body irritation, an increased risk of blood clots or even fatigue fractures of the metal parts.

The new implant system is only temporary; following its absorption and incorporation into the tissue, it almost completely disintegrates. This is particularly suitable for children with a small- to-medium-size ASD II (atrial septal defect) and for adults with a PFO (persistent foramen ovale). However, these PFOs are often only discovered when the causes of strokes or migraines are being investigated.

At the paediatric department, congenital heart defects have been treated with catheter technologies for over 10 years. In that period, more than 1,500 of procedures performed have eliminated open heart surgery. This includes defects of the cardiac septum. Over 400 patients underwent a minimum invasive defect repair. Led by **Professor Christoph Kampmann**, head of the department for congenital heart defects at the University's Paediatric Clinic has successfully used the first available, biologically degradable implant system since December 2007.

'For more than 30 years there have been attempts to repair atrial septal defects minimally-invasively with catheter technology. The new implant system is the first that almost entirely degrades following successful repair. This constitutes a breakthrough in the field of cardiac catheter technologies,' Prof. Kampmann pointed out.

Myocardial infarction

The first minutes following reperfusion are decisive


Professor Hans Michael Piper

In his lecture *Focus on new therapy strategies* for heart attacks, **Prof. Hans Michael Piper**, President of this year's Congress of the German Cardiac Society, gave some fascinating insights in to therapeutic measures after heart attacks. It is possible to significantly limit the loss of cardiac tissue after an acute myocardial infarction with the help of a balloon catheter. Restoring the blood supply of the heart muscle paves the way for cell recovery from the acute infarction.

Recent experimental research has shown how important these first minutes after a reperfusion really are: Reperfusion can make cell damage within the undersupplied heart tissue irreversible, which scientists refer to as 'reperfusion damage'.

'There have already been successful, clinical tests with an experimentally developed procedure for the interruption of reperfusion damage where ANP (atrial natriuretic peptide), a hormone naturally produced by the body, is injected. In a further procedure, a series of short, renewed vascular occlusions immediately after the beginning of perfusion have a protective effect on the cardiac tissue,' Prof. Piper explained. After the opening of a previously occluded cardiac vessel, therapy revolves around the importance of keeping it open. Renewed thrombotic occlusion is prevented through inhibiting the clotting. The insertion of stents is then aimed at long-term prevention of new cardiac vasoconstriction.

Further processes in a partly damaged, partly saved and partly healthy heart are then characterised by 'remodelling'. The heart – although circulation has been restored – changes its structure and cell function, which can possibly lead to heart insufficiency. The therapy now required, such as ACE inhibitors, can positively impact the remodelling process and delay the onset of heart insufficiency. However, the objective is to determine the causes of this tissue remodelling to improve therapeutic measures.

'A further important field for therapy after heart attacks is stem cell therapy which aims to regenerate the heart tissue damaged during the acute infarction. Although there have been first reports of the success with different cell types in experimental studies only few have been clinically examined. We will have to invest a lot of energy into the search for the right procedure here,' Prof. Piper concluded.

AT RISK: qualified cardiac research in Germany


Professor Gerd Heusch

At this year's Congress of the German Cardiac Society (DGK) in March, its President **Professor Gerd Heusch** spoke of the increasingly unfavourable conditions for scientific work at German university departments, which is jeopardising the reputation of cardiac research in this country. 'Germany is the worldwide leader regarding research into saving the heart from infarction and repairing it when an infarction has occurred. Important technological innovations — such as coated balloons and absorbable stents — also originated in Germany. However, these achievements were made by a generation of researchers who are now in their 50s and benefited from comprehensive training in the basics of cardiovascular research. However, due to deteriorating conditions at university departments, this type of training is now very rarely offered.'

Research constitutes an additional burden, which is not rewarded with more income. In fact, with the introduction of the W salary scheme, salaries for professors were cut to 80%. The remaining 20% are voluntary, performance-related payments awarded by the 16 Bundesländer (federal states). However, individual states tend to see this as an opportunity to save money, rather than to promote scientific research. 'The result is that a Professor of Cardiovascular Medicine often ends up with the same salary as a teacher,' Prof. Heusch explained. A strike by research assistants at the university hospitals did nothing to change this situation: Although nurses were awarded better pay, remuneration of scientific activities carried out by doctors and scientists was not increased.

Add to this, the fact that German law dictates an upper limit for fixed-term contracts and you have a situation where many experienced scientists who have not quite made it to professor end up leaving universities to seek a future away from research.

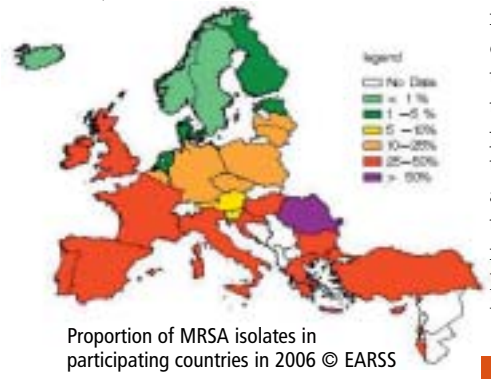
Prof. Heusch concluded: 'It is almost as if the entire system were designed now to destroy the enthusiasm for someone considering entering a scientific career in cardiology as opposed to a purely clinical one.'

Germ-free IT in the operation theatre

Medical PC-Display system with germ killing varnish and no ventilation

Among the major changes to operating theatres (OT) in recent years is the introduction of information technology (IT) equipment.

Dirk Cordt, General Manager for sales and marketing of medical display technology at Totoku Europe, points out, 'The introduction of more IT technology for the operation theatre became the impetus for changes. The first installations involved the use of ordinary PCs and display technology, as used in office environments. However, although products installed should meet the special needs of the OT and intensive care units (ICUs), more than 60% of all PCs used in hygiene-sensitive areas have ventilation holes and slots and a large number of them use active ventilation. The risk of accumulating microbes and dust particles in the computer is very high, and this contaminated dust will be distributed by the expelled air from the machine. As the RKI-Guidelines request plain surfaces and the ability to be disinfected for equipment used inside the OT, this should also be one of the key features for the IT equipment that is to be used in such critical areas.



Proportion of MRSA isolates in participating countries in 2006 © EARSS

'The latest figures from the European Antimicrobial Resistance Surveillance System (EARSS) about the proposition of the Methicillin-resistant Staphylococcus aureus (MRSA) still show the need to avoid any risk of infection inside hospitals,' he adds. 'As keyboards, PCs and displays were initially designed for offices, the use of specially developed products for hospitals is necessary. Many suppliers now offer such products, and the cost of this technology is disproportionate to costs incurred when infected patients must have extended hospital stays.' Although many hospitals are keen to 'keep up' with modern technology, however, many are still not investing in up-to-date hygienic IT equipment, much to their own ultimate cost.

125th German Society of Surgery Congress



Left: DVGC President Ferdinand Köckerling
Right: Congress President Rainer Arbogast

The 125th Congress of the German Society of Surgery and the annual Congress of the German Society of Visceral Surgery (DVGC) in late April, examined the facts behind evidence-based medicine (EbM) under the banner *Surgical Medicine – from Empiricism to Evidence*, and also evaluated current opportunities in hospitals, science and research. 'Is it the implementation of guidelines, the work of the society's study centre, or the network of evidence-based medicine that will move the discipline closer to its objective – the best possible care for patients?' asked Congress President Professor Rainer Arbogast. 'Clinical decision making is a complex, often lonely and intricate task with profound consequences; it can be supported, but not substituted, by randomised, controlled studies (RCT). Moreover, we must remember that the term *evidence* has a very different meaning in continental Europe compared with Scotland, where the talk is of *empirical evidence*.'

The focus of several sessions fell on quality assurance. During an 'hour of the senators', experienced surgeons evaluated training surgeons during their academic studies and in hospitals.

Two important meetings, held jointly with the new Surgical Working Group for Peri-operative Medicine within the German Society of Surgery, focused on peri-operative therapy in surgery.

The European Topic chosen by the DGVC was *The Differentiated Therapy of Rectal Carcinoma*, drew in international experts in the field, some of whom became honorary DGVC members. 'In this area in particular we have gained new findings through prospective and randomised studies that will have an impact on our therapeutic strategies. The sessions on Certification Procedures and Minimum Quantities were closely linked to these topics,' said DGVC President 2007/2008, Professor Ferdinand Köckerling.

CZECH SURGERY NEWS

Rotational artherectomy - Around 33,000 patients are hospitalised annually due to myocardial infarction, but only five percent actually die, thanks to the various state-of-the-art treatments mastered by Czech physicians.

One new addition to their skills is rotational atherectomy, in which a catheter, tipped with a high speed rotating device, is introduced through a blood vessel in the leg or arm to pass on to a blocked artery. The tiny rotating cutting blade rotates at over 160,000 rpm, grinding plaque into minute particles, thus opening an artery that has proved difficult or impossible to treat with conventional techniques. Recently, a team at the Brno Faculty hospital successfully used this minimally invasive approach on a 50-year-old patient, after which balloon angioplasty and stent installation were performed. Following the procedure, patients often can walk within six hours and most are discharged the next day. Now the Brno patient only receives conventional treatment.

Brno Faculty hospital plans to use this procedure annually for around 30 patients from South Moravia, Zlin, and Olomouc counties.

Details: http://www.fnbrno.cz/ and http://www.kardio-cz.cz/

Robot supremacy – Earlier this year, the 100th robot-assisted vascular procedure was performed at Na Homolce hospital in Prague. Specialist medical units abroad have performed about 30 robot-assisted procedures). Since its first performance of this kind in November 2005, the surgical team has gained significant experience, enabling successful surgery on its 100th female patient, whose narrowed pelvic blood vessels inhibited normal blood flow into her leg.

Robotic surgery takes about the same amount of time as a conventional procedure, but as the DaVinci robotic hand is far more precise it enables movements in a limited space and access is through small holes, so healing, recovery and hospital discharge are quicker.

Robot-assisted surgery accounts for between 5-8% of all operations — most frequently an aorta to pelvic artery(-ies) by-pass — whilst aortic and pelvic aneurysms are dreaded most by vascular surgeons.

Details: http://www.homolka.cz/ and http://www.21stoleti.cz/
Reports: Rostislav Kuklik

Manufacturing reusable instruments

The manufacture of reusable instruments needs stringent care to meet constantly increasing processing regulations and also ensure survival in repeated heavy use. 'Quality is what matters most to us,' *Komet Medical* points out, 'especially when it comes to the following points.'

Raw materials: **'Due to experience in the production of reusable instruments since 1923, the manufacturer Gebr. Brasseler has placed great emphasis on high-quality materials. All incoming goods are subject to permanent controls, to ensure the instruments are stable and resistant enough for validated reprocessing cycles and repeated surgical use.'**

Construction: **'In Komet's R&D department the instruments are very critically examined right from the start. It is only under this precondition that we can offer reusable instruments. A good example of the precaution is: The instruments have to be free of corners that might prove hard to reach during reprocessing and that might therefore become a dangerous source of contamination.'**

Durability: **'Only sharp instruments in perfect technical condition pass the final quality control at our headquarters in Lemgo, Germany. The product life of the individual instrument largely depends on the stress it must endure during operations. Careful controls during each validated reprocessing cycle are necessary to confirm the sharpness and reusability of the instruments before the next operation.'**

Product details: Komet Medical, Gebr. Brasseler GmbH & Co. KG E-Mail: info@kometmedical.de www.kometmedical.de

Moscow's medical mighty

Ready and willing to save children worldwide

By **Professor Gennady Souchkevich**, Deputy Director of the Moscow Research and Clinical Institute of Emergency Children's Surgery and Trauma

The Moscow Research and Clinical Institute of Emergency Children's Surgery and Trauma was founded three years ago to provide children with 24-hour treatments for severe brain trauma injury and combined trauma, fractures in various locations, spinal injury, urgent surgery for abdominal cavity diseases, and purulent-inflammatory processes in soft tissues and bones. There are no analogues for this hospital anywhere in the world.

About 60,000 children have consultations and treatments annually at the Institute; 9 000 of these are hospitalised.

The building provides five basic clinical departments: neurotrauma, purulent surgery, trauma, clean surgery, anaesthesiology and resuscitation.

The reception unit has six cubicles and an anti-trauma ward, with separate entrances. Bearing in mind the time factor in emergency cases, critically ill patients are immediately delivered to the anti-trauma ward, which is equipped for resuscitation as well as surgery, having two surgical tables. The equipment also includes ultrasound, electrocardiograph, encephalograph, Doppler and others. Near the anti-trauma ward is a radiological diagnostics department, containing ultra-modern equipment (MRI 3-T, KT, X-ray etc.), as well as an express laboratory and a room for functional and endoscopic diagnostics. A patient is delivered to the resuscitation unit or operating theatre only after his or her condition has been stabilised in the anti-trauma ward.

The anaesthesiology department, resuscitation unit and surgical block are equipped with the most modern systems to monitor patients' vital activities, with breathing and narcosis apparatus. They also have special air-conditioning and ventilation systems.

On the roof of the six-story building is a helipad, where critical patients arrive in a sanitised helicopter. The helipad can receive patients 24/7.

For use in emergencies, the Institution also has back-up electrical and water supply systems.

Children in all wards are under video observation.

Via the IT system, data from X-ray, ultrasound, the laboratory and so on, are transmitted directly to the attending physician's desk.

A group of the Institute's highly qualified physicians has formed a mobile paediatric team that selflessly provides medical care to children in disaster areas all over the world. They have actively treated young victims in Armenia, Georgia, Iran, Egypt, Japan, Turkey, Algeria, Pakistan, Indonesia, Sakhalin, at the train-crash in Cheljabinsk and at military conflicts in Nagorny Karabakh, Ingushetia, North Ossetia, Dagestan, Chechnja, Yugoslavia, Romania, in the Middle East, as well as at the terrorist sites in Nord-Ost (Moscow), Beslan and elsewhere.

Each leading specialist in the Institute is worth writing about. However, I would like to say a few words about our Executive Director and chief, Professor Leonid Roshal. He is a brilliant paediatric surgeon and organiser, and is recognised worldwide as a specialist in disaster medicine. Journalists have called him the 'Children's Doctor of the World'. Prof Roshal is a courageous and fearless man who is always ready to depart immediately to wherever children are involved in disaster and need medical help. While doing this, he never thinks about glory or honours, because he is directed by the conscience of a true citizen of the world.

This is only a brief description of the active life of our medical establishment, which stands at the ready for all the children of the world.

You will find more detailed information about our Institution at our web-site: http://www.mosgorzdrav.ru/niindht

CHILDCARE HELPS WOMEN SURGEONS

Ways to meet the needs of women surgeons who are mothers yet, like their male colleagues, also work night shifts and carry out lengthy procedures, was again discussed at the 125th Congress of the German Society of Surgery (DGCH) in April. 'There is no doubt that there should be a stronger female influence in surgery, which is why the Federal Minister of Family Affairs, Dr Ursula von der Leyen, held an important lecture on this topic, followed by an open discussion,' explained the DGCH President Rainer E J Arbogast MD.

Emphasising the need for a flexible approach to child care, the Murnau Trauma Centre in Germany was mentioned. This has an in-house nursery, where opening hours reflect hospital shifts. Carers look employees for 365 days a year. The scheme has not only increased staff satisfaction but also, said Erwin Kinateder, Administrative Director of the Centre, it has saved on costs. 'This is largely based on the fact that we have lower staff turnover and less time taken off work. In 2004, an in-house study showed that we saved about 82,000 euros.'

Since the nursery opened in 1977 the number of places has increased continuously to reach the 100 available today. From 5.15 a.m. until 9.30 p.m. the carers tend babies from aged eight weeks and children up to ten years old – who not only eat and sleep at the nursery but are also helped with their homework

NEW Safe:Trac A DGU trauma surgery training course

A new trauma surgery training programme has been launched by the German Society of Trauma Surgery (Deutsche Gesellschaft für Unfallchirurgie - DGU).

Aimed at all professions engaged in trauma care, *Safe:Trac* (Safety in Trauma Care) consists of four training modules, the DGU reports. 'It covers patient safety issues from the site of the accident to clinical care. Via the umbrella organisation German Society for Surgery (Deutsche Gesellschaft für Chirurgie - DGCH) the project is being supported by eight professional associations. In addition to the surgery-oriented critical incident reporting system (CIRS), which has already been implemented by DGCH, Safe:Trac is a further major step towards increased patient safety?'

Professor Hartmut Siebert MD, Director General of DGU, added: 'The different interdisciplinary Safe:Trac training modules were developed in cooperation with aviation psychologists and based on the Crew Resource Management seminars for flying staff in Europe. That means the contents comply with the Joint Aviation (JAA*) requirements and were adapted by a team of acute care specialists and psychologists to the specific requirements of the healthcare target groups.'

During training, participants from all professional groups directly involved with patient care, work with case studies to increase awareness of the mechanisms of incident development. Based on this, they can then devise strategies to avoid errors in particularly critical or risky situations, the DGU elucidates. 'This will actively promote and further an interdisciplinary safety culture. The training modules are geared towards the individual participant groups. Practically oriented group and small group exercises, video scenarios and sufficient room for discussion ensure that each topic is covered in detail. Emphasis will be put on the participants' experience in their daily trauma work. The entire team should be trained together if we want a security culture to be promoted and lived in trauma care'.

The training modules include the scientific basics and knowledge on incident development; limitations of human performance and stress management; complications management and error avoidance; situation-adequate awareness; risk assessment and decision-making; communication; leadership/organisation/cooperation (team work); safety culture vs. blaming culture.

DGU trainers are specifically prepared physicians, certified according to the requirements for aviation crew resource management trainers.

OPHTHALMOLOGY

Success for wireless retina implants

Following 12 years of development, German surgeons and technicians have successfully implanted the world's first vision prosthesis in six blind patients. Millions of people suffer *Retinitis pigmentosa*, in which eyesight diminishes continuously as retina cells die, resulting finally in blindness. However, part of the nerve cells usually remains intact, which is where vision prostheses can help.

Led by **Professor Wilfried Mokwa**, engineers at RWTH Aachen University and at the Fraunhofer Institute of Microelectronic Circuits and Systems in Duisburg, developed the vision prosthesis, named EPIRET3 to treat the condition. Today, it is the only system, worldwide, that works wirelessly, i.e. the complete implant is fixed into the eye and needs no connection to external cable links, whereas other retina implants do. This reduces surgery time, simplifies handling and reduces patient stress.

Six patients, all blind for several years, volunteered for the procedure. During a four-week test phase, specialists at the neurophysics group in Philipps University Marburg used various electrical test stimuli to stimulate the patients' retinas. These triggered visual impressions in all the patients, who could distinguish optical patterns.

Following this initial success, the next step is to extend the duration of the implantation and further improve the surgical technology. To ensure patients can find their way around their surroundings the system will have to be linked with a camera that transmits wireless signals to the implant.

Since this system has proved effective and safe in the first patients, several medical technology companies have set up a company to develop a marketable retina implant, which should become available for more patients in a few years. It may also be used to treat advanced, age-related macular degeneration – a commoner eye disease that causes about 50% age-related blindness.

Since 1995, the German Federal Ministry of Education and Research has invested 17.5 million euros to promote the development of vision prostheses. Thomas Rachel, Parliamentary Secretary of State at the Ministry, commented: 'Scientists and technicians have jointly achieved something outstanding. We hope that many blind people will soon reap the benefits of these results.'

A morphological study of gastric polyps performed on a population from Western Romania

By **Ovidiu Cristian Fratila, Adrian Maghiar, Marcel Stoita, Tiberia Ilias, Dana Puscasiu,** of the Clinical County Hospital, University of Oradea, Romania

Dr Ovidiu Cristian Fratila

Gastric polyps (GP) are typically found incidentally, when upper gastrointestinal (GI) endoscopy is performed for an unrelated indication. Gastric polyps are uncommon and have an incidence of less than one percent. Only rarely do they cause symptoms or other clinical signs. Nevertheless, their discovery can be important, because many polyps have malignant potential.

According to recent data, any gastric epithelial polypoid lesion (even <20 mm) should be biopsied or removed, whenever this is considered feasible and safe.

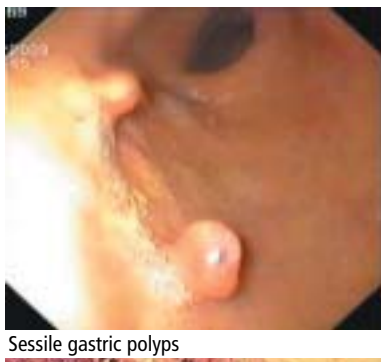
Study aims and methods

We analysed the prevalence, distribution and histological aspects of the removed GP from patients undergoing upper GI endoscopy.

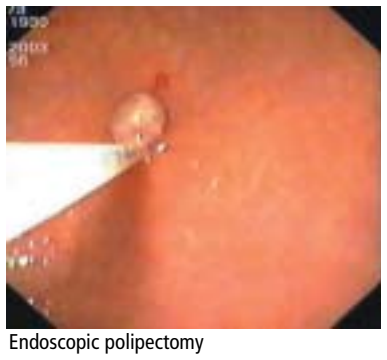
We studied the endoscopic and histological features of gastric polyps (location, multiplicity, presence of dysplasia/adenocarcinoma) resected in Oradea Clinical County Hospital during one year. In this time 929 upper endoscopic examinations were made using an *Olympus Exera CLE145* video endoscope. Every patient had only one examination. Resection was performed applying a Storz 860021 source with cut and coagulation power of 80 and 40 watts, respectively. The following clinical, endoscopic, and histologic features (H&E, modified Romanowsky stain) were evaluated in each patient: age, gender, location of polyp(s), size and type, symptoms, morphological alterations and the presence of gastritis in the surrounding mucosa.

Results and discussions

GPs were found in 16 patients (2.54%), 11 men and five women, aged between 43-76 years. 45% were located in the antrum and 55% in the corpus, no polyps being found in the gastric fundus. The epigastric pain, heartburn and anaemia were observed in 18.7% of the patients. In 11 of 16 patients (68.7%), polyp size was less than 10 mm. Most of the GP were sessile (85%). Hyperplastic polyps, the most frequent histological type of GP reported in literature, accounted for seven cases in our study, followed by inflammatory fibroid polyps (6 cases) and adenomatous polyps in three cases.

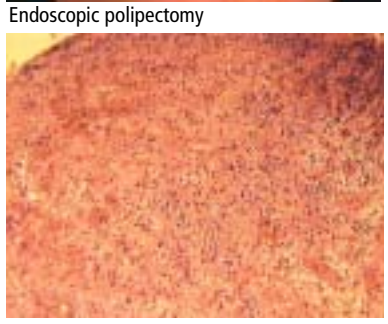


Sessile gastric polyps

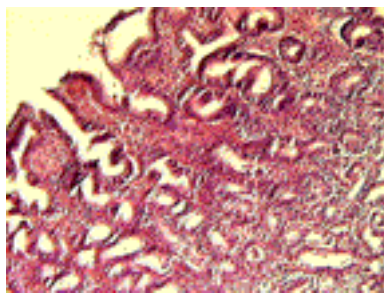


Endoscopic polipectomy

Hyperplastic polyp with distorted or dilated gastric pits, associated with proliferative smooth muscles from muscularis mucosa; stroma is characterised by dilated blood vessels, moderate inflammation (H&E, ob. x10)



Adenomatous sessile gastric polyps made up by proliferative glands with mild epithelial dysplasia (H&E, ob. x10)



Adenomatous sessile gastric polyp made up by proliferative glands with mild epithelial dysplasia (H&E, ob. x10)

Symptoms such as pain, nausea, vomiting were frequent and could not be attributed solely to the polyp, since there were frequently other endoscopic alterations, implying other gastroenterological diseases.

In our study, hyperplastic polyps were more frequent in the antrum, followed by the body, none in the fundus. The risk of developing carcinoma in hyperplastic polyps is low and they are not considered pre-cancerous lesions. Previous reports showed that the risk of focal adenocarcinoma is less than one percent and occasionally greater than one percent.

Histopathological analysis of fundic gastric polyps revealed no alterations, and there was no association between them and stomach adenocarcinoma. Besides, the association between fundic gastric polyps and patients taking longstanding proton-pump inhibitors were not recorded.

There is a strong association between different forms of gastritis and the development of GP, which emphasise the importance of biopsy of nonpolypoidal gastric mucosa during endoscopy. Larger studies are needed.

Conclusions

1. In our population, the prevalence of GP is low (2.54%). 2. Generally, GP are asymptomatic and used to be found during gastroscopy as a lesion lower than 10 millimetres. 3. Most are diagnosed histologically as benign 4. We never observed hyperplastic and adenomatous lesions simultaneously. 5. Larger studies are needed to reveal the association between different forms of gastritis and the development of GP.

SURGICAL TABLES

The 10,000th Alphamaquet

This June, the 10,000th *Alphamaquet* surgical table made by Maquet GmbH of Rastatt, Germany, will be delivered to the department of thoracic surgery at Barmherzigen Brüder Hospital, Regensburg, along with other Maquet medical technology on order.

The Alphamaquet 1150 series of surgical tables provides ten different table tops, and is thus used across the surgical disciplines. It is also used in practically every university

hospital in Germany, the Netherlands, Belgium, Switzerland, Austria and Scandinavia, as well as other leading hospitals in France, Italy and Japan.

Their continuing revisions of design and construction have reflected our changing lifestyles and Western affluence. When first launched in 1995, the load-bearing capacity was sufficient at up to 135 kg. Three years later, the system was oriented to loads of 185 kg and, in a further development, to weights of 225 kg. Today, some surgical patients may have a body weight of up to 360 kg, so these tables are used in centres that specialise in bariatric surgery in many countries.

'Thanks to its consistent and continual further development the Alphamaquet is now regarded as state-of-the-art,' said Maquet's CEO Dr Heribert Ballhaus. 'The system has consistently been amended in line with the changes and rapidly growing needs in surgical techniques — for example the growth in minimally-invasive surgery — and also with the rapid development in medical imaging in X-rays, CT, MR and ultrasound.'

Integration of imaging diagnostics was the last major development, Maquet reports. 'The patient may be transported to diagnostics at any time, i.e. before, during or after an operation. This allows for selective therapies and helps to avoid subsequent surgical intervention.'

The tables have an average service life of 20 to 30 years, and technical improvements can be integrated at any time without problems, explained Dr Dieter Engel, the firm's technical director, adding that the system can also be expanded to include additional components. 'Maquet is a long-term partner for hospitals, and for us partnership means – in addition to 100% reliability – the continual implementation of surgical requirements in our systems.'

Telemedicine for operating theatres

In Genk, Belgium, the Ziekenhuis Oost Limburg hospital simplified surgical workflow by installing a telemedicine system in a newly constructed interdisciplinary surgical wing. Dr Hubert Van der Put, Medical Director of ZOL, recalls its initiation and subsequent success.

For some years, surgeon Dr Kurt Vanderspeeten and ZOL's IT manager Philip Verheye had hoped to install a visual system to support operating theatre workflow, provide access to patient data in a standardised format throughout the hospital, and automatically document and archive data. However, up to 2004, this was a major technical and financial challenge due to the different formats of imaging devices and other data sources. 'Although there had been suggestions about using one solution or another, none of the known solutions were convincing for our individual and complex needs,' Philip Verheye explained.

However, when planning began for a new, 14-ward interdisciplinary surgical wing at the Sint-Jan campus, a working party of members of the medical, IT, finance and administration departments was formed to discuss initial requirements for a central amalgamation of all patient data and imaging results. The main focus was on hospital-wide data availability and documentation. To attain the best possible investment protection, they favoured open, standardised hardware/software interfaces.

From a shortlist of telemedicine providers, *Maquet* won the tender to supply a universally deployable system, having taken into account the best-possible investment protection with a view to the short-term amortisation of the system and the avoidance of later amendments. Significance was attached above all to the system being universally deployable, regardless of manufacturers or a specific discipline.

Every 8-12 weeks during the $2^1/_2$-year project, the working party met with involved companies, e.g. Olympus (endoscopy), Zeiss (microscopy) and MEDA (anaesthesia), to discuss the incorporation of data migration and interfacing with the existing IT. Problem-free access to the Siemens PACS had to be guaranteed, as did local high definition visualisation in the operating theatre. The HIS developed by ZOL was not affected; maintenance/repairs would be carried out by the hospital's software development department.

From a surgical perspective the deployment of the system was to provide the operating theatre team with the best-possible visual support. 'To evaluate a situation we need all the available patient data as the basis for further steps. The possibility to view all of a patient's data immediately saves us lots of time during surgery, because we no longer have to wait for this to be de-archived once a request has been submitted,' said Dr Constantinus Politis, Head of the Oral and Maxillo-Facial Surgery Department. 'At the same time, the operation of the system has to be simple and intuitive for the surgeons and the theatre team.'

In all major projects with lots of participants, success comes from timely planning between every department and company involved

Today, each theatre has at least one high-resolution wall monitor and a flat screen attached to the ceiling unit. Using a touch-screen the individual image sources can be transferred to individual monitors. The system automatically collects patient data from the theatre planning and management tool and clearly allocates each still image or video made during a surgical procedure. For teaching purposes live video images may be broadcast from the theatre over the local IT network to the auditorium.

Discussions within the working party ensured that any changes in their needs, or in technology, would be taken into account in the planning. For example, it was possible to amend the interface and cabling to new HD (high definition) technology for manufacturers' endoscopic camera systems. Analogue camera systems and digital HD systems can be installed in the future without technical changes.

Real-time data exchange

Whereas DVDs were originally planned as data carriers, the disadvantages associated with this format soon became clear. The lack of fully automatic patient allocation and the administration of an ever-increasing media archive would have meant a considerably increased workload for medical personnel. Instead the DICOM format — already tested in radiology — was used. Its added value lies in clear automatic patient allocation and that the existing image viewing solution may also be utilised for theatre imaging. There are no additional costs for the purchase of proprietary archiving and viewing software or for personnel training.

Two electromagnetically shielded theatres proved a challenge for electronic installations. This was resolved by Maquet, which developed and implemented solutions to avoid unwanted electrical fields created by the video line and data cable.

In 2006 came the simultaneous, successful launch of the surgical wing and telemedicine system.

The regular exchange of information and the excellent cooperation between all the project participants played a special role in that success, *Maquet* points out: 'Thanks to the intensive preparation phase with the specialist departments at ZOL and the companies taking part in the project it was possible to avoid all the relevant problems in the implementation. Everyday problems, such as a potential difference of 80 volts between the monitor frame and the floor caused by the wrong cabling on a grounding strip, were quickly identified and rectified through close co-operation between the companies involved. With the choice of a telemedicine provider that exclusively specialises in system solutions for the OR, and also has extensive experience in communications electronics, it was possible to verify additional potential for savings.'

What could have been done better? 'Even more timely planning with all the departments and companies involved, which could have further minimised the communication problems inevitably associated with major projects with a large number of participants.'

conhIT 2008

Held this April in Berlin, this event aims to become an important venue for healthcare IT in Germany. *Guido Gebhardt* reports

From 2004-07, VHitG (Verband der Hersteller von IT-Systemen im Gesundheitswesen) and Messe Frankfurt jointly organised ITeG (IT-Messe und Dialog im Gesundheitswesen). When VhitG moved the event to Berlin, their cooperation ended. Messe Berlin became the new partner of what is now called conhIT. The organisation team, headed by **Jens Naumann**, VhitG chairman, developed an entirely new concept. However, things got off to a bad start. The lobby exuded all the charm of a train station. There were not even chairs to sit on. At the opening session, about 50% of the 600 seats remained empty. Was the move to Berlin and the new partnership really wise? No, poor attendance could not be blamed on a bad event concept nor on the venue. Both Frankfurt (2004-06) and Berlin (2007-08) are within easy reach – and IT is still vital for good hospital management.

Raimund Hosch, CEO of Messe Berlin, emphasised the exchange character of the conhIT concept: Due to the timing of trade fair, congress and academy exhibitors as well as visitors had time to collect and exchange information. Therefore, conhIT could become, as he put it, 'step by step an important event in Europe'.

At the opening session, **Dr Klaus Theo Schröder**, State Secretary with the German Federal Ministry of Health, announced the next roll-out phase for the electronic patient record (EPR). 'In the second half of 2008 we want to deploy card readers, as well as cards, so that we can realise the full potential of the system', he explained.

Peter Waegemann, CEO of the Medical Records Institute in Boston, demonstrated that even the rather unsexy issue of the EPR can be presented with wit and verve. In the USA, he explained, EPRs on a cell phone, or as xml file, and telemedical therapies, or computer-assisted medicine, are a reality. The major goal must be the introduction of computer-controlled therapy support, he added. A physician can no longer exclusively rely on things learned in medical school, or from experience. New medical knowledge springs from a wide variety of sources, 'We have to move away from intuitive treatment to healthcare that is science and computer-based,' he urged. In e-healthcare, doctors and nurses worldwide will have access to patient data. 'Today,' he added, 'this is impossible because we are dealing with data silos that are not networked. We must ensure treatment continuity by offering the EPR.' In the USA, a data standard has been introduced: Continuity of Care Record (CCR). It provides encrypted data sets in xml, which contain data on previous therapies, medication and a list of physicians the patient has seen. A patient can call up his CCR data sets by cell phone and forward them to a physician. 'Sooner or later, we will all have a digital patient companion,' he concluded.

In terms of issues and content, conhIT 2008 struck a high level. So why was there so little interest among healthcare IT professionals? Since neither the venue nor the organisers appear to be the problem, VhitG may want to reconsider its dates. In Germany, a major portion of healthcare IT investments currently go to radiology. In March, ECR (European Congress of Radiology) in Vienna was on the agenda; in May the German Radiology Congress (DRK) will take place. Four weeks later is the Hauptstadtkongress. In 2007, there was also CARS. So, within a few weeks, five healthcare IT congresses were scheduled. Even if the focus of events is different – the targeted users are always identical.

International consolidation

In October 2007, the IBA Health Group — Australia's largest listed specialist health IT company, led by executive chairman and CEO **Gary Cohen** — took over iSoft PLC. In April 2008, IBA appointed **Andrea Fiumicelli** as Chief Operating Officer. Formerly responsible for Agfa's Healthcare IT worldwide R&D and sales/service organisation in Europe, and 20-plus international subsidiaries, he is now based at iSoft's European HQ in Banbury, UK , At conhIT 2008 in Berlin Guido Gebhardt spoke with them about the challenges this new role represents

Andrea Fiumicelli

Gary Cohen

Although much has been done in the last three or four months, iSoft needs to become a stronger global organisation, Gary Cohen emphasised. 'We are now analysing the consolidations of our operations. Until two months ago Germany and Netherlands were two separate organisations, today they are one. Until about three months ago iSoft's international organisations weren't fully amalgamated. Now they are, along with strong systems and procedures. We want to become a quality organisation - whether it is sigma 6 or CMM Level 5.'

'We are setting up IT systems to ensure that, for example, the entire company works on one wide area network, so that we can have VOIP in the whole organisation,' explained Andrea Fiumicelli. We need to have quality systems, so that we do not have multiple support centres in each country. Currently, we have over 200 products to support globally. We need to reduce these to about 20 or 30 products, so perhaps then we will need only two or three support centres worldwide.

'We are now rebranding the whole company on iSoft. In Australia, for example, we brand everything under IBA and iSoft. In future, everything will be iSoft. Our sales people must sell every product in the same way as in Europe — in Australia, China or Saudi-Arabia. Globally, iSoft has a good name and reputation, from which we want to benefit.

'There are few key themes, that the healthcare providers either public or private in Europe will need to address in the next three to five years,' Andrea Fiumicelli continued. One definitely is the continuum of care, he pointed out. 'An efficient, economical healthcare system must address connectivity and interoperability between primary, secondary and tertiary care. Through the creation and implementation of processes that will require IP-solutions, efficiency in healthcare systems will increase.' Next comes chronic disease management, he said. 'Today 75-80% of healthcare money in each country is spent on major chronic diseases. We need preventive campaigns to inform people about their risks.'

The third theme, he believes, is quality. 'If you measure healthcare, it is a two or three sigma industry. Well organised companies run a six sigma system to avoid errors. These are three key themes that could change Europe´s healthcare systems.'

Asked what lies in store for iSoft in the near future, Andrea Fiumicelli said: 'IBA will become not just an infrastructure player, but will also be a player that connects and provides an empowering of the consumer. So the consumer can access health records or interact with the healthcare system — whether to order a prescription and get it delivered, or to find healthcare information. IBA will be an essential element in connecting and empowering the consumer. Most importantly, iSoft´s solution Lorenzo already has a medical semantic terminology services engine embedded. This strong know-how was one of the reasons why I joined Gary and IBA.'

Computer assisted radiology & surgery

CARS 2008

The 22nd International Congress and Exhibition
Joint Congress of CAR/ISCAS/CMI/CAD/EuroPACS

25-28 June Barcelona, Spain

By CARS organiser, **Heinz U Lemke PhD**, Visiting Professor for Computer Assisted Surgery, at Leipzig University, and Research Professor of Radiology at the University of Southern California, LA, USA

The International Congress of CARS aims to provide a forum to close the gap between diagnostic and interventional radiology, surgery and informatics and to encourage interdisciplinary research and development activities in an international environment.

To increase the value of health care for the citizens, the focus of the International Congress of CARS is on providing balanced and in-depth information on new diagnostic and therapeutic processes. This includes results from multidisciplinary R&D efforts, providers' experiences, patient outcomes, economic and management considerations, as well as scientific/medical validation results. It can be expected that the resulting awareness by users and providers will speed up the acceptance of CARS into clinical practice.

CARS distinguishes itself most clearly from other congresses in its focus on innovative solutions to image and model guided diagnosis and therapy. Fulfilling modern clinical requirements with R&D excellence is the core value provided in 66 scientific/medical sessions, workshops and tutorials of the CARS 2008 programme.

The main emphasis of the presentations of the CARS Congress is on information technologies in radiology and surgery for clinical application fields, such as:

- Medical Imaging, e.g. CT, MR, US, SPECT, PET, DR, Molecular Imaging, and Virtual Endoscopy
- Image Processing and Display
- Hospital-wide PACS and Telemedicine
- Computer Applications for Neurosurgery, Head and Neck, Orthopaedics, Ear Nose and Throat, Cardiovascular and Thoraco-abdominal Surgery, and Plastic/Reconstructive Surgery
- Image Guided Therapy
- Surgical Robotics and Instrumentation
- Surgical Navigation and Simulation
- CAD for Breast, Prostate, Chest, Colon, Liver, Brain, Skeletal and Vascular Imaging
- Cranial and Maxillofacial Image Guided Surgery
- Surgical Workflow
- Surgical DICOM and IHE
- Digital Operating Room

Altogether, 474 lecture and poster presentations were selected from 662 submissions received from 42 countries. In addition, 90 invited presentations from international experts have been included to provide CARS attendees with the latest developments on advanced methods and technologies for health care. With this level of active participation, which substantially exceeded any expectations, CARS 2008 in Barcelona will provide a highly professional program for the participants.

In addition to the regular sessions of CARS, special events have been included to focus on highly innovative developments which impact the future of health care. Examples are sessions on biomarkers, model-guided therapy and the digital operating room.

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Seven years of lab re-organisation

By **J L Bedini,** head of Hospital Clinic Core Lab, and **A Mira**, manager of the Biomedical Diagnostic Centre

Barcelona, Spain - The Hospital Clinic is a tertiary level University Hospital that provides a broad range of services, from basic healthcare coverage to 550,000 people, to academic and advanced research activities. Hospital Clinic is a leading institution in certain pathologies, being the reference for Spain in different areas.

Ten years ago, we began a project to develop a patient-centred care delivery model: all healthcare departments would be organised better to address patient needs. Named *The Prisma Project*, it resulted in a holistic re-engineering programme with two lines of action. The first goal was to develop a radically innovative organisational model to enable this new care delivery model. Second, identify and execute cross-functional projects that improve healthcare operations and patient care.

The new organisation grouped services and clinical specialties in units based on functional and diagnostic criteria that would enable improved patient care. These units, called Clinical Institutes (or centres for laboratories and imaging former departments) have management and self organisational autonomy and responsibility. Following this model, all laboratories were grouped in a new structure called *Biomedical Diagnostic Centre (BDC)*.

In the context of Prisma, the BDC decided to create a Core Lab, a new laboratory to centralise the higher volume routine and stat testing in clinical chemistry, immunology, haematology, coagulation and microbiology. The Core Lab goal was to drive operational efficiencies without sacrificing scientific knowledge and provide top quality results to the laboratory services. This goal could be achieved by leveraging new technologies and demonstrating superior service to the functional labs that are dependent on our results to provide optimal diagnostics to our physicians.

In 2000, we selected through a public tender, ADVIA LabCell from Siemens Healthcare Diagnostics (formerly Bayer Diagnostics) as our optimal solution. In March 2001, the automation system went live, becoming one of the European pioneers for total laboratory automation.

ADVIA LabCell is the key element organisation, because it manages all samples in the Core Lab for both connected and non-connected analysers (i.e. nephelometer, electrophoresis and so on). The system has been extended several times since its installation seven years ago. This flexibility has been critical to adapt to our changing needs. Nine

analysers are actually connected: two ADVIA 2400 for clinical chemistry, two ADVIA 2120 for haematology, two Stago STA-r for coagulation and three ADVIA Centaur for immunoassay. We also have connected three sample managers (for loading, unloading, complex sorting and total sample archiving) and two centrifuge/decapper modules.

The Core Lab has achieved several benefits through ADVIA LabCell. We have optimised resource utilisation. We have saved eight FTEs that have been relocated in new technologies and research labs. This has been important to increase our revenue by taking high added-value testing. We have obviously reduced the number of analysers and have reduced the space required by over 120 sq/m.

Efficiency and quality have also improved. In 2007, over 5,400,000 results were produced in the Core Lab, representing more than 85% of the BDC total activity. In the last five years, activity has increased over 35%. Due to vendor consolidation and by maximising platform consolidation, reagent costs have decreased, reducing our cost per test by 17%. The overall financial impact has been significant, completing the return of the automation investment in less than five years.

Above: Core Lab
Top right: Dr J L Bedini
Bottom right: A Mira

ADVIA LabCell has delivered other workflow improvements. The system and analysers point-of-space connectivity allow for efficient sample sharing. This means that we can deliver more than 80 different tests from a single serum specimen. No aliquots are needed in the Core Lab. Reducing tubes benefits the patient by minimising the amount of drawn blood, while eliminating aliquots means less waste due to dead volumes, and less waste due to tips and cups required. Overall, it has provided a significant cost reduction by reducing more than 140,000 tubes annually.

After seven years of experience, the design of the Core Lab and the ADVIA LabCell implementation has represented a major opportunity to change the overall Diagnostic Centre organisational model. We have obtained significant financial and quality improvements that ultimately deliver better patient care.

LAB AUTOMATION

FLEXIBILITY IS A KEY TO SUCCESS

The Netherlands - Automating a laboratory is a very individual process with varying demands and needs. In most cases, the new systems have to be matched with existing instrumentation. Thus an intensive exchange between experts and industry is the first step towards the successful installation of automated systems. In March, during the Amsterdam Clinical Automation Conference, organised jointly by the American Association for Clinical Chemistry (AACC), the Association for Clinical Biochemistry (ACB) and the Netherlands Society for Clinical Chemistry and Laboratory Medicine (NVKC) held in The Netherlands, AACC **President Larry A Broussard** spoke with *European Hospital* representative, *Gabriela Eriksen* about the importance of such events for hospitals and companies

The primary goal of the conference, Larry Broussard explained, was to provide participants, such as hospital administrators, laboratory managers and staff, with enough information to make an intelligent decision regarding lab automation. 'That sounds quite straight-forward, but in view of the role the lab plays within hospital organisation, it still is difficult to transfer the right information to the right people. Although the lab provides 70-80% of data used by physicians to make diagnoses, we are seen as the black box of the hospital that produces information by performing tests. There is the perception that these tests can be performed by just anyone if they use the right instruments. However, we are well trained professionals who serve as laboratory directors as well as clinical consultants who help physicians to interpret test results.'

When talking about automating the lab, the ultimate decision makers are often not aware of some of the issues connected with this work, he pointed out. 'If you are going to automate the sample handling, it has to be compatible with the instrumentation that runs the samples. For example, there may be certain instruments and/or specific tests that do not have the accuracy and precision that laboratory professionals consider necessary to produce consistently accurate results. In a nutshell: If you don't want to purchase automated equipment, that forces you to compromise the quality of the test results and therefore that of the diagnoses; much information and interaction is necessary. The decision makers have to meet the lab experts, who need to meet the industry and vice versa. That's why these conferences are so important.

At the conference he observed a need for flexibility; due to new techniques for new tests, the lab is growing

AACC President Larry Broussard

continuously, he pointed out. 'To benefit from an innovation, a primary laboratory requirement is the possibility to integrate new technologies into the current systems. The companies that provide the system must address that aspect.

'Another important topic is logistics, especially sample handling and the proper identification of samples. If we look at laboratory errors, they tend to occur most often in pre-analytical stages, which means sample collecting and handling prior to performing the analysis itself or, in the post-analytical stages, the handling of the results after analysis. So, one of the primary focuses of the laboratory community is to reduce errors in sample or patient identification, for example with RFID solutions,' he emphasised.

Conferences are very effective in finding solutions for such problems, he explained, because they are international and can compare situations worldwide: they may be different countries, but much the same problems occur. 'In some cases we can all learn from each other, because there are some regulations in the USA, or some instrumentation and testing options that are first introduced in Europe, or the other way round and we can share the experiences.'

Clinical biology

IT'S TIME FOR 'EURO COMPATIBILITY'

by **Bernard Gouget**, Senior Counsellor for Public Health at the French Hospital Federation (FHF), representative and Deputy General Secretary International of the SFBC*and EFCC**, and member of the Francophone Federation of Clinical Biology and Laboratory Medicine (FIFBCML)

France - Clinical biology is faced with many internal and external developments, notably advances in medical science, automation, quality assurance, electronic data transmission, and the impact of the European legislation. On St. Valentine's Day, The French Hospital Federation (Gérard Vincent, Chief executive manager) in collaboration of the French Society for Clinical Biology (SFBC; Société Française de Biologie Clinique) organised a meeting on the evolution of hospital biology – a conference that gathered more than 450 participants from the private and public sectors with backgrounds in medicine, engineering, and administration.

Over the past few months, the French Inspector General of Social Affairs released a report highly critical of private-sector medical biology. Consequently, two missions were launched with the aim of initiating reform in French medical biology, and reorganising public sector laboratory medicine. This renewed interest owes nothing to chance, but rather to the heightened awareness of the central role of laboratory medicine as a necessary complement to the evolution of healthcare facilities. In effect, laboratory medicine unites specialties that contribute to medical diagnoses (with the selection and therapeutic follow-up of medication, and of those that have an impact on quality and safety).

One of the major challenges facing our healthcare system today is the system's ability to internalise the scientific developments in which laboratory biology takes a special place, by guaranteeing equal access to healthcare. This access cannot be guaranteed without considering patient information, geographical location, and the requirements of IT and communications. In other aspects of healthcare systems, just as assessing the relevance of med-lab analyses ensures that quality is guaranteed, so does the assessment and just compensation of those who contribute to that achievement. In reviewing Lab medicine, it is thus, in certain ways, that questioning the quality of care provided and the future of the public hospital that determine other developments; developments such as collaboration between hospitals and strategic groups, efficiency, and the emergence of predictive medicine, translational research connecting basic research to patient care, and fostering innovation.

It becomes necessary, then, to reform the 1975 law that governs the terms under which one exercises one's profession to meet the current challenges of quality, competitiveness, financial issues, and to consider a new common legal framework. Quality of healthcare must be guaranteed in the same manner in the private sector and at the hospital, as both sectors should contribute to maintain the permanent provision of healthcare. It is necessary to establish synergies between the private and public sectors, and to build on the strengths of professionals in order to perform, from the start, at a European level.

We have to learn to manage developments efficiently, and to respond to the strong growth of demand for biological diagnoses. One of the common approaches is quality, which requires regulation, as elsewhere in healthcare sector, through the adoption of professional reference and due process, as well as controls by both peers and national authorities. In this sense, the work of the European Federation of Clinical Chemistry on the accreditation of laboratories in Europe makes a strong point for a European quality medical biology provider contributing to this regulatory dynamic balance.

The FHF is contributing to this collective intelligence in defining the most innovative experiments — in putting this issue in a European framework, assessing the capacity of technical platforms to cooperate with other European healthcare networks, making an inventory of the potential, but also preparing the conditions for a successful changeover.

**SFBC : Société française de biologie Clinique*

*** EFCC: European Federation of Clinical Chemistry and Laboratory Medicine*

The modern laboratory information and management system

By **Dr Andreas Bess** (right), Head of IT Consulting at mgm

Germany - Managing a lab for out- and in-patient care involves not only mastering increasing pressures in terms of efficiency and cost-optimisation, but also being au courant with ever evolving clinical issues and state-of-the-art lab technology and procedures. In addition to its core business – providing the foundation for fast and high-quality diagnoses for a wide range of medical disciplines – the modern lab must perform accounting and controlling tasks, from identifying and documenting billable services to generating invoices.

These varied tasks require data processing and data management support that only a sophisticated lab information and management system (LIMS) can offer.

First and foremost, to accommodate several facilities in a lab cluster while ensuring full compliance with privacy and data protection regulations, LIMS architecture must be scalable. It must support different lab disciplines, such as clinical chemistry and endocrinology, haematology and immuno-haematology, microbiology, molecular biology, immunology, virology, toxicology, pharmacology and infection serology down to transfusion serology and blood depot management – to name but a few. Additionally, the system must allow outsourcing certain services to external providers, for highly specialised procedures, for example.

A state-of-the-art LIMS offers order entry by the client. Data are transmitted via an HL7 interface, or a web-based LIMS tool, to the lab where the LIMS ensures that samples and orders are identified properly and that the digital order and samples are linked in a way compliant with all quality assurance and regulatory criteria.

After being logged in, the order is processed. The LIMS supports rule-based review of order-specimen-material and subsequent queuing or assignment to available analysts or teams, according to the individual lab's organisational structure. The LIMS accompanies the order through all stages of workflow and allows tracking of the order along the entire process chain.

Analyses results are recorded and documented in the traditional quantitative forms, as well as in semi- and full qualitative forms and charts and graphs. Today, the ability to record results online, directly from lab instrumentation, is an absolute must. In addition, decentralised equipment for point of care testing (POCT) must be managed by the LIMS, both in terms of recording results and of quality assurance procedures.

Medical validation is supported by a technical validation, which means a staged release process is performed in which the results are tested on the basis of reference tables and plausibility criteria, possibly also in communication with lab instrumentation and the information services provided by the manufacturers of reagents and equipment. Using plausibilities and customisable rules the LIMS generates work sheets and task lists that are assigned to certain staff or physicians.

Efficient communication and transmission of results is a major challenge in a lab with many different clients. A modern LIMS offers a wide range of flexible (and printable) forms and formats that can be transmitted in various ways via different communication standards. Anything, from simple and unstructured test results down the most complex, highly structured and detailed reports that can be imported directly into the client's system, should be possible at the touch of a button. If the LIMS opts for the paper-less approach, and the data are available only in electronic form, certain aspects assume critical importance, such as validity and long-term access to the data, authentication and electronic signature.

All LIMS components are governed by statutory and voluntary quality assurance requirements. QA in a lab environment is a complex process that involves the implementation of national and international regulations, as well as standardised operating procedures (SOP).

The lab components of an LIMS, such as order management and result transmission, are complemented by sophisticated statistical, reporting and accounting functionalities, which include recording of billable services as well as billing itself. The LIMS collects and represents data on all services provided by the lab and generates detailed and itemised invoices that satisfy the requirements of the lab and client. Consequently, the billing and accounting functionalities of an LIMS should be highly flexible and customisable.

The control-oriented functionalities of a LIMS offer comprehensive reporting options for long-term controlling as well as for ad hoc analytical and statistical purposes, and answer both standard and highly individualised queries.

In short: a modern LIMS should ensure fast and cost-effective service while integrating all information flows that serve one overall goal: to control the entire lab – both from a clinical and a business viewpoint – while complying with regulatory and customer requirements.

Details: www.mgm-gmbh.de

Contact: post@mgm-gmbh.de or bess@mgm-gmbh.de

14,000 urologists flock to EAU 2008

Prostate cancer high on the agenda

Nearly 14 000 urologists from 84 countries attended the 23rd Annual congress of the European Association of Urology held in Milan, where changing horizons in the diagnosis and therapy of prostate cancer, a symposium sponsored by Ipsen, underlined the main focus of the entire event.

New biomarkers for PCa were highlighted at the launch of PROCABIO, a joint initiative of the urology department at Erasmus Medical Centre, Rotterdam and the European Randomised Study of Screening for Prostate Cancer (ERSPC). Under the umbrella of the PRIAS study, a joint academic/industrial partnership, PROCABIO focuses on targeted therapy through the development and assessment of biomarkers. New markers to detect and predict the outcome in early prostate cancer are urgently needed. The 'gold standard' biomarker, prostate-specific antigen (PSA), has limited diagnostic specificity and prognostic value. Its use has lead to a sharp decrease in the prevalence of advanced stages of prostate, but it is thought that up to 50% of diagnosed patients, especially those with PSA levels lower than 10 ng/ml, would have been better served by active surveillance than invasive techniques. Exosomes from prostate cancer cells have been identified as potential biomarkers that are isolated from patient's serum to predict, from early stage, the outcome of the disease.

Biomolecular diagnostics of prostate cancer, taking a genetic rather than a proteomic approach suggest, according to Schneider et al. (Dresden) that only four transcript genes may be sufficient for PCa detection in minimal prostate tissue samples.

For more traditional PSA monitoring, Beckman Coulter offers two new WHO-calibrated Access assays that measure total prostate antigen (tPSA) and free (fPSA). Compared with the traditional Hybritech calibrated assays the new assays gave 25% lower values for both tPSA and fPSA. In clinical practice this lower cut-off for tPSA should be considered when using this assay.

Imaging techniques

One Hamburg-based group has a promising new technique for PCa detection that uses ultrasound-based real-time-elastography (HI-RTE, Hitachi Real-time Tissue Elastography). Tested in 67 patients undergoing radical prostatectomy, elastography was shown to have a sensitivity of between 76-90% and a specificity of 68-78% depending on tumour location, with best results at the gland apex. The authors think there is high potential for elastography to improve PCa detection. But whether it can be used for targeted biopsies and is as sensitive as extended biopsy schemes needs to be determined. Results obtained in Innsbruck show that the use of a stiffness-grading system can enhance the PCa detection rate and increase diagnostic accuracy in real-time-elastography.

Prostate cancer treatment

The recovery of erectile function and avoidance of positive surgical margins are competing outcomes of radical, retro pubic prostatectomy. The decision to preserve or resect the neurovascular bundle during the procedure is based on information concerning the presence and location of the extra capsular extension (ECE). Nuremberg researchers have investigated whether dynamic contrast-enhanced endorectal MRI (eMRI) could be used accurately to depict the positions of the structures involved and aid decision-making. Obtaining excellent results, it appears to be a very sensitive pre-operative, clinical staging-method to identify candidates for nerve sparing RP. In patients with satisfactory erectile function, but a high clinical probability of ECE disease, functional eMRI should be included in pre-operative tests and the results acted upon.

An alternative and equally innovative technique was proposed in an American study evaluating multi-photon microscopy with second harmonic generation (SHG) and fluorescence following excitation of tissues for in vivo imaging of the prostate. The procedure provides real-time microscopic details that correlate well with histological findings and may play a greater role in nerve sparing RP in future.

UK medical teams are trying a more personalised approach to operational procedures. Pre-operative MRI data giving the location of the prostate, the surrounding bone and also tumour position, location of blood vessels and nerve bundles is overlaid on the surgeon's video display to aid robot-assisted radical surgery. Treatment options in advanced prostate cancer were not forgotten. Radical retro pubic prostatectomy appears to be the best treatment option with a Gleason score ⩾8. According to a group from Moscow and Emporia, Kansas, nearly 72% of patients remained progression-free for five years post-surgery. Findings from an Italian study endorsed this, showing a higher rate (3-fold greater) of secondary malignancies in patients treated by external–beam radiation therapy rather than RP, without neo- or adjuvant hormonal therapy for localised prostate cancer.

Intra-operative radiotherapy (IORT) for prostate cancer is a relatively new technique whereby high doses of radiotherapy are given during surgical treatment. The volume treated includes the prostate, the seminal vesicles and perioprostatic area and the mean exposure time was 30 minutes. In the so-far tested, small number of patients with locally advanced prostate cancer, the procedure represents an easy, safe alternative, feasible in acceptable surgery time and with minimal toxicity. The procedure was found to be suitable for 96% of cases and 2 year follow-up finds all 28 patients are still alive.

Other News

Bayer Schering Healthcare used the EAU to launch its new range of men's healthcare products; Levitra, Testogel and Nebido, aimed to treat men caught in the cycle between erectile dysfunction, low testosterone and the metabolic syndrome.

The EAU announced several new updates of their guidelines including one on the management of neurogenic lower urinary tract dysfunction (NLUTD), a multi-faceted pathology treatment of which to now had been outside the urological field.

(Downloads: www.uroweb.org/professional-resources/guidelines).
Congress details: http://webcasts.prous.com/EAU2008/.

On the near horizon

Regular patient screening for Phenylketonuria

The first FDA-approved prescription medication that reduces blood phenylalanine (Phe) levels in patients with Phenylketonuria (PKU) — a genetic disorder that prevents the normal use of protein foods and can lead to impaired brain development if untreated — could result in more regular screening of blood phenylalanine (Phe) levels in PKU patients.

Biochrom Ltd, based in Cambridge, UK, reports that it is ready to provide both the necessary screening instrumentation and the PKU diagnostic reagents. 'The Biochrom 30 Physiological is a compact bench-top instrument designed for metabolic disorder screening and research applications. The instrument's Lithium High Performance Columns perform a full routine analysis of physiological fluids, enabling the determination of up to 53 different amino acids, including physiologically important amino acids for early detection of hereditary metabolic disorders and the effectiveness of nutrient absorption. The Biochrom 30 Physiological incorporates customised *load and go* applications for simplicity of operation, and the instrument's software supports a graphical user interface that fully integrates instrument control and data handling functions and provides flexible data export and customised reporting,' the company explains.

'The IVD (In Vitro Diagnostic) Directive requires that equipment and reagents used for the *in vitro* diagnosis of PKU are subject to stringent quality controls, certified by an external, notified body. Biochrom was the first Amino Acid Analyser manufacturer to achieve this certification for its PKU diagnostic reagents from the UK notified body, LRQA (Lloyds Register Quality Assurance), as part of the company's approval under the new ISO 13485:2003 standard,' explained Sally Bee, Biochrom's Amino Acid Analysis Marketing Manager.
Details: www.biochrom.co.uk

MICROSCIENCE 2008

23-26 June London, England

At the international forefront of microscopy for 169 years, in the past two years, the Royal Microscopical Society (RMS) has seen membership increase by 7%. The Society is responsible for the Microscience exhibition and conference; with a 10% increase in exhibition space from 2006, and 110% since 2002, this year will make this the biggest show in Europe that focuses on microscopy, imaging and analysis.

'The drive towards greater sophistication and miniaturisation of products that we use every day in society, from mobile phones to pharmaceuticals, inevitably means that we need to improve our scientific understanding at a finer scale,' said RMS President Professor Mark Rainforth. 'Consequently, greater emphasis is now placed on microscopy as the basic tool for providing that understanding. Microscopy and imaging are experiencing a renaissance with the advent of numerous new exciting techniques, many of which will be showcased at Microscience 2008.'

With key international companies such as: Bruker, FEI, Hitachi, Jeol, Leica, Olympus, Oxford Instruments, Veeco, Carl Zeiss UK and Carl Zeiss SMT exhibiting alongside nearly 100 others, the exhibition will provide an eclectic selection of the very latest microscopy related scientific equipment under one roof. There will also be a number of companies new to the event, including Agilent Technologies, GE Healthcare, Smiths Detection, Thermo Scientific, Asylum Research, Cambridge Analytical Instruments, CEMMNT, Close-Ups, Edinburgh Instruments, EMS, Essen Instruments, HWL Scientific Instruments, Laser 2000, Nanofactory, Nanonis, Attocube, Michelson Diagnostics, Mad City Labs, Millbrook Instruments, Qioptiq Imaging Solutions, Tescan and Sympatec.

'We see Microscience as the Motor Show of Microscopy!' said Rob Flavin, RMS Executive Director. 'In addition to the exhibition, there will be specialist workshops demonstrating many of the new microscopy techniques and a chance to pick up basic information on different fundamental techniques in our RMS Learning Zone. These features are free to all visitors.'
Event details: www.microscience2008.org.uk

LEAN PRINCIPLES

BEFORE AND THROUGHOUT THE AUTOMATION PROCESS

'Lean Laboratory' and 'Lean Automation' are vital ingredients for the efficient and productive running of today's modern Pathology laboratories. Automation serves as an essential endorsement to Lean, says Paul M Button, Senior Consultant at ValuMetrix, Ortho Clinical Diagnostics*

There is ample evidence from around the world that process improvement strategies based on Lean solutions can cut costs, dramatically reduce processing times and free up valuable staff. Enthusiasts can also demonstrate that sickness and absenteeism in the Lean workplace can plummet.

In pathology such gains can be directly translated into availability of extra beds and improved patient care. The underlying principle of Lean – to change the culture, create flow and eliminate waste in all its forms – is logical and readily understandable. It should be no surprise that Lean process improvement is the methodology of choice for the UK's National Health Service (NHS). Considering its outcomes, it is clear that if Lean were a piece of equipment, every laboratory manager would buy one. But Lean is not a piece of equipment; it is a fundamental change in working practices and the thinking behind them. It is an attitude of mind, which constantly seeks to challenge and refine every aspect of working life. It is proven to work, but it can also hurt.

Established practices are demolished in the search for culture change, flow creation and waste elimination. Batch working and specialisation go out; single piece flow and cross training enter. Laboratory staff that are desperate for more space, discover they can work better with significantly less. Managers can discover the factors that really impact on their workflow; biochemists walk less as Lean processes improve laboratory layout.

Johnson & Johnson's ValuMetrix Services group first made its Process Excellence methodologies, which include Lean, available to healthcare organisations in 1999. Its proven success is based on a training and mentoring model that recognises that culture change should not be imposed and that communications and commitment lie at the heart of any successful project. Unlike many consultancy or change management processes, ValuMetrix actually sets out to transfer intellectual capital and knowledge to the client organisation. The result is that future process improvement projects can be run from internal resources.

The majority of laboratories would benefit from automation, but this should not be incorporated until after lean implementation. Automating a non-Lean process will result in 'automating waste' and this is very difficult to rectify. Achieving an efficient flow is usually impossible without some level of automation. The key is to achieve the right level of automation. Too little means you lose efficiency; too much means you lose reliability and affordability.

ValuMetrix Services offer a combined Lean and Automation approach, whereby the initial phase ensures that the laboratory implements Lean principles followed by subsequent phases that implement automation at the appropriate points in the operations. This is done by a Lean technique known as *Value Stream Mapping*, which moves the laboratory from the current state through a series of future states to achieve the ideal world-class laboratory.

The results can be astronomical with substantial reductions in turn-around-times, substantial reductions in error, substantial cost savings and significant increases in productivity thereby allowing business growth without increasing head-count.

Further information on Lean and/or Laboratory automation can be obtained via your local Ortho Clinical Diagnostics office.

** A Johnson & Johnson Company*

Multiple-targeted therapies

The next big thing in advanced breast cancer

By Olwen Glynn Owen MSc

The next big development in biological targeted therapies for advanced breast cancer will be drugs acting via multiple mechanisms, experts told delegates attending the 1st Asian Breast Cancer conference, held in New Delhi 9-10 February.

Professor Martine Piccart, Director of Medicine at the Jules Bordet Institute, Belgium, and current President of the European Organisation for Research and Treatment of Cancer (EORTC), told oncologists attending the First Asian Breast Cancer Conference in New Delhi, India this month (February 2008) that several biological therapies directed at more than one target are in development. 'It is hoped these will add to what has been achieved by agents such as HER2/neu receptor inhibitor trastuzamab (Herceptin) and lapitinib (Tykerb), and the vascular endothelial growth factor (VEGF) blocker bevacizumab (Avastin). New multi-targeted agents, may further improve median survival beyond the currently achievable 2-3 years'.

Sunitinib malate (Sutent), a small molecule oral tyrosine kinase inhibitor, currently approved for treatment of metastatic renal carcinoma and gastrointestinal stromal tumour (GIST), is currently the most advanced in clinical development of around 10 investigational multi-targeted agents for metastatic breast cancer, speakers disclosed. All are active against two or more targets. Others include recentin (AZD2171), AMG 706 and pazopanib.

The principal focus of new agents is against angiogenesis, Professor John Crown, Consultant Medical Oncologist at St Vincent's University Hospital, Dublin, told delegates; but targeting VEGF alone is not enough. Several drugs act on additional neovascularisation mechanisms . 'Sunitinib targets all VEGF and platelet-derived growth factors (PDGF), the stem cell receptor KIT and other factors including ,' he noted. 'PDGF has a role in stabilising new blood vessels and tumours expressing PDGF and KIT are associated with poor prognosis. KIT is increasingly recognised in triple-negative breast cancers that oncologists scratch their heads over,' he added. 'Some of these difficult-to-treat, HER 2 and hormone-receptor-negative patients respond to sunitinib so that's of great interest.'

Sunitinib has shown proof of concept in preclinical models of advanced breast cancer and has demonstrated activity as a single agent in clinical studies, he remarked. In a phase II clinical study of heavily pre-treated metastatic breast cancer patients, single-agent sunitinib therapy showed an 11 per cent partial response rate. In another study of 22 patients who had failed adjuvant anthracycline-containing regimens, sunitinib combined at a dose of 37.5mg/day with docetaxel (75mg/m2 every three weeks), using a dosing schedule of two weeks on and one week off, showed synergistic activity achieving a 72 per cent partial response rate in 18 evaluable patients treated over 159 cycles. 'This is clearly a very active combination and it has gone on to further investigation in a larger phase III trial,' he noted. Toxicity was as expected given the inclusion of docetaxel but was manageable, he added

Current phase III trials are now investigating sunitinib with taxanes or capecitabine in advanced breast cancer both in chemotherapy-naïve and heavily pre-treated patients who have failed multiple chemotherapy regimens. One trial will investigate a combination of paclitaxel and sunitinib against paclitaxel and bevacizumab as first-line therapy. Another is looking at a combination of docetaxel and sunitinib as first line therapy. In previously-treated patients, sunitinib is being investigated in combination with capecitabine in one trial and is being compared as single-agent therapy against capecitabine in another. A further phase II trial is exploring sunitinib as second-line therapy versus standard care in previously-treated triple negative patients.

If sunitinib shows sufficient clinical activity in phase III metastatic breast cancer trials in combination with chemotherapy, one of the next really interesting lines of investigation to be pursued will be to look at it in combination with HER2/neu antagonists, he suggested. Trials are currently still recruiting patients.

Further information can be obtained at www.suntrials.com.

Analytica 2008

With 121 high level lectures and 65 published posters, Analytica 2008 – organised by the German Chemical Society (GDCh), the Society for Biochemistry and Molecular Biology (GBM) and the German United Society of Clinical Chemistry and Laboratory Medicine (DGKL) – was again a notable bio-chemistry event.

The trend towards automation was keenly discussed, in terms of costs and competitive needs. It was observed that this promotes increasing investments in (semi)-automated systems, and that automation is also called for when development is heading from laboratory analytics towards process analytics. Automated sample handling, for instance, not only guarantees a high capacity of samples but also facilitates fast and reliable online diagnostics for different substances. This in turn results in increased importance of the interaction between technology and the respective software tools.

Nanobiotechnology in tumour diagnostics

More precise, quicker and cheaper laboratory analysis is promised due to a new type of technology — *Immune-SERS-Microscopics* — developed by researchers at the Institute for Physical Chemistry at Würzburg University, which is currently awaiting patent. In this, gold nanoparticles of a certain shape and size are covered with a layer of organic molecules (Raman markers). This is protected by a layer of glass coated with different ligates such as antibodies. These respectively bind to specific biomolecules, such as those in blood samples. Through exposure to laser light these give off characteristic signals which can then be detected. The method allows the determination of type and number of many different biomolecules at the same time, which facilitates, for example, more exact tumour analysis and therefore improved, individual therapy – faster and less costly than previously.

Research on small RNA molecules could bring new therapies

The discovery of small RNA molecules and their relevance for gene regulation has dramatically changed our understanding of many essential cellular processes – and provides the opportunity to develop new ways for treating various diseases. By selectively inhibiting gene expression and thereby 'silencing' genes involved in pathogenesis, the RNA molecules constitute a unique tool to treat cancer, neurological disorders or viral infections and other human diseases. At the XX International Congress of Genetics, held in Berlin (12-17 July) experts will present results from the latest research in RNA biology and discuss potential applications.

'Today, small RNAs are increasingly developing into a therapeutic tool and there is reasonable hope that this will be successful in the near future,' explained **Professor Alfred Nordheim**, Secretary General of the *XX International Congress of Genetics*.

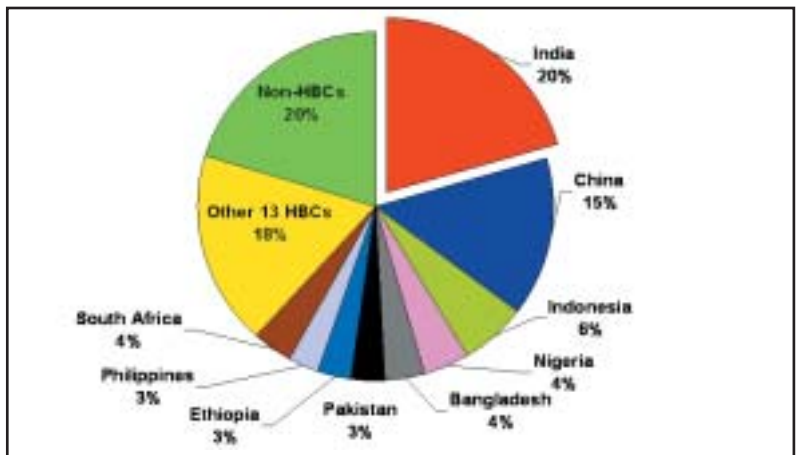
Apart from RNA genetics, modern genetic research is already contributing much to combat diseases. In recent years, improved sequencing techniques made possible the rapid diagnosis of infectious bacteria or other pathogens. Bacterial cultures of patient specimens, which often take days to grow in the lab, thus become redundant, and effective therapies can be implemented sooner. 'There is hardly a disease without a genetic component', the professor observed. 'Not only pathogens, but also food, lifestyle or radiation can make us sick by influencing and changing our genetic information, or its expression. We are now beginning to understand the functioning of a cell on the molecular level.'

Эксперты мирового уровня из Индии о туберкулезе.

Автор: Цинтия Е. Кин (Cynthia E. Keen)

Число заболеваний туберкулезом в Индии составляет пятую часть от общего числа заболеваний по всему земному шару, это самая тяжелая статистика по туберкулезу в мире.
Источник: Всемирная организация здравоохранения, Женева Доклад ВОЗ 2006 года: Организация контроля туберкулеза на глобальном уровне; наблюдение, планирование и финансирование.
Каждые три минуты два человека в Индии умирают от туберкулеза. Это соответствует числу: 370.000 смертей ежегодно. Туберкулез в Индии – это также крайне большие экономические потери, прямые расходы насчитывают 300 миллионов $ США, при косвенных расходах в 3 миллиарда $ США.

Обновленная национальная программа по контролю туберкулеза является самой обширной подобной программой в мире, это ставит сотрудников системы здравоохранения Индии на уровень мировых экспертов в вопросах диагностики, лечения и общей организации контроля, терапии и профилактики населения по поводу туберкулеза. Программа начала действовать в октябре 1993 года в качестве предварительного проекта, после того, как Всемирная организация здравоохранения, Шведское агентство по международному развитию, а также правительство Индии сочли, что существовавшие на то время инициативы по контролю и лечению туберкулеза нуждаются в капитальном пересмотре и совершенствовании.



Одна пятая всех заболеваний туберкулёзом в мире приходится на Индию. Источник: ВОЗ, Женева; Доклад ВОЗ 2006 г.: „Организация контроля туберкулеза на глобальном уровне; наблюдение, планирование и финансирование.“

Обновленная национальная программа по контролю туберкулеза уже в качестве пробного проекта достигла столь впечатляющих результатов, что с 1997 года она стала действовать в качестве постоянной национальной программы. Через десять лет в рамках указанной программы удалось достигнуть 70%-ного выявления туберкулеза, при успешном излечивании в 85% случаев. На 31 декабря 2007 года было проведено лечение 6,7 миллиона пациентов и более чем 1,2 миллиону людей спасли жизнь. В настоящее время ежемесячно проводится терапия более чем 100.000 пациентов.

Широко используется стратегия DOTS, что означает: Ускоренный курс амбулаторной терапии, проходящий под непосредственным контролем. Данный подход предусматривает:

- своевременное выявление заболевания;
- лечение с назначением полного курса медикаментов в продолжении 6 месяцев, или, в случае мультирезистентных форм туберкулеза, в продолжении 18-24 месяцев;
- агрессивное наблюдение пациента в течение всего периода лечения.

В рамках Национальной программы по контролю туберкулеза при участии национальных, региональных и местных властей по всей стране организованы и действуют специальные кабинеты.

Некоторые активные пациенты также вовлечены в эту работу.

Индийские радиологи наработали большой опыт в выявлении как обычных, так и редких форм туберкулеза. Это заболевание стало одной из тем под рубрикой «Европейское радиологическое общество (ESR) встречается с Индией», обсуждавшихся в ходе недавнего Европейского радиологического конгресса 2008 (ECR). Открывая сессию, доктор наук Х.Сатишчандра (Dr H Satishchandra), профессор, глава отделения Медицинского учебного и исследовательского института г. Бангалор (Bangalore Medical College and Research Institute), продемонстрировал диагностические изображения симптомов туберкулеза, полученные при помощи рентгена, компьютерной томографии и магнитно-резонансной визуализации. Симптомы могут быть очень похожи на симптомы других заболеваний. Так, например, проявления туберкулеза легких могут быть очень схожи с проявлениями широкого спектра заболеваний, от пневмонии до злокачественных опухолей. Симптомы абдоминальной формы туберкулеза могут быть сходны с симптоматикой новообразований или воспалительных процессов органов брюшной полости.

Случаи заболевания туберкулезом в большинстве европейских стран немногочисленны, однако следует учитывать, что к этому заболеванию особенно восприимчивы больные СПИДом. Возникновение в последнее время организмов, резистентных к лекарствам, а также увеличение числа заболеваний диабетом и СПИДом привели к появлению туберкулеза в его измененных проявлениях. Для выявления абдоминального туберкулеза применяется ультразвуковая диагностика. Доктор наук С. Дода, фирма «Дода имиджинг» (Doda Imaging), Нью-Дели, рассказал, как он в своей частной практике использует данную методику, экспериментируя и импровизируя в ходе работы. При исследовании спинальных и паравертебральных структур магнитно-резонансная визуализация очень эффективна в очерчивании типичных моделей, по которым происходит поражение туберкулезом этих областей. Она также очень полезна в отслеживании результатов лечения. Для диагностики интракраниального туберкулеза используется спектроскопия.

Академические больницы Индии находятся на переднем крае по некоторым направлениям исследовательской работы по диагностике и лечению туберкулеза. Доктор Сатишчандра подчеркнул, что радиологи Европы в случае затруднений в распознавании скрытых форм туберкулеза могут обратиться за консультацией к своим индийским коллегам, так как они являются экспертами в области такой диагностики.

Дополнительная информация и статистика: *www.eurotb.org,* а также: *www.tbcindia.org*

Многочисленные случаи заболевания корью в Зальцбурге

Австрийское население и власти, ответственные за здравоохранение в Австрии, взволнованы необычно высоким количеством детей заболевших в последнее время корью. Первые случаи заболевания зафиксированы в одной из частных школ Зальцбурга, однако, в течение марта, начала апреля отмечено всё большее количество заболеваний. Только в округе Зальцбурга в течение нескольких дней было зафиксировано более 180 заболевших, отдельные случаи заболеваний были обнаружены на границе с Баварией, в Верхней Австрии, а также в земле Бург. Имевшееся подозрение о специальном заражении здоровых детей при контактах с больными на так называемых «праздниках кори» не подтвердилось.

Несмотря на то, что в школьном плане прививок рекомендована комбинированная прививка против кори, эпидемического паротита и краснухи для всех детей, эта прививка сделана только 90 % школьников. Поскольку инфицированный корью ребёнок может в среднем заразить около 15 незащищённых прививкой человек, то вновь открыта дисскуссия о необходимости осуществления обязательных прививок для всех школьников.

Тревожные случаи заболевания туберкулёзом в Австрии

Ежегодно в мире от туберкулёза умирают более 1,5 миллионов человек. Одна треть населения планеты инфицирована бактерией „Myobacterium tuberculosis“, у 9 миллионов человек развивается туберкулёз. Конечно, в Европе примнимают к сведению информацию о том, что казалось бы «побеждённая» болезнь вновь наступает, однако маштабы этого наступления, очевидно, все ещё недооцениваются.

Только в феврале этого года в венском детском саду несколько детей были заражены воспитательницей, а в начале марта на итальяно-австрийской границе в селении Арнольдштайн у жены владельца булочной была диагностирована открытая форма туберкулёза. Местные власти и клиники были заняты тем, чтобы не допустить дальнейшее распространение болезни. И всё-же, количество заболевших туберкулёзом в Австрии чуть менее 1000 человек в год остаётся константным. Уменьшение количества заболеваний затрудняется из-за наличия широкого обмена товарами и туристами со странами, в которых население подвержено высокому риску заболевания туберкулёзом.

Томотерапия: раковые опухоли под точным прицелом новой техники

Более высокие шансы на выздоровление и меньше побочных последствий – клиника Гелиос Берлин-Бух – это одна из первых клиник Германии, использующая в лечении онкологических пациентов аппарат томотерапии.

В Германии ежегодно около 400.000 человек становятся пациентами онкологических клиник. Примерно 60 процентов из них подвергается лечению при помощи лучевой терапии. При облучении обычными аппаратами опухолей, расположенных в труднодоступных местах, рядом с важными, чувствительными органами, такими, как головной мозг, легкие, простата, органы в полости живота, часто приходится мириться с тяжёлыми побочными последствиями. К упомянутым последствиям относятся, например, кровотечения хронические воспаления или ограничения в функциях органов. «Томотерапия открывает новые возможности и позволяет индивидуально для каждого пациента подбирать методики лечения», отмечает с удовлетворением профессор др. Роберт Кремпиен. По мнению главного врача клиники лучевой терапии центра Гелиос Берлин-Бух, новая техника является огромным шагом вперёд. «При помощи новой системы томотерапии мы можем теперь лечить онкологических пациентов, в отношении которых применение лучевой терапии до сих пор считалось невозможным».

Томотерапевтическая техника представляет собой комбинацию из линейного ускорителя и компьютерного томографа, а методика лечения при помощи этой техники является на данный момент во всём мире самой современной в лучевой терапии. Лишь очень немногие клиники Германии

происходящие смещения органов во время процесса облучения. Аппарат томотерапии перед каждой дозой облучения выдаёт при помощи встроенного компьютерного томографа актуальное изображение опухоли в ее реальной величине и местоположении. Таким образом, облучение попадает точно в цель, вне зависимости от смещения органов.

История клиники, в которой работает профессор д-р Роберт Кремпиен, начинает отсчёт с 1899 года и является неотъемлемой составной частью истории развития медицины Федеративной республики Германия. Уже в 20-х годах прошлого столетия со строительством института головного мозга им. Кайзера Вильгельма был заложен фундамент для проведения биомедицинских исследований.

В ГДР, с основанием Академии Наук, данные исследования получили дальнейшее развитие. Возникли академические институты и клиники в Берлине-Бух, которые осуществляли научные исследования в области терапии онкологических заболеваний и заболеваний сердечно-сосудистой системы. В семидесятых годах появились ещё две клиники: с 1973 по 1976 год на Хобрехтсфельдер шоссе введена в строй «клиника по обслуживанию членов правительства и партийных деятелей ГДР», коротко называвшаяся «правительственная клиника». Вскоре после этого (с 1976 до 1980 г.г.) по соседству была построена «клиника по обслуживанию сотрудников Министерства государственной безопасности ГДР и сотрудников дружественных органов госбезопасности». В 1988 году медицинский комплекс Берлин-Бух мог принимать одновременно 5.000 пациентов, требующих лечения и ухода. Говорили, что это «крупнейшая клиника Евразии».

располагают в настоящее время аппаратом стоимостью в 3,5 миллиона евро. Применяемая методика облучения всех злокачественных клеток даёт решающие преимущества при лечении опухолей головного мозга, лёгких, простаты, а также опухолей, находящихся поблизости от важных органов.

В то время как компьютерный томограф высокого разрешения перед каждой дозой облучения с большой точностью локализует положение опухоли, линейный ускоритель, вращающийся вокруг пациента, облучает опухоль со всех сторон. «Мы щадим тем самым чувствительные органы, не подвергаем их облучению и одновременно облучаем саму опухоль по разным направлениям», - поясняет профессор Кремпиен, подчеркивая главное преимущество данной методики. Кроме того, доза облучения, при помощи которой разрушается раковая опухоль, может быть индивидуально скорректирована в зависимости от «плотности опухоли», т.е. от количества опухолевых клеток. Таким образом улучшается защита здоровых тканей вокруг опухоли и соседних с ней органов.

Другим положительным моментом является то, что при помощи системы томотерапии можно осуществлять облучение опухолевых очагов и метастазов в ходе одной рабочей процедуры. Интенсивность облучения устанавливается с большой точностью в зависимости от масштаба распространения, размера и характера опухоли. Таким образом может быть повышена защита здоровых тканей вокруг опухоли и соседних с ней органов. В зависимости от размера и характера опухоли время облучения составляет от 5 до 20 минут.

Положение органов и опухолей в организме постоянно меняется. Например, в зависимости от наполненности мочевого пузыря простата может смещаться на расстояние до двух сантиметров, а в процессе облучения к тому же уменьшаться. До настоящего времени при облучении обычными аппаратами врачи компенсируют смещение органов путем увеличения поверхности облучения, с тем, чтобы в любом случае гарантировать попадание луча в цель. При такой терапии карциномы простаты облучению подвергается также и часть кишечника, что в лучшем случае вызывает болезненное раздражение кишечника, а в худшем - необратимые хронические воспаления. В противоположность этому, система томотерапии реагирует на

Universitätsklinikum Hamburg-Eppendorf

Университетский медицинский центр «Гамбург-Эппендорф» (UKE)

Университетский медицинский центр «Гамбург-Эппендорф» (UKE) – самый крупный медицинский центр в северной Германии. Центр пользуется известностью благодаря высокому качеству медицины, а также тем, что своей исследовательской деятельностью прокладывает новые пути в медицине. Новейшие апробированные результаты медицинских исследований в лечении пациентов используются в наших специализированных отделениях. Медицинский центр «Гамбург-Эппендорф» занимает первое место в Германии по количеству новых апробированных лечебных методик в Европе. Основополагающей философией UKE является постоянная деятельность по развитию новых и улучшенению имеющихся методов диагностики и лечения заболеваний, при этом особый упор делается на решение сложных медицинских проблем к которым относятся: рак, трансплантации, болезни сердца, системные детские заболевания, специальная урология, редкие болезни кишечного тракта, диабет, специальные офтальмология и отоларингология. Центр располагает ведущим в мире клиническим отделением по лечению рака простаты. Вышеизложенные факторы делают UKE привлекательным для пациентов из всех стран мира; больные желают получить здесь первоклассное обслуживание в части диагностики, лечения и последующей реабилитации. Таким образом, Медицинский Центр является лидером в глобальном высоко-специализированном мире медицины. Центр UKE отвечает высоким требованиям, которые предъявляют ему задачи лечения пациентов из разных стран. Пациенты, а также их родные и друзья получают медицинскую помощь, которая включает в себя диагностику и терапию; помимо этого, предоставляется организационно-административное обслуживание, как для пациента, так и для его близких, например, услуги переводчиков и персональных тренеров-инструкторов из числа носителей родного для пациента языка. Университетский медицинский центр «Гамбург-Эппендорф» считается в Германии пионером в области исследований, образования и медицинской подготовки; он, в то же время, является надежным источником альтернативных медицинских заключений. Центр UKE имеет специальный отдел для работы с иностранными пациентами, который координирует все организационные, финансовые, административные и личные проблемы пациентов.

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Важна оценка степени общего риска

Рекомендации по лечению гипертонии

Статины снижают риск сердечно-сосудистых заболеваний, при этом уровень содержания холестерина в крови не играет роли.

Последние рекомендации Европейского общества по борьбе с гипертонией и Европейского кардиологического общества (ESH/ESC) советуют использовать статины в лечении пациентов

группы высокого риска независимо от уровня содержания холестерина. Оба названные Общества опубликовали совместные рекомендации по диагностике и лечению гипертонии в Европе в 2003 году. Эти рекомендации были пересмотрены в конце 2007 года; в их более актуальном варианте отражены прогрессивные возможности лечения гипертонии, а также результаты некоторых основных проводимых на международном уровне исследований в области сердечно-сосудистой медицины. Новый подход к проблеме отдает предпочтение её комплексному решению с точки зрения оценки абсолютного риска возникновения сердечно-сосудистых заболеваний у конкретного пациента, в противовес учёту лишь отдельных факторов риска.

В терапии кардиоваскулярных факторов риска лечение по нескольким направлениям представляется гораздо более эффективным, чем терапия только по одному из направлений. Так, например, снижение на 10 % кровяного давления и на 10% общего уровня содержания холестерина в крови даёт снижение риска кардиоваскулярного заболевания более чем на 40%.

Конечные данные исследований ASCOT-ЭСКОТ (Англо-скандинавские исследования результатов терапии сердечных заболеваний), которые продемонстрировали столь значительные улучшения в лечениии сердечно-сосудистых заболеваний, явились существенным стимулом к изменению вышеупомянутых рекомендаций. Были проведены рандомизированные исследования примерно у 20.000 пациентов из всех стран Северной Европы, страдающих гипертонией и находящихся на амбулаторном или стационарном лечении, по одному из направлений исследований ЭСКОТ, а именно, снижению уровня липидов. Все пациенты, участвовавшие в исследованиях по этому направлению, имели общий уровень содержания сывороточного холестерина < 6,5 ммоль/л, в их анамнезе не было ни ишемической болезни сердца, ни сердечного инфаркта, но по условиям исследования у них должны были наблюдаться дополнительно 3 показателя на уровне риска возникновения сердечно-сосудистого заболевания. Рандомизация с двойной степенью анонимности означала, что пациенты в дополнение к назначенной анитигипертонической терапии каждый день получали 10 мг аторвастатина, или же плацебо.

В ходе рандомизированного исследования было абсолютно неясно, будут ли наблюдаться синергические эффекты в плане предотвращения кардиоваскулярных инцидентов в результате мер по снижению кровяного давления на фоне снижения уровня липидов. У пациентов наблюдались одинаковые показатели снижения кровяного давления, но снижение уровня липидов на этом фоне привело к существенному улучшению общих результатов.

Исследования были окончены почти на 3 года и 4 месяца раньше, чем это было запланировано, так как по основным показателям были получены существенные позитивные результаты, а именно: уменьшение на 36% относительного риска нелетального инфаркта миокарда и летальной ишемической болезни сердца, уменьшение на 45% относительного риска формирования нелетального инфаркта миокарда, уменьшение на 27% относительного риска инсульта.

Анализ результатов исследования показал, что существенные положительные результаты начинают проявляться уже после трех месяцев после начала терапии. Данные результаты являются очень важными, так как терапия статинами ранее назначалась лишь больным, страдающим гиперхолистеринемией. Новые рекомендации разъясняют, что пациенты - гипертоники с повышенной степенью риска возникновения сердечно-сосудистых заболеваний (более, чем 20%), но с нормальным уровнем содержания холестерина, также могут получить пользу от назначения терапии статинами. Для врачей на практике это означает, что при лечении пациента с высокой степенью риска они сначала оценивают степень риска, и в зависимости от результата, в случае, если это является единственной возможностью предотвращения серьезных кардиоваскулярных осложнений, назначают агрессивную терапию.

В случае пациентов-диабетиков, а также пациентов, имеющих в анамнезе сердечно-сосудистые заболевания, необходимо также применение более агрессивных терапий, с тем, чтобы постараться предотвратить серьезные сердечно-сосудистые инциденты. Новые рекомендации также высказываются в пользу начала антигипертонической терапии для пациентов, страдающих диабетом, на стадии, когда кровяное давление варьирует в диапазоне от повышенного до нормального.

Приниципп подхода к лечению сердечно-сосудистых заболеваний с точки зрения оценки совокупного риска, заявленный в рекомендациях ESH/ESC, соответствует принципам, изложенным в большей части международных рекомендаций по лечению сердечно-сосудистых заболеваний.

Ссылка на источники:

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EUROPEAN HOSPITAL

Наша информация

Мы рады тому, что с публикацией русской специальной части нашего издания мы продолжаем обмен информацией между западно-европейским и российским секторами медицины. Этому способствуют в англоязычной части журнала статьи наших российских корреспондентов и авторов.

Профессор Геннадий Сушкевич в своей статье рассказывает о работе московского научно-исследовательского института неотложной детской хирургиии и травматологии на стр. 23

Наш российский корреспондент Ольга Островская сообщает о международной конференции передовых технологий лечения диабета (ATTD), прошедшей в Праге (стр. 3) и о 3-ем российском съезде интервенционных кардиоангиологов, состоявшемся в марте этого года в Москве (стр. 19)

Университетский Центр сердца медицинского комплекса Гамбург-Эппендорф (UKE)

Информация об Университетском Центре сердца UKE часто попадает на страницы немецких и иностранных газет, благодаря проводимым там инновационным хирургическим вмешательствам и операциям на открытом сердце. Так, специалисты Центра сердца, кардиологи и хирурги, осуществили установку нового клапана аорты пациенту в возрасте 81 года без проведения операции. Поскольку операция на открытом сердце представляла для пациента большую опасность, специалисты Центра серца решились установить сердечный клапан через сосуд при помощи специального катетера. При помощи ультразвука были проведены необходимые измерения сердечного клапана пациента, после чего катетер был введен через сосуд до повреждённого места в сердце. Затем, баллон, который был закреплён на катетере раскрылся так, что старый клапан сильно растянулся и возникло место для размещения нового клапана. Новый клапан в сложенном состоянии был введён при помощи катетера в левый желудочек сердца и там раскрыт. Хирургическое вмешательство с использованием такой конструкции было осуществлено в конце прошлого года впервые в мире в университетском Центре сердца. У данного пациента высокого риска такое хирургическое вмешательство было единственной возможностью для спасения жизни.

Профессор, д-р., д-р., Герман Райхенспурнер

Университетский Центр сердца известен также благодаря и другим выдающимся медицинским успехам. Например, такое широко распространённое сердечное заболевание как аритмия излечивается в Центре сердца при помощи операционного робота с навигатором.Такая методика, по сравнению с традиционными, имеет ряд преимуществ: они заключаются в том, что трёхмерная навигация робота позволяет добиваться гораздо более высокой точности и безопасности проведения вмешательства. При таких видах хирургических вмешательств не было ещё ни одного случая медицинских осложнений или технических проблем, а у пациентов не наблюдалось рецидивов. Философией университетского Центра сердца является внедрение и использование щадящих для пациентов методик лечения. Малоинвазивные хирургические вмешательства пользуются у пациентов всё большим спросом, и специалисты Центра сердца предлагают такие процедуры в полном объёме.

Университетский Центр сердца является одним из ведущих и широко известных в Германии и в Европе благодаря проведению сложных и комплексных хирургических вмешательств с использованием новейших технологий. Особенно это относится к операциям по восстановлению сердечных клапанов, успех которых обеспечен многолетним позитивным опытом, накопленным специалистами кардиохирургии Центра сердца.

Университетская база Центра сердца позволяет гарантировать, что новейшие данные, полученные в ходе научных исследований, быстро внедряются в медицинскую практику. Широкая известность Центра сердца не только в Германии, но и за её пределами привлекает в Гамбург многих иностранных пациентов для прохождения лечения. Международный отдел Университетского центра UKE берёт на себя все вопросы по индивидуальному обслуживанию таких иностранных пациентов. Для пациентов, говорящих на русском языке контактным лицом является сотрудница меджународного отдела Ирма Агрикола (тел.: +49 177 4001903), с которой Вы можете связаться в любое время. Ваши вопросы Вы можете также направить на русском языке по следующему адресу электронной почты: patients@uke.uni-hamburg.de. На все Ваши вопросы Вам будет дан ответ на русском языке.

Детская кардиология университетской клиники г. Майнца расширила спектр щадящих методик лечения.

Имплантирована первая биологически устраняющаяся система по лечению пороков детского сердца.

По данным регистра рождаемости г. Майнца примерно у 1,26 процента всех новорожденых младенцев ежегодно диагностируется врождённый порок сердца. В связи с этим, врождённые пороки сердца считаются наиболее часто встречающейся аномалией развития. Если упомянутая аномалия не подвергается лечению, это может привести к ухудшению качества жизни и уменьшению продолжительности жизни. До недавнего времени врождённые пороки сердца устранялись путём проведения сложных операций – сегодня значительная их часть излечивается путем малоинвазивных хирургических вмешательств, а именно, при помощи катетеров для зондирования сердца, в большинстве случаев путём введения имплантатов. В детской кардиологии университетской клиники г. Майнца с декабря 2007 года применяется первая биологически устраняющаяся система имплантатов. Преимущества этой системы вытекают из применения малоинвазивного метода вмешательства, а также из того обстоятельства, что пороки излечиваются в ходе роста сердца, а имплантат впоследствии практически полностью устраняется биологически. Одновременно естественная реакция заживления способствует замещению имплантата тканями собственного организма.

Имевшиеся на рынке имплантатные системы для устранения порока сердечной перегородки изготавливались из непоглощаемого материала. Через несколько месяцев после их внедрения они полностью врастали в ткани организма и выполняли свою функцию по устранению порока, одновременно отпадала необходимость и в имплантате. Однако, поскольку такая система не может быть устранена и остаётся в растущем организме, это может приводить к побочным последствиям, таким, как например, хроническое раздражение от присутствия постороннего предмета, повышенный риск образования тромбов. Могут иметь место даже усталостные трещины металлических частей системы.

Новая имплантатная система является временной для организма системой по устранению пороков сердца, так как после заживления и обрастания собственными тканями организма она практически полностью растворяется. Наиболее подходящей эта система является для детей, имеющих так называемый малый или средний порок предсердия (ASD II), а также для взрослых с персистирующим овальным отверстием (PFO). Часто порок PFO выявляется лишь при уточнении причин инсульта или мигрени.

В детской кардиологии клиники университета им. Иогана Гутенберга г. Майнца в течение 10 лет осуществляется лечение врождённых пороков при помощи катетеров зондирования сердца. За это время проведено более 1500 таких вмешательств, что позволило полностью отказаться от операций на открытом сердце. К вышеупомянутым малоинвазивным вмешательствам относятся также и вмешательства по устранению порока межжелудочной перегородки сердца. Малоинвазивное вмешательство для устранения данного порока проведено у более чем 400 пациентов. С декабря 2007 года в отделении врожденных пороков Центра детской и юношеской медицины клиники университета им. Иогана Гутенберга в г.Майнце под руководством профессора д-ра Кристофа Кампманна успешно применяется первая сертифицированная биологически устраняющаяся система имплантатов.

В течение 30 лет предпринимаются попытки устранения пороков сердца в области межпредсердной перегородки при помощи малоинвазивных хирургических вмешательств с использованием катетеров зондирования сердца. Новая система имплантатов является первой системой, которая после успешного устранения порока сердца практически полностью удаляется из организма. «Тем самым удалось добиться очень существенного прогресса в области использования катетеров зондирования сердца» - говорит руководитель отделения врождённых пороков сердца Центра детской и юношеской медицины клиники университета им. Иогана Гутенберга в г. Майнце.

Успешная имплантация беспроводного протеза в сетчатку

В результате 12-летней работы немецкие хирурги и технические специалисты успешно имплантировали первый в мире улучшающий зрение протез шести слепым пациентам.

Миллионы людей страдают пигментным ретинитом (*Retinitis pigmentosa*), болезнью, в ходе которой происходит прогрессирующее снижение зрения вследствие отмирания клеток сетчатки, в результате чего наступает слепота. Часть нервных клеток, тем не менее, остаются невредимыми, и именно в этом случае может помочь протез.

Исследовательская группа, возглавляемая профессором Вильфридом Моква (Professor Wilfried Mokwa) в составе инженеров из Рейн-Вестфальского технического университета, г.Аахен, Аахенского университета (RWTH Aachen University) и из Института микроэлекторонных схем и систем Фрауэнхофера в Дуйсбурге (Fraunhofer Institute of Microelectronic Circuits and Systems, Duisburg) разработали улучшающий зрение протез, получивший название EPIRET3, который помогает больным пигментным ретинитом На данный момент это единственная во всем мире система, которая функционирует в режиме беспроводного питания, иными словами, имплантат полностью фиксируется в глаз, при этом нет необходимости в подсоединении к внешним источникам питания с помощью кабеля, в отличие от других протезов. Такой принцип сокращает время операции, упрощает применение и уменьшает стресс для пациента.

Шесть пациентов, утратившие зрение несколько лет назад, стали добровольцами и подверглись процедуре имплантирования. В период четырехнедельной испытательной фазы специалисты из группы нейрофизики Марбургского Университета Филиппс, (Philipps –Universitdt Marburg) проводили тесты, в ходе которых сетчатка пациентов стимулировалась различными электрическими стимуляторами. В результате все пациенты получали зрительные впечатления и различали оптические образы.

После этого первоначального прогресса последовал следующий этап, задачей которого было продлить длительность ношения протеза и совершенствовать хирургическую технологию. Для того, чтобы обеспечить пациентам возможность ориентироваться в окружающей обстановке, система должна быть подсоединена к камере, которая осуществляет трансмиссию радиосигналов, или же оптоэлектронную трансимиссию на протез.

Система, имплантированная первой опытной группе пациентов, продемонстрировала эффективность и безопасность. В результате несколько компаний, занимающихся медицинскими технологиями, учредили или фирму по разработке протеза сетчатки, который можно было бы представить на рынок с тем, чтобы через несколько лет он стал доступен большему числу пациентов. Такой имплантат можно также использовать при другом, более распространенном офтальмологическом возрастном заболевании – запущенной старческой дегенерации желтого пятна. Данное заболевание является в 50% случаев причиной старческой слепоты.

Начиная с 1995 года Федеральное министерство науки и образования Германии инвестировало 17,5 миллионов евро в исследования по разработке возвращающих зрение протезов.

Парламентский статс-секретарь при Федеральном министерстве по вопросам науки и образования Германии Томас Рахель комментирует это так: «Ученые и технические специалисты добились выдающихся результатов. Мы надеемся, что люди, утратившие зрение, в скором времени смогут воспользоваться данными достижениями».

Обучающие курсы по травматической хирургии; Немецкое общество травматической хирургии

Немецкое общество травматической хирургии (Deutsche Gesellschaft für Unfallchirurgie - DGU). начало реализацию новой обучающей программы по травматической хирургии.

Курсы предназначены для персонала всех специальностей, имеющих отношению к лечению травм. Курсы называются «Сэйф Трэк» (Safe:Trac - Обеспечение безопасности пациента в лечебном обслуживании травм) и состоят из 4 частей-модулей. DGU информирует, что программа охватывает весь комплекс проблем по соблюдению безопасности пациента на всех этапах: начиная от места происшествия, где получена травма, до лечения в клинике. При посредничестве организатора - Немецкого общества травматической хирургии - проект поддерживает 8 профессиональных ассоциаций.

Немецкое общество травматической хирургии уже ввело в практику работы систему регистрации критических инцидентов применительно к хирургии. Обучающие курсы «СэйфТрэк» - еще один шаг на пути к повышению гарантии безопасности пациента.

Профессор Хартмут Зиберт, Доктор медицины (Hartmut Siebert MD), который является генеральным директором вышеупомянутого Общества, рассказывает: «Различные междисциплинарные обучающие модули “Сэйф Трэк“ были разработаны в сотрудничестве с авиционными психологами. Они базируются на материалах семинаров по управлению ресурсами экипажа (Crew Resource Management), которые проводятся для персонала, работающего в европейской авиации. Это означает, что программа обучения находится в соответствии с требованиями, предъявляемыми Объединенным управлением гражданской авиации Европейского Союза; она адаптирована коллективом высококвалифицированных медиков и психологов применительно к специфике задач здравоохранения.»

Немецкое общество травматической хирургии далее разъясняет, что в рамках программы курсов участники из всех профессиональных групп, непосредственно связанных с обслуживанием пациента, работают над учебными проблемными ситуациями; тем самым они повышают свои знания в области механизма возникновения и развития инцидентов риска. Основываясь на этом, они могут впоследствии вырабатывать стратегии, позволяющие избежать особо критических и рискованных ситуаций.

«Все это должно активно способствовать дальнейшему совершенствованию культуры безопасности пациента на междисциплинарном уровне. Обучающие модули адаптируются под конкретные группы участников. Существенную роль при обучении играют: практическая ориентация, проведение упражнений в небольших группах, использование видеосценариев. Достаточное время уделяется также обсуждению проблем. Указанные обучающие методы, гарантируют, что каждая тема разбирается самым детальным образом.

Обучение опирается на использование собственного опыта участников в их ежедневной работе с пациентами травматологии, и этому фактору придается особо важное значение. Вся команда должна проходить совместное тренировочное обучение, если мы хотим добиться такого результата, при котором культура соблюдения безопасности пациента была бы введена в качестве неотъемлемого элемента в практику повседневной работы и получила развитие».

Программа обучающих модулей имеет научную основу, включая теорию возникновения критических инцидентов. Она охватывает круг проблем, таких как:

- ограниченные возможности человеческого фактора и стрессовый менеджмент;
- менеджмент в осложненной ситуации и пути избежания ошибок;
- оценка риска и принятие решения;
- вопросы коммуникации;
- лидерство, вопросы организации и кооперации (работа в команде);
- культура безопасности, культивирование ответственности вместо культивирования вины.

Обучающие специалисты Немецкого общества травматической хирургии – это врачи, получившие специальную подготовку и сертифицированные в соответствии с требованиями, предъявляемыми к обучающим специалистам по управлению ресурсами экипажа в авиации.

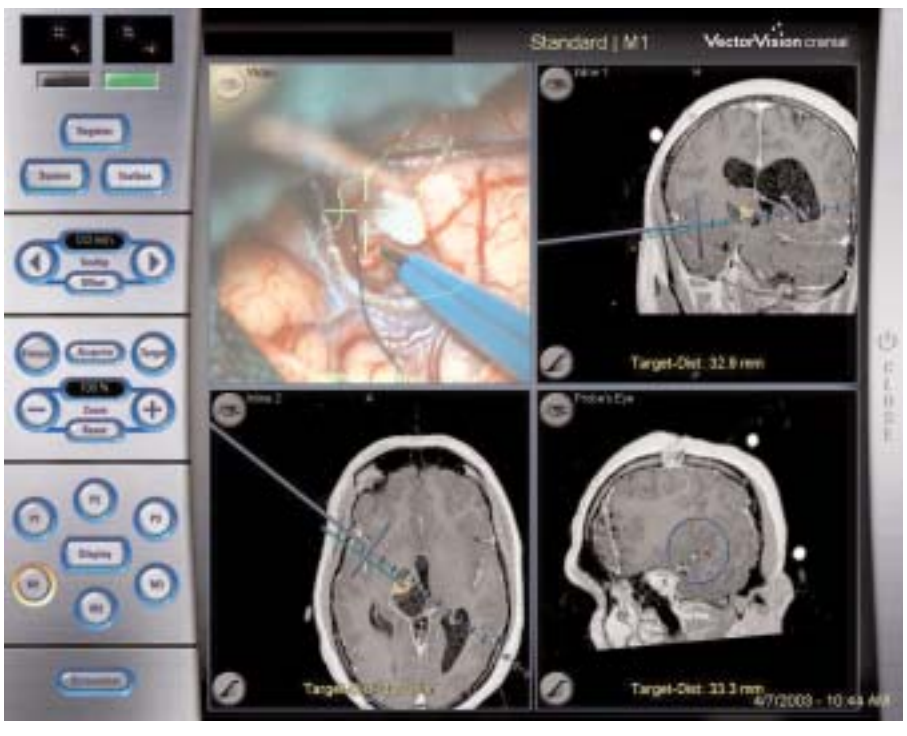
Компьютер в помощь врачам

Детская нейрохирургия клиники Charité

Детская нейрохирургия – это относительно молодая дисциплина, находящаяся на пути к становлению. Прогресс в детской анестезии и реанимационной медицине за последние два десятилетия позволил разработать обширный операционный инструментарий для недоношенных младенцев, детей и подростков.

В последнее время особое значение для операционного лечения заболеваний центральной нервной системы приобрели компьютеризированные методы. Без нейронавигации уже нельзя больше представить лечение опухолей головного мозга у детей. Она позволяет точно локализовать глубоко залегающие процессы в центральных отделах головного мозга и производить щадящее оперирование с использованием микрохирургической техники. Для этого осуществляется высокоразрешающая магнитно-резонансная томография (МРТ) головы в трехмерном диапазоне. Так производится виртуальное планирование операции на компьютере. С помощью оптического сканирования рельефа лица достигается пространственная локализация головы в операционном зале посредством навигационной системы. Теперь навигация руководит операцией, в соответствие с виртуальным планом её проведения, следуя предварительно заданным параметрам:

1. определение места разреза кожи
2. определение места вскрытия черепной коробки
3. путь через ткань головного мозга



Определение распространения опухоли при помощи операционного микроскопа

При этом, напрмер, при помощи операционного микроскопа определяется рапространение опухоли в тканях головного мозга (фотография 1). В навигацию можно интегрировать эндоскопию, инструменты, а также метаболические и функциональные графические данные.

Преимущества данного метода проведения операций:
1. повышенная безопасность,
2. уменьшение числа точек проникновения,
3. более щадящий характер вмешательства для маленьких пациентов.

Компьютеризированные методы применяются также в области диагностики и лечения детских пороков развития. Их целью является улучшение планирования сложных операций. Тяжелой задачей в практике оперативной терапии по устранению пороков развития черепной коробки, в рамках сложных синостозов швов, является пластическая реконструкция черепа в оптимальную эстетическую форму головы. При помощи магнитно-резонансной томографии получают трехмерное изображение поверхности головы. Необходимую поддержку при этом оказывают самая современная компьютерная техника и сложные программы. На экране происходит виртуальное преобразование формы порока развития, которое в наибольшей степени приближается к существующей форме головы. Результат в виде трехмерной модели используется как образец в операционном зале. Таким образом достигается оптимальное изменение формы головы.

Так, разработанный клиникой Charitй метод позволяет добиваться выдающихся пластических результатов.

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Европейская урологическая ассоциация - 23-й Ежегодный конгресс, Милан 2008

Около 14.000 урологов из 84 стран радовались весеннему солнцу Милана, куда они прибыли для участия в ежегодном конгрессе. На конгрессе обсуждались все аспекты урологии, как в ходе практических обучающих семинаров, так и на пленарных и научных заседаниях.

Расширение горизонтов в диагностике и терапии рака простаты – такова была тема симпозиума, организованного фирмой «ИПСЕН» (Ipsen). Основные положения, представленные на этом симпозиуме, конечно, получили резонанс в рамках всего конгресса в целом .

Диагностика рака простаты

Новые биомаркеры для диагностики рака простаты были предметом обсуждения на пресс-конференции, целью которой было заявить о начале инициативы PROCABIO (ПРОКАБИО - Исследования биомаркеров рака простаты на клиническом фоне применения методики активного контроля). ПРОКАБИО является совместной инициативой отделения урологии Медицинского центра Эразмус в Роттердаме (Голландия) и Европейского рандомизированного исследования по скринингу рака простаты (ERSPC). Данная инициатива осуществляется под эгидой исследований PRIAS (Международные исследования по выявлению рака простаты), в рамках объединенного научно-промышленного партнерства и нацелена на удовлетворение потребностей в целевой терапии путем разработки и оценки биомаркеров. Существует неотложная потребность в новых маркерах для выявления рака простаты на ранней стадии и прогнозирования его развития. Биомаркер «золотой стандарт», как называют простатспецифичный антиген (PSA), ограничен в своей диагностической специфичности, ограничены также его возможности в прогнозировании исхода. Использование указанного биомаркера привело к резкому сокращению превалирования диагностики на поздних стадиях развития болезни. Существует, вместе с тем, точка зрения, что до 50% пациентов с диагнозом рака простаты, в особенности, те из них, у которых уровень PSA ниже 10 нг/мл, получили бы лучшее медицинское обслуживание в рамках методики активного контроля, чем при применении инвазивных методик. Экзосомы из раковых клеток простаты идентифицированы в качестве потенциальных биомаркеров; выделеннные из сыворотки крови пациента, они уже на ранней стадии могут дать информацию о прогнозе заболевания.

Биомолекулярная диагностика рака простаты берет ориентацию скорее на генетические, чем на протеомические аналитические методы. По мнению г-на Шнейдера (Schneider) и его коллег из Дрездена, достаточно транскриптов всего лишь четырех генов для выявления рака простаты на пробах ткани простаты, минимальных по размеру.

Для мониторинга уровня простатспецифичного антигена более традиционным способом фирма «Beckman Coulter» предлагает две калиброванных в соответствии со стандартами ВЗО системы Access® для определения общего уровня концентрации в сыворотке крови простатспецифичного антигена (tPSA), а также определения уровня концентрации свободной фракции простатспецифичного антигена (fPSA). Новые системы калиброваны таким образом, что дают численные значения показателей tPSA и fPSA , которые на 25% ниже по сравнению с калибровкой, принятой в традиционных системах Hybritech. В клинической практике при использовании новой системы следует учитывать указанные изменения в калибровке

В диагностике рака простаты также имеет значение технология визуализации. Группа немецких исследователей из Гамбурга имеет в распоряжении многообещающую новую методику для выявления рака простаты, (HI-RTE, Hitachi Real-time Tissue Elastography). Данная методика

использует эластографию в режиме реального времени, основанную на применении ультразвука. Метод испытан на 67 пациентах, подлежащих проведению радикальной простатэктомии, причем метод эластографии продемонстрировал чувствительность от 76% до 90% и специфичность от 68% до 78%, в зависимости от местоположения опухоли; лучшие результаты наблюдаются, если опухоль расположена в верхушечной части железы. Авторы считают, что у метода эластографии большой потенциал в плане совершенствования диагностики рака простаты. Предстоит, однако, еще установить возможность использования данного метода для проведения направленных биопсий, а также уточнить, является ли упомянутая методика столь же чувствительной по сравнению с расширенными схемами биопсии.

Результаты, полученные в Инсбруке, демонстрируют, что использование методики, основанной на сопоставлении степени уплотнения тканей, может увеличить позитивную статистику выявления рака простаты, а также повысить точность диагностики методом эластографии в режиме реального времени.

Лечение рака простаты

Восстановить эректильную функцию и при этом полностью удалить опухоль, не оставляя позитивных на рак тканей – это две несовпадающие цели радикальной ретролобковой простатэктомии, которые необходимо сбалансировать. Врач основывается на имеющихся у него данных о том, вышла ли опухоль за пределы капсулы простаты, и в каком месте, а затем принимает решение: можно ли сохранить в ходе операции нейроваскулярный пучок, или же его необходимо удалить.

Группа учёных из Нюрнберга провела исследование по возможности использования магнитно-резонансной визуализации с дополнительным применением контрастных средств для получения точного представления о расположении интересующих врача структур. Рассмотрена также проблема, в какой мере такая методика способна помочь принятию оптимального решения. Были получены очень хорошие результаты. Данная визуализация представляется высокочувствительной и может проводиться в условиях клиники до операции, в целях выявления пациентов, которым может сделана щадящая нервные узлы радикальная простатоэктомия. У пациентов с удовлетворительной эректильной функцией, но с высокой клинической вероятностью локально-прогрессирующего характера опухоли (T3) предоперационные исследования должны включать функциональную эндоректоральную магнитно-резонансную визуализацию, и, на основании полученных результатов, должны предприниматься последующие шаги.

Альтернативная, также инновативная технология была предложена по результатам американского исследования по оценке применения микроскопии тканей с использованием вызванной мультифотонами флуоресценции и генерации вторых оптических гармоник в целях визуализации простаты in vivo. Данная методика позволяет визуализировать микроскопические детали и хорошо сочетается с гистологическими результатами. В будущем она может играть более существенную роль в осуществлении радикальных простатэктомий с сохранением нервных узлов.

Медицинские исследования в Великобритании стремятся к более персонализированнному подходу при осуществлении операций. Предоперационные обследования методом магнитно-резонансной визуализации предоставляют информацию о расположении простаты, окружающих костей, а также о расположении опухоли, кровеносных сосудов, нервных пучков; все эти данные передаются на видеодисплей хирурга для проведения радикальной хирургической операции с помощью робота.

Не упускается также из вида выбор терапии лечения рака на более поздних клинических стадиях. Радикальная ретролобковая простатэктомия представляется лучшим способом лечения при показателях тяжести заболевания по шкале Глисена ≥8 – таково заключение группы исследователей из Москвы и г.Эмпория (Emporia), Канзас, США. Примерно у 72% пациентов, по данным этой группы, в течении пяти лет после операции не наблюдалось дальнейшего прогресса заболевания. Результаты итальянского исследования, похоже, подверждают это мнение. Сравнили пациентов с локализованной формой рака простаты которые прошли терапию путем наружного направленного облучения, с пациентами, подвергшимися по указанному поводу радикальной простатэктомии, при этом не проводились ни адъювантная, ни неоадъювантная гормонотерпия. В первой группе было выявлено в три раза больше случаев повторных злокачественных новообразований.

Интра-оперативная радиотерапия по поводу рака простаты является относительно новой методикой. Суть данной методики в том, что высокодозированная радиотерапия осуществляется в ходе хирургического вмешательства. При этом облучению подвергаются простата, семенные пузырьки, а также периопростатическая область. Среднее время облучения составляет 30 минут. По результатам обследования небольшого числа пациентов, прошедших такое лечение по поводу локально-прогрессирующего рака простаты, можно сделать выводы, что такая радиотерапия представляет собой простую и безопасную альтернативу, которая укладывается в рамки допустимого для проведения данной операции времени, имеет минимальную токсичность. Данная методика лечения в 96% случаев признана соответствующей, последующее двухлетнее наблюдение показывает, что все пациенты живы.

Другие новости

Группа по медицинским продуктам фирмы «Байер», «Bayer Schering Healthcare», представила на конгрессе Европейской урологической ассоциации новую серию медикаментов для пациентов-мужчин. Levitra®, Testogel® и Nebido® - эти препараты обеспечивают урологам необходимые возможности для лечения пациентов, у которых наблюдается порочный круг проблем, таких, как: эректильная дисфункция, низкий уровень тестостерона, метаболический синдром.

Европейская урологическая ассоциация опубликовала некоторые обновления к своим рекомендациям. В частности, это касается терапии нейрогенной дисфункции нижнего мочевого тракта. Это многостороняя патология, лечение которой выходит за рамки компетенции только урологии.

Все рекомендации и тексты Европейской урологической ассоциации можно найти на странице интернета: www.uroweb.org/professional-resources/guidelines.

Видеоинформацию о всех научных и пленарных заседаниях, а также видеоинформацию о Курсах Европейской школы урологии /European School of Urology (ESU) Courses)/ можно найти на странице интернета: http://webcasts.prous.com/EAU2008/.

Следующий конгресс будет проводиться в Швеции в г. Стокгольм с 17 по 21 марта.

India's world experts on TB

By **Cynthia E Keen**

Every three minutes, two people living in India die of tuberculosis. This equates to approximately 370,000 deaths each year, and a staggering economic toll: an estimated US$300 million in direct costs and US$3 billion in indirect costs.

The Revised National Tuberculosis Control Programme (RNTCP), the world's biggest TB control programme, has made Indian healthcare officials world experts in the diagnosis, treatment and public health management of this disease. The Programme was launched in October 1993 as a pilot project after the World Health Organisation, the Swedish International Development Agency and the Government of India had determined that existing TB control/treatment initiatives needed overhauling.

The RNTCP pilot achieved such impressive results that it became a permanent national programme starting in 1997. Ten years later, RNTCP has achieved a 70% case detection and a treatment success rate of more than 85%. By 31 December 2007, more than 6.7 million patients had been treated and over 1.2 million lives saved. More than 100,000 patients are currently treated each month.

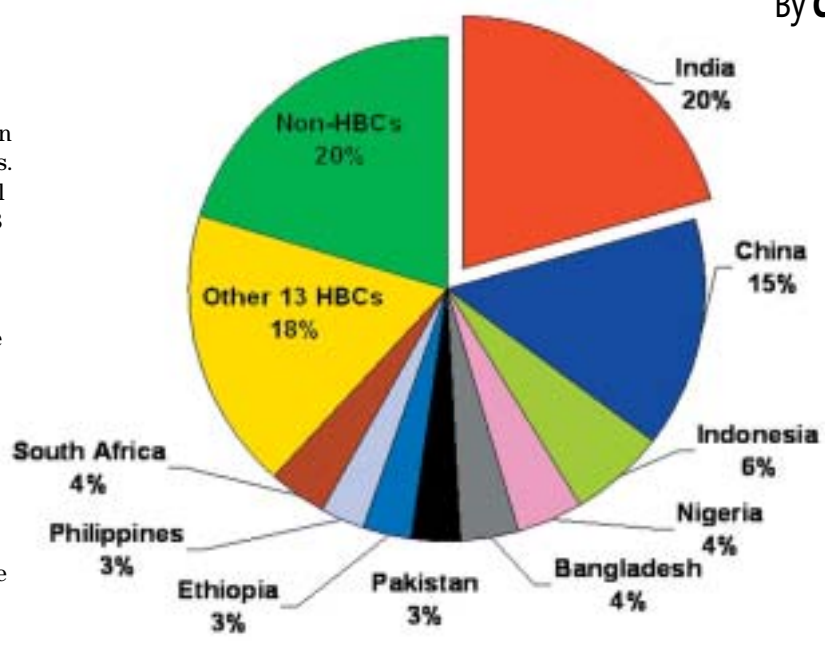
The strategy utilised, the Directly Observed Treatment Short Course (DOTS), oversees timely diagnosis, treatment with a full course of drugs administered over a duration of six months (18-24 months for multi-drug resistant TB) and aggressive patient monitoring for the entire period of treatment. RNTCP has established bureaus throughout the entire country, involving local, regional and national participation, including some of the patients themselves.

Indian radiologists have become experts in the detection of both common and rare manifestations of TB. This disease was the topic of *ESR Meets India* at the recent ECR 2008 conference. Introducing the session, Dr H Satishchandra, professor and head of the Department of Bangalore Medical College and Research Institute in Bangalore, showed diagnostic images of TB from X-rays, CT and MRI of TB symptoms that mimicked other medical symptoms. TB in the lungs, for example, can mimic a wide range of conditions from pneumonia to malignancy. In the abdomen, it can mimic mass lesions and other inflammatory bowel diseases.

TB is rare in most European countries, although HIV patients are particularly susceptible to it. The recent emergence of drug-resistant organisms, and the increase in the incidence of diabetes and AIDS, have led to TB being seen with protean manifestations. Ultrasound is used to detect abdominal tuberculosis. Dr S S Doda, of Doda Imaging in New Delhi, explained how his private practice has experimented and improvised in its use. MRI can most efficiently delineate common patterns of involvement in spinal and paravertebral structures, and is very useful in monitoring the effect of treatment. Spectroscopy is being utilised to diagnose intracranial tuberculosis.

Academic hospitals in India continue to undertake some of the most leading-edge research in TB diagnosis and treatment. Dr Satishchandra stressed that European radiologists who may not recognise subtle forms of TB should turn to Indian radiologists as expert consultants for such diagnoses.

Further details and statistics: www.eurotb.org and www.tbcindia.org



With one fifth of the global TB incidence, India has the highest TB burden worldwide. *Source: WHO Geneva; WHO Report 2006: Global Tuberculosis Control; Surveillance, Planning and Financing*

MEASELS

Numerous measles cases in Salzburg

Austria - An unusually high number of measles cases is currently causing concern amongst the public as well as health officials. Presumed to have originated in a private school in Salzburg, increasing numbers of cases were being reported at the end of March and beginning of April. In the Salzburg area alone, over 180 cases were reported within a few days; isolated cases were also reported across the border in Bavaria, in Upper Austria and in Burgenland. Rumours that the disease may have been spread through 'measles parties', where healthy pupils and those struck down by the disease meet intentionally to contract measles, have not been confirmed.

Due to the long incubation period (10-14 days) a further spread cannot be ruled out, particularly because one of the infected pupils took part in a billiard tournament with 120 participants. In the affected areas, particularly in nurseries and schools, healthcare officials organised a comprehensive vaccination programme and raised measles awareness via the media. Pharmacies have ordered sufficient supplies of vaccines and offer the combined measles, mumps and rubella (MMR) vaccination at reduced rates.

Although MMR vaccination is recommended for all Austrian children, uptake is currently only around 90%. As a person infected with measles can infect an average of 15 unprotected people, the debate around compulsory vaccinations has been fuelled again.

There is currently no medicinal therapy against the virus.

TUBERCULOSIS

Alarming TB cases in Austria

By **Christian Pruszinsky**

A third of the world's population is infected with the bacterium *Myobacterium tuberculosis* which infects around nine million people annually.

Although there is European awareness that this disease — although long thought defeated — is on the rise again, the extent of the danger is obviously underestimated, and risk is still thought to be restricted to underdeveloped countries.

However, according to WHO data, eight people in Europe die from TB every hour and another 50 are being infected. Every hour! The old EU member states report an average of 13 cases of TB per 100,000 people; the ten new member states report twice as many. The figure for Romania and Bulgaria stands at around 53 cases per 100,000 people and in the former Soviet Republic this figure rises to just under 100 cases per 100,000.

There is increasingly alarming news from highly developed countries: as recently as February this year children in a Viennese nursery were infected by one of their carers and at the beginning of March the wife of a bakery-owner in the Austrian town of Arnoldstein close to the Italian border was diagnosed with open TB. Local hospitals and health trusts were stretched to prevent a further spread of the disease. Nevertheless, the number of TB cases in Austria has remained constant with just under 1,000 cases annually. Further containment is doubtlessly being made difficult by the country's proximity to Eastern Europe and its comprehensive movements of people and goods.

Successful vaccine development in preclinical tests

However, Austria has produces more positive news: Biotech firm Intercell, specialist in prophylactic and therapeutic vaccines development, has announced that a TB vaccine, which consists of antigens from the Statens Serum Institute (SSI) and Adjuvans IC31 by Intercell is currently being tested in clinical studies. Additionally, this is undergoing further development in cooperation with the SSI and Sanofi Pasteur. SSI and Intercell will continue their TB vaccine R&D cooperation with Intercell's own Adjuvans IC31.

The participation by Sanofi Pasteur means that the activities are being escalated to advanced stages, aiming to make a TB vaccine available as soon as possible

The Berlin TB Symposium

By **Dr Timo Ulrichs**, Head of the TB section, Koch-Metchnikov-Forum

The WHO-Euro region ranges from Portugal to the East Asian parts of Russia, including Central Asia and the Southern Caucasus. Because of the increasing numbers of tuberculosis and rates of multidrug resistance (MDR TB), tuberculosis was declared a regional emergency in 2004. According to the WHO Global TB Report published in March 2008, 49 patients get tuberculosis and seven die – every hour!

In order to discuss possible ways for more efficient TB control, WHO-Euro and the German Federal Ministry of Health invited the health ministers from all 53 member states of the WHO-Euro region to a Ministerial Forum in Berlin, in October 2007. There, the health ministers adopted the *Berlin Declaration on Tuberculosis*, which names the current problems in TB control and asks all member states for immediate action.

As a follow-up to the Ministerial Forum, the Koch-Metchnikov-Forum (KMF), together with other TB control expert centres, namely the Robert Koch Institute (RKI), the German Central Committee (DZK) against Tuberculosis and the KNCV Tuberculosis Foundation, organised a scientific symposium in Berlin with the focus on the latest results in research on new diagnostics and treatment strategies, as well as novel vaccine development and prevention strategies for efficient tuberculosis control.

Speakers from the EU, US and Eastern Europe, including Russia, highlighted current R&D problems and practical TB control. WHO-Euro presented the most recent data on the spread of MDR TB throughout the WHO-Euro region (harbouring 12 out of 14 regions worldwide with high burden of MDR TB). Contributions also pointed to new developments in basic TB research, especially various novel vaccine candidates already in early clinical testing phases and based on an EU-funded research network (TB-VAC). The Aeras TB Foundation, funded by the Gates Foundation and supporting TB vaccine research, suggested ways of collaboration. Presentations were also given by other nongovernmental organisations, e.g. TB Alliance (development of new TB drugs) and FIND Diagnostics (development of new diagnostic techniques).

Held on *World Tuberculosis Day 2008*, the symposium drew 150 participants, including many from East European partner countries of the KMF, including the Russian Federation and Moldova.

The Berlin Declaration on Tuberculosis: http://www.euro.who.int/Document/E90833.pdf

Inhaled TB vaccine

STUDY SHOWS PROMISING RESULTS

USA - A new tuberculosis vaccine successfully tested at the University of North Carolina (UNC) is easier to administer and store and just as effective as one commonly used worldwide, according to research published in the *Proceedings of the National Academy of Sciences*.

Led by Professor Tony Hickey PhD, of the molecular pharmaceuticals division of the UNC School of Pharmacy, a team of scientists vetted a dry powder vaccine provided by Harvard University. This is administered using an inhaler. 'It is at least as good as the injectable vaccine,' Prof. Hickey concluded. 'The real advantage is that this vaccine does not need to be refrigerated. It also doesn't require needles, syringes and water like the injectable vaccine. Administering it is as easy as breathing in, making it ideal for use in developing countries.'

The vaccine is spray dried instead of freeze dried. Spray drying is the process of spraying a liquid through a heated gas, such as nitrogen, to create a powder. Traditional TB vaccines are freeze dried, requiring refrigerated storage and transportation, and a source of clean water to reconstitute the vaccine for injection. Spray dried vaccines do not need refrigeration or water before use.

Prof. Hickey's group specialises in developing drugs and vaccines that can be inhaled as a dry powder. The vaccine used in the study was a *Bacillus Calmette-Guérin* (BCG) vaccine, which is not common in the USA but is used extensively throughout the world. Given to 100 million infants annually, the current BCG vaccine for TB is the world's most widely administered childhood vaccine.

As an expert on the delivery of vaccines and medicines via dry aerosol, Prof. Hickey said that breathing in a TB vaccine is beneficial because inhalation is the way TB is contracted. He also believes this successful vaccine test could encourage the development of others. 'Other bacterial vaccines are being developed that might benefit from this technology,' he said.

Prof. Hickey is a co-founder of Oriel Therapeutics, a company that develops dry-powder inhaler products to deliver medicines effectively to the lungs to treat a wide range of respiratory diseases, such as asthma and chronic obstructive pulmonary disease. He is also the founder, president and CEO of Cirrus Pharmaceuticals – both based in North Carolina.

Study co-authors: UNC School of Pharmacy research assistant professor Lucila Garcia-Contreras PhD, and postdoctoral fellows Pavan Muttil and Danielle Padilla.

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