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Centre supplement
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Berlin, 8-9 September 2008

VOL 17 ISSUE 4/08

AUGUST / SEPTEMBER 2008

Patients' views on pay for their personal self control

USA – To reduce health costs as well as improve health, many large employers and insurers are introducing pay for the performance of patients (P4P4P).

Led by Judith A Long, researchers in Pennsylvania set out to assess the view of patients on P4P4P by surveying a cross-section of patients in waiting rooms at two university-based primary care clinics.

Asked for their opinions about paying smokers to quit smoking, obese people to lose weight, hypertension patients to control their blood pressure, or diabetics to control their blood sugar, 36–42% of respondents thought it a good/excellent idea. However, 41–44% of participants thought paying them is a bad or very bad idea.

Smokers and obese patients were more in favour of P4P4P to stop smoking and lose weight, respectively, than the non-smoking and non-obese respondents.

The researchers conclude that acceptance by the public of paying patients for performance is equivocal and add that establishing the value of P4P4P programme may help such a programme to gain wider acceptance.

The study was published online in July for registered users of the *Journal of General Medicine* (www.springer.com/medicine/internal/journal/11606 [doi:10.1007/s11606-008-0739-1])

World's first robot-assisted vascular surgery for aneurysm

London, UK – A *Hansen Sensei** robot has been used to perform vascular surgery on a 78-year-old patient for an aneurysm that would have been thought too high-risk for conventional surgery.

During the operation a robotic catheter was manipulated by the surgeon at a console outside the operating theatre, using a steerable tip through the blood vessels. Viewing the blood vessels onscreen, a stent was accurately fitted in the aneurysm. Blood then flowed through the stent rather than through the aneurysm, reducing the risk of rupture.

This procedure with a stent is an advanced type of minimally invasive surgery (MIS) which offers all the advantages over conventional surgery as other MIS procedures: surgical incision, minimal blood loss, shorter hospital stay and quicker recovery. However, the robot takes this process a step further; it can potentially offer patients an even shorter procedure time and



BENEFITS
Shorter procedure time, reduced blood vessel wall damage and minimised staff exposure to the ionising radiation

reduced damage to the blood vessel wall as well as minimising staff exposure to the ionising radiation in theatre, surgeons report. 'The Sensei robot has the potential to treat extremely complex aneurysm cases that have been considered inoperable until now – reducing the risk of death by rupture.'

The operation took place at St Mary's Hospital in Paddington, London, which is part of the Imperial College Healthcare NHS Trust. Professor Nick Cheshire, Consultant Surgeon and Director of Imperial's Circulation and Renal Sciences Group, said: 'Using this robotic technology will take us closer to our goal of treating every vascular patient with minimally invasive endovascular techniques to improve patient outcomes. These technologies are proving to be safer and more cost effective than open surgery and this project is a perfect example of how our Trust, as the first Academic Health

EHFG celebrates first decade 1-4 October 2008

The programme for this year's European Health Forum Gastein (EHFG) – its 10th gathering – covers a far broader range of topics than before. During over 20 plenary sessions, forums and workshops, with about 120 lectures, key topics that embrace European and the national health politics of EU member states will be presented and discussed by experts. To be included:

- Europe on the way to a standardised healthcare market? The new EU guideline on patient rights and trans-national healthcare
 - More coordination and integration: Modern information technology improves the care of the chronically ill
 - Increased patient safety and improvement in the quality of care as central challenges for healthcare in the 21st century
 - Why social and economic disparities can prevent better health for all and what we can do against this
 - The responsibilities of positions in the healthcare profession in a changing healthcare environment
 - Smoking bans, food labelling and alcohol abuse: How more prevention and EU initiatives can prevent the development of diseases at an earlier stage
 - Rare diseases and orphan drugs: EU measures help to improve the healthcare for people with rare diseases
 - Health and innovations – biotechnology, new vaccines and their financing
- The EHFG has initiated a new European Health Forum Award, to promote health policy initiatives that have contributed significantly in Europe to meet healthcare challenges, such as the inequality and disparity in health status, access to services and the provision of treatment within Europe. (Entry is now closed.)
Details: www.ehfg.org

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£50,000 fine proposed for breach of hygiene code

UK – Although outbreaks of nosocomial infections, e.g. Clostridium difficile and MRSA, have dropped by almost a third since last year, and many hygiene measures have been initiated and improved, there are now proposals for an even more stringent measure to control hygiene: the possibility that National Health Service (NHS) Trust hospitals that break hygiene regulations could be fined up to £50,000 in the future. In addition, inspectors may also be empowered to close unhygienic wards or clinics.

The hygiene code covers infection control, decontamination and cleanliness. However, recent data has revealed that, although there has been a considerable improvement in hygiene standards in hospitals, about 25% of NHS Trusts, which govern their area hospitals, have failed to meet at least one of these standards.

These are part of new measures that come under the new Care

Quality Commission (CQC), which will replace the Healthcare Commission, the current NHS supervisory body, in 2009. As well as regulating hospitals, the CQC will become responsible for overseeing general practitioners' (GP) surgeries, care homes, and private facilities, all currently regulated by several different organisations.

The maximum fine of £50,000 would be issued for the most serious offences, e.g. not carrying out advised improvements after an infection outbreak. The proposals also include fixed penalty notices with fines up to £4,000, issued against Trusts that do not meet minimum hygiene standards. Further, if a Trust obstructs a CQC inspector, or fails to provide documents or data, it could be fined £1,250.

Although these draft measures, which will further govern hygiene control, have met with opposition, they are now under consideration. See page 2: Advice on MRSA control

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Pioneering software to protect patients' privacy

Information in patients' records could benefit biomedical research in terms of understanding diseases and their treatments. The drawback is that those records contain confidential information that could identify patients. If that data has to be removed manually, the task is not only painstaking and therefore expensive, but also not foolproof.

Now a computer programme that can automatically delete confidential data from medical records, yet leave their vital medical information intact, has been developed by researchers at the Massachusetts Institute of Technology (MIT). 'We've developed a free and open-source software package to allow researchers to accurately de-identify text in medical records,' explained **Gari D Clifford**, a principal research scientist in the Harvard-MIT Division of Health Sciences and Technology (HST) who led the research* with Principal Investigator **Professor Roger G Mark**, of HST and MIT's Department of Electrical Engineering and Computer Science.



Prof Roger G Mark

To test the new software, the researchers used it on 1,836 nursing notes (containing 296,400 words). Using multiple experts and additional algorithms, they replaced all personal data with 'fake' information. They report that the software successfully deleted over 94% of the confidential information, but only 0.2% of the medical content was wrongly deleted. 'This is significantly better than one expert working alone, at least as good as two trained medical professionals checking each other's work and many, many times faster than either,' they pointed out.

The free, open-source software package (labelled de-identified data together with the software) will enable other researchers to improve their systems and allow adaptation of the software to other data types with different qualities.

According to Dr Zohara Cohen, programme director at the National Institute of Biomedical Imaging

and Bioengineering, sponsor of the work, the information in patients' medical records is a 'largely untapped treasure trove' that the biomedical research community could use to increase understanding of diseases and their treatments. 'The automated de-identification software developed under the guidance of Dr Mark is a big step forward in permitting the widespread sharing of patient information without the risk of compromised privacy and confidentiality,' he pointed out.

* This research was published in journal *BMC Medical Informatics and Decision Making* (24/7/08). Other research team members: *Ishna Neamatullah; Margaret M. Douglass; Li-wei H. Lehman, an HST research engineer; Andrew Reisner, an HST visiting scientist; Mauricio Villarroel, an HST visiting engineer; William J. Long, a principal research associate in MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL); Professor Peter Szolovits of the Department of Electrical Engineering and Computer Science and HST; and George B. Moody, HST sponsored research staff.*

Hunt Biobank, Norway's biggest research biobank, is using Thermo Fisher Scientific Inc's Nautilus LIMS in its HUNT 3 study, to gather, store, manage, track and retrieve the biological data of approximately 100,000 people from Nord-Trøndelag County.

HUNT Biobank studies provide insight into disease status and progression, particularly in relation to quality of life measures such as

Thermo Fisher reports that participation from the population has been successful in large part because every participant receives the feedback document reporting their health status, facilitated by Nautilus LIMS. The system also provides clinical follow-up, data handling and quality control following data collection and distributes coded data files to various research groups. Additionally, the LIMS has become the means of linking infor-

Nautilus LIMS used in Hunt Biobank population study



environment, education and occupation. Spanning almost 25 years, HUNT Biobank now represents an integrated family and personal database. The HUNT 3 study, part of one of the largest population-based health studies ever performed, incorporates over 130 sub-studies, including status in subjective health, diabetes, lung, cardiovascular, thyroid, muscle and skeletal diseases, mental diseases, prostate complaints, urinary incontinence, female reproductive disorders and gynaecological diseases.

Initiated to support epidemiological, clinical and preventative medical research, it is due for completion this June.

The Nautilus LIMS interfaces with the laboratory's existing robotics, import files from the hospital laboratory, and then return results for every participant.

mation from the extensive HUNT database to each study participant's personal identity number, as well as to end-point national health registries. The Nautilus LIMS installed base of biobanking organisations also provides a network of shared user experiences.

'Being totally configurable, the system has been very easy to implement right out-of-the-box and has delivered superior data capture, integration and automation capabilities,' said Thor Gunnar Steinsli, LIMS Manager of HUNT Research Centre and Biobank.

'The unique security capability of Nautilus LIMS has allowed HUNT Biobank users to keep regulated data separate from unregulated processes, to ensure maximum data authenticity, integrity and traceability,' Thermo Fisher points out.

Worldwide first robot-assisted vascular surgery for aneurysm

continued from page 1

Science Centre in the UK, has literally taken research from the bench to the bedside.'

Annually, 5,000 people in the UK die from abdominal aortic aneurysms, which occur in 7% of men over the age of 60. At Imperial College Healthcare NHS Trust 60% of patients receive endovascular repair with a stent compared to a national average of 20%. With the new robot the Trust hopes to be able to provide this treatment for up to 100% of cases.

Celia Riga, Vascular Research Fellow, said: 'The combination of innovative technology and clinical excellence within the Trust has enabled us to translate cutting edge research into practice.'

The Vascular Unit at St Mary's Hospital, part of Imperial College Healthcare Trust, is a leading European centre for endovascular treatment with the largest number of endovascular thoraco-abdominal aneurysm repairs worldwide. The Imperial College Endovascular Group has undertaken prize winning research into vascular robotics. The Group won the 1st prize (scientific session) from the British Society of Endovascular Therapy in July 2008 (Riga CV, Bicknell CD, Hamady M, Cheshire NJW). A similar robot to the Sensei is being used by the Trust to treat arrhythmias in cardiology patients.

* Robot details: www.hansenmedical.com

ADVICE Nosocomial and community MRSA infections

Professor Wolfgang Witte PhD of the Robert Koch Institute, Wernigerode, Germany, urges tests to be carried out on emergency or ambulatory care cases

First emerging at the beginning of the '60s, Methicillin-resistant *Staphylococcus aureus* as a nosocomial infection – healthcare associated MRSA (haMRSA) – has become an increasingly prevalent infection control problem in many countries.

Nosocomial MRSA infections are usually associated with a number of risk factors. As a consequence of shortening of hospital stay and treatment in specialised ambulatory facilities, a number of MRSA infections is acquired in healthcare institutions but becomes manifest in the community – healthcare associated community onset MRSA (hcaMRSA).

During the past 10 years, the emergence of MRSA infections in the community, in previously healthy individuals lacking the risk factors known for ha and hcaMRSA have been reported worldwide. For pathogens causing this kind of infections the term community associated MRSA (caMRSA) has been introduced.

CaMRSA have a pronounced capacity for causing invasive infections of skin and soft tissue, a minority of patients affected also develop necrotising pneumonia and necrotising fasciitis. Although its role in pathogenesis is not really understood, formation of Panton-Valentine leukocidin is a characteristic of caMRSA.



Professor Wolfgang Witte

The prevalence of caMRSA infection in Europe is still low compared to the USA, where increasing frequencies are recorded. Nearly half of infections treated in the emergency departments of US hospitals are caused by caMRSA. Meanwhile, clusters of nosocomial infections with caMRSA have also occurred. This is mainly associated with spread of the so called 'USA300' strain (characteristics in molecular typing: MLST ST8, spa-type t008, PVL +, arcA +). As can be expected in a globalised world, caMRSA USA300 has also arrived in a number of European countries. Although risk factors favouring the spread of community MRSA, such as low social conditions associated with minor access to healthcare compared to the USA, frequent histories of incarceration and high sexual promiscuity (in both MSM and heterosexuals) may be less frequent among urban communities in Europe, nevertheless the presence of caMRSA needs particular attention and preparedness.

Although caMRSA infections are not notifiable in European countries, so far, it is highly advisable to

perform bacteriology when treating deep seated infections of skin and soft tissue in emergencies or ambulatory practice. In a case of demonstration of caMRSA, not only the affected patient should be checked for nasal colonisation, with the consequence of eradication when positive, but also family members and comparable associates.

Clusters of nosocomial infections with caMRSA not only require careful measures of in-house infection control but also information to the general practitioner (GP) in the case of patients discharged and needing further ambulatory care.

Livestock

Additional attention should also be paid to individuals with professional exposure to livestock in agriculture. Mainly pigs, but also other animals, are frequently colonised (nasal) with a particular MRSA strain, namely MRSA ST398. As for other groups of patients with risk factors for MRSA colonisation, these patients should be subjected to admission screening when entering hospitals and barrier precautions should be applied. Eradication of nasal carriage is advisable in case of elective surgical measures. It is not sensible in general due to frequent recolonisation when being in contact with livestock.

UK Polyclinic proposals meet opposition

The relationship between England's GPs and hospitals is currently at a sensitive stage, with a review of health services across the country set to impact on the way the two groups work and liaise with one another.

The issue has been brought into focus by the review of healthcare in England by health minister Lord Darzi.

While the proposals are wide-reaching, one of the higher profile areas is the creation of GP-led health centres, or 'polyclinics'. Lord Darzi, a surgeon, initially proposed these under a review of London's healthcare, but now wants a separate network of 150 GP-led health centres across England.

Polyclinics (common in Central and Eastern Europe), or 'super-surgeries', provide a wide range of medical services and are staffed by teams of GPs, dentists, nurses, midwives, therapists and hospital doctors offering X-rays, blood tests and diagnostic tests.

Ministers claim polyclinics will improve patient care by offering a wider range of treatments and staying open from 8am to 8pm daily. They say the clinics will be able to offer quick appointments and reduce waiting times for

patient care, and 42% were not convinced they would improve access to treatment. More than 70% said they would destabilise hospitals and GP practices.

Under England's current system, hospitals are paid per patient treated and there is a growing concern that, if polyclinics take the simple cases, they may deprive hospital trust of income.

Dr Chaand Nagpaul, a London

GP and a negotiator with the BMA's GP committee, said the problem with the plans for polyclinics and GP-led health centres is that they are something of an unknown quantity and the details of how they would operate are not clear. 'It is also unclear how GPs and hospital doctors will work together through the polyclinic proposals and what the financial transactions of the partnership

will be,' he added. 'We need more details from the government on this before we really know.'

The matter is the latest in a series of issues that has brought UK GPs into conflict with the government. Recently, the BMA led opposition to plans to extend the opening hours of surgeries into evenings and weekends.

Other proposals in Lord

Darzi's report include hospitals publishing death rates for various conditions; the old and terminally ill to have the right to choose to die at home instead of in hospital; greater scope for private health care firms to supply primary care services, and a new NHS constitution that will enshrine rights to confidentiality, control of patient records and a second opinion.

Report: Mark Nicholls



Health Minister
Professor Lord Darzi

Dr Chaand Nagpaul

diagnostic tests that are currently only provided in hospital.

Doctors' leaders and patient groups fear polyclinics will end the personal relationship between a patient and their general practitioner (GP). Additionally, the British Medical Association, which represents doctors, claims some existing GPs will be forced out of business.

However, a Department of Health spokeswoman said: 'We are not imposing super-surgeries or polyclinics, or replacing existing services. The 150 health centres will complement existing GP practices and serve as an extra way to see a doctor.'

The King's Fund, the healthcare think tank organisation, warns that the proposal could backfire if GPs and other healthcare staff end up being concentrated in a single building and make it more difficult for patients to visit their GP, especially those living in rural areas.

Similarly, NHS consultants have raised doubts about the merits of polyclinics. In a BMA poll, which received 1,587 responses, 60% either disagreed or strongly disagreed that polyclinics would improve



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ANNOUNCEMENT: Competition Winners

DNA-Art

A personal depiction of his own DNA as an artwork was won by **Dr Antonio Poli**, Director of the S. Anna Hospital in Castelnovo Ne' Monti, Italy.

Dr Poli has now received the artwork, which he said is 'Absolutely wonderful. I have hung it behind my desk in my office.'

For further details about this unique art concept go to: www.dna.art.co.uk



Olympus Mju 850 SW camera

The winner of our pretty pink waterproof camera is **Susan Blum**, who is a care assistant at Kings Mill Hospital in Shirebrook, England.



The needs of migrant patients

By Heidi Heinhold

In hospitals all over the world people of very diverse cultural backgrounds come together, whether as employees in various roles, or as patients. This means that hospital teams must deal with diverse needs, cultures and languages.

In 1963, Virginia Henderson in the US determined the 15 basic human needs in her *Theory of Basic Principles of Nursing Care*. These are internationally acknowledged as the lowest common denominator for patient care. Nurses are responsible for the basic needs of patients, which include rest and sleep, cleanliness and personal hygiene, the expression of emotions, distress, and their fear or feelings about dealing with others.

Transcultural nursing care

About 10 years ago Renate Pfortner-Hüttner*, then a nurse at the Nuremberg Hospital, examined the situation regarding foreign hospital patients as part of her *Professional Care* training course.

● **Expectations:** It transpired that these patients did not expect or demand that the staff should know much about their cultures – expectations were very low. Patients from Eastern Europe and Turkey consciously tried to assimilate into the daily life on the wards without any problems.

● **Religious needs:** Patients accept a hospital's particular organisation and adapt their individual needs to those expectations. However, Muslim patients did state that they missed a room where they could carry out their religious rituals, particularly cleansing before prayer, which should always be carried out with running water. This, however, is not possible for bedridden patients. There is one comfort – Islam permits making up for missed prayers at a later time.

● **Religious diet:** Patients were not worried about something as obvious as mistakenly being served pork. However, they were concerned about whether, in a large hospital kitchen, there was sufficient care to keep different foods apart, e.g. in the preparation of sauces. Some patients preferred to use their own cutlery and crockery to avoid possible contamination.

● **Language barriers:** There were fewer than assumed and these mostly occurred among Muslim women whose lives were focused around their families and who only communicated in their mother tongue.

● **The generation gap:** Muslim patients of the so-called first generation were a lot less forthcoming with their wishes and demands than those of the second generation. Younger patients were very well informed about their rights and opportunities in a hospital.

To summarise: It could be said that foreign patients acknowledge the singular situation they are in and so put their individual needs on hold.

Are foreign patients ill in a different way?

Twenty years ago the German Red Cross examined this question in their project: *Older migrants – the promotion of social commitment by younger people to help older, foreign fellow citizens in Germany*.

62.1% of men and women polled stated that they felt sick rather than healthy, whereas 37.9% reported that they felt their current physical

state was good. The most common complaints were headaches, back and joint pains, circulation problems, cardiac trouble, nervousness and other ailments, such as bronchial infections and ulcers (in stomach, duodenum, which can have psychosomatic elements).

Working practices in western industrial nations, e.g. working in large scale industries, industrial production, shift work etc. were

identified as contributors to the development of illnesses. These practices are very different to the way that people had previously worked in their own countries, where they may have been agricultural workers, craftsmen or traders, leading to premature dete-

rioration of health, high occurrence of sickness, increasing numbers retiring early due to ill health, occupational diseases and problems after occupational accidents.

Conclusion: In- and out-patient nurses cannot solve the issues alone. Apart from voluntary training, they need professional support from reliable individuals who mediate between the hospital and the patients. Many problems are unlike-

ly to be solved, particularly as in-patient stays are increasingly shorter; for other problems that occur consistently and repeatedly (e.g. the need for a room for religious rituals) in time there will be a solution acceptable to all.

*Source: Pfortner-Hüttner, Renate: *Study on the care of foreign patients: How important are cultural differences.* *Pflegezeitschrift* 1/99 59-61, Kohlhammer, Stuttgart

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Britain is a primarily Christian country. It is also home to people with various religious beliefs who have migrated here from many parts of the world, or are British born. In a 2001 census, 72% of the population identified itself as Christian. The next biggest religious faith was Muslim (2.7%), followed by Hindu (1.0%), Sikh (0.6%), Jewish (0.5%) and Buddhist (0.3%), and the rest followed other religions, had no faith, or stated none for the census.

In terms of numbers, seven in every ten people in Britain claimed to be Christian; the Muslim population equates to 1.6 million people; Hindu to 599,000; Sikh to 336,000, Jews to 267,000, and so on.

In August, the statistical research body Eurostat released projections that suggest that the current UK population of around 61 million could increase steadily to about 77 million by 2060. Healthcare and social care may account for a huge increase in numbers – particularly of old people.

These figures are not just of interest; they also reflect Britain's changing way of life.

With its long history of Empire and Commonwealth, Britain has long prided itself in welcoming and assimilating immigrants. However, change is not easily accepted by all.

Thus, when Muslim groups began to request that various religious needs should be met within the National Health Service (NHS) these have been met with a mixture of willingness and generosity but also consternation. The situation is often controversial, not least because so many hospital practices are challenged.

Medical students and staff dress: Although Muslim women medical students were allowed to wear the full-face veil for lectures and on the campus, Birmingham University School of Medicine banned this in hospital clinical areas and in GP surgeries, on the grounds that it could prevent good communication between them and their colleagues – as well as patients. It was said that regulation surgical masks provide adequate face covering in the operating theatres. Headscarves worn as part of

Muslim woman – doctor, medical student, nurse or patient – should be forced to bare her arms below the elbow.' The problem continues. **Patients' gowns:** In 2005, a hospital gown, called the 'inter-faith gown', was designed to comply with rules on women's dress, in Muslim, Hindu, Orthodox Jewish and Rastafarian faiths.

Made by the UK company Interweave Textiles (www.interweavetextiles.com), one of the biggest suppliers of textiles to healthcare and contract markets,

some ladies simply felt they could not wear the normal gown which, as we know, can show parts of us we do not want on show. We have had examples of people not showing up for operations. This can only help.'

In November 2006, the inter-faith gowns went on general sale, costing about €16 per set.

Gender of patients and doctors: The preference among Muslims is to be seen by same sex doctors. However, if no female doctor is available, some women may agree to be seen as long as another woman

another across our different faith traditions.'

Representatives of Christian, Muslim, Hindu, Jewish and Buddhist faiths attended its July opening. Candles were lit and sacred texts and other religious artefacts were donated by the religious groups.

Drugs: There is concern that, although Muslims must avoid porcine and alcohol derived drugs,

Muslims and healthcare in the United Kingdom

By Brenda Marsh



Garment made for Muslim female patients

religious observance were to be allowed.

A recent Department of Health guidance stipulates that all doctors must be 'bare below the elbow', to help prevent infections. Various hospitals have received objections from Muslim women trainees who do not wish to remove arm coverings in the operating theatre and to roll up their sleeves when hand washing. In terms of hygiene, this is vital. However, it is a problem for some Muslims: one university hospital reported that some students said they would rather give up their studies than bare their arms.

Nonetheless, the Islamic Medical Association insisted: 'No practising

these jade green polycotton garments come in five pieces, which include trousers and a choice of head pieces, to cover the head, neck and body, leaving only a gap for a patient's eyes. They also have elasticated cuffs to ensure women's arms are not revealed.

Inspired by Karen Jacob, linen services manager at Lancashire Teaching Hospitals, the gowns were tested for a 12-month period at Lancashire Teaching Hospitals. 'The use of the gown at our Trust produced some very positive feedback from patients,' she said.

A Lancashire Teaching Hospitals NHS Trust spokesperson said the gown was introduced '... because

(e.g. a nurse) is present. Others may refuse to be seen. Mixed wards also cause stress to female Muslims, but this is also disturbing to women patients of any faith.

Beds to face Mecca: Last December, the Mid-Yorkshire NHS Trust proposed that Muslim patients' beds should be turned to face towards Mecca five times a day. Running water should also be provided for these patients to wash before and after their prayers, and for many other purposes.

This was first implemented in the Dewsbury and District Hospital, Yorkshire, where there is a large Muslim population. A spokeswoman for the Mid Yorkshire Trust said: 'This is all part of our holistic approach to treating patients of all faiths. Where it is safe and practical we will move the beds of seriously ill patients so that they face towards Mecca five times a day, should a patient request it. We are keen to accommodate all faiths, for example if a patient is Roman Catholic then we would try and ensure they can receive Holy Communion.'

However, critics of the ruling said it would be far better to create Muslim-only wards, with all beds facing Mecca, than to burden overworked nurses with this extra task.

Religion: British hospitals generally house Christian chapels and many have multi-faith prayer rooms.

The Ashford and St. Peter's Hospitals, serving a diverse population of over 400,000 people, have provided a Christian chapel and improvised arrangements for other faiths. Recently, however, a Multi-faith Centre was opened at St. Peter's, and a similar project is planned for Ashford.

The Centre comprises the existing Chapel, Multi-faith Prayer Room, Quiet Room and Ablutions Room for ritual washing before prayer, and also provides a shoe rack for footwear. The ample Prayer Room floor has a simple compass design. Secure storage space is provided for sacred texts and religious artefacts.

'Our vision was to develop the Chapel area to provide more fitting facilities for all who wish to spend time in quiet, reflection, meditation or prayer,' explained Judith Allford, Head of Pastoral Care for both hospitals. The new double doors, set with decorative glass, link the Multi-faith Prayer Room to the Chapel. These, she explained, have both a practical and symbolic purpose. 'Practically, they offer the option to extend the space in both the Prayer Room and the Chapel when the need arises. Symbolically, they represent the welcome and hospitality which it is our desire to offer to one

possibly objectionable drugs may not be labelled as such, nor advice given on alternatives.

Catering: Some outside catering services in Britain can provide not only halal food, but also the necessary equipment for their hygienic handling.

Ramadan and Hajj: Recognition of their importance has been advised, for example not to book hospital appointments for Muslim patients during these events.

During Ramadan, the holiest of Islam's four holy months, eating, drinking and sexual relations are forbidden in daylight hours. Last year, the Scottish Executive and the Scottish NHS issued a guidance that, during Ramadan, 'consideration' should be shown to Muslim colleagues and patients. Food should not be eaten in front of them, and food trolleys kept away.

Are separate faith-based hospitals the answer?

Aziz Sheikh, professor of primary care research and development in the Division of Community Health Sciences, University of Edinburgh, and principal investigator on a Scottish Executive supported grant to investigate the end-of-life care needs of South Asian Sikhs and Muslims in Scotland, advocates that doctors and health policy makers should realise their needs and provide specific services for them.

It is even suggested that faith-based hospitals may improve the well-being of Muslim patients. (Moscow's first private clinic based on Sharia law opened last year. Among other things it observes gender differences, supplying female or male specialists according to a patient's gender. The doctors show only their hands; female doctors wear headscarves or hijabs. In the prayer room a screen separates men from women. Halal food is served.)

In Britain, although male infant circumcision is not approved by the National Institute of Clinical Excellence (NICE), Professor Sheikh believes that male infant circumcision should be available throughout the NHS. A few Trusts do provide this service, but most Muslim parents must resort to poorly regulated operators, sometimes unhygienic and dangerous.

Conclusion: There is a laudable commitment to prevent racism or religious prejudice in all public services. Certainly, small advances have been made, but with so many issues involved, the way forward is by no means straightforward.

*Should Muslims have faith based health services? *BMJ* 2007; 334:74 (13/1/08), doi:10.1136/bmj.39072.347720.68

Germany's Muslim patients

Which doctor, physician or witch doctor?

A new Turkish patient is admitted. What would almost any nurse think? 'The whole family will always be there', says health economist Fatemeh Pohl-Shirazi. 'In Muslim cultures illness makes someone the centre of attention and the whole family wants to show compassion – which unavoidably changes normal hospital routine. The patient's room will always be full, with visitors coming and going, and visiting times often re-interpreted. They will also bring food for the patient.' Here she outlines a few significant cultural differences and ways to better understand and therefore avoid awkwardness in care



Fatemeh Pohl-Shirazi, a German/Iranian, gained a health economics degree at the University of Applied Sciences for her thesis on Muslim patients and the German healthcare system – with a focus on culture and ethics.

Muslims are not a homogenous group: some are deeply religious, others more or less so and more or less open towards Western lifestyles. However, they all grew up in a culture very different from that which has been dominant in Western Europe. In many regions and families, the hodscha (healer) is still an important figure – and he may well determine the 'evil eye' or some evil demon to have caused an illness. Additionally, the women are often shy and consider undressing for a medical examination extremely embarrassing.

Although Christians and Muslims appear to share everyday life in Germany, they largely live in separate worlds and often do not know much about the others' customs and rituals. In the microcosm of a hospital this separation cannot be so easily maintained. Their worlds clash. Lack of knowledge, on both sides, can cause misunderstandings with awkward results.

The major, most immediate issue is language. Many Muslims here speak little if any German. Therefore family members become interpreters. But do they – for whatever – reason tell the truth? Sometimes the family member wants to spare the relative the truth and consciously offers a wrong translation.

Different expression of pain and medical approaches

In Turkish culture, expressing emotions and pain is acceptable, because the suf-

ferer is the centre of attention, and the more severe the pain, the greater the attention.

Thus, the expression of pain may be increased if Muslim patients fear that hospital staff will neither understand them nor take them seriously. This means the expression of pain may be more intense than the pain actually is.

Same disease, different perspective: In any culture physicians strive to fight, mitigate and heal illnesses. But what is an illness and what is health? The answer can be very different in different cultures. So, who can help, doctor or traditional healer?

The behaviour of patient and physician may also lead to misunderstandings: German doctors frequently distance themselves from patients. Diagnosis is brief, physical gestures are minimal. The physician should expect to be observed critically by the patient who may decide, without hesitation, to obtain second and third opinions.

What role does a Muslim physician play? He or she enjoys considerable respect, trust and authority. Physical gestures are welcomed as signs of a trustful relationship. Most physician-patient interviews begin with the physi-

cian enquiring about the wellbeing of the patient's family.

Mutual information and expressions of empathy can build bridges, not only because knowledge of Muslim perspectives and rituals facilitates communication in the hospital and even increases the probability of successful treatment, but also because we live in times of transition, in times when cost-efficiency is imperative, because customer and patient-oriented work is vital to a hospital's economic success – and because Muslims are a target group. Not to mention the fact that a specialised service for this target group may attract a solvent clientele from the Middle East – a major beneficial economic factor.

How can medics learn more about Muslim culture that would not only help to solve stressful daily problems but also improve quality of care? An initial, simple step can be found in workshops on communication with patients from different cultural backgrounds and further education of clinical staff.

* Workshop details: Pohl-Shirazi@gmx.de

LEADERSHIP TOOLS FOR HEALTHCARE MANAGERS

Strong leadership is vital for healthcare management. 'Operationalisation' of leadership is necessary in order to learn, apply and evaluate leadership in healthcare facilities contexts, says Dr Eduardo de la Sota Guimón. But how is this best achieved? Although various authors suggest methods to attain effective leadership, their approaches are not always uniform. Here he reviews some of the literature and authors' advice.

The Leadership Strategies for Evolving Health Care Executives Programme (Harvard University, 2008) focuses on leadership skills essential for achieving individual and organisational objectives. Interesting highlights:

- Develop creative problem-solving. Learn how to successfully implement your agenda during organisational change
- Evaluate, diagnose, and build a high-performance team
- Attain a firm grasp of your organisation's financial management controls in order to effectively bring organisational vision to reality
- Learn how improving operational performance
- Balance organisational interests with those of professional staff, patients, and the community
- Position and brand your services and products to prevent them from being turned into a commodity
- Learn legal and ethical responsibilities.



Bryant Nelson has recently written the book (2007) 'Leadership Tools For Inspiration and Motivation'. He maintains that inspiration and motivation are musts for any leader and that you can have

perfect structures, awesome communication, and loads of emotional intelligence, but they are not worth much if your group is not inspired and motivated.

K Blumberg (2007), points out 15 Essential 'Leadership Tools':

- **Strategic vision.** Like an SLR camera with several lenses, you need to be able to think about the long-term (telephoto lens) and the short term (normal length lens).
- **Automatic focus.** A key leadership job is making sense out of the mass of information in the world and focusing it down to the few key things the organisation needs to do.
- **A heart.** Blumberg believes you lead best from caring for others.
- **Input tools.** These include a good pair of ears for listening carefully to those around you, a clear pair of eyes for observing

your world, and a strong pair of legs for getting out of your chair and walking to where the action is.

- **A funny bone.** You need to be able to see something to smile about even in the midst of trouble, because laughter is often the grease that gets the wheels turning again.
- **The ability to delegate.** And the ability to track performance and correct it before it's too late.
- **Curiosity.** The burning desire to understand why things occur.
- **Financial intelligence.** The ability to understand financial information.
- **Planning skills,** including time management
- **Problem solving skills**
- **Risk management skills,** especially Potential Problem Analysis.
- An evidence-based approach to **new ideas** – healthy scepticism about the latest management fad.
- **Measurement skills.** The ability to devise measures for most things that matter in your organisation.
- The ability to know when and **how to make decisions.**
- **Tenacity**

Interestingly, the fourth annual Leadership Tools for Women Conference (New York, June 2008), has taken place under the banner 'Changing the Power of Women'.

The conference is designed specifically for women working in higher posts who wish to heighten their understanding of the contemporary issues facing women as they move to assume leadership roles in their institutions.

The **Leadership-Tools.com** page, by **Richard Gorham**, offers leadership tools and resources that will assist managers in becoming more effective leaders in the workplace.

Leadership-tools.com is devoted to researching, creating and delivering **high quality tools in five strategic categories:**

- Business planning
- Leadership development
- Sales management
- Customer service
- Team building

As we can see, different authors have their specific interpretations over leadership tools, but all of them pursue effectiveness and efficiency, through people.



Efficient processes in the Finnish hospital HUS



By **Dr Janne Aaltonen**,
Director R&D, HUS
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The Hospital District of Helsinki and Uusimaa (HUS) is the biggest of 20 hospital districts in Finland. It provides specialised and university level health care services in and around city of Helsinki, with regional responsibility of 1.5 million people. HUS has 23 hospitals, 21,000 employees (2,500 doctors), 1.4 million annual outpatient and 500,000 in-hospital visits, and annual revenues of 1.4 billion EUR. Helsinki University Hospital is part of HUS.

The HUS strategy was fully aligned in 2007. Our objective is to increase productivity 2–3% per annum, adoption of the purchaser/provider split, customer-orientated services and structures, and reform of operating models throughout the organisation. All of these objectives apart from purchaser/provider split call for process development. Actually, even before aligning the strategy the Ideal Hospital project was started, which aim is to develop a new process oriented concept for HUS.

The Finnish healthcare system is relatively effective, if we use GDP proportion of healthcare costs as an indicator of efficiency. In 2005 Finland used 7.8% of GDP in healthcare (OECD health data). All people have access to public healthcare; there is also a small private sector (about 10% of services). Primary and secondary care is currently disintegrated, although there is a legislation process to join these two. Specialised care is provided by Hospital Districts, each municipality belong to one (of 20). Most districts use DRG reimbursement system.

The quality of Finnish healthcare systems is also quite high if we ask people who have used healthcare services. Finnish people regard our system third best in the EU (EurLIFE survey 2003). If we combine efficiency as a GDP share and quality as asked from people, we can find Finland the number one OECD country in quality-efficiency matrix. Low costs are mainly due to lower than average personnel cost because of smaller number of doctors and nurses.

We have described numerous processes in diagnosis or treat-

ment level, for example hip replacement procedure, angioplasty, diabetes, etc. This is what we should do if we want to develop standard operating procedures for treatment of patient groups. However, there is a problem of high number of separate diagnoses and treatment options and in addition high variety between patients (acute vs. chronic, emergency vs. elective, etc.). Therefore we wanted to study if there are process steps and subprocesses common to different patient groups and specialities. And, naturally, there are. A referral process, diagnostic process, operation process or transfer process is similar between different patients and specialities.

By combining these two approaches we can form two-dimensional process matrix, elements that are common to all patients at certain stage (vertical process) and elements which are common to all patients at certain diagnosis or treatment (horizontal process).

If we consider all medical care, we can find out, that processes in emergency care and elective care are quite different. Elective care is scheduled; therefore we can utilise resources differently from emergency care. Also, an elective patient has a diagnosis, while first step of emergency care is to define diagnosis. Due to differences in these processes we have concluded, that it would be reasonable to separate elective care totally from emergency care. Similarly there are major process and resource optimisation differences concerning elective in-hospital treatment and elective ambulatory services where people flow anyway, i.e. in shopping centres and city centres, not in the hospital environment.

As a conclusion, there are two ways to define processes in hospital: 1) customer processes (vertical), which allow optimising allocative efficiency ('doing right things'), and 2) production processes (horizontal), which allow optimising technical efficiency ('doing things right'). Customer processes can be used in developing ICT, and for comparison of different specialities in one organisation. Production processes should be used to standardise operating procedures, and for comparison of one unit in time, and same activity in different organisations.

We expect productivity gain of 10–20% by standardising customer processes, and 5–10% by standardising production processes.

Essential: Training staff for sudden disasters

The doors of the accident & emergency department fly open. An explosion occurred at a nuclear power station. Severely injured workers, some screaming, some unconscious flood are rapidly arriving on trolleys pushed by paramedics; doctors and nurses rush in. About 50 accident victims need care. Who should be treated first – and where? Primary treatment is extended to other wards. 'I think the power station reactor has also been affected,' shouts a paramedic. The workers may be radioactively contaminated. 'We can't admit them to the hospital just like that!' someone cries. Too late! Suddenly, everything eases up; everyone's thinking the same thing: 'Just as well this was just a training exercise!'

Norman Hecker, Head of the Project for Emergency Medicine at the German Institute for Disaster Medicine, is well versed in the effects of large scale incidents, pandemics and mass accidents, for he advises on and trains hospital staff for worst case scenarios, so that people can learn from the mistakes demonstrated in the above scenario. 'Planning or no planning,' he said, 'training exercises or no training exercises can sometimes mean the difference between life and death. It is important to practice processes through regular training – that's the only way to ensure that in a real emergency everything runs smoothly. Well-trained staff and optimised alarm action plans can often prevent an escalation of a crisis. One of the prerequisites for this is that the hospital continuously and critically checks its concepts for their suitability for practical use. Many hospital action plans are outdated and based around threats that no longer correspond with current reality. The terrorist attacks in the US on 11 September 2001 and those in Madrid and London showed the necessity of preparation for large-scale events through more efficient rescue strategies, and this applies to Europe as well.' But, he adds, internal crises such as hospital fires or power cuts are also underestimated. As the sources of danger and the

structures are very different from hospital to hospital individual risk analysis is needed to build up a functioning crisis management system.

'The cost pressures that hospitals internationally face are well known. For this reason alone there should always be customised advice for each individual hospital, so that their effectiveness is not impaired, and also to guarantee first-class medical care under normal conditions. Disaster medicine training sessions in healthcare institutions should be held at least once a year, although it would be desirable to hold them more frequently. It goes without saying that not every possible scenario can be provided for with training exercises right down to the last detail, but we have repeatedly noted that participants in such simulations under real conditions develop very creative coping strategies.'

Efficient crisis management is characterised by three big Cs: Command, Communication and Coordination, he explained. This means that a senior management team should be appointed to take on the coordination of individual resources, and that organised reporting channels guarantee the transfer of information – if this is not done it can lead to situations where, for example, a contaminated patient contaminates all sensitive areas within a hospital because there has been insufficient preparation and structuring of his transfer through the building. In particular, the responsibilities and distribution of executive functions should be clarified before it is too late. 'The incident command team must be determined,' he advised. 'They take over the strategic management and coordination of the crisis on site. Although, in Germany, they are supported by the super-ordinate danger defense organisations, such as the police and fire brigade, the hospital management can be, and is made, personally liable if a lack of prior planning is proved. Hospitals are ethically and legally obliged to ensure the best possible medical care for patients in the case of catastrophes despite limited resources.'

Courses for future hospital managers



Today hospital managers have to meet varied and complex requirements. Their field of activities covers multiple disciplines and the decisions they make are of far-reaching significance for

the future positioning and economic viability of their hospitals or hospital group.

It is therefore imperative to create a work environment that is attractive, despite the high workload. Economic success depends on the optimisation of organisational processes, while medical care, diagnostics and interventions must be state-of-the-art. Quality management measures taken in hospital organisation must also focus on patient safety and comfort and ensure the continuous improvement of treatment outcomes.

Special training courses prepare (future) hospital managers for these tasks by offering broad business education that provides them with the technical and methodological competence required for managing hospitals.

The catalogue *medicine & health 2009** gives an overview of courses offered in hospital management. The 19th edition of *medicine & health* presents a comprehensive listing of and concise information on 2,500 flagship courses from 50 thematic areas structured in seven chapters. The courses and conferences included are offered and held by over 750 universities, higher education institutions and international organisations.

Specifically for hospital managers and healthcare executives, new and renowned courses and seminars organised at the regional, national or international level are listed in an exemplary and clear fashion in the chapters on hospital management and organisation, quality management, information technology, healthcare and health

Gerhard Polak MD DTMH outlines the 2009 catalogue of courses commencing in Europe this October

services as well as management for non-profit organisations (NPOs).

Examples of courses in Europe:
Health Care Management, Dresden International University

International Executive MSc in International Primary Health Care by Web-Based Distance Learning, University College London (UCL)

Master en Dirección Médica y Gestión Clínica, Escuela Nacional de Sanidad, Instituto de Salud Carlos III, Madrid

Master in Health Services Research, Erasmus MC, University Medical Centre Rotterdam Master of Arts in Hospital Management, University of Leeds

MBA Health Care Management, Medical University of Vienna

MBA Health Care Management, SMBS - University of Salzburg Business School

MBA International Hospital & Health Care Management, Frankfurt School of Finance & Management

MSc in Health Services Research, University of York

MBA Health Services Management, Danube University Krems

The courses are described in abstracts, which facilitates their comparison. On around 300 pages, the catalogue presents seminars, courses, summer schools and conferences taking place from October 2008 to June 2010. Each chapter starts with expert articles and includes additional short articles informing on training opportunities and career paths in the thematic fields covered. In addition, *medicine & health 2009* offers comprehensive indexes, a guide to 150 selected websites and a directory of organisers.

*Price: €39.90 (Austria and Germany), 42.00 (rest of Europe) and 51.00 (overseas, airmail).

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By 2010 India could capture clinical trials business of around US\$ 1 billion, up from US\$ 200 million in 2007, making the subcontinent one of the world's preferred destinations for clinical trials

Ethical concerns over clinical trials in India

As an increasing number of international drug companies are moving their clinical trials business to India, the clinical trial industry has been raising concerns about the lack of regulation of private trials carried out there, including the uneven application of requirements for informed consent and proper ethics review.

There is now a new urgency for the reform of clinical trials registry in the subcontinent.

Dr Ambujam Nair Kapoor, a senior scientist of the Indian Council of Medical Research (ICMR), stated: 'Unless we put in place systems that ensure safety of patients and good quality of trials, people will get away with whatever they can get away with.' ICMR, a national body responsible for the formulation, coordination and promotion of biomedical research, is striving to do just that with the Clinical Trials Registry of India, which was launched in July last year. This encourages the registration of all clinical trials conducted in India before the enrolment of the first participant. Dr Kapoor, who added that the Registry is meant to bring transparency to clinical trials conducted in India, is very aware of the shortcomings of current trial publication practices, including a tendency to publish trial results only when they are positive: 'Trials done earlier, where the drug has not been found to be effective, are



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sometimes not publicised,' she said, adding that information about failures should also be put in a publicly searchable database.

Working with the Indian Journal of Medical Research, early this year the Clinical Trial Registry also brought together the editors of 12 Indian biomedical journals to develop policy covering the publication of clinical trials. The editors issued a statement in April urging all those conducting and/or planning to conduct clinical trials

involving human subjects to register their trials in the Clinical Trials Registry or any other primary clinical trial register. From January 2010 these journals will consider publication of a trial started in or after June 2008 only if it has been previously registered.

'We are wearing down the resistance [to registration],' says Dr Prathap Tharyan, professor of psychiatry at the Christian Medical College, Vellore, India. Tharyan is the coordinator of the South Asian

Cochrane Network, and a member of the Scientific Advisory Group of the WHO International Clinical Trials Registry Platform (ICTRP) and of the steering group of the Clinical Trials Registry.

The latest developments in India reflect a concerted effort on the part of the global public health community to push clinical trials issues to the fore in the wake of several high-profile cases in which pharmaceutical companies were shown to be withholding information from regulators. In September 2004, for example, the members of the International Committee of Medical Journal Editors (ICMJE) published a joint editorial promoting registration of all clinical trials. The ICMJE stated that, from 1 July 2005, only registered trials would be eligible for journal publication. In 2007 the ICMJE stated that it would consider a trial for publication if it had been registered in any World Health Organisation Primary Registry.

The WHO's involvement in clinical trial registration began in October 2003 with consultations with different stakeholders to identify a potential basis for collaboration to address complex issues related to trial registration and reporting. This culminated in the establishment of the ICTRP Secretariat, which began operations in August 2005. It is committed to harmonising standards within which trial registers and databases worldwide can operate in a coordinated fashion, providing a global trial identification and search capability, and promoting compliance.

For a full report published in the WHO Bulletin in August, go to: www.who.int/entity/bulletin/volumes/86/8/08-010808.pdf

Researchers funded by the European Union have devised OptoLabCard, a system that prepares samples and performs DNA tests on bacteria in a portable, easily used, cost-effective lab-on-a-chip.

Within three years, this work will lead to commercially available hand-held devices that detect bacteria in the food chain and diseases as diverse as cancer, hepatitis, AIDS and flu within 20–30 minutes, replicating laboratory processes anywhere at any time.

OptoLabCards could also be used to identify pathogens and pollution in water supplies, says Dr Jesús M Ruano-López, coordinator of the OptoLabCard project at the IKERLAN Technology research centre, Arrasate, Spain. The

Integration of POCT into the clinical laboratory

Unlike regular laboratory analyses, which is performed by clinical pathologists and technicians in the clinical laboratory, Point of Care Testing (POCT) are devices to perform laboratory analyses in the vicinity of the patient by the attending physician or nurses.

POCT is essential in all hospitals, either due to the instability of the analytes (e.g. in blood gas analysis) or the necessity of immediate reporting (e.g. glucose testing to adjust insulin doses) and the very demanding logistics for the alternative, i.e. testing samples in the laboratory. This has led to the development of several devices specially designed for POCT. Not only is the location different for POCT, but the levels of analytical expertise in the ward and the ease of testing are also different.

In general, POCT devices analyse unprocessed samples (e.g. whole blood) and can be run by personnel with only limited training. The devices automatically check the integrity of the analytical procedure and the necessary pre-analytical steps (replacing centrifugation for the separation of blood cells from serum/plasma) are generally performed within the devices.

POCT carries several challenges: the immediate medical response to the results, and the tests in terms of medical analysis by a layperson, demand supervision by analytical experts. In Germany, for example, supervision by the central laboratory is mandated by law and DIN EN ISO 22870 describes in detail the optimal organisation of POCT. The decentralised testing makes this supervision very demanding: a typical 800-bed hospital has about 50 patient sites for glucose testing and about 10 for blood gases; large university hospitals may have several hundred sites in which to perform POCT. The high volume of POCT analyses – in general, about 50–100 tests are performed annually per hospital bed – and the widespread use of electronic patient records (EPRs) should

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The OptoLabCard

company develops products that combine mechanical with electronic and software engineering.

Clearly, the quick detection of diseases such as campylobacter and salmonella well before they enter the food chain would greatly enhance food safety, especially as tests on farms or in food processing and distribution require laboratory testing that can take days.

The notion of a device small enough to perform tests normally needing lab facilities arose from the development in the last century of microelectromechanical (mems) technology, which made it

possible to put sensors, fluid channels and optical components into a tiny space, using components measured in microns (millionths of a metre).

But until now production costs have been prohibitive. What distinguishes the OptoLabCard is the material used to manufacture the components and the way in which samples are prepared for testing.

The device integrates optoelectronic, microfluidic and microbiological advances. Chips are simpler and cheaper to produce because, for most components, the OptoLabCard uses a negative

Spanish researchers develop a new lab-on-a-chip for 20–30 minute tests. **David Loshak reports**

thick photoresist – photosensitive resin that loses its resistance to chemical etching when exposed to radiation and used in the transference of circuit patterns to semiconductor chips when making integrated circuits.

The base unit contains all the electronics and optics and the chip is disposable. Incorporating sample preparation into the chip enables users to perform laboratory processes wherever they need.

'Sample preparation is the crucial part but it was abandoned by earlier developers,' Dr Ruano-López notes.

'After all, to detect the presence of bacteria you must have a reliable sample.'

Rubbing a swab across a chicken carcass, for example, might produce a sample containing as few as ten bacteria, an amount that could go undetected once transferred into the device.

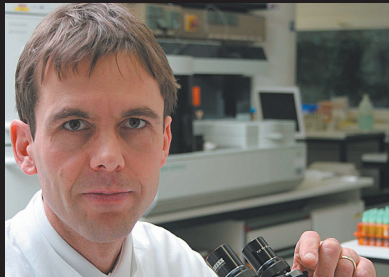
That inability to provide a representative sample could mean the bird, or even the entire batch, being deemed clean even though covered with pathogens.

To overcome that problem and

improve the accuracy of detection, Ikerlan incorporated magnetophoresis and the polymerase chain reaction (PCR) technique to concentrate samples before testing, PCR being well-established as a method of replicating DNA to create higher concentrations.

'In that way we can create more concentrated bacteria samples,' Dr Ruano-López explains. 'And because it works with DNA, the same device can be used to detect many types of bacteria and diseases.'

Campylobacter detection will be especially important, as the bacteria are highly prevalent in poultry, leading to gastrointestinal infections costing \$1 billion to treat in the USA and Europe annually.



By **Matthias Orth MD**
of the Institute for
Laboratory Medicine in
Stuttgart, Germany

mean an automatically transfer POCT results into the EPR. In general, different POCT devices are connected via Connector software with the laboratory information system (LIS).

Connector software is available from the major vendors of POCT devices (e.g. Siemens, Radiometer, Roche) and from independent companies (e.g. Conworx). This software allows supervision of quality controls and patient results. Depending on the level of compatibility, several functions of the POCT device can be monitored remotely and even some maintenance steps can be started and monitored remotely. Patient results are transferred to the LIS and are then transferred to the EPR. The communication between these systems employs standard protocols, such as HL7, HCM, ASTM Protokoll or POCT1A. While the connection of instruments, supervision of quality controls and managing the device status remotely are easy, the integration of patient reports into the EPR can be challenging. In general, the LIS first generates an order and will then ask for the results. In the case of POCT, the POCT device generates a result (including time stamp and patient data) which is transmitted to the LIS. However, few LIS can generate an order simultaneously with the transmission of results.

From a legal standpoint, those responsible must be indicated on each laboratory report. This is challenging, particularly for POCT results: a high number of people perform these tests (i.e. essentially all nurses and doctors) and the full responsibility for the results is in the department where the analyses have been performed and not in the central laboratory. Taken together, POCT with supervision by the central laboratory can be a very efficient tool for the quick and reliable treatment of patients in the hospital.

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Laboratory Outsourcing: What next?

By Mary Black

A quiet revolution is occurring in clinical laboratory services. In any business model, laboratory services are cost centres, and cost centres can be moved around, services outsourced, amalgamated, contracted out. Globally, diagnostics and laboratory outsourcing are following the already trodden path of information technology. Two types of work are involved in the move overseas – diagnostics and pathology testing, and clinical trials/research.

There are three ways of handling the sample materials themselves:

- Clinical materials can be sent overseas for direct testing
- Photomicrographs of lab tests can be sent for review and reporting by experts. Time zone differences can be used to advantage, with reports sent overnight to be picked up on the next business day.
- Testing on humans can be sent overseas (as in clinical trials) and laboratory services simply follow.

This really is big business. 20 years ago, in the USA diagnostics was a highly fragmented industry. It is now annually a \$50 billion industry, with 50% coming from the top five chains. This pattern is replicating across the world and chains of consolidated super labs, providing services on a contracted basis, are becoming well established in Europe. The next business trend will be transnational outsourcing. National health services and individual hospitals are dipping their



toes in the market, attracted by costs that may be considerably lower than a local laboratory. The use of telepathology services are increasing in Europe and the US, but also in countries such as West Asia, Sri Lanka, Africa, Nepal and Bangladesh. Metropolis, a market leader in diagnostic services nationally in India, also provides hospital laboratory management services with labs in the Middle East and South-East Asian countries, including Thailand, Indonesia and Vietnam. They process more than 10 million sample tests in their global chain annually, but only 1.0% is classed as outsourcing. This is set to rise.

Clinical Research outsourcing has moved faster, driven by lower costs and access to clinical subjects. An estimated 30 Global Clinical Research Outsourcing (CRO) companies are involved in India alone. Dr Umakanta Sahoo, a managing

director of the global CRO firm Chiltern international, expects the Indian market to hit the \$1-1.5 billion mark by 2010. Most of their work comes from Europe (70-80%) and the remainder from the US (almost 20%).

New concerns are arising out of this outsourcing shift, including how to deal with patient confidentiality, regulatory barriers, and an ongoing debate on quality and the minimisation of reporting errors. These have been ongoing concerns for laboratory services for years; the difference now is that debate crosses not just organisational but international boundaries. We can predict that lower prices alone will not drive the industry, but that quality will come to the fore. Public awareness of laboratory outsourcing is still low, but as the industry develops, patient and other advocacy groups will enter the debate.

UPDATE UniCel integrated systems

This summer, California-based Beckman Coulter Inc. began general distribution of its UniCel DxC 880i's integrated system in Europe. 'The company's technological achievement with the DxC 880i has been to devise a way to integrate the testing process by running chemistry and immunoassay tests in parallel and to do this without removing sample caps and exposing the blood to contamination,' explained **Marc Meyer**, Beckman Coulter Europe's new clinical diagnostics marketing director. 'Since it was first featured at EuroMedLab 2007, customers have ordered the individual elements, the UniCel DxI 800 immunoassay analyser and UniCel DxC 800 clinical chemistry system, planning to connect them with Beckman Coulter's second generation closed tube aliquotter (UniCel CTA) to form the DxC 880i.'

Scott Garrett, the firm's Chairman, President and CEO, emphasised how it relies on customer input to help define laboratory requirements. 'Before the beginning of this century, customers were indicating the value they placed on integrating chemistry and immunoassay testing, so we started development of systems to



Marc Meyer



Scott Garrett

meet those needs. Market analysis today tells us that integrated systems are the fastest-growing segment of chemistry system sales.' He followed this with announcements that included the launch of three more integrated systems by the end of 2008 – the UniCel DxC 860i; DxC 660i and DxC 680i.

Molecular diagnostics

Unveiling plans for expansion into the US \$2.1 billion molecular diagnostics market with the launch of a random access analyser, the UniCel DxN, Scott Garrett explained: 'Molecular diagnostics is one of the most important technological advancements in clinical diagnostics, but it currently operates outside the core laboratory. We will use our expertise in laboratory instrument design and our diverse intellectual property portfolio to

develop a 'sample-to-result' system that meets the needs of the core laboratory.'

Market expansions

Talking about the growth in health care infrastructure investment in emerging markets, he said:

'This is one of the key factors for growth of the entire industry. We have made significant investment in our operations outside the United States to take advantage of this trend. For example, in India, we established a direct sales office. And growth in China continues in the double digits as we invest in our operations there.'

The group's former EMEA (Europe, Middle East, Africa and India) region has been split into two: Europe (Western); and Emerging Markets (covering Eastern Europe, Eastern Mediterranean, Africa, Russia, the Middle East and India). Both operations are still managed from the group's European headquarters in Nyon, on Lake Geneva, Switzerland.

Pre-eclampsia markers

The company is also focusing on prenatal testing; prostate cancer, anaemia; reproductive endocrinology; and cardiac testing. In terms of pre-eclampsia, for which currently there is no diagnostic test, the company is working on the development of two markers to help diagnose the condition.

DIABETES

Arrays

Chromosomal rearrangements leading to genomic disorders are often mediated by low-copy repeat regions of the genome (e.g. segmental duplications)



Roche reports that, using its NimbleGen CGH arrays, researchers* have identified a recurrent reciprocal genomic rearrangement of chromosomal region 17q12 in foetal samples with congenital anomalies that is also associated with paediatric renal disease and epilepsy. 'The results emphasize the importance of evaluating de novo structural variation events in paediatric diseases other than mental retardation and the importance of duplication architecture as a predisposing factor for disease,' Roche points out.

Genomic disorders result from

nonallelic homologous recombination (NAHR) between low-copy repeat regions of the genome and occur in approximately 1 in 1,000 live births. The phenotypes of many of these known genomic disorders include developmental delay and mental retardation. Therefore, screening for novel genomic disorders has largely focused on patients with cognitive disability and/or peripheral nervous system defects.

Previous studies reported on the development and use of a BAC-based microarray targeting 130 'rearrangement hotspots', defined as regions of the genome with an

Bayer's new Contour meter and Microlet 2 devices

The new *Contour* blood glucose meter from Bayer HealthCare Diabetes Care promises enhanced testing features that can be personalised to meet diabetics' individual treatments. The firm has also redesigned the *Microlet 2* lancing system.

The new updated *Contour* includes Bayer's *No Coding* technology, small sample size and fast testing time, but is also reported to be the only meter that will provide diabetics with a choice of 'basic' or 'advanced' settings, i.e. either for simple diabetes management or to make it more specific.

In the advanced setting, test reminders can be programmed in, and pre- and post-meal markers can provide information on how a meal can affect blood glucose – particularly helpful for self-adjusting insulin users. In this mode they can also set their own high and low blood glucose targets. The setting also provides 7, 14 and 30 day testing averages.

The *Microlet 2* lancing system, which will be included with the new *Contour* system, has been redesigned to simplify testing. 'It also has a large release button, smooth silicone-coated lancets and reduced puncture force. Plus it enables easy lancet ejection,' Bayer adds.

These new devices soon will be launched in selected European markets, first in Germany and Nordic countries.



See clinical laboratory events: Page 27

to detect genomic disorder

architecture suggestive of a susceptibility to recurrent microdeletion and/or duplication. Employing this array, novel genomic disorders associated with mental retardation and developmental delay (MR/DD) were discovered. Surprisingly, many of the predicted 130 hotspot regions have never been associated with copy number variants in either apparently normal individuals or patients with MR/DD.

To address the hypothesis that genomic rearrangements mediated by many of these regions affect gene pathways other than those involved in MR/DD, and to broaden the spectrum of diseases caused by genomic disorders, H C Mefford and colleagues analysed DNA samples from prenatal autopsy specimens from 155 fetuses with one or more congenital anomalies, no known cytogenetic anomalies, and detailed pathology data were analysed by BAC array CGH.

According to the data, nine individuals (6%) showed evidence of microdeletion or microduplication and eight were identified with potentially pathogenic deletions or duplications. Fine-mapping using a custom oligonucleotide array (NimbleGen, 385K, average probe spacing 53 bp) revealed that three of the individuals harbour microdeletions with breakpoints mapping to flanking segmental duplications. One foetus with bilateral multicystic dysplastic kidneys contained a deletion region of 1.8 Mb at 17q12 that involves 19 known genes. Mutations in one of these genes, TCF2, has been shown to cause

maturity-onset diabetes of the young type 5 (MODY5) and both paediatric and prenatally detectable cystic renal disease. In one study, one third of MODY5-affected individuals exhibited deletion of the entire TCF2 gene and surrounding sequence.

Five patients with paediatric renal disease without diabetes and three patients with MODY5 previously shown to have deletions encompassing the TCF2

gene were analysed using a custom oligonucleotide array (NimbleGen, 385K, average probe spacing 53 bp). Four of five paediatric and all three of the MODY5 patients showed microdeletions nearly identical to the foetal case. In addition, Roche NimbleGen custom fine-tiling array CGH was used to identify the reciprocal microduplication in patients with mild-to-moderate mental retardation, epilepsy, and

focal cortical dysplasia.

In summary, the analysis revealed novel microdeletions and duplications in a series of foetal samples with congenital anomalies other than mental retardation. The 17q12 deletion is the first genomic disorder identified that results in diabetes and the identification of this recurrent microdeletion will have a significant impact on diagnosis, prognosis, and management of renal disease and

early-onset type II diabetes in children. Therefore, the evaluation of this microdeletion should be considered early in the diagnostic workup for children with renal pathology. In addition, the authors advocate generalised screening of genomic hotspot regions of both parents and offspring for other paediatric diseases for which the genetic aetiology is not well understood, including schizophrenia, asthma, and cardiovascular disease.

* Mefford HC et al.: Recurrent reciprocal genomic rearrangements of 17q12 are associated with renal disease, diabetes, and epilepsy *Am J Hum Genet* 2007; 81: 1057-1069



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Note that the envisaged first launch of this product in Europe will be in Germany in September 2008. Possible future availability of the product is to be assessed on a country-by-country basis. Ask your local Bayer Diabetes Care representative if/when the product is/will be available in your country.

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Massimo Porta

The 44th annual meeting of the *European Association for the Study of Diabetes (EASD)* will focus on scientific research into diabetes mellitus. From 2,498 abstracts submitted, the Scientific Programme Committee, chaired by EASD Honorary Secretary Professor Michael Stumvoll, selected 1,402 for presentation.

In his invitation to attend the event, Massimo Porta, Chairman of the Local Organising Committee and member of the Abstract Review Committee, promises it will be unforgettable and, of course, Rome is a great venue: 'Do come to enjoy the outstanding EASD scientific programme, and a bit of dolce vita.'
Details: www.easd.org

Scots test telemetry system

Report: Anja Behringer



The world's first installation of Cisco's telemetry system *HealthPresence* has been completed at Aberdeen Royal Infirmary in Scotland. The system combines video, audio and call centre technology with medical information in a high-security network. 'By integrating the video conferencing solution TelePresence it allows a virtual face-to-face conversation although physician and patient may be miles apart,' Cisco explains. 'HealthPresence interfaces with diagnostic equipment such as stethoscopes, otoscopes and to a monitor that displays blood pressure, temperature, pulse rate and pulse oxymetry. An attendant operates the equipment at the patient site and monitors it.'

In partnership with the Scottish Centre for Telehealth and the National Health Service Scotland, Cisco has been live testing, since earlier in the year, the efficacy of the solution as well as patient and caregiver satisfaction. Further international tests are planned.

Telemetry delivers healthcare to even the most remote areas, bringing with it the value of distant medical specialist involvement in a case. The system can be installed in an office building, community centre, hotel or school, also bringing easier access to the elderly.

A satellite link is envisaged that will make the IT platform the ideal partner for short-term use, for example in disaster areas or during the outbreak of epidemics.

The 1st tele-



French and Cypriot members of MARTE 2 SAPPHIRE mission



FEATURES

- Based on Cisco TelePresence and a secure networking infrastructure.
- Combines state-of-the-art video technology with physiological data captured by an array of medical devices.
- Can be located anywhere there is broadband access; integration with satellite communications is expected in the future.
- Based on industry-leading audio and video technology offering high-definition images.
- Supported by attendants.
- Can be integrated with Electronic Medical Records (EMRs) and can access other hosted services.
- Will be integrated with IP-based call centre technology.

BENEFITS

- Enables access to care anywhere, anytime.
- Can be configured to deliver primary care, specialty care, and chronic care management services.
- Facilitates new care delivery models, extending the service delivery area.
- Uses an IP communications platform; clinical providers can be co-located or distributed; can be serviced from call centres, medical offices, hospitals, and clinics.
- Provides better and more convenient access to healthcare.
- Can be placed in retail and office locations, schools, industrial parks, planned communities – anywhere services are not easily accessible.
- Patients can access remote specialists without travelling.
- Replicates the in-person experience for both patient and provider, with life-size images and no voice delay.
- Does not require expensive health personnel.
- Assures a safe and pleasant experience for patients.
- EMRs used over a secure network provide the best enabling technology for continuity of care and efficient care delivery.
- Optimises use of scarce clinical resources
- Can organise resources by region, type, specialty, gender, or any other organising principle

ultrasound via satellite

Robot Estele probes patient onboard ship and transmits images to France

France – The first robotised tele-ultrasound examination has been performed by participants in the European *Mobile And Robotised Tele-echography (MARTE)* project, in collaboration with Robosoft, specialist in the development and production of service robot systems.

Using Robosoft's *Estele*, a tele-operated robotic system, an expert clinician can perform remote echographic diagnosis as if in the same room as the patient.

The system is based on a 3 kg, 4-axis ultrasound Probe Holder Robot, which can be positioned on a patient by any on-the-spot medical assistant, is controlled by the distant specialist at the Remote Master Controller. Via the bi-directional 'visio' conferencing system, the specialist receives the ultrasound images and can see and communicate with the patient.

Several robots equipped with preliminary versions of the robuBOX have already been deployed: Estele, the tele-ultrasound robot; robuCAB, an autonomous GPS-guided vehicle, and general-purpose mobile platforms such as the robuLAB10 for domestic help or the robuROC for security and military

applications.

Beyond professional applications, Robosoft believes the era of personal robotics is approaching fast and that its service robots, called roboters, will be part of everyday life within five years (i.e. they will not only be utilised for amusement, education, culture and healthcare, but also for

assistance for the elderly and handicapped, etc.)

To bring these applications to life, Robosoft already integrates 80% of programming complexity into the robuBOX, a module programme using the Microsoft Robotics Developer Studio. Although robuBOX is incorporated into the heart of Robosoft robots,

it can also be licensed to robotics integrators and manufacturers for mass production.

According to the Japan Robotics Association's predictions, the world market for service and personal robotics will reach 17 billion dollars by 2010.

Details: www.robosoft.com



Multi-screen video conference between Sapphire team and Bourges

Communication can be via ISDN (known as RNIS in France) or a specific communication link, such as satellite, as used in this the first tele-ultrasound examination of a patient who was on the ship Sapphire, owned by Cyprus-based Louis Cruise Lines.

Researchers at PRISME – a new multidisciplinary research institute that includes some 170 university researchers, engineers, technicians and doctoral students at several locations (Bourges, Orléans, Chartres, Châteauroux, Paris) – initially spent a month becoming familiar with the software in the Estele robot, which is entirely controlled by the robuBOX, a universal robotics engine adapted for the growing service robots market. The team then developed and implemented software for internet communication via satellite between the Remote Master Controller in France and the remote Probe Holder Robot on the ship, which was sailing in the Mediterranean.

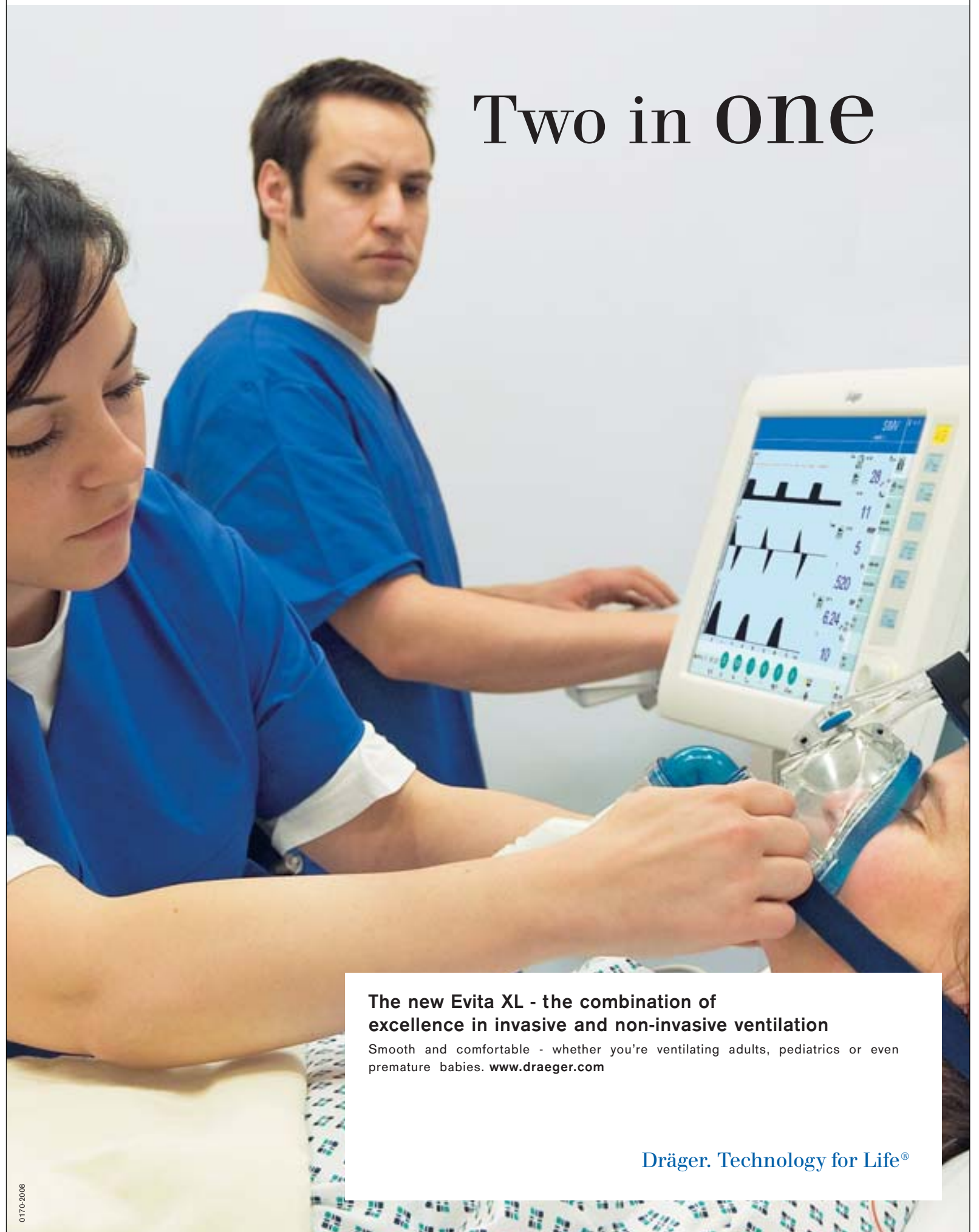
'These kinds of projects show the soundness of the generic approach used in the robuBOX,' said Vincent Dupourqué, CEO of Robosoft. 'The standard tele-ultrasound robot was originally delivered for use in a classic video-conferencing system over phone lines. Thanks to the robuBOX development toolkit, included with the standard robot, a customer can add his own functionalities, and can also integrate the robot into a larger system.'

For the project the PRISME Institute team adapted Estele's software using *Microsoft Robotics Developer Studio* (see <http://www.microsoft.com/robotics>)

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In 2005, the Dutch Ministry of Health embarked on a journey to implement a national Electronic Health Record for all Dutch citizens. Its goal is to improve the effectiveness and quality of care through the optimal use of ICT. Though the Dutch efforts may not often be cited in international contexts, progress over the last years has been impressive.

'bang' replacement. Healthcare providers have invested heavily in HCIT over the last years. The Netherlands has one of the highest penetrations of practice management and HIS/CIS solutions. Additionally, 100% of hospitals have chosen digitised radiology (PACS). The EHR approach assumes the principle of autonomous healthcare providers. Information 'stays at the source', creating

E-health in the Netherlands

The Dutch E-health initiatives have made remarkable progress in recent years, writes Marcel Swennenhuis, President of Topicus HealthCare. Many solutions, such as online medication services, patient portals and web-based disease management initiatives, demonstrate the success of the country's EHR approach.

The Dutch follow both a top-down as well as a bottom-up approach. On the one hand, work is being done to establish a countrywide infrastructure (called AORTA) including elements such as an electronic healthcare provider card, a countrywide patient registry, security standards and legislation for one unique countrywide patient ID.

In parallel, local and regional initiatives have resulted in many implementations of solutions. Local software companies, e.g. Topicus HealthCare, were involved in these initiatives from the start. Topicus was instrumental in the overall architecture and technology solutions for the leading EHR regions. Solutions were deployed varying from an electronic medication service (showing all of a patient's medication), a web service for weekend/evening doctors in duty (allowing them to access a specific view to the patient's record during out-of-office hours), and integrated solutions for disease management such as diabetes. Web-based patient portals have been introduced, allowing patients to schedule appointments, re-order medication and have e-consultations. A web-based referral service has been introduced, allowing referring physicians to create and manage their referrals. This shows availability, waiting times, etc. It also allows hospitals and clinics to define their services interactively and add them to the referral service.

The Dutch approach strongly supports a gradual integration and co-existence with existing HCIT solutions. Not a 'big

'virtual' record whereby healthcare providers can access information from other systems online through secured connections, one-time login, etc. Everything is based on patient consent. And it works.

Experience shows that involvement of healthcare providers in regional initiatives (covering 500,000 – one million patients) provides a good basis for success. Using existing regional cooperation structures, it creates a better understanding of the needs/benefits of the individual healthcare providers. The mutual trust stimulates willingness to share information. The implementations are done faster with greater acceptance. Fast and iterative software development approaches complement this flexible organisational approach.

The open competition model stimulates HCIT providers, such as Topicus, to work continuously on the cutting edge of e-health solutions. Using standards like IHE and HL7 discourages lock-in to specific vendors. At the same time, co-existence with older de facto standards and even proprietary protocols enable a gradual and smooth introduction and transition into the new e-health world.

In the coming years regional initiatives are expected to cover the entire country, whilst, in parallel, all regional solutions will connect to the countrywide infrastructure. The solution space is now being extended to new services, for example other disease management solutions, home care, youth care and more.

Software aids medication dosing decisions

The drug information system *AiDKlinik* developed by Dosing GmbH is a software solution for the server-based intranet for medication dosing. Dosing reports: 'It is used to maximise the safety and efficiency of drug therapy qualitatively and quantitatively and to prevent errors with medication by running database checks on individual patient data prior to drugs being prescribed.'

Among users of the software is Professor M Dominik Alischer MD, Head of the Centre for Internal Medicine at the Robert-Bosch Hospital in Stuttgart, who said that, given the increasing complexity of medication, any tools that help to

provide information quickly and precisely at the point where medical decisions are being made are decisive for the quality of care. 'For all aspects of the prescription of drugs, AiDKlinik is the tool that makes it possible to find the best possible drug reliably, quickly and economically and to avoid interactions with other drugs. It is therefore a valuable tool for all doctors.'

'It's as simple and efficient as using Google,' adds Dosing, which has worked closely with University Hospital Heidelberg, where digital medication prescriptions have been provided since 2003.

Latest SurgiMedia to be launched at MEDICA 2008

France – Isis* will unveil the latest version of *SurgiMedia*, the company's integrated display system for operating theatres, at the MEDICA trade show (19–22 November, Dusseldorf)

SurgiMedia is a multimedia digital-display station designed for use in operating theatres. It can be used for managing, checking and recording patient data. Isis reports: 'The latest version is fully integrated and modular, offering users greater flexibility. SurgiMedia is now available in two ranges of digital-display stations – a free-standing version and a hub version.'

The free-standing SA range is a fully integrated all-in-one system that displays, records and transmits patient data in the operating theatre (including radiological images, videos of surgery and expert opinions). It can be adapted to fit any operating theatre setup. It is modular via its optional functionalities and also offers the flexibility of multiple configurations: it can be wall mounted, or attached to a surgical arm or a wheeled trolley.

'The hub-system SC range is a complete solution for the entire theatre. It is based around a control centre that is

installed by the operating area. This control system then powers the display on remote monitors, ensures the recording of data in a variety of formats, as well as the broadcast of this data via video-conference. This system can be customised by Isis according to each hospital's specifications.'

'With both systems, data can be retrieved directly from other devices in the operating theatre (such as microscopes, endoscope cameras, computers and imaging devices), from CDs, or from the PACS via the network. SurgiMedia has an intuitive touch screen based on pictograms, which is easy to use.'

* Based in Saint Martin d'Hères (near Grenoble), Isis designs computer-based surgical equipment and provides technical maintenance for its products.

Isis will also exhibit at *Zdravoochraniye* in Moscow (8-12 December) and *Arab Health* in Dubai (26-29 January 2009). Details: www.isis-robotics.com

Emergency first aid advice via mobile phones

Austria – Only 28% of the public would give first aid 'no matter what'; 32% would be 'very likely' do so, according to a study by the market research institute Market. However, the Austrian Red Cross warns that those figures may be overly optimistic: their observations at accident sites indicate that significantly fewer people are prepared to administer first aid. 'The most important measures that every student driver should learn are recovery position and cardiopulmonary resuscitation (CPR),' advises Wolfgang Schreiber, Medical Director of the Austrian Red Cross.

In another recent study 73% of the participants reported being scared to do the wrong thing in an emergency. 40% had first aid training over a decade ago. Only 3.5% could identify the correct sequence of emergency measures at an accident site. Yet, greater knowledge could save lives. The Austrian Red Cross also points out that failure to render assistance is legally considered a misdemeanour; it's better to make a mistake than not help at all. No one need fear punishment for a mis-

take. 'I don't know a single case where a first aider was taken to court for making a mistake,' says Red Cross solicitor Bernhard Schneider.

The Austrian Arbeiter-Samariter-Bund (ASB) has developed Samariter, a mobile phone application that can be downloaded (the mobile must be Java-enabled, as are most current models). On the phone display, this shows how to put a person in recovery position, how to perform CPR and how to staunch bleeding. 'The system is intended to help a first aider to use the time sensibly until the emergency medical service arrives,' explains Franz Schnabl, President of ASB Austria.

To date, about 4,000 people have installed Samariter, which is network-independent, enabling use even in poor transmission zones, e.g. mountains.

ASB points out that the instructions are only to help in an emergency, it is no substitute for full first aid training, which it strongly recommends.

Samariter details: www.dersamariter.at

PACS: Netcentric clinic services based on JiveX product line



From left: Axel Fromm, Senior Business Consultant in Business Centre Healthcare, T-Systems; Jörg Holstein, Managing Director of Visus; Andreas Dahm-Griess, Director Business Centre Health Care, T-Systems; and Peter Rosiepen, Visus Sales Manager

Hospitals must digitally keep medical documents audit proof, which involves a lot of material and personnel efforts. Following the principle 'Software as a Service', Telekom subsidiary T-Systems, together with Visus, offers a solution that covers installation, maintenance and ser-

vices for the necessary systems. 'Customers can rent Services on a flexible basis,' Visus explains. 'They will pay per examination respectively per data unit (e.g. Gigabyte) or they simply pay a fixed price for each year of archiving.'

So they do not have to invest in

their own hardware and software.'

The system is already successful in the market, Visus points out. Currently, Visus and T-Systems are taking over external long term archiving for three hospitals within the Evangelischen Stiftung Augusta in Bochum, Germany, starting with a data amount of more than ten terabyte. 'A user hotline comes with the offer of T-Systems and Visus.'

Also included in this service is the necessary data and/or hardware implementation within the scope of the stipulated term of safekeeping,' Visus adds.

'The digital long term archiving solution has been developed according to the regulations of the IHE (Integrating the Healthcare Enterprise).

It aims at unifying data exchange in using standards like Health Level 7 (HL7) and DICOM (Digital Imaging and Communications in Medicine). With that the development, awarded a prize by the State of North-Rhine Westphalia, a high degree of investment security for customers is ensured.'

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NUTRITION AND HEALTH Obesity in adolescents leads to metabolic syndrome

Children are not born overweight. Dramatic weight gain in some children and adolescents tends to start only during school, puberty and after. The reasons are known: unhealthy diet – too much, too fatty, too sweet – and lack of exercise.

According to estimates by the EU Commission 22 million children in Europe are overweight; five million of these are classed as obese. An EU Commission study published in mid-2008 showed that almost every third boy and every fifth girl aged between 13 and 17 years are overweight.

Nowadays, overweight children tend to suffer illnesses formerly only seen in adults: type 2 diabetes, high blood pressure, elevated blood lipids and uric acid levels. In short, these children are developing metabolic syndrome. As adults they are at higher risk of heart attacks or strokes. Severe obesity in particular – which goes hand in hand with an increased waistline (abdominal obesity) – increases the risk of cardiovascular diseases.

As yet there is no standard definition of metabolic syndrome in children that is recognized across Europe. However, Italian researchers at the University of Verona have recently shown that overweight five to 15-year-olds in whom the ratio of waist to body height is larger than 0.5 have an eightfold increased risk of developing metabolic syndrome compared to those with normal weight.

Here, losing weight is necessary. Precise scales, such as those manufactured by seca gmbh & co. kg. in Hamburg, Germany, help to document even the smallest success.

To fight obesity in children across Europe, in summer 2008 the European Commission suggested a programme that envisages free fruit and vegetables for schoolchildren aged six to ten years. The programme is due to start with the school year 2009/2010 and is aimed at teaching children about a healthy diet.

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AUGUST / SEPTEMBER 2008

HOT TOPIC cardiovascular imaging

Every summer the European Society of Cardiology (ESC) holds Europe's biggest annual meeting of specialists in cardiovascular medicine, inviting and drawing in top international medical professionals. *Karoline Laarmann* asked **Professor Kim Fox**, President of the European Society of Cardiology and Consultant Cardiologist at the Royal Brompton Hospital, and professor of clinical cardiology at Imperial College, London, UK, about the most relevant issues and highlights planned for this year's programme.

Last year's key focus was on heart failure. What will be this year's hot topic?

KF: 'This year we decided to go for cardiovascular imaging because any cardiovascular condition that will be discussed during our congress always involves imaging in some form. Imaging is the cornerstone not only for diagnosing a condition but also to assess prognosis and tailoring individual treatment, too. By imaging we are talking about procedures from the simplest form such as the electrocardiogram to the most complicated non-invasive imaging techniques – MRI, nuclear imaging, echocardiography and, more recently, car-

diac CT scanning, and of course not forgetting to mention all the invasive techniques: cardio-angiography and cardiac catheterisation.'

Which of the current imaging modalities is making the strongest progress?

'The gold standard is multimodality imaging, because although a single tool may be sufficient, patient evaluation is often best when used in conjunction with other techniques. Every imaging technique has its individual strengths and weaknesses; they all give a different piece of information, so it depends on what you intend to measure.

Therefore one of the hot ESC topics will be to discuss which are the right imaging tools to use for a special problem. Of course we have considerable hopes in molecular imaging. It may be the tool to identify different forms of heart muscle diseases that may respond to different therapies and, in particular, may respond to stem cells. If it were to be shown that stem cells were to be beneficial, then to deliver the stem cells will require sophisticated imaging. The second hope we nourish in molecular imaging is to identify vulnerable plaques. We've just started to get some imaging information by using intravascular ultrasound of the coronary artery.'

What form does work sharing take between cardiology and radiology imaging?

Nowadays the management of a patient is multidisciplinary, to achieve the best quality of healthcare. As a cardiologist I think that radiology is extremely important in particular cases where physics is involved – radiation in particular. Radiologists need to be involved in ensuring that proper safety is taken into account. However, when it comes to actually deciding which imaging tool should be used for a patient, the cardiologist must be the person to make the decision. The most controversial issue here

is: Who should execute the procedure? The demarcation lines for that are changing currently and they differ from country to country. In the UK, for example, the radiologist will lead on cardiac CT, most of the others by cardiologists but with special expertise in imaging. I assume that coronary CT will probably remain the area of radiologists just now.

What will be the biggest challenges for cardiology in the future?

'Heart transplantation is a fantastic technique but we clearly need to think about some form of alternative technique, which may be stem cells or a form of artificial heart. Better still, of course, would be better implementation of prevention. We probably could deal with most of the cases of heart failure if prevention would be better, which brings me to obesity, which causes an increasing number of heart diseases. Last year, at the ESC opening ceremony, I emphasised my dislike of smoking. Now I see child obesity as a major issue to take care of. But it is much tougher to handle because you cannot legislate what people eat. The trouble is that fast food is much cheaper than a healthy diet. It will take huge educational programmes to accomplish a change of thinking.

'Finally, it would be very helpful to identify the 20–30% of patients benefiting from treatment with drugs, because this would lead to enormous cost savings and allow access to medicinal treatment for people who truly need it. What we are doing now is treating the whole population with a drug or procedure from which only a few profit. But the most important thing to do in cardiology is prevent ischaemic heart disease. We have to identify the people who show an aggravated risk to optimise our strategies of prevention and treatment based on the individual.'

euHeart Aiming to personalise CVD diagnosis and treatment

Royal Philips Electronics is to lead 'euHeart', the new European Union (EU) funded research project that aims to improve CVD diagnosis, therapy planning and treatment.

By targeting the diagnosis and treatment phases of the care cycles for heart conditions such as heart failure, coronary artery disease, heart rhythm disorders and congenital heart defects, the euHeart project complements the recently announced *HeartCycle* project (also led by Philips) which focuses on the long term management of chronic

heart disease patients.

The newly created 'euHeart' consortium aims to improve the diagnosis, therapy planning and treatment of CVD by developing computer models that simulate the normal and disease-related behaviour of each individual patient's heart and aorta.

Supplied with information about how specific CVDs affect heart function at molecular, cellular, tissue and organ level, these computer models have the potential to allow doctors to

continued on page 2

Professor Henning Sass (left) and Guy Peeters MD (right), chairmen of the Boards of Management of the Aachen and Maastricht university medical centres, respectively, with Dr Henk van Houten (centre), head of the Healthcare Research Programme at Philips Research, together for the signing of a letter of intent for a joint cross-border medical research programme for CVDs



euHeart Consortium membership (alphabetical order)

Academic Medical Centre Amsterdam (Netherlands); Berlin Heart (Germany); Deutsches Krebsforschungszentrum (Germany); HemoLab (Netherlands); Hospital Clínico San Carlos de Madrid Insalud (Spain); Institut National de la Santé et de la Recherche Médicale (France); Institut National de Recherche en Informatique et en Automatique (France); King's College London (United Kingdom); Philips Healthcare (Netherlands, Spain); Philips Research (Germany); PolyDimensions (Germany); Universitat Pompeu Fabra (Spain); University of Karlsruhe (Germany); University of Oxford (United Kingdom); University of Sheffield (United Kingdom); Volcano Europe SA/NV (Belgium).

Professor Kim Fox is the acknowledged European expert in the understanding, investigation and treatment of angina. His major roles in many significant international clinical trials include EUROPA, HPS, and ASCOT etc, which have revolutionised the treatment of this condition. He also chairs the task force producing the European Angina Guidelines as well as the committee responsible for the audit for the management of these patients in Europe.



Prof Fox has published over 400 papers in leading scientific journals, lectured to national societies worldwide, and has given the Finlayson Lecture to the Royal College of Surgeons in Glasgow, the St Cyres Lecture to the British Cardiac Society and the Andrea Cissalpino Lecture to the Italian Society of Cardiology.

For his services to cardiology he is an elected honorary member of the French Cardiac Society and the Japanese Circulation Society.

Hypertension worldwide

Social and cultural differences affect risk factors for cardiovascular diseases

Countries vary widely in their capacity to manage hypertension, but globally the majority of diagnosed hypertensives is inadequately controlled. Not treated it can cause cardiovascular disease (CVD), myocardial infarction and stroke. According to the WHO, hypertension is estimated to cause 4.5% of the current global disease burden and is as prevalent in many developing countries as in the developed world. Here, three experts from three continents comment on risk factors and hypertension management in their countries.

Dr Fiona Turnbull, George Institute for International Health, University of Sydney, Australia



Blood pressure-related disease is a major global health problem and is responsible for nearly eight million deaths annually. About half of all stroke and coronary heart disease is attributable to non-optimal blood pressure (BP). Furthermore, about 50% of these major cardiovascular events occur in people who are so-called 'normotensive'. Therefore major health gains can be achieved by lowering BP, even in people who are not hypertensive according to traditional threshold values. Obviously obesity and nutritional factors, especially salt consumption, play a major role in blood pressure. With the rapid epidemiological transition occurring in low-middle incomes, such as China and India, CVD attributable to BP is becoming increasingly prevalent in developing as well as developed countries.

Although lifestyle factors are important, drug therapy remains the mainstay of blood pressure control and, given the millions of people increasingly prescribed therapy, it is critical to be able to discern even small differences in the benefits of different drug classes. A major component of my activities has been the leadership since 2003 of the Blood Pressure Lowering Treatment Trialists' Collaboration (BPLTTC). This is an international collaboration of the principal investigators of major trials of blood pressure-lowering regimens. The collaboration seeks to provide clinicians, patients and policy-makers with the most reliable information about BP drugs and their effects on major cardiovascular events, such as stroke and coronary heart disease, by conducting meta-analyses (pooled analyses) of these trials.

The work of the Collaboration is conducted at the George Institute for International Health in Sydney, Australia. This international initiative is based on information from more than 30 trials collectively including nearly 200,000 patients from the UK, Europe, US, China, Japan and Australasia. The collaboration brings together not only the data from the largest BP trials but also the expertise and experience of the principal investigators of these trials, who are leaders in their respective fields. To date, the Collaboration has provided important information about the effects of newer compared with older classes of BP-lowering drugs and about their effects on stroke, coronary heart disease in patients of different age, sex, and disease status. These findings have informed major international BP guidelines as well as clinical practice. A major challenge to this research is to ensure continually that the research is translated into practice. Huge gaps between evidence and practice exist and large proportions of the global population at risk of blood pressure-related disease continue to remain untreated. Part of the problem is that doctors persist in using outdated models of treatment based on managing individual risk factors rather than consideration of the patient's 'absolute risk' of experiencing a major cardiovascular event.

As new drug classes and new indications for treatment evolve, the work of the BPLTTC will continue to be a valuable source of reliable information about the effects of these important drugs.

Dr Yackoob Kassim Seedat, Nelson R Mandela School of Medicine, Faculty of Health Sciences, University of KwaZulu-Natal, Durban, S. Africa



Sub-Saharan Africa (SSA) contains a diversity of ethnic groups, cultures and countries (54 in all) of vastly different socio-economic status. Data from many parts of sub-Saharan Africa are poorly explored because of financial constraints. South Africa is one of the few countries where data are reasonably accurate. Available data focusing on black groups indicate that hypertension seems more common with increasing acculturation, with a group of truly rural dwellers still being relatively protected. However, it is not known what proportion of the African population lives in truly rural conditions, relatively immune to the advances of civilisation versus those succumbing to urbanisation either rapidly or gradually.

The prevalence of hypertension according to rural studies undertaken in the 1970s, 1980s and 1990s has generally been low: 4.1% in Ghana, 5.9% in Nigeria, 7% in Lesotho and 9.4% in the rural Zulu. The migration of people to urban settings led to an immense increase of BP due to change in diet of new arrivals in the cities and higher pulse rates due to psychosocial stress and hard work.

Salt intake and lack of potassium due to inadequate fruit and vegetable consumption are also main causes for hypertension here. Other factors are obesity, particularly observed in black females, whereas alcohol excess is a problem particularly in black males.

Because SSA is the world's poorest continent, only low cost hypertension programmes can be afforded. The healthcare expenditure in many SSA countries is around US\$10 per person annually in contrast to between US\$2,000 and \$5,000 in industrialised Western countries. The major health challenge is still HIV/AIDS which takes a large portion of healthcare resources. There is a lack of adequate financing for research, but a comprehensive CVD programme is absolutely necessary. Furthermore, there is inadequate financing for researchers who need to be trained in excellent research centres so that they can learn techniques in research methodology. It would be helpful if researchers from the developed world could provide expertise and engage in collaborative work. We need administrators and politicians in sub-Saharan Africa to be convinced of the value of research on risk factors in CVDs. Inadequate funds, inexperience and lack of infrastructure remain important barriers to hypertension diagnosis and therapy.

To sum it up: The effects of urbanisation which influence the prevalence of hypertension and CVDs in SSA are decreased physical activity, increased energy and fat consumption and increased psychosocial stress. This leads to obesity, dyslipidaemia, diabetes and an increase in blood pressure. The future approach to CVD prevention should be a population focus on societal change and not only individual focus on high risk factors. This should include primordial prevention, salt restriction and physical exercise.

Dr Tomasz Zdrojewski, Dept. of Hypertension and Diabetology at the Medical University of Gdansk, Poland



Generally we can say that, with the political transformation in Poland over the last 15 years, the risk factors for CVDs have dramatically changed, some of them significantly decreased (e.g. smoking) and some increased (e.g. psychosocial factors). With regard to hypertension the consumption of too much salt is our main national problem. The recommended daily allowance is 7g but every Pole eats 10–15g, in

poor families it is even 15–20g. The government began to take action last year with an information campaign on Polish TV and radio. Additionally, there are attempts to convince industry to replace sodium by potassium.

Education is the crucial factor in prevention and control of arterial hypertension. One step to increase public awareness was to make primary physicians measure BP during every patient visit.

The place of residence is also a major indicator for prevalence and a starting point for the control of hypertension. One can say that Poland, especially during the early and very rapid phase of political and economic transformation, has been separated into two sections: large cities and small cities (county boroughs) and villages. People in large cities have had much better access to the best medical treatment, so we have many more cases of severe heart failure in the countryside, for example. Consequently, the hospitalisation rate of the rural population has been much higher in the last 15 years.

However, we have made significant progress in recent years, due to huge investments and the long term and complex health policy project – National Cardiovascular Diseases Prevention and Treatment Programme (POLKARD 2003-2008). For example, Poland now has a tight nationwide network of interventional cardiology and cardiac surgery centres. Access to these procedures dramatically improved and large inequalities significantly decreased. For example, in 2002, 2,300 coronary angiographies were performed per million people, and almost 900 percutaneous coronary revascularisation interventions (PCI), the respective numbers in 2007 were 3,850 coronary angiographies and 2185 PCI.

I hope this improvement in access to best procedures, changes in population awareness, healthier diet and less smoking are the most important factors responsible for a 30% reduction in CVD premature mortality in our country. This year we want to check this hypothesis and calculate the importance of each factor using the IMPACT model elaborated and published in most prestigious medical journals by Prof Simon Capewell from the University of Liverpool.

One side effect of the transition to a market economy was that we lost our national industry and the drugs to treat arterial hypertension became more expensive. Furthermore, primary care was privatised which, in the beginning of this process, especially in small cities and villages, made access to basic medical care more difficult. However, over the last five years we have observed an opposite trend and social and medical awareness of arterial hypertension is increasing again. At the moment about 66% of the population who have arterial hypertension know about it.

Another important problem is the very poor control of people who already had a stroke or myocardial infarction. I am the coordinator of an international study for Poland, Ukraine and Russia. This shows that very few patients receive adequate post-myocardial infarction or post-stroke treatment. My most recent project is the 400 Cities Programme, a very large-scale educational and prevention project to fight CVDs. We focus on the smaller cities, where the epidemiological situation is worse than in large cities and, for example, offer special classes in primary schools or special training for the nurses, doctors and administrative staff responsible for healthcare in their cities.

continued from page 1

investigate the effects of different therapy choices on a virtual model of the patient's heart and aorta, before going ahead with the option that offers the best clinical outcome. The availability of clinical decision support tools that utilise these personalised heart models could therefore improve the outcome for patients with life-threatening conditions such as heart failure, coronary artery disease, heart rhythm disorders and congenital heart defects.

However, as Henk van Houten, senior vice president of Philips Research and head of the Healthcare Research programme, said: 'The development of computer models that integrate structural and functional information of the heart and then personalise it to individual patients is a mammoth task that will require the multi-disciplinary effort of researchers with strong know-how in biophysical

modelling and image processing, clinical experts, and engineers in the device and imaging industries.' But, he adds: 'In the euHeart project we are confident that we have brought together the necessary expertise,' which could, he says, make a real contribution to improving cardiac treatments.

From molecules to organs

A characteristic of biological complexity is the intrinsic interaction of physiological behaviours across a range of time scales and anatomical levels. The computer models developed in the euHeart project will therefore relate what happens at cellular and microvascular levels to what happens at tissue level, and what happens at tissue level to what happens at organ level. This will require the integration and interconnection of existing and future models from many different areas of biological research, including molecular biology, biochemistry, bio-

physics, anatomy and physiology – a task that will be facilitated by the use of standardised mark-up languages such as CellML and FieldML to describe them.

Patient-specific

Most importantly, the resultant comprehensive model will be adaptable to reflect the condition of a specific patient's heart, using anatomical and functional information obtained via diagnostic techniques such as medical imaging (CT, MRI, ultrasound, etc.), blood flow and blood pressure measurements or electrocardiograms. At the intra-cellular level, the model could even take into account specific gene defects in individual patients.

By having an accurate personalised model of the patient's heart to work with, doctors may be able to gain a deeper understanding of the patient's disease. This could allow them to make more accurate diagnoses, predict the likely effectiveness of different

treatment therapies and improve therapy planning. In addition, the models could lead to improvements in the development and programming of implantable devices such as pacemakers, left ventricular assist devices, and endografts.

Therapy planning

Because of the need to build the model over time, particularly in relation to incorporating molecular-level to organ-level disease pathologies for diagnostic purposes, the first applications are likely to be in therapy planning for pre-diagnosed conditions, e.g. heart arrhythmias, sometimes treated by radio-frequency (RF) ablation. During this procedure, the cardiologist relies on experience to decide which areas of tissue to destroy, a task complicated by the fact that each heart's electrical activity is subtly different. Aided by a computerised model that reflects the patient's unique heart structure and function, the cardiologist

may be able to test the results of destroying different tissue areas before actually operating on the patient.

In addition to RF ablation therapy for arrhythmias, other clinical focuses for the euHeart project include heart failure (cardiac resynchronisation therapy and congenital cardiac surgery and left ventricular assist devices), coronary artery disease, and diseases/defects in the heart valves and aorta.

Work packages

The euHeart project is broken up into a number of work-packages that include database management/validation for individual (sub-) models and their coupling together into larger structural/functional models; the development of appropriate mark-up languages and communication infrastructures for model description/exchange; the personalisation of anatomical models from image data;

Recent studies have shown that overweight and obesity during childhood and adolescence have a negative impact on the functioning of the internal walls of the arteries (vascular endothelium), paving the way to the development of an arteriosclerotic disease from an increasingly early age. They also prove that, regardless of age, race and sex, child and adolescent obesity affects the vascular endothelial functions. 'The evidence that the risk factors of cardiovascular diseases that reveal themselves in adulthood begin in childhood or adolescence makes it imperative that prevention strategies be planned from a very early age,' said **Dr Héctor Trunfelliti**, President of the Paediatric Cardiology Committee of the Argentine Federation of Cardiology (FAC), speaking this May at the World congress of Cardiology, held in Buenos Aires. 'These risk factors, such as overweight and obesity, as well as a sedentary lifestyle, nicotine addiction, dyslipidemias, hypertension and type 2 diabetes, share a common element that cannot be denied: the adoption of poor health-related habits characteristic of western societies.'

Released at the congress were the preliminary results of the Educando (Educating) Plan, a project, developed by the Argentine Federation/Foundation of Cardiology, and launched in 2001. The plan aims to prevent cardiovascular disease from childhood, and is targeted at primary school teachers, to encourage healthier lifestyles by providing information about the disease and prevention. 'Its clear and didactic message can be easily communicated to children,' explained Dr Rodolfo La Greca, co-director of the plan.

Since the programme began in 2001, around 8,000 primary school teachers, in charge of about 100,000 children between four and five years old, have received training. 'We will try to convey the Argentine experience because, due to its characteristics the Educando plan is unique as regards the centralised and unified management of the plan, addressed to teachers and not directly to children, who sometimes do not receive the

and the biophysical (structural and functional) personalisation of the models. The clinical relevance of the project will be ensured by additional application work-packages that will focus on specific model development for each of the clinical focus areas listed above – tailoring the model to specific diseases.

Funding

The euHeart consortium comprises public and private partners from 16 research, academic, industrial and medical organisations, from six European countries. Planned to run for four years the budget is around euros 19 million; 14 million of this provided by the EU as part of the EU 7th Framework Programme. The project forms part of the Virtual Physiological Human (VPH) initiative – a collaboration aiming to produce a computer model of the entire human body so that it can be investigated as a single complex system.

CHILDHOOD OBESITY

New strategies to prevent obesity and sedentary lifestyles

message properly,' Dr La Greca pointed out, adding that teachers are the proper vectors to convey life quality concepts to children.

The World Heart Federation in Colombia also has a project to promote healthy life habits in childhood and adolescence. 'Healthy Habits For Life', presented through the television show Plaza Sesamo (Sesame Workshop), consists of the

development of audiovisual materials that encourage pre-school children (aged between three and six years) to take regular physical activity and eat a healthy, balanced diet, and to promote the importance of instilling healthy life habits in children among their carers. Along with this the project encourages multi-sector collaboration for the prevention

of cardiovascular disease, said **Dr Shahyar Sheik**, President of the World Heart Federation, who added that it also aims to '...identify those elements of the programme that are cost-effective in order to reproduce them; and to develop an association with Plaza Sesamo that can be spread to other countries.'

This project began in 2006,

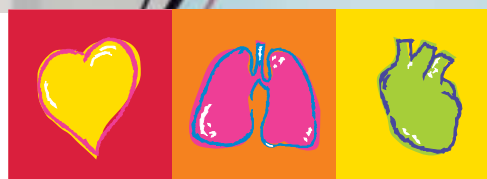
with the development in Colombia of audiovisual content that focuses on healthy life habits, designed to be used by health and education professionals and to enable the later evaluation of their impact on both children's and parents' activities. Six out of the 27 audiovisual materials initially planned have been broadcast in 2007 within the Plaza Sésamo show, which is broadcast virtually all over the American Continent through the cable TV channels Discovery Kids, TeleFutura and Televisa, and others. New episodes are being broadcast during 2008.

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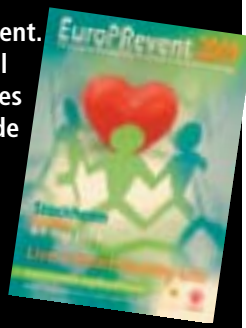
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Deadline for abstracts: **19 November 2008**

Details: European Society of Cardiology, France.

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The ageing population and growing risk factors have made a significant impact on driving up the number of registered heart failure (HF) cases. Existing pharmacological strategies are improving the survival rates of acute and early-stage HF patients, ironically providing a growing body of patients with progression of the disease to HF.

With no new drug therapies addressing advanced HF and existing pharmacological strategies failing to compensate for a weakening heart, alternative solutions have to be found. In view of long waiting lists for heart transplants and the growing lack of

donor hearts, significant numbers of patients die while waiting for a heart transplant. However, cardiac resynchronisation therapy, mechanical circulatory support devices and other alternative technologies have demonstrated promising results, and the continuing rapid technological developments in this area suggest we may only be a decade away from eliminating the reliance on heart transplants, according to a new report* by Datamonitor, an independent market analyst that provides online data, analyses and business forecast platforms (www.datamonitor.com).

Heart

The growing HF population

The number of HF sufferers is expected to climb to epidemic proportions. Worldwide, HF affects nearly 23 million people. In the United States, HF affects approximately 4.7m persons with approximately 550,000 incidences of HF diagnosed annually. Estimates of the prevalence of symptomatic HF in the general European population are similar to those in the United States and range from 0.4 to two percent of the total population. Existing gold-standard pharmacological strategies are able to provide superior compensation of acute and early-stage HF patients, increasing their survival rates without ensuring a full recovery. This results in an increasing long-term shift of such patients into the advanced HF group.

With no new drug therapies addressing advanced HF and existing pharmacological strategies failing to compensate for a weakening heart, alternative, non-pharmacological solutions have to be found, reports Dr Sergey Ishin, Datamonitor's senior cardiovascular analyst. 'Cardiac transplantation continues to be the gold standard for the treatment of end-stage HF. However, the number of potential transplants far exceeds the number of donors. In the US, about 2,500 heart transplants are carried out each year and research has suggested that up to 100,000 patients have advanced heart disease that would benefit from transplantation. This leads to 30% of patients on the waiting list dying annually.'

Cardiac resynchronisation therapy (CRT), through multiple randomised clinical trials, has demonstrated promising results in terms of both safety and efficacy, improving left ventricular efficiency and, subsequently, improving functional class. 'However, one of the greatest limitations of this technology is the fact that existing CRT devices, similarly to pharmacological treatment, can only temporarily improve symptoms and to some degree delay the progression of myocardial deterioration. Unfortunately, neither can prevent, stop nor reverse it. This unfortunate situation eventually brings advanced HF patients back to the heart transplant waiting lists,' Dr Ishin points out.

Improving survival with alternative solutions

Although advances in surgical techniques and immunosuppressant therapy make it possible to perform successful heart transplantations even in the most critically ill patients, the rapidly growing end-stage HF population creates a tremendous gap in the number of patients waiting for new hearts and the number of organs that actually become available, Dr Ishin adds: 'In view of this, in addition to avoiding the immunosuppression and rejection complications of transplantation, mechanical circulatory support devices work as the only promising option which can help resolve the issue of organ availability and save more patients.'

The idea of finding a mechanical alternative to donor transplants is not new, Datamonitor points out. Mechanical circulatory support devices and total artificial hearts have been under development since

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failure Can technology diminish reliance on heart transplants?

the 1950s, but only recently, with advances in technology, have they started demonstrating some serious potential in completely eliminating the need for heart transplants. With many different design concepts tested throughout the decades the new face of mechanical circulatory support technology started to emerge. Bulky, immobile systems have gradually been replaced with more portable and even fully implantable solutions providing full patient mobility.

Even though scientists initially desired to create a complete artificial heart the lack of technological solutions at the time prevented rapid development in this area. Further research subsequently showed that it is more feasible to create a device that supports only the left ventricle. Presently, Dr Ishin continues, ventricular assist devices are the most well researched and technologically diverse area. 'The biggest advantage of ventricular assist devices over a complete artificial heart is the ability to instantly provide sufficient cardiac output to the patient, possibly for a very long period of time, and at the same time avoid any irreversible surgical modifications and keep an albeit weak, yet still functioning patient's heart working while potentially improving its functionality. Originally most of these devices were designed just to provide the necessary support while a patient is waiting for the donor heart. This is so called bridge-to-transplantation approach. Technological progress, however, made it possible to implant these devices for a significantly longer period of time, creating an opportunity for the so-called destination therapy approach, when the device can be left implanted permanently, eliminating the need for heart transplant.'

Miniaturisation of the components is one of the most important keys in the developmental process. New, totally implantable solutions, such as Jarvik 2000 and BerlinHeart Incor, may not only eliminate the need for the heart transplantation, but also allow full patient mobility and a return to normal life.

Still far from complete replacement of transplants

In spite of rapid technological developments and successful clinical trials there are still a considerable number of issues associated with this technology Dr Ishin says. 'Among them are material biocompatibility and coagulation control, mechanical reliability of internal components, smaller device size allowing implantation into smaller patients and children, power sources, size of the batteries and device energy consumption, which would allow for fully implantable solutions with better infection control and patient mobility. Even the most advanced devices allow fully independent device operation for no longer than 20 minutes before it has to be connected back to its external batteries, which can be rather bulky and heavy.'

In 2007 the Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS)

reported device malfunction in 9% of all reported implantation cases. Factors that affect the probability of device malfunction are directly related to the number of individual components and moving parts in the system. Hence, simplification of design and reduction in the number of components and moving parts should improve long-lasting performance and durability of devices.

In addition to device malfunction, device-related infections are

one of the most frequent complications of ventricular assist device placement. Infections are reported to occur in no less than 13% of cases, Dr Ishin points out. 'Although device-related infections can involve any aspect of the device: the surgical site, the driveline, the device pocket, or the pump itself, and more than half of all device-related infections include multiple sites, the existence of external components, such as drivelines and batteries, leads to a sig-

nificant increase in the chance of an infection, leading back to the problem of external power supply and longer lasting batteries.

'Although at present we can not completely eliminate the need for heart transplantation, rapid technological developments indicate that we are not that far away from sorting mechanical issues, coagulation control and device-related infections with serious breakthroughs expected within next five to 10 years,' Dr Ishin concludes.

** Datamonitor's report Stakeholder Opinions: Heart Failure; When drugs do not work: Treatment of advanced heart failure with medical device therapies (Report author: Dr Sergey Ishin) provides in-depth analysis of the current status and future potential of treatment opportunities in advanced stages of HF. It includes an overview of existing and emerging technologies including cardiac resynchronisation therapy and mechanical circulatory support devices.*

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For the fourth article 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 of Mannheim, University of Heidelberg, invited his colleague from Mannheim, Henrik J Michaely, and experts from the David Geffen School of Medicine at UCLA for a round-table discussion on:



Advances of vascular MRI at higher field strengths

Stefan G Ruehm, Kambiz Nael, Derek Lohan and Henrik J Michaely* describe impressive images that benefit patient treatment

Contrast-enhanced MR angiography (CEMRA) has evolved as an increasingly competitive diagnostic modality challenging both catheter angiography and CT angiography (CTA) for imaging of nearly all vascular territories. Over the recent years, improvements in gradient technology, pulse sequences, and postprocessing algorithms, combined with dramatic improvements in radiofrequency (RF) technology, have enabled the current status of CEMRA applications at 1.5T. Lately, whole-body 3T MRI systems have been introduced, with the promise of greatly improved signal-to-noise ratio (SNR) compared to 1.5T. With 3T imaging it appears feasible to obtain almost double the available SNR compared to 1.5T.

However, the move from 1.5T to 3T involves more than just increasing SNR: For some pulse sequences, many of which are now routine for imaging at 1.5T, there are substantial trade-offs at 3T such as so-called dielectric resonance effect, which can result in bands of signal loss on the MR image, particularly when RF intensive techniques (e.g. steady state free precession sequences) are employed.

High field imaging at 3T has proven to be particularly beneficial

in combination with parallel imaging techniques. This technique allows for a reduction of MRI measurement times by using spatial information from multiple surface coil elements at the same time to substitute for the overall number of phase-encoding steps which determine the scan length. With the appropriate coil arrangement and receiver chain, it is possible to accelerate an acquisition manifold. In this context, a specific number called 'acceleration factor' characterises the increase in data collection speed. However, the penalty for the increased speed of parallel acquisition is a drop in SNR. Since there is more SNR available at 3T, it is possible to use higher acceleration factors at SNR values still adequate for diagnostic image quality. Therefore with identical acquisition times, images can be collected with higher spatial resolution or greater anatomical coverage compared to 1.5T.

Contrast-enhanced MRA is based on the use of T1-weighted fast spoiled 3-D gradient recalled-echo sequence in combination with the T1-shortening effect of gadolinium-based contrast agents. As an attractive feature of contrast-enhanced MRA at 3T the sensitivity to injected

gadolinium agents is increased. This is based on an increase of the longitudinal relaxation time (T1) of background tissues with higher field strengths, which allows the use of smaller volumes of paramagnetic contrast agents.

With recent advances in scanner gradient performance, fast data acquisition times for isotropic three-dimensional (3-D) data sets for 576 matrix acquisitions have become possible enabling high spatial-resolution 3-D imaging during a comfortable breath-holding period.

An additional feature of MRI is the capability to generate temporal-

ly resolved 3-D images that display the first-pass transit of contrast through the vascular system. Time-resolved MRA can provide additional functional information and requires only very small doses of contrast. For many applications, in-plane resolution can be preserved while through-plane resolution is commonly traded for rapid temporal sampling.

Clinical Applications

In many institutions 3-D CEMRA has found its role as the method of choice for the evaluation of the craniocervical vasculature. Indications include a variety of conditions such as atherosclerotic disease, aneurysms, and arteriovenous malformations, presurgical assessment of tumours as well as post-treatment surveillance. The ability to time-resolved contrast-enhanced 3-D MRA with high spatial resolution is particularly valuable for the characterisation of arteriovenous malformations and allows the differentiation between high versus slow flow lesions. This may play an



Stefan G Ruehm



Derek Lohan



Henrik J Michaely



Kambiz Nael

Table: Benefits of 3 Tesla CEMRA for improved therapeutic strategies

| Technique | Problem | Solution |
|------------------------|-------------------------|--|
| High-resolution MRA | Stenosis quantification | Improved accuracy for determination of significant stenoses |
| | Fibromuscular dysplasia | Better detection of distal renal artery involvement by string-of-beads changes |
| Time-resolved MRA | Occlusion | Detection of collateral flow |
| | High-grade stenosis | Improved visualisation of altered haemodynamics |
| T1 morphologic imaging | Activity of vasculitis | Improved detection of subtle vessel wall enhancement |

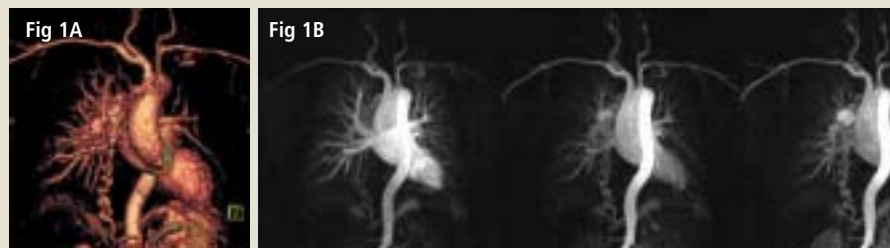


Fig. 1: 1.5T high resolution MRA (A) and time-resolved echo-shared MRA (B) of a patient with pulmonary AVM. With both techniques an aberrant feeding vessel originating from the abdominal aorta can be appreciated. The time-resolved technique additionally demonstrates the dynamics of the blood flow.

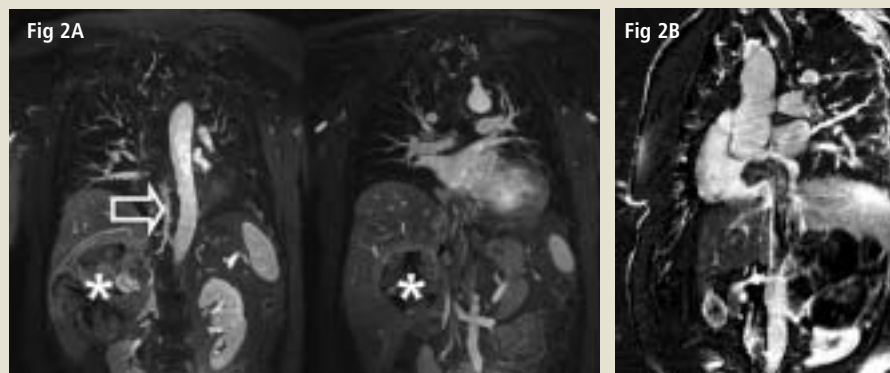


Fig. 2: 20mm thin MIP of the 3T-MRA (A) and 3T-phase-sensitive inversion recovery (PSIR) images of a patient with giant adrenal carcinoma. The carcinoma can be well depicted on the coronal MRA images (star, A) which was acquired after the administration of 15ml of Gd-BOPTA (Multihance). There is also tumour growth into the inferior vena cava and reactive dilatation of the azygos system (arrow). In the cardiac exam the extension of the thrombus into the right atrium is well demonstrated. As the MRI demonstrated that the thrombus was not attached to the atrial wall a surgical resection of the tumour was performed.



Fig. 3: Time-resolved MRA in a patient with left-sided foot ulcer and PAOD. In the dynamic time-resolved-echo shared MRA at 3.0T (TREAT, 1.5 x 1.4 x 1.5 mm spatial resolution, 3s temporal resolution) after administration of 7 ml of gadofosveset (Vasovist) a regular run-off of the right lower extremity can be appreciated while on the affected left side no patent arterial vessel can be seen. There are only small collateral branches excluding interventional revascularisation.

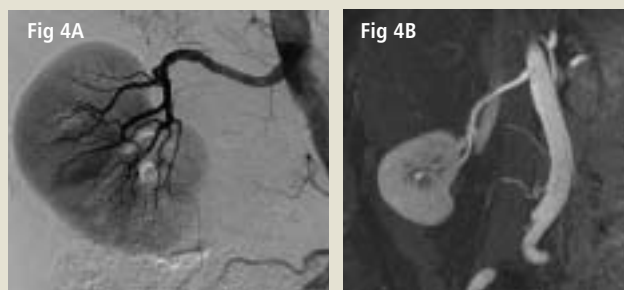


Fig. 4 (a+b): Conventional renal angiogram (a) and corresponding 3-D high-resolution contrast-enhanced MR angiographic oblique maximum intensity projection (MIP) (b) from a female patient with fibromuscular dysplasia of the right renal artery. This is evidenced by beading and irregularity of the distal third of this vessel on both imaging techniques. While of inferior spatial resolution to conventional radiographic techniques, CE-MRA at 3 Tesla maintains high diagnostic accuracy, while precluding the requirement for arterial puncture and ionising radiation exposure.

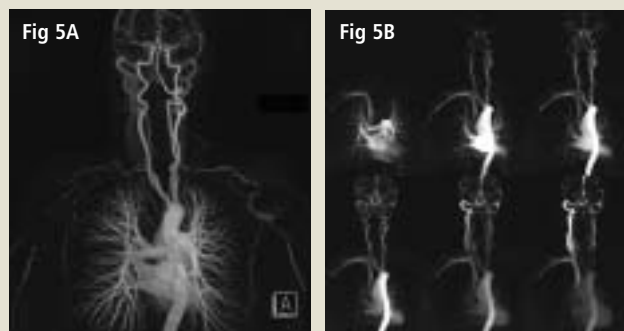


Fig. 5 (a+b): High-resolution 3-D contrast-enhanced MRA full-thickness MIP (a) obtained at 3 Tesla with injection of 12cc of Magnevist (gadopentetate) in a patient with Giant Cell Arteritis. An aberrant right subclavian and conventional left subclavian artery are occluded, with resultant arterial collateralisation. Dynamic time-resolved images acquired with a TWIST sequence using a relatively diminutive dose of 5cc Magnevist, confirms delayed bilateral upper extremity perfusion due to the attenuated size of these collateral vessels.

important role for determining adequate treatment strategies which include conservative treatment, embolisation therapy or surgery.

With a critical stenosis level of 70% as determined by the NASCET study to be the threshold for treatment of patients with thrombendarterectomy, improved spatial resolution for accurate stenosis grading of carotid arteries appears mandatory. Similarly, high spatial resolution imaging for improved characterisation of vascular wall invasion can play an important role to determine resectability of neck tumours. Cranio-cervical contrast-enhanced MRA can be used to evaluate patients following treatment for vascular disease, for example to assess re-stenosis after endovascular treatment following stent placement or for follow-up of patients with vessel dissection in order to detect possible progression of stenosis or occlusion which may mandate invasive therapy such as surgery or stenting to prevent ischemic cerebral complications.

Applications in the pulmonary circulation include evaluation of pulmonary embolism, pulmonary hypertension, and congenital heart disease. Pulmonary venous MRA plays an increasing role for accurate planning and follow up of radiofrequency ablation therapy in patients with cardiac arrhythmia.

For the abdominal vasculature, clinical applications include the assessment of atherosclerotic arterial disease, aneurysms, and dissections, as well as the preoperative

assessment of tumour extent. In addition, MR venography is a rapidly growing application in chest, abdomen, pelvis and lower extremity which benefits from high spatial resolution and the potential reduction of contrast volumes.

Indications for renal MRA include the diagnosis of atherosclerotic renal artery stenosis, fibromuscular dysplasia (FMD), renal aneurysms, dissections, as well as the evaluation of patients pre- and post renal transplantation. In combination with functional imaging techniques such as ultrasound, nuclear medicine imaging, phase-contrast MRA

or perfusion MRI, the accurate characterisation and quantification of the severity of stenotic renal artery disease plays an important role for planning revascularisation strategies. High-resolution MRA at 3T may help to limit the over-estimation of the degree of stenotic disease and may therefore avoid unnecessary renal revascularisation procedures which may further increase the risk of patients with borderline renal function.

FMD represents the second most common cause of renal artery disease. It tends to affect younger patients. Patients benefit from

early diagnosis since there is a good response to balloon angioplasty. FMD usually affects the mid and distal artery segments. These segments may be missed on conventional MRA at 1.5T due to limited spatial resolution. It is expected that CEMRA at 3T increases sensitivity and specificity for the early detection of FMD.

Similarly to single station MRA, multistation peripheral or whole-body imaging can be performed at 3T yielding high spatial-resolution data sets with isotropic submillimeter voxel size. With the combination of parallel imaging, an appropriate

contrast-injection protocol, and flexible table movement, venous contamination can be minimised or avoided. The procedure is feasible and holds promise for screening applications.

In summary, a wide spectrum of vascular diseases may benefit from imaging at 3T. Our experience suggests that CEMRA at 3T is robust and besides providing spectacular images holds promise to improve patient care by improved diagnostic accuracy which may positively affect therapeutic strategies.

**Henrik J Michaely is a consultant to BayerHealthCare*

Atrial and ventricular contraction is differentially regulated

Beta-3-adrenergic receptor activation increases human atrial tissue contractility and stimulates the L-type Ca²⁺ current

France – The contraction of the atria and ventricles is differentially regulated, according to a study by **Rodolphe Fischmeister** and colleagues, at INSERM UMR-S 769 in Châtenay-Malabry. The contraction phase of the heart beat is controlled by several pathways, including one initiated by stimulation of cell surface proteins known as beta-adrenergic receptors. At the molecular level, the flow of Ca²⁺ through protein channels known as L-type Ca²⁺ channels has a central role in the regulation of the contraction of the heart by beta-adrenergic receptors.

Previous data have indicated that stimulation of beta-3-adrenergic receptor (beta-3-AR) decreases the contractility of tissue from human ventricles and decreases the activity of ventricle L-type Ca²⁺ channels in various animal models. In contrast, Dr Fischmeister and team have found that beta-3-AR stimulation increases the activity of L-type Ca²⁺ channels in heart cells isolated from human atria and increases the contractility of the atrial tissue.

The finding that beta-3-AR stimulation has opposing effects on human atrial and ventricular tissue could lead to the development of therapies that target beta-adrenergic receptors to treat CVDs.

Details: www.inserm.fr

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HIFU surgical ablation products gain CE Mark **NEW**

St. Jude Medical, Inc. has received European CE Mark approval and US Food and Drug Administration (FDA) clearance for its *Epicor LP* cardiac ablation system, a second generation technology that uses HIFU (high intensity focused ultrasound) for surgical ablation of cardiac tissue to disrupt abnormal cardiac electrical impulses.

The first patient to undergo treatment with the Epicor LP System was a 73-year-old male with coronary artery disease and atrial fibrillation (AF). The procedure was performed by cardiac surgeon **Malcolm Dalrymple-Hay FRCS PhD FECTS**, at Derriford Hospital in Plymouth, UK. The patient, who has suffered persistent AF for over three years, had a normal heart rhythm upon completion of the ablation procedure.

'An increasing volume of published literature is demonstrating the benefits of treating pre-existing AF in patients who are undergoing valvular or coronary artery bypass surgery,' explained Dr Dalrymple-Hay. 'The Epicor LP System provides a technology that is flexible enough to treat AF patients during either standard open chest procedures or minimally invasive surgical procedures.'

'In surgical ablation performed with a HIFU energy source, energy is focused from outside a beating heart. This treatment has been designed to create precise and complete lines of cardiac tissue ablation to block chaotic electrical impulses. The patient does not need to be placed on a heart-lung bypass machine nor is the heart stopped. Because HIFU energy is directed from outside the heart inward (instead of from the inside out as is sometimes the case in ablations performed with other energy sources), the risk of unintended peripheral damage is minimised,' St. Jude Medical explains.

'In contrast, the traditional surgical approach requires that patients be placed on a heart-lung bypass machine with their hearts stopped while a cardiac surgeon cuts maze-like patterns in the atrial tissues and then sews the incisions to encourage the formation of lesions, or tiny scars. Surgeons may also use alternative energy sources, such as radiofrequency or cryotherapy, to create lesions in heart tissue. The lesions disrupt the abnormal electrical impulses that cause AF.'

'The Epicor LP system has a lower profile (smaller relative to the first generation technology) as well as other features designed to facilitate easier device introduction and placement around and on patients' hearts,' St. Jude Medical continues, adding: 'The Epicor LP System is equally suited for use in both closed-chest procedures performed through a single incision, and in open-chest procedures.'

In the December 2007 edition of *The Annals of Thoracic Surgery*, the results of an independent investigator clinical trial led by **Mark Groh MD**, showed that AF is effectively treated using the Epicor Cardiac



Ablation System when used concomitantly to corrective heart surgery. The investigators reported that more than 83% of all patients, followed for at least six months after surgery, were free from AF. In addition, 86% of the patients followed for at least 18 months remained free from AF. The investigators reported that there were no device or ablative procedure-related adverse events and specifically noted an absence of oesophageal, coronary or phrenic nerve damage.

The 2007 results confirmed the findings of an earlier European multi-centre trial published in the September 2005 *Journal of Thoracic and Cardiovascular Surgery*. The investigators in the European clinical trial reported an 85% freedom-from-AF rate at six months post-procedure - the study's primary efficacy end point - in patients concomitantly treated for AF with the Epicor cardiac ablation system.

St. Jude Medical acquired Epicor Medical in 2004 and worked closely with Dr James Cox to develop the Epicor Medical HIFU ablation system and its related surgical procedure. 'Dr Cox is the developer of the Cox-Maze surgical procedure for the treatment of AF and is acknowledged by his peers as a pioneer in the field. Since the acquisition, St. Jude Medical has been committed to improving the manufacturability and performance of the HIFU surgical ablation technology,' the company adds. The company is continuing its pursuit to expand clinical data, as well as additional tools to facilitate minimally invasive procedures, for the technology.

The first generation Epicor System gained regulatory approval for the treatment of AF in Europe in 2006. In the US, the first generation Epicor System and the Epicor LP System received clearance from the FDA for the surgical ablation of cardiac tissue but have not been indicated by the FDA specifically for the treatment of AF.

St. Jude Medical has over 12,500 employees worldwide and is headquartered in St Paul, Minnesota. The firm focuses on developing systems for cardiac rhythm management, atrial fibrillation, cardiac surgery, cardiology and neuromodulation.

Echocardiography acquires instantaneous, non-stitched full-volume images in a single cardiac beat **NEW**



Acuson SC2000

The Acuson SC2000 volume imaging ultrasound system - reported to be the first system in the world to acquire non-stitched real-time full-volume 3-D images of the heart in one single heart cycle - will be launched by Siemens Healthcare at the European Society of Cardiology (ESC) meeting in Munich. Referred to as 'Echo in a Heartbeat,' this new technology marks the greatest paradigm shift in ultrasound since the introduction of 2-D imaging in the late '70s, Siemens explains. 'Instantaneous, non-stitched, full-volume imaging comes 55 years after echocardiography pioneers Inge Edler und Hellmuth Hertz acquired the world's first cardiac ultrasound recording using Siemens technology in 1953.'

Klaus Hambuechen, CEO of Ultrasound, Siemens Medical Solutions USA Inc. added: 'The system has unparalleled capabilities in information rate processing that allow us to acquire a full volume of the entire heart with 90 degree pyramids. With a high-volume acquisition rate like this - in one second, every second - acquisition time is dramatically reduced, improving the overall workflow in the echocardiography suite.'

Next generation system architecture and transducer technology

The Acuson SC2000 cardiology platform is expected to change the way echocardiography is currently practiced. 'Its advanced architec-

ture delivers vastly more information than today's conventional systems and is strengthened by Siemens patented Coherent Volume Formation technology. Coupled with the system's high-volume acquisition rate, Coherent Volume Formation moves away from serial line-by-line acquisition towards simultaneous, multiple beams, delivering excellent image resolution,' Siemens reports.

'The proprietary 4Z1c transducer features revolutionary, patented active cooling technology, enabling full output power within regulatory limits. This results in improved penetration, reduced noise and high-volume acquisition rates when compared to conventional 3-D transducers. The 4Z1c is a single transducer solution for adult echo applications that provides all the modes needed: volume imaging, 2-D, M-mode, colour Doppler, and spectral Doppler. This breakthrough technology showcases Siemens acoustic mastery and delivers on the long-awaited promise of true volume imaging for every patient.'

Better outcomes through workflow-driven examination sequences

The Acuson SC2000 system is designed to support advanced cardiovascular applications. The knowledge-based workflow software uses learned pattern recognition technology and an expert database of real clinical cases. This enables the system to recognise anatomical patterns and landmarks, as well as to perform automatic measurements streamlining clinical workflow.

'The system automatically derives reference plane images from the full-volume cardiac capture dataset and offers automated full-volume contouring for fast qualitative and quantitative analysis. Customisable, programmable, and protocol-driven workflow sequences deliver repeatability for better outcomes: greater efficiency, accuracy, consistency, and care - from data acquisition to diagnosis,' Siemens adds. 'To further enhance efficiency, the offline workstation enables reporting as well as complete review and processing of the acquired volumes.'

The company has also addressed the ergonomics of the system to meet and exceed today's recommended ergonomic guidelines to reduce work-related stress injuries and to accommodate the varied work environment of sonographers. The new system is expected to become available in Europe this autumn.

Beijing Olympics research finds enlarged hearts can be good hearts



Cardiologist **Dr Malissa Wood**, of the Massachusetts General Hospital, Boston, USA, has reported that a study of Olympic athletes, using GE Healthcare's Vivid I cardiac compact ultrasound technology, has allowed the medical research team in Beijing to identify healthy patterns of heart enlargement that can differentiate it from hypertrophic cardiomyopathy.

Previously, it was believed that heart size is indicative of risk of Sudden Cardiac Death (SCD); however, Dr Wood's research with the USA Weightlifting and US Men's Rowing teams has shown that it is the health of the systolic or blood-pumping action - not the heart size - that is the distinguishing factor of a healthy heart. 'As a result of these findings, we are in the process of developing a cardiac fitness index to be released later this year that will help trainers and coaches understand how cardiac conditions impact performance of high-endurance athletes,' Dr Wood said. 'Our work also will provide healthcare professionals with insight into new, more effective ways of assessing and treating heart disease for the general public.'

Based on Dr Wood's findings, **Dr Patrick Schamasch**, Medical and Scientific Director of the International Olympic Committee (IOC), has recommended routine cardiac monitoring of Olympic athletes. 'I fully support the action to have preparticipation cardiovascular screening mandatory for elite athletes. This will evaluate athletes before participating in sports for the purpose of identifying (or raising suspicion of) abnormalities that could provoke disease progression or sudden cardiac death. Ensuring the well-being of all athletes is the IOC's priority, and we feel that the identification of the relevant diseases will allow clinicians to make decisions earlier on, of whether a player can stay in the game or not, but above all tailor their training programs to best meet their needs and ensure athlete safety.'

CVD specialists meet footballers

World's first symposium on sudden death syndrome among European athletes

Spain - The world's first symposium on the molecular analysis of sudden death syndrome (SDS) among athletes drew in leading cardiovascular researchers and several top Spanish footballers. Sponsored by Applied Biosystems, and held in the Madrid's Hospital Clinico San Carlos, the I Symposium de Prevención en el Fútbol aims to initiate the development of new tests to identify sports players at SDS risk.

This syndrome, most common in men under 40, generally causes immediate cardiac arrest during strenuous exercise. Reports of unexpected deaths of young men participating in marathons, cycling races and football matches are not unusual. Sudden death can be caused by a variety of diseases or genetic factors. Genetic causes usually have no symptoms, so professional athletes at risk of the syndrome can appear to be in peak physical condition during routine medical and fitness checks. Currently available CVD tests are usually insufficient to detect an individual at risk of SDS - only a genetic test will provide the required accuracy and reliability.

A roundtable discussion ensued on methods to identify specific molecular or genetic changes in people at risk. Applied Biosystems points out that these biomarkers could be used to develop a test panel for screening football players or other sportsmen to identify their risk of sudden death. There are several known genetic causes of sudden adult death, including abnormalities of the heart muscles, and malfunctioning of ion channels - vital cellular structures through which ions (e.g. calcium, potassium or sodium) pass in or out during a heart's normal functioning. Malfunctions of these channels can result in cardiac arrest. Several ion channel abnormalities have been identified that are known to increase the risk of sudden cardiac arrest, including long QT syndrome and Brugada syndrome.

Rolling out ScanCath

USA - With the recent opening of its new headquarters in Newark, California, NovaRay Inc's CEO and President, Jack Price announced that the firm will now 'scale-up and roll-out with the development of our first clinical product, the ScanCath cardiac catheterisation system.'

NovaRay, which develops digital cardiac X-ray imaging technology, explains that the ScanCath cardiac catheterisation system provides advanced imaging capabilities coupled with reductions in radiation.

Economic recession: a cause of later CVD?

Germany – Bad economic conditions, e.g. a recession, at the time of birth may lead to a higher risk of cardiovascular mortality much later in life, according to a recent study published by researchers at the Institute for the Study of Labour (IZA) in Bonn.

The study showed that individuals born in a recession on average live 15 months less than those born under better conditions and that this difference can be mostly attributed to cardiovascular health risks. 'What is surprising is that such effects may pop up 70 or 80 years after birth,' said **Gerard van den Berg**, Economics Professor at VU University Amsterdam and Programme Director at IZA, who co-authored the study with **Gabriele Doblhammer-Reiter** and **Kaare Christensen**. In the intervening years no extraordinary health events may occur, until suddenly the fatal cardiovascular problems arrive. The authors report that they do not find such long-run effects on cancer in general, although certain types of cancer have been linked to low birth weight, another marker of early-life conditions.

The team used data on individuals born around 1900, as well as that of twins in Denmark, whose mortality causes have been systematically gathered for many years. The latter made it possible to check whether a twin pair's health outcomes are more similar later in life if they were born under adverse conditions than if they were born under good conditions. The finding was that they are more similar later in life if the starting position was bad. Conversely, if an individual is born under better conditions, then individual-specific factors dominate more.

Why might a recession, for example, cause later damage to the cardiovascular system? Dr Van den Berg said analyses carried out by the team for specific parts of Denmark suggest that long-run effects are particularly triggered by the combination of suboptimal nutrition and a suboptimal health infrastructure early in life. Low household income is less harmful for the baby's future if the environment has good healthcare and hygiene facilities. In addition, stress is possibly a major factor. Parents who are economically stressed may produce offspring with features that make them more susceptible to CVDs at advanced ages.

One may wonder whether the results are of significance for present-day birth conditions. Of course, we need another 80 years to know for sure. But there are signs that long-run effects are as important as ever. For example, birth weight studies among recent cohorts show effects on health and adult height that are as strong as ever. And with the advent of the fast food society, nutritional habits among segments of society may not be as good as they used to be.

From this point of view, it may be worthwhile to screen young individuals born under adverse conditions for



CV markers and predictors, and to expose those who have unfavourable test values to preventive interventions. Moreover, the results support investments in nutritional quality and health infrastructure in countries with a high degree of deprivation, as a means to reduce the cardiovascular mortality rate in future years.

As recession looms in various countries, so the effects of economic stress on families may be passed on to the children born during such times, causing a higher risk of them developing fatal cardiovascular diseases in later life

HeartVue 6S seeks USA marketing

Pegasus/Heartview LLC has announced that clinical studies of its HeartVue 6S Heart Screening System – which obtained CE Mark Approval in Europe almost two years ago – have been completed according to FDA guidelines, as a pre-marketing condition for release in the USA.

The HeartVue 6S Screening System, use as a screening tool, provides a quick, accurate assessment of patients with suspected coronary artery disease in 1–2 minutes.

The clinical studies included testing 170 patients of various ages, genders, races, weights and health conditions. The results will now be analysed, interpreted and presented to the FDA in the form of a 510K Filing.

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Source: Gerard J. van den Berg, Gabriele Doblhammer-Reiter, Kaare Christensen: *Being Born Under Adverse Economic Conditions Leads to a Higher Cardiovascular Mortality Rate Later in Life: Evidence Based on Individuals Born at Different Stages of the Business Cycle IZA Discussion Paper No. 3635, Bonn: August 2008.*
<http://ftp.iza.org/dp3635.pdf>

The diagnostic work-up of syncope patients often raises the question of how much diagnosis is necessary and what examination methods are really needed. To save time, specialists recommend focusing on determining whether the syncope may be caused by a cardiac problem – a question answered quite easily in many cases.

According to Professor Andreas Schuchert, a basic diagnostic work-up for every syncope case consists of three steps: the first a thorough anamnesis, followed by a brief physical examination and an ECG. 'Further measures are only necessary either if no specific type of syncope can be determined or if there are indications of their being caused by a cardiac problem.' Only

Heart sounds

The basic diagnostic physical work-up often only requires a few steps. 'The first is auscultation of the heart, during which pathological sounds of any kind must be assessed as warnings of cardiac syncope,' Prof Schuchert emphasises. The neck vessels should also be auscultated for stenosis of the carotid artery. The physician should also listen very carefully for an irregular heartbeat or a heart rate below 50 or above 100 beats a minute, which may indicate AV block or atrial fibrillation as the cause of syncope. 'The most important alarm signals are evidence of cardiac insufficiency – for example, the legs are oedematous or there are rattling sounds from the lungs or a

Karl Eberius MD, European Hospital's new correspondent, discussed advice for physicians with **Professor Andreas Schuchert**, principal author of the German Society of Cardiology's official statement on syncope

Counter pressure



SYNCOPE Diagnosis and therapy

cardiac syncope shows a clearly raised death rate (18-33% annually) depending on the study, he adds

What is relevant in medical history?

Syncope caused by cardiac disorders can often be identified during the anamnesis by asking just a few questions, importantly whether the syncope occurred during physical effort, which, the professor points out, is primarily an indication of aortic stenosis or hypertrophic obstructive cardiomyopathy. Another question: whether there was chest pain before or after the syncope, which may indicate coronary ischaemia, the professor explains. The physician should also check for previous arrhythmia or other cardiac disease. 'If, for example, there has been a heart attack in the past, cardiac syncope should be assumed until there is evidence to the contrary,' says Prof Schuchert, who also considers the family's medical history an important indicator. For example, the sudden death of a young relative from cardiac causes may indicate hereditary heart disease, e.g. Brugada syndrome – rare but it should be considered.

congested liver is detectable more than two finger widths below the rib cage,' he reminds us. 'The combination of cardiac insufficiency and syncope indicates a critically raised risk of mortality and therefore needs to be immediately diagnosed.'

Vasovagal events

If that basic procedure indicates no cardiac cause, the physician can focus on determining the actual type of syncope – often possible by looking at the medical history. 'A **vasovagal attack**, the most frequent kind of syncope, must always be assumed, for example, when typical symptoms preceded the fainting attack: nausea, sweating, dizziness, drowsiness, weakness, abdominal discomfort or blurred vision,' he explains. 'Similarly when fainting followed a long period of standing tensely or the attack followed pain, emotional stress, anxiety or procedures like having blood taken.'

Fainting during defecation

Situational syncope must be assumed if loss of consciousness occurs while urinating, defecating, coughing or vomiting. 'Unlike the vasovagal attack, the trigger in

these cases is not a diffuse sensation, like anxiety or pain, but a clearly defined situation. Furthermore situational syncope typically occurs more suddenly and without any warning.'

Orthostatic syncope occurs when standing up from lying down or sitting. Unlike a vasovagal attack, an orthostatic syncope typically does not occur after standing for a long period but immediately after the change in position.

A **drug-induced syncope** should be considered if the blood pressure (BP) has been too drastically modified in hypertensive patients. On the other hand, if fainting occurs when turning the head, for example while shaving or looking over one's shoulder in a car, carotid sinus syndrome should be considered.

Additional examinations

Depending on the results from the basic diagnosis, various other investigations may be recommended to clarify the type of syncope. If the medical history indicates an orthostatic syncope, for example, diagnosis can be confirmed by the Schellong test, in which the BP taken after five minutes in the lying position is compared to that taken after subsequently standing up. The diagnosis is confirmed when the systolic value after standing up falls below 90 mmHg or is more than 20 mmHg below the measurement taken when lying down. Prof Schuchert points out that, if the previously ascertained medical history indicates vasovagal syncope, carotid sinus syndrome or situational syncope, the Schellong test is unnecessary. Moreover, tilt tests may be useful, for example when vasovagal syncope is suspected but the medical history does not unambiguously indicate this. However, the predictive value of tilt tests is increasingly challenged.

Laboratory tests of doubtful benefit

The professor believes laboratory tests are almost always unnecessary for clarifying syncope – particularly true for the determination of Hb levels, a test frequently performed due to a lack of other ideas, but which is actually only necessary if anaemia

is clinically indicated. 'In 99% of syncope diagnoses no laboratory tests are required.'

The same applies to carotid Doppler examinations, which are only indicated when sounds of stenosis can actually be heard on auscultation of the vessels of the neck. 'Otherwise the probability of syncope caused by carotid disorders should be ignored.'

Therapy

Vasovagal syncope can often be treated effectively by the simplest methods. Counter pressure manoeuvres are particularly useful in many cases, and in recent years have become a highly popular way to prevent decreasing BP without complications.

Before beginning treatment for vasovagal attacks, specialists recommend sufficient time is given to explain the therapy. 'Patients should know that fainting attacks are not a symptom of a dangerous disease of an organ,' Prof Schuchert emphasises. 'When they know this they can then react more calmly to the fainting, which for many is already a great relief.'

During a consultation the typical trigger factors for syncope should be addressed. 'Someone who tends to have syncope attacks in narrow, overheated spaces should avoid department stores. And a person



Karl Eberius

Andreas Schuchert

who has problems when asked for a blood would be wise to lie down before the procedure,' he advises, deploring the omission of these simple but important recommendations.

Counter pressure manoeuvres are in many cases a very effective aid, widely used in clinical practice to counteract the fall in BP in a vasovagal attack. Counter pressure manoeuvres require a hand size rubber ball, simply carried in a pocket or bag. If a fainting attack approaches, in vasovagal attacks not frequently heralded by typical symptoms, e.g. nausea, dizziness or drowsiness, one squeezes the ball as hard as possible. As a result of muscle contraction, the sympathetic system is evidently activated, producing constriction of the peripheral blood vessels, thus often preventing the fall in BP causing syncope in the preliminary stage.

Alternatively one can perform the manoeuvre shown in the image.

Treatments

Orthostatic syncope – If loss of consciousness occurs directly after standing up from having been lying down or sitting, this indicates orthostatic syncope. The most important recommendation of Prof Schuchert is simply to stand up more slowly so that the cardiovascular system can adapt better to the body being upright. 'Support hose, the sympathomimetic drug etilefrine or the mineral corticosteroid fludrocortisone can also be helpful.'

Situational syncope – Mostly occurring during micturition, defecation, coughing or vomiting, in many cases this is not easy to treat and there are no proven evidence-based measures. 'Any therapy that is also used for vasovagal attacks is worth a try,' Prof Schuchert says, adding that many patients are helped by support hose or etilefrine.

Summation

- Diagnosis is the priority in vasovagal attacks. People affected should be aware that the loss of consciousness does not indicate a dangerous disease of any organ.
- It is important to avoid factors triggering syncope.
- Counter pressure manoeuvres (e.g. squeezing a rubber ball or pulling clasped hands apart) have proved valuable to counteract fall in BP during vasovagal attacks.
- Lifestyle changes can be tried in motivated patients, e.g. increasing physical exercise, fluid and salt intake.
- For vasovagal attacks, midodrine is the first drug of choice (3 x 10 mg/d).
- The benefits of selective serotonin re-uptake inhibitors have not been definitively clarified.
- Support hose, etilefrine and fludrocortisone can be useful for orthostatic syncope.
- There is no evidence-based drug to treat situational syncope.

EARLY DIAGNOSIS

Hearing future heartbeats at ESC



Simply clasp your hands together with arms at about chest height in front of your body and try to pull your arms apart while not loosening your clasp. In both counter pressure manoeuvres muscles contract for as long as it takes for the signals of the attack to disappear.

Medication

Medication can also be useful to treat some vasovagal cases, particularly when other therapies have failed and syncope continues to occur. 'The drug of choice is the alpha antagonist midodrine. At a dose of 3 x 10 mg/d this effectively raises the BP, and in almost all cases the drug avoids recurrence,' the professor says. However, it is not suitable for every patient because it potentially increases the BP. This applies particularly to the elderly, whose BP compared to that of younger people is often already raised. Additionally, since this drug must be taken three times a day, many patients have compliance problems.

If patients suffering vasovagal attacks are already hypertensive, beta-blockers can also be a useful alternative. Although not recommended by the ESC due to unproven benefit in vasovagal attacks, studies in recent years in patients aged 40+ indicate positive effects, so for this age group they are often to be recommended, he points out. Other drug alternatives, including selective serotonin reuptake inhibitors, e.g. paroxetine, are being discussed, but Prof Schuchert recommends their very careful use due to lack of long-term data.

Furthermore, in cases of vasovagal attacks the physician should check whether the patient is taking anti-hypertensive medication, which might cause the syncope and which could be reduced or discontinued.

In some cases a cardiac pacemaker may be an option. 'Such an implant is indicated if, for example, an event or loop recorder, which records the ECG over several months or even years, shows that asystoles are the cause of the fainting attacks,' he points out.

Fluids and physical exercise

Often, various lifestyle changes are also recommended to avoid vasovagal attacks: more fluid intake, more salt in the diet and more

physical exercise. However, scientifically, he points out their benefit has not been confirmed, which does not mean such changes are not worth a try in sufficiently motivated patients.

For many specialists, less recommendable is 'tilt training', in which patients stand leaning against a wall, depending on the treatment plan, say for half an hour daily, to train their circulatory systems. Theoretically it produces good results, the professor says, 'But it's time-consuming and thus compliance is very poor.'

Atrial fibrillation

Experts gathering to define future research

France – Seeking to set the agenda for urgent atrial fibrillation (AF) research, European and international cardiologists will gather this October at the European Heart House, in Sophia Antipolis, the headquarters of the European Society of Cardiology.

A panel of international AF experts has been invited by The European Heart Rhythm Society (EHRA) and the German Atrial Fibrillation Network (AFNET) to their second joint conference to define new research perspectives and identify

unresolved clinical issues in the diagnosis and treatment of AF.

Among subjects for discussion: anticoagulation in patients at intermediate stroke risk; new concepts for rhythm control drug treatment; what to do if pulmonary vein isolation fails; relevance and intensity of ECG monitoring in clinical practice; relevance of clinically identifiable risk factors for AF progression; what causes the first episode of idiopathic AF, and novel therapeutic goals for AF treatment.

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Under the banner *Hear today the heartbeats of tomorrow*, at this year's ESC meeting GE Healthcare will showcase its latest cardiology technology for the management of cardiovascular disease (CVD) as well as several new products. These include the MAC 1600 electrocardiograph, which is based on Win CE5.0 to provide seamless communication to MUSE and CardioSoft and features automatic sync with a time server. GE points out that the device is scalable, to evolve as a department's needs arise.

* A GE sponsored satellite symposium will be held on Tuesday, 2 September.

GE at ESC: Booth C520 + D500 in Hall B2.

NEW

Website advice for HF patients

A new educational website specifically for heart failure patients, their families and carers, has been set up by the Heart Failure Association of the European Society of Cardiology. On this site, host 'Anna', an animated woman who speaks in a friendly, matter of fact way, guides the visitor through the website advice sections.

There are also animated explanations covering how the normal heart works, what goes wrong in HF, how the body compensates, and much else (example in illustration).

Cardiologists and physicians who wish to advise patients that they can learn more about their HF condition via their own computers, should pass on this address: www.heartfailure.org

Sample of website animated advice:



How heart failure causes fluid accumulation



How diuretics work in heart failure

Implantable cardiac monitors

Syncope (fainting) is a leading cause of hospital emergency visits. In almost 10% of patients, syncope has a cardiac cause; in 50%, a non-cardiac cause, and in 40% the cause of syncope is unknown. Syncope is difficult to diagnose as syncopal episodes are often too infrequent and unpredictable for detection with conventional monitoring techniques.

Medtronic reports that its new *Reveal DX* and *Reveal XT* can provide diagnostic and monitoring insights into cases of syncope or abnormal heart rhythms,



including ventricular tachyarrhythmias (VT), fast ventricular tachyarrhythmias (FVT), bradyarrhythmias and asystole. 'The *Reveal DX* continuously monitors the heart's electrical activity to help physicians diagnose whether or not there is a cardiovascular cause for symptoms such as fainting, dizziness and unexplained seizure-like episodes.'

During a simple out-patient procedure, the *Reveal DX* monitor – weighing just 15g and about the size of a memory stick – is placed subcutaneously in the chest area using local anaesthesia. The monitor then records important cardiac rhythm data, which may help a physician to diagnose the patient and provide appropriate treatment.

Unlike a pacemaker or implantable cardioverter-defibrillator, there are no leads (tiny wires) that extend from the device into the heart's chamber(s). To store an electrocardiogram (ECG) at the time of an episode, a patient places a hand-held, pager-sized activator over the device and presses a button. Later a physician analyses the stored information and determines if the episode was caused by an abnormal heart rhythm.

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Heart Failure Congress 2009

30 May -
2 Jun 2009



Among the many aims of the *Heart Failure Association* of the ESC is the establishment of networks for the HF management, education and research. The HFA's next annual meeting will be held next summer in the Palais Acropolis, Nice, France.

www.escardio.org/congresses/HF2009
Heart Failure 2009 Secretariat, ESC
European Heart House, 2035 Route
des Colles, Les Templiers - BP 179
06903, Sophia Antipolis Cedex,
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EH@ESC 2008 is a supplement published in EUROPEAN HOSPITAL issue 4/08.

Publisher: EUROPEAN HOSPITAL Verlags GmbH

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High risk of contrast-induced nephropathy refuted

USA – The belief that iodinated contrast agents can induce nephropathy has been held for many years, even though most of the clinical literature has not been able to distinguish contrast-induced nephropathy from other causes of the condition.

This August, however, Columbia University researchers published* results from their study of the clinical data of over 32,000 patients that spanned a decade. These suggest the estimated risk from iodinated contrast media may have been grossly overestimated. 'We don't claim that IV contrast material never induces nephropathy, but it may do so less frequently and severely than previously thought,' said principal investigator Dr Jeffrey Newhouse, director of the abdominal imaging division at Columbia-Presbyterian Medical Centre, New York City. 'If subsequent experimentation proves its safety, it could be used more frequently in patients with renal failure.'

The retrospective review involved electronic records for radiology, cardiology, and laboratory results stored in the clinical data warehouse from January 1995 to the end of December 2004. The researchers identified 32,161 patients who had undergone imaging without iodinated contrast material. The frequency and magnitude of serum creati-

nine changes in these patients was then compared with the clinical data reported in previously published articles on the correlation of contrast media, serum creatinine levels and nephropathy.

The Columbia team found that creatinine levels rose as often in patients who had not received contrast material as in the patients who did.

Over 50% of the 32,161 patients who did not receive contrast material showed a change of at least 25% in creatinine levels. Some two in five showed changes of at least 0.4 mg/dL. These changes occurred in patients with normal and abnormal initial creatinine values and had been caused by a wide range of conditions, treatments and laboratory variations that may alter creatinine levels.

Dr Newhouse said these changes were not different from those published by the clinical literature on patients who underwent contrast-enhanced exams.

He advised a cautious interpretation of prior studies of the relationship between iodinated contrast material and renal function, because serum creatinine levels change frequently in the absence of iodinated contrast media material. Future studies need to incorporate appropriate controls.

*Publication: *American Journal of Roentgenology* (August 2008;191:376-382).

Panel reviews safety of drugs cleared for echocardiography

USA – Last October the Food and Drug Administration (FDA) added a 'black box' warning on ultrasound (US) contrast agents used in echocardiogram imaging examinations, around 200 reports of serious allergic reactions were received. Problems included cardiac arrest as well as breathing difficulty and seizures; seven of the cases resulted in death.

Following reports from doctors that the information resulting from the use of contrast agents could be life-saving, the FDA warning was relaxed in May.

The only two FDA approved echocardiography contrast agents are Optison, made by GE Healthcare, and Definity, made by Lantheus Medical Imaging. So far, most of the reported problems involved patients given Definity. According to the FDA, GE's Optison was not marketed from November 2005 to October 2007. GE Healthcare had voluntarily withdrawn Optison after an FDA inspection indicated problems with a contract manufacturer. Optison was then re-launched last year. GE has stated that there have been no reported serious side effects.

In documents released by the FDA, Lantheus stated that there have been under 300 reports of serious complications and that the mortality rate was small compared to the number of doses given – around two million – since Definity's launch in 2001. The firm also reported that results from recent clinical trials show that doctors' ability to make

diagnoses have been improved through the use of Definity. Since October, the FDA has approved labelling changes for this contrast agent, which removed most of the warnings that had been added.

However, four more deaths in patients given Definity have been reported to the FDA since October 2007. According to the Agency, one patient, suffering congestive heart failure, died within five minutes of receiving the dose; another, who suffered cardiac arrest minutes after receiving a dose, was revived. 'The FDA remains concerned about the accumulating safety data pertaining to marketed ultrasound contrast agents, and the labels for these products continue to contain a boxed warning that highlights the risk for serious cardiopulmonary reaction,' the Agency stated.

Calling for further studies to determine the safety and effectiveness of the contrast agents, a panel of independent medical experts was appointed by the FDA to review the safety of contrast agents used in echocardiography as well as other experimental contrast agents that are focused on other uses, e.g. to detect liver problems. Initially, the panel is being familiarised with the overall issues involved, before the FDA seeks its advice in coming months.

The FDA is also working with the Optison and Definity producers to develop a risk assessment and management programme. This has prompted two new clinical studies.

NEW

Molecular imaging software tailors therapy planning and response monitoring

USA – Atlanta-based Velocity Medical Solutions launched VelocityAI, its new molecular imaging software, at the 2008 American Association of Physicists Medicine (AAPM) in July. This platform can save clinicians significant time in creating today's more complex, yet more beneficial, treatment plans, the company explained. 'Incorporating leading-edge techniques for rapid and precise image fusion, VelocityAI enables automatic registration of multiple imaging modalities including CT, MR, SPECT and PET.'

The firm adds that the software enables rapid plan creation using pre-defined atlases, and advanced deformation methods support adaptive planning and complex re-treatment cases. 'For enhanced patient follow up, VelocityAI allows volume analysis of biologic uptake of FDGPET imaging so that a more quantitative assessment of a patient's progress can be made over time.'

Velocity recently received 510(k) clearance from the FDA to market v2.0 of VelocityAI in the USA. VelocityAI v2.0 is an updated version of the VelocityAI v1.0 product that received FDA clearance in March 2007, and added deformable image registration and atlas-based segmentation to the powerful software's capabilities, the company explained.

High-res cardiac images available at peak stress

NEW



USA – While treadmill exercise stress testing is essential to detect cardiovascular disease, gaining clear cardiac images at peak stress level are not easy to gain using standard testing procedures. Now, however, researchers at the Ohio State University Medical Centre have designed equipment to provide high-resolution cardiac images at a critical testing stage, with results in under one hour.

'In the past, we were constrained by the time lapse between the completion of exercise and capturing the images,' explained **Orlando Simonetti PhD**, associate professor of internal medicine and radiology. 'We now have the ability to exercise patients to peak stress and obtain a high definition image of their heart within 60 seconds, which helps us more accurately identify exercise-induced abnormalities. OSU Medical Centre is the only place in the world performing treadmill exercise stress tests inside the MRI scan room.' The standard design of treadmills has made exercise stress testing a challenge near the large magnetic field generated by the MRI equipment. Simonetti and team, working with graduate students from Ohio State's College of Engineering and faculty from the OSU Agricultural Technical Institute, modified a treadmill for use in close proximity to the MRI examination table. Magnetic components were replaced with non-magnetic stainless steel and aluminium equivalents.

While patients perform the treadmill exercise test, they are monitored

using a 12-lead electrocardiogram system, which is disconnected after exercise. Heart rate and rhythm are then monitored with a wireless, MRI-compatible electrode unit while patients undergo a rapid, real-time imaging procedure that takes less than a minute.

Clinicians are excited about the possibilities. 'While current forms of stress testing have been helpful, combining exercise stress with cardiac magnetic resonance imaging

allows us to better measure the presence and extent of heart disease with a clarity not previously possible,' said Dr Subha Raman, associate professor of internal medicine in OSU Medical Centre's cardiovascular medicine division.



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11.30 am – 12.30 pm:
Law and radiology:
the consequences of the legal reform

1.30 pm – 3.45 pm:
Controlling and financing:
performance and cost control

4.30 pm – 6.00 pm:
MARA Radiology Cooperation »RIS/PACS«:
user expectations and industry product offering

Sunday, 12 October 2008

9.00 am – 10.20 am:
Breast cancer screening

11.00 am – 12.45 pm:
Workshop »Communication«

12.45 pm – 1.00 am:
Congress wrap-up

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Almost 25 years ago Michael Harrison of the University of California, San Francisco (UCSF) operated on the bladder of an unborn child. Almost eight years later, surgery was carried out on the diaphragm of an unborn child. His approach was controversial: a paediatric surgeon opened the abdomen and uterus of the pregnant woman, lifted out the foetus, performed the surgery and returned the foetus to the womb. The disillusioning result: Almost all these 'open fetal surgery' cases were born prematurely and most died.

Harrison faced not only criticism from experts and laymen, but also respect for his courage and innovation. 'Late one night, it must have been before my internship, I sat in my room in the hall of residence in Essen Margarethenhöhe and flicked my way through the TV channels when I came across a report on Michael Harrison and fetal surgery,' recollected **Thomas Kohl**, today Head of the renowned *German Centre for Fetal Surgery & Minimally Invasive Surgery (DZFT)* at the University Hospital Bonn. 'I've never been able to get it out of my mind.'

Dr Kohl's approach has little in common with that open surgery. With a small group of colleagues he has paved the way for minimally-invasive fetoscopic fetal surgery. These new interventions, he says, 'have fewer complications than open fetal surgery and most importantly, put less pressure on pregnant mothers and their unborn babies.' Today a whole range of diseases, e.g. twin transfusion syndrome, diaphragmatic hernia, spina bifida and some cardiac problems can be treated in this way, as well as urethral rerouting.

Treating those with spina bifida hold his particular interest. Spina bifida, in which part of the spinal cord is exposed to the amniotic fluid and therefore damaged, can be detected at very early stage pregnancy, using ultrasound and marker protein determination (alpha-1-fetoprotein-concentration). Risk of paralysis increases according to the level of the affected parts of the spinal cord not protected by the vertebral body. Moreover, the cerebellum and the brain stem are displaced.

'Although children rarely die from spina bifida, diagnosis can be fatal because most couples decide to terminate the pregnancy,' Dr Kohl pointed out. One reason is that parents are still being given the wrong kind of advice. 'Contrary to popular perception

spina bifida, even if it is not treated with fetal surgery, actually rarely leads to severe mental disabilities. As the opening in many children is quite low, paralysis is less pronounced and despite the characteristic clubfoot they can often walk well enough.' By surgically closing the back, American fetal surgeons as well as Dr Kohl hope to reduce the extent of palsy and improve the concomitant malformations in the brain so that an affected baby is

than the diameter of the ink cartridge of a biro. If left untreated, a fetal diaphragmatic hernia can lead to the internal organs shifting into the thorax and can prevent the lungs from developing properly.

Three further quantum leaps in medicine helped the further development of this still relatively new specialty: The change from large, open surgical interventions to minimally invasive procedures from the beginning to mid-1990s

and premature births. The longer and more complicated the extent of the intervention, the higher the risk. The main problems feared by the surgeons are births occurring particularly before the 30th week of pregnancy. 'Up to two years ago this was a really big problem,' he pointed out, but now around 80% of the babies treated are born after the 30th week, and 50% are actually born after the 34th week of pregnancy.

To avoid very early premature

twin' transfusion syndrome the placenta vessels fuse together, causing a life-threatening exchange of blood between the twins. Using a laser, Dr Kohl and colleagues close the vessels, in this way saving most of the babies.

Dr Kohl has now developed a procedure for certain cardiac conditions that does not involve surgery. 'Ultrasound scans can sometimes show that the left side of the heart is very small and the main artery is very underdeveloped,' he explained. In over two thirds of cases the baby needs cardiac surgery after birth, to widen the aortic arch. 'My new approach is to give the mother oxygen in the last weeks of pregnancy. When this reaches the baby the lung vessels open through reflex. This leads to more blood flowing to the left side of the heart, which can then grow further.' For some babies this completely eliminates the need for surgery after birth; for others doctors are at least able to improve the conditions for this kind of surgery. Dr Kohl has now dealt with 14 of these cases, and has five more already on his waiting list.

How does he find time to develop such new procedures? 'The good thing about my special subject is that I have comparatively few patients,' the surgeon explained, 'therefore I have more time to refine my approaches.' *by Edda Grabar*

Foetal surgery

Scanning and cutting on a miniature scale

less disadvantaged through problems developing after its birth.

Thomas Kohl developed and practiced his technique on sheep, operating on about 200 unborn lambs before he dared operate on a human. He also worked under renowned fetal researchers in San Francisco, among them the pioneer Harrison, to perfect his technique. Today he is considered one of the world's leading fetal surgeons.

'Around 70% of all babies who undergo fetal surgery survive these interventions along with treatment once they are born,' he said, 'and most can expect a normal quality of life.'

The foetal surgery centre in Bonn has operated on more than 200 unborn babies or treated them with new, non-invasive procedures; without these interventions, most of them would have died or would have had to live with severe disabilities.

The progress of fetal surgery was significantly dependent on the development of sensitive imaging procedures and the necessary surgical instruments. Ultrasound has proved itself the most important tool. 'Siemens offers a machine that even allows us to capture images of the oesophagus of an unborn baby with the help of a small ultrasound catheter. This is particularly suitable for monitoring surgery with certain heart problems,' explained Dr Kohl. The tube containing the ultrasound transducer and the surgical instruments measures only five millimetres. The diameter of the hollow needle he and his colleagues use to treat a fetal diaphragmatic hernias measures just under one millimeter, i.e. less

and, very topical, the 'newly developed anaesthetic procedures developed at the DZFT, which allow us to anaesthetize unborn babies safely and effectively without putting too much of a strain on the mother's cardiovascular system, and finally the ability to close up holes in the amniotic sac,' explained Dr Kohl.

A hole in the amniotic sac is a problem well known from examinations of the amniotic fluid: It can lead to amniorrhaxis

births Dr Kohl tends to treat problems that will only become life-threatening after birth, e.g. underdevelopment of the lungs in the unborn with diaphragmatic hernias, ideally only from the 34th week of pregnancy. Up till then he prefers not to disturb the baby's development as far as he can. Even at this late stage in pregnancy he achieves sufficient catching up in the development of the lungs in most of his patients treated in this way.

However, there are some fetuses that doctors try to save at the earliest possible stage in pregnancy. The most common cases treated at the Centre are twin pregnancies. With 'twin-to-

UNDER- OR OVER-UTILISED?

By **Dr Soenke H Bartling**

Although ultrasound imaging is a very powerful imaging modality it is mostly under-used

Ultrasound combines several very appealing characteristics. It is among the non-invasive imaging modalities, indeed it is really non-invasive. Similar to MRI, no harm to the patient can be caused by ultrasound.

Through the years it has witnessed great developments: Resolution increased, functional modes have been added and novel contrast concepts invented. It constantly served doctors during the last decades. Often, it can be used to replace more expensive and more invasive ('harming') modalities. The latest developments have made ultrasound devices small and flexible so that they can even be carried in ambulatory or preclinical medicine. Novel ultrasound probes were reduced in size and made 3-D, or better, 4-D imaging possible – most famously 'baby-facing', where a mother-to-be can see the face of her unborn child in 3-D.

However, many still maintain that the power of ultrasound is under-utilised, whilst others say it is over-utilised.

To explain this apparent discrepancy one has to understand that ultrasound is an imaging modality that is strongly dependent on the training level of the operator. The probes give insight into parts of the human body, but only those that are looked at. Furthermore, in contrast to all other imaging modalities,



Ultrasound of a normal kidney (the intravascular blood flow, as measured through the Doppler effect, is colour coded) combining the structural as well as functional information that ultrasound can derive

ultrasound does not allow a profound documentation of the findings – at least not those findings that weren't seen during the examination. An ultrasound examination cannot be looked at retrospectively. In other words, there are almost no consequences for a doctor if he misses some findings. This has led to ultrasound mostly being used for screening and not the final 'elimination'.

To compensate for declining reimbursements for ultrasound, doctors increased (over-utilised) the number of examinations, which itself leads to a consecutive decrease in reimbursement, despite the fact that a good ultrasound examination takes time. So, to perform a really good ultrasound examination no longer pays well.

While in many countries a wide variety of doctors perform ultrasound – radiologists as well as specialists and general practitioners – in the USA the problem of a declining reimbursement has been solved differently: radiographers perform very standardised scan protocols that are then read by radiologists.

Independent of widely discussed local implementations, the potential of ultrasound is not used to its full extent – healthcare politicians (adopting reimbursement, assure quality examiners) as well as the healthcare industry (make ultrasound less user dependent, develop new probes, assure proper documentation) have the potential to change this in the future.



Ultrasound experts to meet in Davos

Switzerland – The 32nd congress of three national ultrasound associations – Swiss, German and Austrian – will take place from 24–27 September, with a particular focus on ultrasound for mammography, paediatrics and neurology.

At this three-country-event manufacturers showcase new products and initiate new scientific partnerships. Details (German language): www.ultraschall2008.ch

STROKE PREVENTION

What is the role of vascular ultrasound in stroke prevention? Asked by Karoline Laarmann of *European Hospital*, **Professor Christian Arning MD**, Medical Director of the Neurology Department at Asklepios Klinik Wandsbek, Germany, and Deputy Chairman of the German Society of Ultrasound in Medicine (DEGUM), gave an unequivocal answer: crucial – but only if the sonographer is properly qualified.

‘Without any doubt prevention is not only the best but also the safest treatment for stroke. It is precisely in prevention where ultrasound offers these enormous advantages over all other modalities, and this applies not just to radiation exposure. Roughly 90% of all strokes are due to insufficient blood supply to the brain due to vascular obliteration, including stenosis of the carotid arteries. Since this part of the human anatomy is easily investigated by ultrasound, in 98% of the patients we can assess the status of the carotid arteries quite definitely, without having to fall back on any

tent vascular stenosis will be diagnosed or dangerous stenoses will simply be overlooked.’

These significant differences in the quality of ultrasound instruction result in a large risk for the patient. Since currently there is no ‘warranty’ for a constantly high level of competence in ultrasound, the DEGUM* has developed a voluntary scheme of certification that will make transparent the quality of the ultrasound study. ‘For this certificate physicians will have to pass tests on specialised areas of application of ultrasound.

Ultrasound brings many advantages, but trained sonographers are too few

This ensures that the physician treating the patient will be able to solve the pertinent issues in a particular disorder.’

The problems of specialisation are also seen in other countries: For example, in the USA and the UK ultrasound is performed by

sonographers. These are medical technicians with extensive experience in the modality but whose diagnostic ability is hampered by the fact that they are not fully-trained physicians.

‘Qualified diagnostic ultrasound makes it possible to realise a new structure in diagnostic decision-making. Currently, in the case of ambiguous findings, a physician not well trained in ultrasound will refer the patient to the radiologist. However, it would be much better if patients with ambiguous findings

could be referred to an experienced sonographer,’ the professor concluded.

* *The DEGUM certification scheme has three levels. ‘DEGUM Level I is a qualified basic training, teaching the user the principles as well as simple applications,’ Prof Arning explained. ‘DEGUM Level II deals with more demanding applications and requires several years of experience by the sonographer. The level II certificate also includes the skills as an instructor. DEGUM III, the third and highest level of excellence, also includes scientific research in ultrasound.’*

The homepage of the German Society of Ultrasound in Medicine has a link to an open database listing of all sonographers certified by DEGUM.



Karoline Laarmann (*European Hospital*) with Christian Arning

other modality. It is our overall goal that ultrasound will supplant X-ray studies, even in the diagnostic workup of stroke. In the case of catheter angiography, a modality with a certain inherent risk of side effects, we have already been successful: the standard modality up until recently, angiography of the cerebral arteries is uncalled for in 99% of cases,’ said Prof Arning. Since no other low-risk imaging modality exhibits such an excellent spatial resolution as ultrasound he also advises: ‘Patients at increased risk for stroke should undergo regular preventive ultrasound workup. The degree of stenosis is the most important criterion when assessing the risk of vascular obliteration. From this information alone the expert investigator can infer the seriousness of the carotid artery stenosis.’

However, the safety and accuracy of the study requires proper training and extensive experience of the sonographer. According to Professor Arning many German hospitals specifically lack these competent healthcare professionals. ‘The reason for this stems from the fact that although in Germany ultrasound is taught during residency, there are no uniform standards in quality assurance and no minimum standards for the teaching syllabus. Furthermore, not even the qualification of the teacher has been laid down in the residency regulations. Therefore, quite often one resident will pass on his/her partial knowledge to the next. But for this modality the operator’s experience is of paramount importance. A study on abdominal ultrasound published in 2006 demonstrated that less experienced ultrasound operators came up with the correct diagnosis in only 39% of cases, while for the experienced sonographer this rate jumped to 95%. An accuracy of 95% is identical with that seen in other modalities, such as CT and MRI. When patients are studied by sonographers who are not properly trained, time and time again either non-exis-

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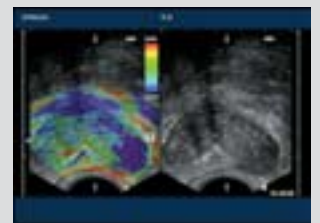
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NEW

Philips HD15 ultrasound system

Philips has added a new platform to its HD ultrasound products – the HD15 – which aims to provide small hospitals, clinics and private practices with advanced image clarity and broad application support for everyday use. 'The HD15 brings capabilities that assure user simplicity and productivity to more clinicians in a variety of clinical settings,' explained Anne LeGrand, senior vice president, Ultrasound, for Philips Healthcare.

'The system may be used as a primary system for some users, particularly those in emerging markets who require a feature-rich system but may not need all of the features of a high-end ultrasound solution,' Philips added. Along with workflow improvements, the HD15 capabilities include general imaging, cardiac, vascular and obstetrics/gynaecology applications. Features such as contrast enhanced ultrasound and PureWave transducer technology also allow real-time guidance and evaluation of minimally invasive treatments.

The HD15 includes Philips QLAB quantification software, XRES image processing and PureWave transducer crystal technology. 'New Microfine EX focusing

provides sharper images and improved tissue uniformity throughout the depth of field through application of new dynamic receive lens tuning with five times more focal points than previous generation systems,' Philips explained. 'Tissue Specific Imaging presets and iSCAN one button image optimisation can quickly provide clear images with little to no adjustment. A broad suite of configurable patient reports and exam storage options, such as DVD-CD-R/RW, USB drive, and full DICOM capabilities, provide efficient patient data management and colleague or specialist consulting.'

Active native data allows clinicians to manipulate examination parameters and image settings even after a patient has left. 'Images and Cineloops can receive further investigation by manipulating the original image to see new detail. Live compare allows the clinician to compare a previous exam side-by-side with an active exam in order to see immediately changes in structure or blood flow. This can be particularly helpful in comparing changes in cardiac and vascular anomalies, further documenting changes after interventional procedures, or evaluating foetal development.'



'High performance systems need not be large,' says Aloka, manufacturer of the new compact ProSound α7, which produces high-resolution images yet can be used in areas with little spare space. 'Broadband Harmonics provides high sensitivity and penetration that is comparable to fundamental-frequency imaging resulting in a significant improvement above standard harmonic imaging,' Aloka reports.

The system also incorporates Directional eFlow (D-eFLOW), Aloka's unique technology that dynamically improves spatial and temporal resolution of blood flow. Aloka points out that it copes with the full range of haemodynamic velocities from fine blood vessels with low velocities in the tip of a finger to large vessels with high velocities such as the Aorta. The Dual Dynamic Monitor (DDM) mode allows viewing of a fundamental B-Mode image and a contrast-enhanced image simultaneously, side by side in real time. Aloka points out a range of ProSound α7 abilities:

- **Adaptive Image Processing (AIP)** for speckle reduction: Speckle noise is reduced while maintaining frame rate thus enhancing tissue differentiation without affecting temporal resolution.
- **Image Optimiser:** Instantaneous automatic optimisation of the live B-mode image freeing the user from individual image adjustments during examinations, resulting in enhanced patient throughput & examination efficiency.
- **Spatial Compound Scan:** Offers an enhanced image processing technology by superposing images created by steering the ultrasound beam in multiple directions & user definable angles. Enhancing the definition of structures.

ProSound α7



Aloka's compact ultrasound system

- **Edge Optimiser:** Improves overall edge definition of tissue boundaries to improve diagnostic confidence. Thus making measurements such as IMT & Nuchal Translucency definitive.
- **Multi-Slice Imaging:** This is a multi-planar sequential display function of 3D volume data, which is a popular display technique in CT and MR. Multiple cross-sectional images of arbitrary slice width can be displayed, making it easy to observe the extent of a lesion or structure such as the foetal heart for objective understanding of anatomical location.

- **Flow 3-D:** This function allows the user to add 3-D colour flow information to conventional 3D images of tissues. This makes it easier to appreciate the complex vessel positioning, such as tortuous or tangled vessels, in relation to the surrounding tissue which is harder to appreciate while viewing standard with 2-D images.

- **Automatic Doppler Angle Correction:** Flow direction is tracked using the colour Doppler image allowing automatic adjustment of the angle correction cursor at a press of a button. Thereby minimising user input & improving examination efficiency.

- **Compatibility with 13 Additional Probes e.g.**

- Compound Array Linear Probe allows electronic focusing in two planes to generate images of a uniform slice thickness from superficial to deep areas.
- 28 types of probes are now compatible, expanding the system's application range and enabling more specialised examinations in respective fields.

- **Flow Mediated Dilatation (FMD)** analysis is available by utilising the Aloka eTracking function. Automatically tracing the change in the diameter of vessels with a high accuracy of 0.01mm (at 10MHz) by tracking the zero cross phases of RF signals. Thereby providing an accurate way to evaluate & quantify vascular health.

Although launched only this year, Aloka reports that this compact ultrasound system is reported to have already attained a successful reception.

European debut for Acuson S2000

Siemens Healthcare will show its Acuson S2000, the first ultrasound system in the new product series S, at the ESC*. The system platform includes integration of the newest technologies to optimise workflow, e.g. comprehensive software applications such as new software for breast imaging. The system is also equipped for future technologies: It enables the implementation of innovative ARFI (Acoustic Radiation Forced Impulse) imaging and is prepared for integration of new silicon ultrasound technology, which is almost ready for the market, Siemens points out. 'The Acuson S2000 is suitable for internal medicine radiology imaging including vascular diagnosis and echocardiography as well as gynaecology and obstetrics.'

ARFI ultrasound compresses tissue using acoustic energy, enabling qualitative and quantitative evaluation of the stiffness of deep tissue. Current research indicates that this type of evaluation can be helpful in differentiating abnormalities such as liver tumours, or quantifying the advancement of fibrosis (development of excess connective tissue), Siemens explains.



The Acuson S2000 is already designed for integration of future silicon ultrasound technology, the first groundbreaking development in probe technology in over 40 years. This uses the precise procedures of semiconductor production and realises isotropic 3-D and 4-D ultrasound imaging for the first time, which offers the same true-to-detail representation in every direction.

'We believe that the ARFI and silicon technologies will change ultrasound imaging as extensively as Doppler imaging did in its day,' said

Klaus Hambüchen, CEO of Siemens Ultrasound Business Unit.

Siemens is also preparing the Acuson S2000 for Automated Breast Scanning (ABS). This method provides automatically created, reproducible 3-D ultrasound volumes of the breast. ABS is important for screening, early detection, diagnosis and aftercare for breast cancer and complements mammography, especially for women with dense breast tissue. Compared to manual breast ultrasound, ABS shortens the examination time and reduces user dependency. This makes ultrasound imaging more reproducible and provides more uniform results than before, Siemens explains.

Innovative applications of the Acuson S2000, e.g. 'SieClear Spatial Compounding', also increase the reliability of a diagnosis. 'One push of a button allows highlighting of anatomical boundaries and improves tissue contrast as a whole. Simultaneous use of the Dynamic TCE technology reduces speckle patterns and noise signals and ensures excellent image quality, even in difficult cases. For the first time the Acuson S2000 will use this 3D TCE with speckle reduction to acquire 3-D images. The High Density (HD) probe technology also results in exceptionally fine signal levels for excellent depth and contrast resolution,' Siemens adds.

The Acuson S2000 also integrates knowledge-based applications, for example the syngo Auto OB software, which creates semi-automatic biometric measurements of a foetus and saves the operator up to 75% of the stages in a routine examination. Advanced-fourSight technology provides improved functionality for volumetric acquisition, data rendering and postprocessing. This software also includes Amniotic Rendering, a unique method of surface rendering to show almost photorealistic and detailed views of the foetus, Siemens continues. The additional imaging with Foetal Heart STIC (Spatio-Temporal Image Correlation) acquires data over the course of several cardiac cycles and creates a 3-D volume of the foetal heart, which a physician can use to view the heart in several layers.

Another feature is syngo eSie Calcs software, intended for boundary detection and segments it scans areas of interest, automatically calculating all parameters of interest to the physician, Siemens continues. 'The simple definition of a delimited area allows the tracing of lesions and calculating either their volumes in 3-D or surfaces in 2-D.'

(See EH@ESC supplement, centre 12 pages of this issue).

At this year's European Society of Cardiology (ESC) meeting, GE Healthcare will celebrate a decade of achievements since it acquired Dasonics Vingmed Corporation. 'To think about the achievements and strides we've made over the past ten years is remarkable,' said Business General Manager Anders Wold, who joined GE from Dasonics Vingmed. 'Perhaps even more remarkable, however, is to think of those achievements as a prologue to the endless possibilities ahead.'

1999 – GE introduced System Five, its first cardiovascular ultrasound system. This offered the then-breakthrough features of quantitative contrast imaging and DICOM connectivity.

2000 – GE's new Vivid 3 became one of the first PC soft/hardware based ultrasound systems. The Vivid FiVe added tis-

GE celebrates a decade of Vivid memories

sue tracking to the series.

2001 – Debut of Vivid 7 and information management solution EchoPAC PC. Vivid 7 became GE's high-end PC-based ultrasound scanner and the foundation for many future innovations.

2002 – Vivid 7 gained strain imaging as well as new vascular and shared service applications. Vivid 3 gained a new transducer (the3S) and EchoPAC connectivity.

2003 – TSI (Tissue Synchronisation Imaging) added to Vivid 7. Vivid 4 debuted with its 18 transducers.

2004 – Vivid 7 picked up the Dimension moniker based on its new real-time 4-D and multi-dimensional imaging capabilities. Vivid entered the



compact ultrasound market with the introduction of the Vivid i. GE's first compact cardiovascular ultrasound system brought the performance of 400-pound console systems into a lightweight, compact design. GE acquired

Amersham and contrast agent Optison joined the GE portfolio.

2005 – Vivid 7 gained Automated IMT (intima-media thickness) measurements and 9-slice imaging. Structured findings came to EchoPAC and Image Vault.

2006 – Vivid e, brought compact ultrasound into doctor's offices. Vivid & gained 4-D real time colour flow and AFI (Automated Function Imaging). 4D LV volume measurement came to EchoPAC.

2007 – Leveraging miniaturisation expertise gained from Vivid I and the performance of Vivid 7 and Vivid 4, launched Vivid S6 and S5 cardiovascular ultrasound systems. Vivid 7 gained ultra-definition imaging.

And now?

The 10,000th Vivid 7 and the 5,000th compact Vivid system will be sold this year.

In both the console and compact ultrasound lines, GE says it will introduce some significant new additions to the Vivid series. 'In the console line, they'll share the promise of true 4-D heart imaging, new 4-D quantitative tools and open the door to enable full cardiac studies in a completely 4-D environment. In the compact Vivid product line, we continue to add new quantitative analysis tools and new leading edge imaging quality enhancements, bringing even more diagnostic confidence into the equation. The new introductions will take users and their patients in directions they can only dream of.'

Dr George Salomon: We are currently using sono-elastography with high-risk prostate cancer patients who underwent biopsy but show a high PSA value despite negative tumour results. With these patients sono-elastography offers a complement to conventional ultrasound since measuring tissue elasticity allows us to gather information on suspicious regions that were not identified during biopsy. So far the results have been very promising. As soon as we have identified a suspicious region we can perform targeted biopsies, which increase diagnostic accuracy.

We validate this method by ten biopsies thus working with the current gold standard. In a final step we compare the results and use additional information from our database, in which we save all the elastograms we have performed.

How reliable is this method?

At this point our patient cohort counts approximately 100 patients with negative biopsy findings. We have to analyse these data before we can make valid statements on the reliability of the method.

SONO-ELASTOGRAPHY

A valuable additional method to improve diagnostic precision of prostate cancer

Martini Clinic, in the University Hospital Eppendorf (UKE) campus in Hamburg, is one of the world's major centres for nerve-sparing prostatectomy. The Martini physicians not only specialise in surgical intervention but are also at the cutting edge of diagnostics, being among the few in Germany to use sono-elastography, an innovative tool to detect prostate cancer.

We asked **Dr Georg Salomon (GS)**, chief physician and head of diagnostics at Martini Clinic, who has used sono-elastography for over a year, about this work and his aims to improve the diagnosis and prognosis of prostate cancer.



In a previous study we were able to show that sono-elastography as such offers diagnostic benefits. We compared pre-surgery ultrasound data of cancer patients with the post-surgical histological results of the removed tissue. Sensitivity and specificity were about 76%, the positive predictive value was 87%, and the negative predictive value was about 59%. That means the method is significantly better than conventional ultrasound.

However, to assess the precise diagnostic benefit we need more

data that we can analyse. Sono-elastography is only an acceptable diagnostic tool for prostate cancer if it offers the same reliability as the gold standard. At this point, measuring tissue elasticity is a mere complement, which provides additional information.

What would a physician need to learn to use this?

As with any other modality there is a certain learning curve for sono-elastography. First, one has to understand how the hard tissue is displayed. That means the user has

to move the transducer precisely, in order to generate the elasticity images. In a second step the images have to be interpreted based on their reproducibility. And finally the elastogram has to be compared with conventional ultrasound. If, for example, the elastogram shows hardened tissue, the ultrasound image can provide information on the nature of the hardened tissue, for example whether it is a calcification. Currently, the criteria to assess elastograms are

not yet standardised but there are different ideas on how to arrive at a standardisation.

Despite these positive results the method is not being used widely in Europe. Why not?

On the one hand this can be attributed to the fact that the industry has neglected this method for a long time. Promising approaches have been around for a couple of years, but they were not followed through. Today, as far as I know, the Hitachi system is the only one on the market that offers this diagnostic benefit. But things seem to be moving ahead as other companies are increasingly interested in sono-elastography – a fact which proves that the method is indeed promising.

At the same time sono-elastography is increasingly used clinically as an additional modality. This will provide more data to work with in order to assess and optimise the method.

In short: I'm convinced that sono-elastography offers a valuable additional method to improve diagnostic precision of prostate cancer.

Laparoscopy is playing an increasingly important role in urology and centres of excellence have been established to provide training in urological laparoscopic surgery. However, increased patient demand for the latest minimally-invasive techniques means there is still a potential shortfall in urology laparoscopists in Europe.

Robot-assisted surgery may help ease the situation, though many leading urologists are not yet convinced either of its cost-effectiveness or ability to offer outcomes better than regular laparoscopy.

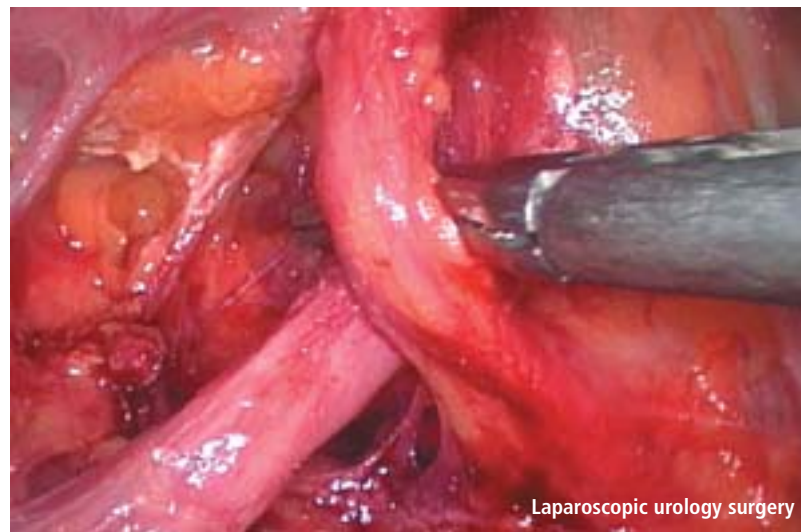
According to **Per-Anders Abrahamsson**, Secretary General of the European Association of Urology, 'There are more demands from patients for minimally-invasive and laparoscopic surgery – with or without robot-assistance. That has been increasing exponentially in the last few years in many European countries.'

Laparoscopic urology surgery began in the mid-90s in America but was dropped because it was considered too time consuming to suit the needs of the US reimbursement system. In turn, French and German urologists took up the discipline and have become world leaders in developing the role of laparoscopy in the treatment of urological disease and tumours. Professor Abrahamsson, who is Chairman and Professor of the Department of Urology at Malmö University Hospital in Sweden, said: 'There is an unmet need in many countries in Europe and we have to teach more urologists in terms of laparoscopy.'

The EAU, through its European Urological Scholarship programme (EUSP), and the British Association of Urological Surgeons (BAUS) have established laparoscopy training programmes for urologists.

A study of residents' laparo-

Laparoscopy in urology



Laparoscopic urology surgery

scopic surgery training co-authored by **Dr Stephanie Kroeze** of the University Medical Centre, Utrecht, concluded that laparoscopic training needs to be improved but highlighted laparoscopic virtual reality simulation as helping meet that need in urological surgery.

Frank Keeley, a consultant urologist at Bristol Urological Institute in England, said: 'Urologists have been slow to develop laparoscopic expertise because there is no procedure which is relatively straightforward. As a consequence, the number of expert surgeons acting as trainers has been small.'

He said urologists had to develop their surgical expertise 'on the job' and after they had completed formal training, and added: 'The impact on hospitals is fairly obvious: many surgeons do not offer laparoscopic surgery; open surgery involves longer hospital stays and more blood loss than laparoscopy.'

Laparoscopic surgery utilises different skills to conventional surgery, but Mr Keeley believes

there are clear advantages. 'Patient quality of life after laparoscopic surgery is higher, and many patients now ask whether their operation can be carried out laparoscopically,' he said.

'Once the surgeon reaches the required level of expertise, he should have more job satisfaction and fewer postoperative complications.'

In urology, operations that laparoscopy most benefit include nephrectomy, adrenalectomy, and pyeloplasty because an upper abdominal or loin incision can be very debilitating.

Although some centres are using robotic equipment for urological procedures, some surgeons have reservations about whether the technology provides better clinical outcomes than regular laparoscopic surgery.

Dr Vincent Ravery, professor and chairman of the Department of Urology, Bichat-Claude Bernard Hospital, Paris, and Chairman of the European Society of Oncological Urology, said that a problem in gaining a

consensus on the value of robotic surgery is that circumstances differ from one European country to another. 'In France for instance, this issue is not prominent because the pure laparoscopic surgeons are skilled enough to proceed without robots but in other countries, in which regular laparoscopic procedures are not as regularly carried out, the robot is probably more important.'

Urologists say the robotic issue is often commercially driven with suppliers encouraging hospitals to take advantage of the technology, without any widespread clinical investigation of its effectiveness.

Dr Ravery added: 'The issue is also driven by the patients who come to us asking for the robots without any rationale but at this stage we are not sure that robotic surgery dramatically improves on the oncology and functionality of regular surgery.'

However, urologists acknowledge having the option of robotic surgery makes it easier to attract patients and for some complex



Per-Anders Abrahamsson



Frank Keeley

procedures the robot may be more effective, especially with a radical prostatectomy.

Advantages of robotic surgery include the surgeon being seated and having a three-dimensional view of the operating field. Robots are also effective for remote surgery being used by a surgeon in one centre to operate on a patient in another hospital.

But with the machinery costing millions to purchase and maintain, Dr Ravery says this is another factor in deciding whether to go down the robotic route: 'To invest at this level we have to be sure that the oncological results are at least as good as using other procedures. So far, we are not sure.'

At present the main robotic system available is the da Vinci, but the Chinese are developing a robot that could be commercially available within the next few years and, with greater choice through competition, the cost could decrease.

The da Vinci makers say there are benefits of robotic surgery – for the surgeon of magnified 3-D visualisation, increased precision, tremor filtration and improved access to and manipulation of organs, tissues and nerves, and for patients shorter hospitalisation, reduced pain, faster recovery times, and quicker resumption of normal activities.

Robot-assisted prostatectomy in practical use

At the *Medizin Innovativ 2008* congress (9–10 July, Nuremberg, Germany)

Professor Jens-Uwe

Stolzenburg MD (right),

Director of the Urology Clinic and Polyclinic at the University Hospital Leipzig, talked about his experiences with the *da Vinci* robot. Used by surgeons at University Hospital Leipzig since last October 2007, they performed 40 operations in the first two months.



The *da Vinci* technology has been under development since 1995. Over the last three or four years, robot-assisted surgery has replaced the open retropubic prostatectomy as standard surgical procedure for prostate cancer in the USA. In 2007, 68% of all radical prostatectomies in the US were performed using *da Vinci*. This percentage has been increasing and is expected to rise even further.

The *da Vinci* technology, which is a significant further development of laparoscopy, offers a number of advantages. From a workstation, the surgeon controls the laparoscopy instruments in the patient body via three-dimensional optics. Patient-side sterile procedures are no longer necessary and the ergonomically designed workstation reduces the physical stress for the surgeon. The instruments of the *da Vinci* robot can be moved in six increments. Thus, the movement of the surgeon's fingers are directly transferred to the instruments and possible tremors are avoided.

It is above all the 3-D optics that allow ideal orientation in the operative field, a significant advantage over traditional laparoscopy, which requires orientation in a two-dimensional space – a fact which poses problems for many, particularly inexperienced, surgeons. In short, the *da Vinci* technology combines the advantages of laparoscopic access (minimally invasive) with those of open procedures (3-D view, intuitive movements, dexterity).

Robot-assisted surgery, however, requires substantial initial investments and the operating costs are comparatively steep. A system comes with a price tag of around €1.3 to 1.5 million. The annual maintenance costs will amount to approx. €50,000 plus approx. €1,000 to 1,500 per procedure for the instruments. Costs are thus one reason why *da Vinci* robots are not yet being used widely.

From October 2007 to December 2007 we performed radical prostatectomies in 40 patients using the *da Vinci* system. The average patient age was 66 years, the average PSA was 11.6 ng/ml. Average OR time, including docking times, was 188 minutes, no transfusions were required. No patient required a conversion (open surgical procedure), no major complications, such as injuries of the rectum, were recorded. Histological analyses had found a pT2 tumour in 31 patients (77.5%) and a pT3 tumour in 9 patients (22.5%). Positive margins were detected in 6.5% (2/31) of the pT2 tumours and 33.3% (3/9) of the pT3 tumours. Catheters were placed on average for 6.1 days.

After three months 77.5% of the patients were fully continent, after six months the rate had increased to 90%. Short-term oncological and functional results are thus highly promising and comparable to the results achieved with endoscopic, extraperitoneal radical prostatectomy (EERPE) which we perform routinely in our hospital.

It remains to be seen whether the *da Vinci* prostatectomy will yield better long-term results. So far, the international literature does not indicate the advantages of robot-assisted surgery to have long-term impacts on the 'quality indicators' of radical prostatectomy such as complications, tumour control, continence or potency.

A compressed cranial nerve by blood vessels is responsible for numerous diseases. The most well-known example is trigeminal neuralgia, which is agony for many people affected by its sudden shooting pain in the face.

Other examples are glossopharyngeal neuralgia, hemifacial spasm or even superior oblique myokymia in which, likewise, too close contact between a cranial nerve and a vessel is assumed to be the cause.

Medication or the extensively used positional manoeuvre should not be the only treatments considered for effectively helping

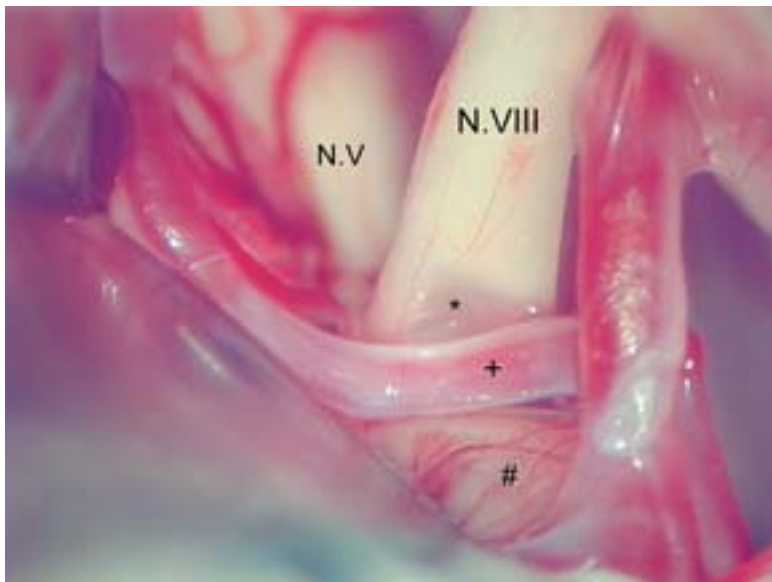
lines, but which for most other forms of dizziness is useless. However, success was not long-lasting. In just a few weeks, the administration of carbamazepine led to a considerable increase in liver enzyme values, whereupon the treatment had to be discontinued and the gruelling vertigo attacks returned in full force.

To end the suffering it was finally decided to undertake surgery to widen the gap between the compressed cranial nerve and the artery causing the problem. Indeed the agonizing spells of vertigo disappeared com-

Simply operate giddiness away?

Only surgery can provide help for some forms of dizziness, writes

Karl Eberius MD



Compressed cranial nerve as the cause of vertigo: In disabling positional vertigo an artery near the brain stem presses on the eighth cranial nerve. Surgery can provide a cure. Lasting two to three hours the operation requires making a hole of about 2.5 cm diameter in the skull*

cases of dizziness. Surgery can also be useful for some forms of dizziness as shown by the case of a 61-year old woman who suffered repeatedly from vertigo. Most recently her problems had become even more severe. She had sudden attacks of vertigo several times a day, which were of strikingly short duration. The unpleasant event lasted from just 30 seconds to a maximum of five minutes, usually accompanied by a whistling sound in the right ear. Another particularity was the fact that the attacks ceased when the patient lay down on her right side, as was reported in the journal *HNO [ENT]* by Dr Wolfgang Reuter and team from Lippstadt, Germany.

These typical symptoms indicated vestibular paroxysmia (disabling positional vertigo) which is well-known for its extremely short attacks lasting from seconds to minutes and which can be triggered or ended by certain positions of the head. Tinnitus, sounds in the ears, is also characteristic accompanying symptoms for this diagnosis. The cause of disabling positional vertigo is an artery of the cerebellum being compressed by the VIII cranial nerve from, which not only consists of fibres transmitting the sense of balance but also contains the auditory nerve.

Test treatment with carbamazepine clarifies the situation

The diagnosis of disabling positional vertigo was confirmed in the 61-year old woman by treating with carbamazepine, a low dose of which is recommended as first line therapy for vestibular paroxysmia in various guide-

pletely after the operation, which took some two to three hours and required a hole of around 2.5 cm in diameter in the skull. After the surgery, the woman was able to lead a normal life.

Rate of complications: roughly 5–8%

The decision for such an intervention however should be carefully considered on account of possible complications, emphasized **Professor Friedrich Albert**, head of the neurosurgery unit of Paracelsus Hospital, Osnabrück, after carrying out the surgery on the vertigo patient. 'The operation is only recommended if the patient's everyday life is considerably restricted because of the attacks and the diagnosis of disabling positional vertigo is unequivocal.' He pointed out that this surgery carries a roughly 5–8% risk of serious complications, e.g. loss of hearing, facial paresis, or vascular damage that could lead to corresponding ischaemia of the brain stem.

The chances of success of such an operation cannot be precisely quantified owing to lack of data, but according to Prof Albert they are thought to be good. Complete freedom from symptoms, or at least a marked improvement, can be anticipated in about 75–80% of cases, much the same rate as for trigeminal neuralgia – likewise caused by too close contact between a vessel and a cranial nerve.

**Compression through contact with blood vessel, VIIIth n. Vestibulocochlear nerve, +Branch of the anterior inferior cerebellar a., #Pons (Source: Reuter W., Fetter M., Albert F.K., HNO 2008; 56: 421-424, pic 3, © Springer Medizin Verlag 2007).*

Conclusion for general practice

- For some forms of dizziness neurosurgery may be a great help.
- This applies, for example, to disabling positional vertigo, which is among the ten most frequent causes of symptoms of vertigo and results from too close contact between an artery and the eighth cranial nerve (in the same way as an artery compresses the fifth cranial nerve in trigeminal neuralgia).
- Typical symptoms of disabling positional vertigo are short attacks which in severe cases may occur up to 30 times a day. There are often also sounds in the ears on the side affected. The attacks are moreover frequently triggered or ended by certain positions of the head (for example by lying down on one's side).
- The first line therapy for disabling positional vertigo is not considered to be surgery but carbamazepine, which is also indicated for trigeminal neuralgia. The dose given is 200 to 600 mg per day.
- Oxcarbazepine can also be administered in which case the dose suggested is 300 to 900 mg per day. If there is intolerance to these drugs, gabapentin or phenytoin can be used as alternatives.
- The surgical treatment of disabling positional vertigo consists of widening the gap between the artery causing the problem and the eighth cranial nerve.

Terry Shivo was 27 when she collapsed. Paramedics found neither respiration nor a pulse.

Almost three months later her eyes had opened, but she was not conscious. She has a sleep/wake circle and sometimes appeared to smile – she was in a vegetative state. Up to her death in the USA in 2005 her case caused a bitter court battle for guardianship between family members and a worldwide controversial debate began about the quality of life following severe brain damage.

Reliable methods of diagnosis could give more certainty about signs of awareness and chances of recovery. Presently, the Functional Magnetic Resonance Imaging (fMRI) is the most promising tool not only to provide better diagnosis and predict outcome of brain injuries but also to communicate with the patient.

In Europe only two research centres perform this imaging technique on coma patients: the Cambridge Neuroscience Centre in the UK and the Coma Science Group from the Cyclotron Research Centre at the University of Liège, Belgium. The latter is led by **Professor Steven Laureys**, Head of Clinics in the Department of Neurology.

Asked why coma research is so important, the professor said that, due

Adiposity is not factor for stroke



Professor Tobias Back MD is medical director of the Clinic for Neurology and Neurological Intensive Medicine in Arnsdorf, Germany. Being the initiator of the first large-scale European case-control study on abdominal fat mass and stroke risk he presented the study results at the annual congress of the *European Neurological Society*, held in June in Nice, France.

Dr Back and his research team were able to demonstrate that in overweight patients it is not the body mass index (BMI) that counts when assessing stroke risk but solely abdominal girth. 'There had only been insufficient studies that analysed the fat distribution pattern of stroke patients. The few available preliminary data were collected in the US. Now we are proud to say that we were the first Europeans to present meaningful data that show that abdominal adipositas is the sole independent risk factor associated with cerebrovascular stroke,' he explained.

Funded by the German Ministry for Education and Research, the research project was conducted in Mannheim and Heidelberg, Germany, between February 2005 and January 2006. 'We took great pains to assemble a suitable regional cohort of regular people. In the end we had 379 stroke patients and a control group twice that size in order to optimise the statistical relevance of our results. Average patient age was 65.'

The researchers measured the waist-to-hip ratio (WHR) by taking the abdominal girth at the navel and dividing the result by the circumference of the hip at the hip bone. Abdominal adipositas is a value defined by the World Health Organisation (WHO): in men a value above 1.00 is considered pathological, in women a value of 0.85. The WHR is more precise than the body mass index (BMI): 'The BMI does not differentiate fat mass and muscle mass. That means a person's individual physical state is not taken into account. The waist-to-hip ratio on the other hand is more predic-

Coma: Functional MRI to predict first signs of awareness

to modern emergency medicine and intensive care, an increasing number of patients survive injuries, toxications or hypoxia.

'Unfortunately they are often considered as a homogenous group of hopeless cases, but this is not true. Studies have proved that around three or four in 10 patients diagnosed as unconscious in fact show signs of awareness. There are at least four different states of severe brain damage we observe: coma, vegetative state, minimally conscious state (clearly discernible evidence of consciousness of self or environment) and locked-in-syndrome (fully conscious but paralysed). Especially the demilitation of vegetative and minimally conscious states is very difficult to differentiate. fMRI is helping us to understand the brain function and cognitive processes.

'Functional magnetic resonance imaging (fMRI) shows the function of the brain in contrast to MRI which displays structural images. The haemoglobin in the red blood cells transport oxygen to the brain and can be used to make scans with the help of a magnet field. So actually, we measure the blood oxygen level, also called

haemodynamics, indirectly to obtain information about the activity of neurons in special parts of the brain. But fMRI can do more: The technique enables us to communicate with the patient. We can ask him questions by telling him to think of playing tennis if he wants to say "yes", or imaging to walk through his home if he wants to say "no". We then directly see the reaction of brain activity in specific areas on the monitor. It permit us to give back autonomy to the person to decide for himself if, for example, he wants life-prolonging measures.'

'In functional neurological imaging



Professor Steven Laureys

fMRI replaces PET scanning, which requires radiotracers injection. With fMRI you can possibly acquire more scans and a better resolution in time

and space. According to time, tools to measure electrical activity from the scalp are even more precise – these would be EEG and Magnetoencephalography (MEG). That's why the gold standard is to record simultaneously both: EEG during fMRI. The present challenge is that MRI needs a very high magnetic field – at the moment 3-Tesla, but we can move up to 7T, or even higher.

Unfortunately the signals of both tools distort each other. So the EEG electrodes must be shielded to avoid image interference and burning at the patient.

Presently we have no direct treatments to help the brain recover from traumatic or anoxic cases, because first we would have to know what gives rise to recovery of consciousness. We know that the vegetative state can be permanent or transitory and that the longer someone stays unconscious the smaller their chance of recovery. Retrospective studies indicate that patients taking specific drugs apparently recover more often. In the future, fMRI could help to measure the effects of drugs testing directly to the central nervous system.

generally a risk

Abdominal girth is decisive

tive since this adipositas marker identifies visceral (abdominal) fat mass independent of body height and physique. Even more: our study clearly shows that the BMI is not an independent stroke risk factor,' Dr Back emphasised.

'The analysis of our data demonstrated that, after adjustment for factors such as hypertension, smoking, physical inactivity, or diabetes, pathological abdominal girth was the sole indicator for increased risk of stroke, with the risk being four to seven times higher and women being in general slightly more at risk than men.'

But why is abdominal fat so dangerous? Is it a certain type of fat that builds up around the abdomen, the so-called visceral fatty tissue that determines abdominal girth? 'Intra-abdominal fat mass has crucial implications for a body's fat and carbohydrate metabolism since it is particularly that kind of fat mass that causes free fatty acids, cytokines and hormones to enter the portal circulation and thus increases the risk of metabolic syndrome or diabetes.'

Consequently, with regard to stroke the Mannheim-Heidelberg Stroke Study arrives at very similar conclusions in a large-scale international study, which in 2005 showed the risk of myocardial infarction to be associated with abdominal adipositas.

'Adipositas – both in children and in adults – will become one of the major health issues,' Dr Back prophesied. 'The number of people in industrialised countries that develop a metabolic syndrome is increasing steadily. We should therefore expect the number of patients with a highly unfavourable vascular risk profile to skyrocket over the coming decades. We urgently require additional studies that not only explore the association between abdominal girth and increased stroke risk but that also look at how the treatment of adipositas, particularly abdominal weight loss, decreases the risk of stroke and myocardial infarction.'

2008/10.29-11.01
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Д-р Чанд Нагпол

В Англии взаимоотношения между врачами общей практики и больницами в настоящее время претерпевают период некоторой нестабильности. Это положение связано с пересмотром состояния дел в здравоохранении по стране в целом, при том, что одной из поставленных задач является укрепление контактов и тесное взаимодействие именно между этими двумя медицинскими сферами.

Данная проблема рассматривалась в отчете о состоянии дел в здравоохранении Англии, представленном Министром здравоохранения, лордом Дарзи. Предложенные в его докладе меры затрагивают широкий круг вопросов, вместе с тем наибольшее внимание привлекло предложение о создании медицинских центров под руководством врачей общей практики, или «поликлиник» – под этим названием они стали известны.

Лорд Дарзи, являющийся практикующим хирургом, первоначально предложил

Поликлиники в Великобритании?

внедрить эту систему в рамках службы здравоохранения Лондона. Теперь, однако, он хочет организовать отдельную систему из 150 медицинских центров под руководством врачей общей практики по всей Англии. Поликлиники, по его замыслу, – это своего рода врачебные практики, но высшего уровня, предлагающие обширный спектр медицинских услуг. В состав лечебного персонала должен входить большой коллектив врачей широкого профиля, а также стоматологи, медсестры, акушерки, терапевты и больничные врачи. Такие центры могут осуществлять диагностические и рентгеновские обследования, анализы крови.

Министры в правительстве утверждают, что подобные центры улучшат медицинское обслуживание, так как предложат более широкий спектр услуг и будут открыты с 8 утра до 8 вечера. По их словам, в поликлиниках можно будет быстро попасть на прием; сократится также время на ожидание диагностических обследований, которые сейчас возможно провести лишь в больницах.

Представители врачей, а также пациенты высказывают опасения, что поликлиники уничтожат человеческие отношения, которые ныне существуют между пациентами и их семейным врачом, а также, что определенное количество ныне практикующих врачей

будут вытеснены и лишатся практики.

Представитель Департамента здравоохранения заявила, однако: «Мы не навязываем поликлиники в качестве какой-то сверхструктуры, призванной заменить существующие службы. 150 медицинских центров будут дополнять существующие врачебные практики, предоставят пациентам дополнительные возможности для того, чтобы попасть к врачу.

Службы анализа и разработки концепций Медицинского фонда короля высказали опасение, что реформа может повлечь за собой отрицательные последствия, если врачи общей практики, а также другой медицинский персонал сконцентрируются, в итоге, все в одном здании. Пациентам, в особенности в сельской местности, станет трудно попасть на прием к своему семейному врачу.

Консультанты Национальной службы здравоохранения также сомневаются в достоинствах поликлиник. В результате опросов, проведенных Британской медицинской ассоциацией, получено 1587 ответов. При этом 60% опрошенных не согласны, или крайне не согласны с тем, что реформа приведет к улучшению медицинского обслуживания; 42% не уверены в том, что она облегчит доступ пациентов на прием и лечение; более 70% опрошенных считают, что

Автор статьи Марк Николлс

реформа дестабилизирует работу как в больницах, так и во врачебных практиках.

При существующем положении вещей больницы получают оплату за лечение каждого пациента. Если поликлиники будут лечить более простые случаи, это оттянет часть доходов больничного треста, что вызывает озабоченность.

Доктор Чаанд Нагпол, врач общей практики из Лондона, уполномоченный по ведению переговоров от Комитета врачей общей практики Британской медицинской ассоциации, отметил, что проблема имеющихся планов по созданию поликлиник, а также медицинских центров под руководством врачей общего профиля заключается в отсутствии определенности по количеству данных. Неясно также в деталях, как центры будут функционировать. Он прибавил: «Неясно и то, как врачи общей практики и больничные врачи будут взаимодействовать в их рамках и как это партнерство будет оформлено с финансовой точки зрения. Нам нужна более подробная информация, только тогда мы сможем сформулировать свое мнение.»

Вышеизложенное предложение является одним из последних по времени появления в целом ряду вопросов, приведших к конфликтной ситуации между врачами общей практики и правительственными службами. Не так давно Британская медицинская ассоциация выразила несогласие в связи с



Лорд Дарзи

планами продлить часы приема во врачебных практиках в вечернее время, а также принимать пациентов в выходные дни.

В докладе Дарзи содержатся также, в числе других, следующие предложения:

- чтобы больницы публиковали статистику летальных исходов по результатам лечения различных заболеваний;
- чтобы пациенты преклонного возраста и пациенты в терминальной стадии заболевания в случае предполагаемого смертельного исхода имели возможность выбора и могли выписаться из больницы.;
- чтобы было расширено поле деятельности для частных медицинских фирм, предоставляющих первичные услуги.

Он заявил, что обновленный устав Национальной службы здравоохранения Великобритании будет предусматривать тщательное соблюдение конфиденциальности, контроль медицинских карт пациентов, обеспечение альтернативного мнения.

Кризисный менеджмент в больницах.

Двери отделения неотложной помощи больницы широко распахнутся. Вокруг воцаряется хаос. Куда ни кинешь взгляд – всюду мечутся врачи и больничный персонал, и очень много пострадавших. На атомной электростанции произошел взрыв. Рабочие тяжело ранены, многие кричат от боли, многие потеряли сознание. Спасатели суетливо толкают тележки по длинным коридорам. Доставлено уже 50 жертв несчастного случая, которым нужно оказать медицинскую помощь. Но кому в первую очередь и где? «Я думаю, что и реактор на атомной станции тоже поврежден!» – это кто-то из санитаров старается перекричать общий шум. «Вы что, с ума сошли?! – кричит другой. – Ведь рабочие могли сильно облучиться, мы не можем их просто так перемещать по больнице!». Но уже поздно. Внезапно, так же быстро, как некоторое время назад начался хаос, воцаряется тишина, и все думают одно и то же: «Как хорошо, что это только учебная тревога!»

Норман Хекер, руководитель проекта неотложной медицинской помощи в Немецком институте медицины катастроф, хорошо разбирается в катастрофах, пандемиях, массовых несчастных случаях. Он консультирует и обучает больничный персонал поведению в «сценарии худшего варианта»; ведь на ошибках, подобных описанным выше, тоже можно учиться. Хекер знает «Планировать, или не планировать, обучаться, или не обучаться – разница может здесь быть такой же, как разница между жизнью и смертью. Важно регулярно тренироваться, отработывая различные сценарии, тогда при реальной чрезвычайной ситуации каждое действие уже будет отточено». Часто хорошо обученный персонал, а также оптимизированные планы действий в чрезвычайных ситуациях предотвращают их эскалацию. Для этого больницы должны регулярно критически пересматривать свою концепцию безопасности на соответствие реальным требованиям. «Многие

больницы имеют устаревшие планы действий в критических ситуациях, не отвечающие современным условиям и требованиям. Очаги опасности, также как и структура в разных больницах различны, поэтому необходимо провести индивидуальный анализ рисков, с тем, чтобы разработать эффективную систему кризисного менеджмента».

«Нам достаточно хорошо известно, что больницы как в Германии, так и в других странах испытывают финансовый прессинг. Одно это уже подтверждает необходимость индивидуального подхода для каждого лечебного учреждения с тем, чтобы не поставить под угрозу его эффективную работу и гарантировать первоклассное обслуживание больных также и в нормальных условиях. В каждом лечебном учреждении необходимо по меньшей мере ежегодно проводить тренировочное обучение по действиям в чрезвычайных ситуациях».

Эффективный кризисный менеджмент – это три «К» – командование, коммуникация, координация. Это означает, что



необходимо организовать штаб по преодолению кризисной ситуации, который возьмет на себя координацию работы отдельных служб. Необходимо также разработать надежную схему передачи информации. Особенно важно заранее распределить, кто за что должен отвечать, объясняет Норман Хекер: «Необходимо определить, кто и как должен руководить клиникой в кризисной ситуации. Штаб берет на себя стратегическое руководство и координирует ситуацию на месте.

Руководители лечебного учреждения могут и будут, в случае необеспечения ими предварительного планирования, нести уголовную, или персональную материальную ответственность. Лечебные учреждения, как с точки зрения медицинской этики, так и с точки зрения закона обязаны обеспечивать, вне зависимости от ограниченности их ресурсов, наилучшее медицинское обеспечение для пациентов даже в случае чрезвычайной ситуации».

Ультразвук

Эмбриональная хирургия – ультразвуковая диагностика и операции в микроформате

Очень немногие врачи решаются проводить операции на эмбриональном уровне. В Германии расположен один из центров, занимающий ведущие позиции в этой области: Немецкий центр эмбриональной хирургии и малоинвазивной хирургии (DZFT) при Университетской клинике в Бонне. Операции, проводимые в этом Центре, сопровождаются значительно меньшим количеством осложнений, по сравнению с операциями, осуществляемыми традиционными методами, а, кроме того, уменьшается нагрузка на плод и на беременную женщину. В центре проведено более 200 эмбриональных операций на неродившемся плоде с применением новых малоинвазивных методик, при этом удалось предотвратить смерть, или инвалидность у младенцев. Прогресс в достижениях эмбриональной хирургии во многом зависит от развития систем получения графического изображения, а также от разработки необходимых операционных инструментов. Как оказалось, одной из важнейших методик в руках специалистов является ультразвуковая диагностика.

(См. страницы: 16)

Менеджмент

Внебольничный и больничный MRSA

Метициллин-резистентный *Staphylococcus aureus* (золотистый стафилококк) стал представлять большую проблему в области осуществления инфекционного контроля, так как наблюдается распространение данного штамма во многих странах. В результате того, что сроки пребывания в больницах сокращаются, и лечение производится в специализированных амбулаториях, заражение стафилококком происходит в лечебных учреждениях, но затем инфекция распространяется во внебольничных условиях, (внебольничный стафилококк).

Хотя внебольничный стафилококк в Европе пока не подлежит обязательной регистрации, рекомендуется проводить бактериологическую пробу при лечении бессимптомных инфекционных заболеваний кожи и мягких тканей в пунктах неотложной помощи и в амбулаторных врачебных практиках.

(См. страницы: 2)

Кардиология

Цель ‘euHeart’ – персонализация диагностики и лечения кардиоваскулярных заболеваний.

Компания Royal Philips Electronics возглавит проект «Евро-сердце» (‘euHeart’). Это новый исследовательский проект, финансируемый Евросоюзом. Его целью является совершенствование диагностики, терапевтического планирования и лечения сердечно-сосудистых заболеваний. Проект «Евро-сердце» выделяет в качестве основной цели исследований диагностику и лечение сердечных заболеваний, таких как: сердечная недостаточность, ишемическая болезнь сердца, аритмии, врожденные пороки сердца. Он дополняет тем самым заявленный недавно проект «Сердечный Цикл» (HeartCycle), также возглавляемый данной фирмой. Проект «Сердечный Цикл» концентрирует усилия на организации долговременного лечения пациентов с хроническими заболеваниями сердца. Созданный недавно консорциум ‘euHeart’ ставит целью улучшить диагностику, терапевтическое планирование и лечение сердечно-сосудистых заболеваний путем создания компьютерных моделей нормального, а также обусловленного болезнью функционирования сердца и аорты индивидуально для каждого пациента. Более подробную информацию об этом научном проекте Вы можете прочитать на 1 стр. нашего издания (ESC-Special).

Обмороки - диагностика и терапия

При определении этиологии синкопальных состояний имеет место проблема, какой объём диагностических мер необходим в действительности, и от каких методов обследования можно отказаться. В целях большей оперативности необходимо, по мнению экспертов, концентрироваться на выяснении вопроса – носит ли причина возникновения данных синкопальных состояний кардиогенный характер. Ответ на этот вопрос можно получить относительно легко. Более подробную информацию о диагностике и терапии синкопе Вы можете прочитать на 10 стр. нашего издания (ESC-Special).

О лечении гипертонии в мире



Д-р Томаш Здревски, Гданьский медицинский университет, Польша



Д-р Фиона Тернбул, Сиднейский университет, Австралия



Д-р Якуб Кассим Сейдат, Университет Квазулу-Наталь, Дурбан, Южноафриканская Республика

В различных странах возможности организации лечения повышенного кровяного давления тоже очень различны, но, в целом, можно сказать, что большинство больных с этим диагнозом не получают адекватного медицинского контроля. В отсутствии лечения эти болезни могут стать причиной возникновения сердечно-сосудистых заболеваний, инфаркта миокарда, инсульта. По данным Всемирной организации здравоохранения, гипертония составляет 4,5% от всех болезней, отягчающих человечество, причем она распространена как во многих странах третьего мира, так и в развитых странах. В нашем специальном выпуске ESC (стр.2) три эксперта, представляющие три континента, рассказывают о гипертонии как факторе риска, а также об организации лечения этого заболевания в своих странах.

Лаборатория & фармакология OptoLabCard

Испанские исследователи разрабатывают новую лабораторию на чипе, которая позволит осуществлять тесты за 20-30 минут. Исследователи, при финансировании Европейского Союза, разработали оптическую диагностическую лабораторную карточку. Их система позволяет подготавливать образцы и производить ДНК-тесты на бактериях при помощи портативной, простой в применении, экономичной

лаборатории на чипе. В результате вышеуказанных разработок через три года ожидается появление и коммерческого образца. Приборы, умещающиеся в руке, смогут определять наличие бактерий в продуктах, а также диагностировать самые различные заболевания – рак, гепатит, СПИД, грипп за 20-30 минут. С их помощью можно будет воспроизводить лабораторные реакции в любом месте и в любое время.

(См. страницы: 9)

Martini-Klinik am UKE Hamburg-Eppendorf
Ein Unternehmen des UKE
Мартини-Клиник
Центр рака простаты в Гамбурге, Германия

С созданием Мартини-Клиник на территории Клиники Университета Гамбург-Еппендорф (УКЕ), Германия, появилась современная частная клиника рака простаты. Только в 2007 году в Мартини-Клинике и клинике УКЕ врачами было проведено 1350 операций по удалению рака простаты. Тем самым Мартини-Клиник относится к трем большим центрам по вопросам диагностики, лечения и исследования рака предстательной железы в мире.

С помощью команды врачей и санитарных работников во главе с профессором Хартвигом Гуландом международно признанные в области лечения рака предстательной железы эксперты индивидуально заботятся о каждом пациенте.

Помимо выдающихся медицинских результатов на скорейшее выздоровление оказывает влияние особая атмосфера Мартини-Клиника. Поэтому мы предлагаем комфорт, отвечающий самым высоким требованиям пациентов из различных стран мира. Наши пациенты из Германии и из других стран мира ценят вид отеля клиника, который делает восстановительный период максимально приятным.

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ЕН: Д-р Саломон, Вы используете метод соноэластографии в диагностике более полугода, что Вы можете рассказать, исходя из опыта Вашей работы?

ГС: Мы используем в настоящее время метод соноэластографии у пациентов, имеющих сочетание признаков высокого риска по возможному наличию карциномы простаты. Это означает, что у данных пациентов проведен первоначальный анализ биопсии, который показал отсутствие опухолей, но выявил высокие показатели PSA. У пациентов этой группы мы используем метод соноэластографии в дополнение к обычному обследованию ультразвуком, чтобы на основе произведенных измерений эластичности тканей выявить возможные выделяющиеся ареалы, которые не были определены при проведении биопсии. Исходя из нашей практики, это даёт хорошие результаты. После определения границ такого ареала мы можем провести дополнительный целевой анализ биопсии в целях повышения точности диагноза. В подтверждение этого метода мы проводим 10-кратную биопсию,

Метод будущего – соноэластография

Проведение щадящих нервы операций простатэктомии является специализацией частной клиники Мартини, расположенной на территории Университетской клиники Эппендорф (УКЕ) в Гамбурге. Эта клиника по праву занимает одно из первых мест в мире по количеству проведенных операций. В области диагностики специалисты на Эльбе также занимают лидирующие позиции; они, одни из немногих в Европе, используют в настоящее время соноэластографию в качестве дополнительного инструмента для более точной и надёжной идентификации карциномы простаты. Конечно, это делается для того, чтобы повысить шансы пациента на выздоровление. В беседе с EUROPEAN HOSPITAL (EH) главный врач и руководитель отделения диагностики клиники Мартини д-р Георг Саломон (ГС) рассказывает о накопленном опыте в применении данного метода.

для того, чтобы удержать уровень «золотого стандарта». В заключение мы сравниваем полученные результаты, а также сопоставляем их с информацией из нашего банка данных, накопленных в результате проведенных методом соноэластографии исследований.

ЕН: Можно ли уже говорить на основании полученных Вами данных о надёжности этого метода?

ГС: Группа наших пациентов с негативным анализом биопсии составляет примерно сто человек, поэтому мы должны провести оценку полученных данных, чтобы сделать обоснованный вывод о надёжности этого метода. Мы можем, тем не менее, уже сейчас заключить на основании проведенных исследований, что применение метода соноэластографии имеет положительный диагностический эффект. Мы сравнили данные обследования пациентов с карциномой простаты перед проведением операции с данными обследований после операции. Соотношение позитивных и негативных результатов составило около 76%, при предварительном

позитивном показателе 87% и при предварительном негативном показателе 59%. Это говорит о том, что указанный метод значительно лучше по сравнению с обычным ультразвуковым обследованием. Диагностическую эффективность данного метода мы сможем адекватно оценить после того, как у нас будет накоплено больше данных, которые мы сможем соответствующим образом проанализировать.

Чтобы метод соноэластографии утвердился в качестве диагностического инструмента по выявлению карциномы простаты, он должен иметь такую же надёжность, как уже существующие лучшие методики. На сегодняшний день я рассматриваю измерение плотности ткани как чисто сопутствующую методику, предоставляющую в наше распоряжение дополнительную информацию.

ЕН: Эта информация должна быть ещё соответственно интерпретирована. А какие требования метода соноэластографии предъявляет к врачу?

ГС: Как и в других областях, для освоения метода соноэластографии имеются

соответствующие учебные пособия. Сначала необходимо научиться распознавать графическое изображение уплотнённого ареала ткани. Это означает, что врач, проводящий обследование, должен осуществлять очень точные движения ультразвуковой головкой, чтобы получить растянутое графическое изображение. Следующим шагом является оценка графического изображения на основании его повторяемости. В заключение проводится сравнение полученной эластограммы с результатами обычного ультразвукового обследования. Если эластограмма показывает уплотнение ткани, то обычное обследование ультразвуком может дать ответ о характере этого уплотнения, например, не является ли это уплотнение известковым отложением. В настоящее время критерии оценки эластограммы ещё не стандартизированы, но уже имеются предложения о том, что такое стандартизирование может из себя представлять.

ЕН: Несмотря на позитивные результаты этого метода, он относительно мало распространён в Европе. Чем это объясняется?

Во-первых, тем, что данный метод долгое время не находил интереса со стороны производителей медицинской техники. Много лет назад были сделаны многообещающие разработки, которые затем, однако, не были реализованы. В настоящее время, насколько мне известно, единственную систему на рынке, дающую необходимый диагностический эффект на практике, производит фирма Хитачи. Мы констатируем, тем не менее, что сейчас в данном сегменте рынка началось движение и другие фирмы стали проявлять усиленный интерес к соноэластографии. Это, в общем, однозначно говорит в её пользу. Параллельно с этим проявляется тенденция со стороны медиков по использованию соноэластографии в качестве дополнительного обследования, а это, в свою очередь, приводит к тому, что мы получим больший объём данных, который позволит нам развивать и улучшать данный метод.

В общем и целом, я полагаю, что в будущем соноэластография будет хорошей дополнительной возможностью для улучшения диагностики карциномы простаты.

Как мы используем ультразвуковую диагностику – недостаточно, или слишком часто?

Автор – Др. Сонке Х. Бартлинег

Визуализация с помощью ультразвуковой диагностики является очень эффективным методом, но, как правило, слишком мало используется. Данный метод имеет много привлекательных сторон.

Он относится к числу неинвазивных, и притом в действительности соответствует этому определению. Подобно магнитно-резонансной визуализации, ультразвуковая визуализация безвредна для пациента. В последнее время эта технология претерпела значительные усовершенствования. Улучшилась разрешающая способность, появились новые функциональные возможности, изобретены новые концепции использования контрастов. Ультразвуковая диагностика неизменно находится на вооружении у врачей на протяжении вот уже нескольких десятилетий. Часто она может быть применима взамен более дорогостоящих, или в большей степени инвазивных, т.е. «травмирующих» методик. К настоящему времени разработаны небольшие и гибкие в применении приборы для ультразвуковой визуализации, их можно использовать в амбулаториях, в

преклинической медицине. Новейшие разработки датчиков уменьшенных в размерах дают возможность получать трехмерные, или даже четырехмерные реконструкции. Широкую известность получила реконструкция «лица плода», при этом будущие матери имеют возможность увидеть лицо младенца в 3-х измерениях.

По мнению многих, однако, ультразвуковая визуализация используется недостаточно, или, наоборот, слишком часто. Это очевидное противоречие можно объяснить тем, что данная методика визуализации в очень значительной степени зависит от квалификации специалиста, который осуществляет обследование. Датчики дают возможность заглянуть внутрь тела человека, но только туда, куда смотрит прибор, поэтому ультразвуковое обследование не дает возможности обстоятельно задокументировать результаты, то есть нельзя



Ультразвуковое обследование нормальной почки – анализ интраваскулярного кровотока методом доплеровского цветного картирования – ультразвук может давать комбинированную информацию о структуре и функциях.

зарегистрировать то, что не было увидено. Следовательно, нельзя сделать ретроспекцию обследования, если доктор во время обследования что-то не увидит, его трудно в этом обвинить. Вследствие вышеизложенного, ультразвуковое обследование используется, в основном, для скрининга, но не для

окончательной диагностики методом исключения.

В целях компенсации снижения окупаемости ультразвуковых исследований врачи стали увеличивать их применение, и, зачастую, сверх меры. Это само по себе также привело к снижению окупаемости. Следует учитывать, что качественное ультразвуковое обследование требует времени. Таким образом, можно констатировать, что хорошее ультразвуковое обследование уже не очень хорошо окупается.

Во многих странах ультразвук используют врачи различного профиля – радиологи, врачи узкой специализации и врачи общей практики. В США проблема окупаемости ультразвуковых обследований была решена по-другому: система сканирования высоко стандартизирована, сканирование осуществляют техники – радиологи, они подготавливают стандартизированные протоколы

сканирования, которые потом читают врачи-радиологи.

Вне зависимости от различного применения ультразвука на местах, в целом можно сделать вывод, что потенциал ультразвуковой визуализации не используется в полной мере. Лица, определяющие политику в сфере здравоохранения, а также производители медицинской техники обладают достаточными возможностями для того, чтобы изменить это положение дел.

Первые – принимая на себя решение вопросов окупаемости, а также обеспечивая хорошую квалификацию персонала, осуществляющего ультразвуковые обследования.

Производители, в свою очередь, – делая новые разработки менее зависимыми в использовании от уровня квалификации обслуживающих их людей, разрабатывая новые виды датчиков и обеспечивая хорошую сопроводительную документацию.

ПЭТ/КТ: Предельно точная диагностика рака



Доктор Кристиан Ришке, заведующая центром диагностической радиологии и нуклеарной медицины города Фрайбурга, рассказывает о

преимуществах позитронно-эмиссионной томографии (ПЭТ) в комбинации с компьютерной томографией (КТ) для онкологических пациентов.

ЕН: Почему этот метод настолько важен для диагностики опухолевых заболеваний?

Ришке: ПЭТ/КТ - один из самых высокоинформативных методов в онкологии: обследование дает предельно точные данные о величине опухолевых образований и помогает распознать возможный рецидив намного раньше обычных методов диагностики. Особым преимуществом является точная локализация нужного фрагмента органа перед операцией или для биопсии. Метод становится все более важным и при планировании облучения опухоли, а также для наблюдения за изменениями опухоли после лучевой или химиотерапии, позволяя сделать крайне важные выводы в отношении успеха стратегии лечения.

ЕН: Как проводится обследование с ПЭТ/КТ?

Ришке: ПЭТ отображает процессы обмена веществ в клетках организма: пациенты получают молекулу фруктозы низкой степени радиоактивности (FDG), которая накапливается в клетках организма как обычная фруктоза. Раковые клетки делятся интенсивнее и чаще, чем здоровые, т.е. нуждаются в существенно большем количестве энергии. Их усиленный обмен веществ ведет к более высокому накоплению FDG - группы высокоактивных раковых клеток появляются на

изображении ПЭТ как светящиеся точки. Таким образом, клетки опухоли четко отграничиваются от здоровых клеток органа. Даже миллиметровые опухолевые узлы отчетливо видны при обследовании. Однако локализовать опухолевые образования с помощью ПЭТ часто оказывается сложно, так как отображенные им структуры и ткани порой не совсем четки. На комбинированном снимке ПЭТ показывает опухолевые структуры с повышенной биологической активностью, а КТ локализует их на своего рода трехмерной анатомической карте человеческого тела.

Более подробную информацию Вы сможете найти на сайте ПЭТ/КТ центра www.sanafontis.com

Услуги в аутсорсинг - что на очереди?

В системе предоставления медицинских услуг клиническими лабораториями наблюдается тихая революция. Согласно теории бизнеса, услуги лабораторий являются затратными местами, а затратные места можно перемещать, передавать другим исполнителям, объединять, переводить на контракт.

В глобальном масштабе аутсорсинг лабораторных анализов и диагностики происходит по модели, уже испытанной в области информатики.

Две категории медицинских услуг перемещаются за границу:

- диагностика и пробы на патологию;
- клинические испытания и клинические исследования.

Аутсорсинг собственно биоматериала может осуществляться по трем направлениям. Во-первых биоматериалы можно посылать прямо на анализ.

Во-вторых, их можно отсылать специалистам фотомикрографии анализов для рассмотрения и получения результата. Разница между часовыми поясами является при этом преимуществом: результаты можно подготовить в течение ночи, и утром, в начале рабочего дня, они уже будут у заказчика.

В-третьих, аутсорсинг испытания на людях, (аналогично клиническим испытаниям); услуги лабораторий, соответственно, будут осуществляться на такой же основе.

Это, действительно, очень крупный бизнес. Двадцать лет назад в США вышеупомянутая сфера медицинских услуг существовала в разобщенном

виде. Теперь же мы имеем дело с индустрией с годовым оборотом в 50 миллиардов долларов, 50% которого приходится на 5 основных лабораторных сетей. Данная организационная модель репродуцируется по всему миру, сети объединенных крупных лабораторий, предоставляющих услуги на контрактной основе, организованы в Европе и имеют хорошие позиции. Очередная тенденция в этой области – транснациональный аутсорсинг.

Национальные службы здравоохранения, так же как и отдельные больницы начали осваивать его преимущества, их привлекают расценки, которые зачастую значительно ниже, чем у местных лабораторий. Использование услуг телепатологии значительно расширяется не только в Европе и США, но и в странах западной Азии, Бангладеш, Шри-Ланке, Непале, а также в странах Африки. Лидером рынка по предоставлению диагностических услуг является Индия, но и страны Ближнего Востока, а также юго-восточной Азии, в т.ч., Таиланд, Индонезия и Вьетнам оказывают такие услуги в своих клинических лабораториях. Более 10 миллионов медицинских анализов осуществляется ежегодно в



рамках этой глобальной сети, только один процент от указанного количества на принципах аутсорсинга, здесь имеется тенденция к росту.

Аутсорсинг клинических исследований идет активнее; привлекают более низкие затраты, легче доступ к субъектам исследований. Только в Индии насчитывается 30 глобальных компаний по клиническим исследованиям, действующих на основе аутсорсинга. Др. Умаканта Сахоо, исполнительный директор одной из таких компаний, «Чилтерн Интернэшнэл», предполагает, что объем рынка к 2010 году достигнет в этой области 1-1,5 миллиардов долларов. Основное число заказов поступает из Европы (70-80%), остальные заказы идут из США – почти 20%.

Новые проблемы являются следствием новых тенденций в практике оказания лабораторных услуг, в том числе: соблюдение права пациента на конфиденциальность, барьеры в виде всякого рода регламентаций.

Не прекращаются также дебаты о качестве анализов, о минимизации ошибок при передаче результатов. Эти проблемы в лабораторном медицинском обслуживании на протяжении многих лет вызвали озабоченность. Теперь же, когда данная сфера стала транснациональным бизнесом, дебаты по существующим в ней проблемам вышли за рамки отдельных медицинских учреждений и организаций и форсировали национальные границы. Можно предвидеть, что только лишь низкие цены не смогут служить решающим фактором в данном сегменте индустрии медицинского сервиса, первостепенное значение будет иметь качество.

Общественность еще мало информирована о практикующемся аутсорсинге лабораторных медицинских услуг. По мере дальнейшего развития вышеуказанной тенденции пациенты и другие заинтересованные группы тоже выскажут свою точку зрения.

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A scales to have faith in

The seca 959, a chair scale, has been designed by seca gmbh & co. kg, Hamburg, Germany, with input from experts, to accommodate patients with mobility or other problems.

It is not only easy for patients and nurses to use, but, as the firm explains, '... practically eliminates body contact, which patients of Islamic faith in particular find unpleasant and try to avoid.'

The adjustable footrests are unique: they can be turned to the side or tucked completely under the chair seat, giving a patient plenty of foot room and a sure foothold when taking a seat. 'The

adjustable footrests also eliminate the danger of the caregiver's banging a patient's Achilles tendon or ankle when wheeling the



chair scale into place from behind a patient.' Each footrest can also be adjusted separately, allowing one foot at a time to be placed on the supports after the patient is seated.

In addition, the swivel armrests can be moved aside when a patient is being transferred from a bed or wheelchair on to the chair scale. Nurses who tend patients with hemiplegia (paralysis on one side of the body) and hemiparesis (partial paralysis of one side of the body) appreciate this labour-saving function, seca explains.

The seca 959 (Class III calibrated) weighs patients up to 150 kilograms in 50-gram increments and

from 200 kilograms with a graduation of 100 grams. The operating and display element has easy-to-read 20 mm high LCD figures. The 'hold' function keeps the measured weight on display after the patient has left the scale. The caregiver can attend to the patient first and then note the weight.

The model also provides a body mass index (BMI) function. The patient's height is entered, weight determined and, at the touch of a button, the BMI is calculated.

Though small and lightweight, the battery operated scale is robust and also highly manoeuvrable even in tight spaces.

Set the clinical standard for the independent healthcare company that's setting the pace.

NHS

UKSH sets the standard in patient care by providing services of the highest quality – achieving outstanding clinical results. As a leading-edge independent sector healthcare company, we serve NHS patients via our superbly equipped treatment centre and we can offer outstanding rewards and careers to professionals who share our passion for excellence and innovation. Based at Shepton Mallet Treatment Centre in Somerset, you will significantly enhance the reputation of a 34 bedded unit with four operating theatres and on-site imaging equipment, as you help us treat 10,000 patients a year.

Consultant Orthopaedic Surgeons

UK

Circa £95,000 + 7.5%
Flexible Benefits Package + up to £8,000
Relocation Assistance

Combining both clinical and support activities, you will find yourself directing all aspects of preoperative, intraoperative and postoperative care. To be equal to the challenge, you should be a GMC registered specialist with demonstrable evidence of having performed at least 250 hip replacement procedures, 250 knee replacement procedures, 500 knee arthroscopic procedures or 500 hand and feet procedures over the last three years.

Working with advanced pain management techniques should be second nature to you, and you will be an efficient performer in theatre and a strong advocate for our organisation. At the same time, you will be keen to enhance clinical pathways, capable of building productive relationships with colleagues, and happy to participate in general management and our out-of-hours on-call rota.

For an application form and job description please visit www.uk-sh.co.uk or call +44 174 933 3695 quoting reference SMTC/OS017 for the Consultant Orthopaedic Surgeons positions and SMTC/CR016 for the Consultant Radiologist position.

Closing date: Friday 3rd October 2008

Candidates for the above positions will be subject to CRB disclosure and police checks from their home country.

These positions are within the Shepton Mallet NHS Treatment Centre run by UK Specialist Hospitals on behalf of the NHS.

We are an Equal Opportunities Employer

Consultant Radiologist

0.5 FTE

UK

£42,500 to £47,500 + 7.5%
Flexible Benefits Package + up to £8,000
Relocation Assistance

Working with cutting-edge equipment including a CR general X-Ray room, ultrasound scanner, MRI scanner and Aspyra PACS, you will provide detailed reports for clinical decision-making. Your remit will span theatres, outpatients and the Shepton Mallet Community Hospital, and you will partner multidisciplinary colleagues in conducting peer review of general cases and enhancing our policies and practices.

Fully registered with the GMC, you will bring wide experience of general and cross sectional imaging, ideally backed by considerable expertise in musculoskeletal radiology. Above all, you must be able to support our existing Consultant Radiologist in managing a substantial throughput of patients – in 2007, we conducted 1,300 MRI and 3,370 US scans, plus 8,000 plain X-Rays.

UKSH

www.uk-sh.co.uk

ProDoc incorporates digital height rods

Detecto's new ProDoc Professional Doctor Scale series incorporates time-saving digital weight, height, and body mass index (BMI) measurements.

The ProDoc series are heavy-duty scales that can weigh up to 220 kg while providing the accuracy needed with 0.1 kg increments. The LCD display provides easy-to-view 25 mm readouts.

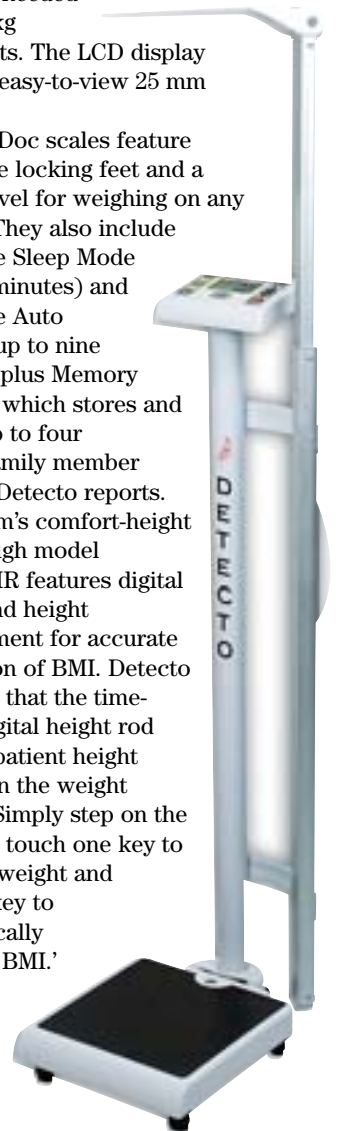
All ProDoc scales feature adjustable locking feet and a bubble level for weighing on any surface. They also include selectable Sleep Mode (up to 9 minutes) and selectable Auto Shutoff (up to nine minutes) plus Memory Function which stores and recalls up to four patient/family member weights, Detecto reports.

The firm's comfort-height 122-cm-high model PD300DHR features digital weight and height measurement for accurate calculation of BMI. Detecto also adds that the time-saving digital height rod displays patient height quickly on the weight display. 'Simply step on the scale and touch one key to see your weight and another key to automatically calculate BMI.'

The scales also have integral wheels for easy transportation.

Detecto points out that it offers a complete line of ProDoc scales, so multiple configurations are available. 'The ProDoc's feature medical-grade accuracy and are versatile enough to be used in exam rooms or physician offices for medical use, or in homes or fitness centres for healthcare measurements.'

The Cardinal Detecto range will be on show at MEDICA 2009 in Dusseldorf, Germany, this November. Hall 12 – B34



For half a century, day after day, Dräger's Vapor has saved lives. Yet no patient knows this. Only the anaesthetist and surgical team can be fully aware of its value in keeping their patients unconscious and pain free during surgery, Dräger reports proudly, in the 50th year of Vapor's service.

Delivering anaesthetics could never be exact until the mid-20th



Dräger celebrates half a century of Vapor care

century, when new technologies and alternative liquid anaesthetics arrived, stimulating demand for a new and precise dosing technique. In 1958 Dräger produced Vapor, a calibrated dosing device that could be attached to the anaesthesia equipment that supplies fresh gas. Vapor adds the anaesthesia dose and concentration as defined and set by the anaesthetist to the fresh gas. Although the dosing (bypass) mechanism used by the Vapor has changed very little, the device's technology is continuously optimised, the firm points out.

Materials

Impressively, Vapor never needs recalibration. Special stainless steel and brass alloys in the device ensure a long service life, resistance to alteration, and pressure and



temperature compensation, the manufacturer points out. Other features include a bypass mechanism that is adjusted down to micrometer level, and the dosage area is free of aluminium, which may react with the anaesthetic.

Transportable and standard bottle refills

Today's five main types of liquid anaesthetics – sevoflurane, desflurane, enflurane, halothane and isoflurane – are used in various

ways, according to clinical indication, but each needs its own Vapor. This means that the vaporizer must be moved, in a sealed state, between hospital departments. To make this easier, Dräger integrated a patented transport setting, a hand wheel,



and this hermetically seals the vaporizer (prior to this, the device had to be emptied each time). 'Even if only a minute of aesthetic

remains in Vapor, the vaporizer's 300 ml tank accommodates standard 250 ml refills, thus virtually eliminating wastage,' explains Dräger.

Special Applications

When a patient needs to be sedated for an MRI scan, Vapor can be used in conjunction with a Fabius magnetic resonance tomography (MRT) anaesthesia unit. Vapor is interoperable with 1.5 tesla and 3-T MRT systems.

The Vapor output remains stable within physician-defined anaesthesia dosage at temperatures ranging from 10 to 40°C. This is particularly important for bone surgery, where the operating theatre temperature of 15°C is maintained, or for surgery on burn victims, for which theatre temperature must be raised, Dräger points out.

7th National Congress on Laboratory Medicine

3rd National Symposium on Immunopathology

3rd National Congress of Clinical Laboratory Assistants

20-22
October
2008

Bucharest,
Romania

The 7th Romanian Society of Laboratory Medicine Congress 2008, held under the auspices IFCC, EFCC, BCLF, WASPaLM and the patronage of the Romanian Academy of Medical Sciences, will highlight the most relevant issues in the diagnostic strategies, total management of quality and other advances in the clinical laboratory. The scientific programme will include a focus on the relevance of testing clinical outcomes as well as standardisation. 'Romanian standardisation efforts have begun for the pre-analytical aspects of clinical laboratory,' say Professor Gheorghe Benga, RSLM President, and Dr Manole Cojocaru, Congress President, who expect about 500 delegates 'from every corner of the world' will attend this year's event.

The 3rd Symposium on Immunopathology, held in conjunction with Congress, will address teaching – particularly clinical aspects.

The RSLM Congress will include the 3rd Congress of Clinical Laboratory Assistants, which aims to share knowledge of advanced technology, standard operating procedures and educational material.

Details: www.srmlcongres.ro E-mail contact: srml2008@srmlcongres.ro

The 20th WorldLab IFCC International Congress of Clinical Chemistry and Laboratory Medicine

28
September -
2 October

Fortaleza, Brazil

'In the next 10-20 years, great changes will occur in the field of laboratory medicine. We will go from personalised tests, to predictive tests, to a personal (individualised) sensitive database, to great use of computer systems, to virtual laboratories, and to the need to focus ethical attention on respecting the integrity and greatness of the human being, just to mention some of the issues,' said Paolo Mocarrelli, Chairman of the IFCC International Scientific Committee. We have worked while bearing most of these problems in mind, and we hope that this congress will help in the long walk expected of youth as well as the less youthful.

Taking place at the same time will be the SBAC Congress, for which Prof Ulisses Tuma and the Brazilian societies members have prepared an 'international-level congress', Paolo Mocarrelli pointed out, adding that the to acknowledge the efforts of young scientists 'to whom the future belongs', every session has 'two selected speakers' (born after 1/1/1973).

Congress languages: English, Portuguese and Spanish.



French to the fore in HIV tests

Mexico – During the XVII International AIDS Conference held in Mexico City this August, keynote speakers from Europe, Latin America and Africa addressed issues including the importance of early detection of HIV infection, the relevance of rapid testing for epidemiology studies, the use of *Dried Blood Spots* for routine viral-load testing in remote areas, and the experience of South Africa in routine high-volume viral-load testing.

'One of the latest advances in viral-load monitoring and our most recent developments is the *Dry Blood Spot*,' explained the French firm bioMérieux, which organised the integrated symposium 'Viral Diagnosis is key in the fight against Aids' at the conference.

Currently used for research purposes, the company plans to ex-

pand the availability of this simple test '...to bring viral load monitoring to patients in remote areas'.

bioMérieux began its work on HIV testing at the very beginning of the AIDS epidemic 25 years ago, developing one of the first screening tests in 1985. The firm has since produced a stream of innovative tests and technologies to respond to new and changing needs in HIV testing, and reports that it now provides the widest product ranges available to laboratories (with the exception of the US market) for diagnosing and monitoring HIV infection. This range covers third and fourth generation screening tests in various formats (automated immuno-analysers, microplates for high volumes, and rapid manual tests), as well as molecular tests for real-time viral-load monitoring.

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Subscription rate

6 issues: 42 Euro, single copy: 7 Euro. Send order and cheque to: European Hospital Subscription Dept

Finishing media technique jöhri, Weilerswist, Germany

Printed by VVA GmbH, Düsseldorf, Germany

Publication frequency bi-monthly

European Hospital ISSN 0942-9085

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**Düsseldorf, Germany
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