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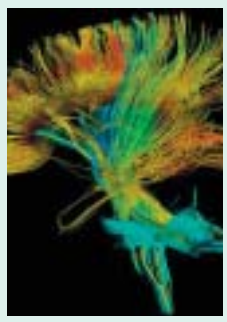

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FRANCE: Thousands will lose healthcare cover

By **Keith Halson**

The French national health service is set to hit a record deficit of €11.7 billion in 2007 and the government is about to introduce measures to stem the financial hæmorrhage, including tackling the issue of early retirement benefits for French nationals – as well as the thousands of EU citizens (e.g. Dutch, British, Belgian, German, etc.) who live in France but are not working, or who have taken early retirement. These expatriates will be classed as economically 'inactive' and as such will lose their right to a *carte vitale*, which entitles them to healthcare treatment in this country.

The new ruling follows the application of EU directive 2004/38, which states that, 'in order to live in another member state, EU citizens must have health cover and sufficient resources to support themselves without recourse to the social assistance of the host member state'.

This ruling was brought into force in the French administrative system by law number 2006-911 of 24 July last year and subsequently by decree number 2007-371 on 21 March this year. It puts France broadly in line with other EU countries such as Spain and Portugal.

Reaction to the moves has been swift. London MEP Mary Honeyball is drumming up support for a motion to the European Parliament opposing the new rules. She says EU nationals should be able to live in other member countries with no loss of rights to the state healthcare they could expect at home. She insists: 'There should be full reciprocity between EU counties; citizens should be able to live wherever they want without their healthcare being affected.'

Mary Honeyball has identified key groups likely to be badly affected. One of these is wives who benefit from state healthcare because their husbands are older and of state retirement age but who may find themselves with no cover if they are widowed.

Talks are taking place with MEPs from the Netherlands, Belgium and Germany, who also have citizens affected by the change. Ms Honeyball also wants to clarify whether early-retired or non-working foreigners from outside the EU will still be able to access the French healthcare system while EU citizens – those targeted in the new rules – will not.

Europe has actively encouraged the free movement of citizens between member states. When that was merely a trickle, they were absorbed without much difficulty. But now thousands are migrating, the new host countries must reconsider the consequences.

However, the position over modifying the healthcare coverage

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'If you think 53 makes you old enough to retire, then fine, go ahead and retire. But don't expect the state to pay for it.'

President Nicolas Sarkozy, during his election campaign

Roselyne Bachelot-Narquin, 60, was appointed French Minister of Health and Solidarity in May 2007. A Doctor of Pharmacy, she is a member of the Union for a Popular Movement party (part of the European People's Party) and an MEP for western France. Dr Bachelot-Narquin sits on the European Parliament's Committee on Employment and Social Affairs. Her health portfolio overseas the healthcare public services and health insurance section of the French Social Security. Other portfolios: Youth Affairs and Sport

Nanorods of gold blast holes in cancer tumours

USA – Miniscule gold 'nanorods' triggered by a laser beam can blast holes in tumour cell membranes, which then activates a complex biochemical mechanism that leads to the tumour cell to self-destruct, according to researchers at the Weldon School of Biomedical Engineering in Purdue University, Idaho.

Recently, scientists had determined that gold nanorods, and other nanostructures, can be used to target and destroy tumour cells, but cell death was thought to be caused by the high temperature produced by the light-absorbing nanoparticles. Writing in the journal of *Advanced Materials* (19/10/07), the Purdue team* explained their research had discovered a more complex biochemical scenario occurs. The cells are not cooked to death; death is chemically induced by an influx of calcium.

The immune system clears away particles bigger than 100 nanometres, but the gold rods are just 15x50 nanometres – about 200 times smaller than a red blood cell, so they can remain in the blood stream time enough to attach to tumour cells.

Using two-photon luminescence (a type of optical imaging that provides higher contrast and brighter images than conventional fluorescent imaging techniques) the researchers monitored the position of nanorods in real time during tumour-cell targeting.

Light shone on the gold nanorods causes them to become extremely hot, ionising molecules around them. Tumour cell membranes often have an abnormally high number of receptor sites to capture molecules of folic acid, or folate, a form of vitamin B desired by many tumour cells. So the researchers attached folate to gold nanorods to target the receptors and attach to the membranes. Ji-Xin Cheng, an assistant

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SPAIN: Reduced radiotherapy procedures

Andalusía – Surgery and chemotherapy have overtaken radiotherapy for cancer treatments according to a study carried out by Dr. Patricia Cabrera Roldán, of the Radiology and Physical Medicine Department at Granada University, and directed by Prof Jose Exposito Hernandez.

Based on one year's data, from among 10 Andalusian public hospitals, of patients who were submitted to radiotherapy procedures to treat breast, lung, head and neck, cervix or endometrium cancers, the researchers analysed the frequency of application of radiotherapy treatment in cancer patients (rate of radiation) and determined the existence of substantial differences in the application of radiotherapy treatment among different hospitals.

The research revealed that radiotherapy procedures varied depending on the hospital in which they were delivered. The main differences: common treatment procedures (purpose and type of treatment, simulation methods used in the treatment, immobilisers or verification systems) and the definition of the treatment itself (total dose and treatment volume). 'Radiotherapy is not used as much as expected for the treatment of cancer in the hospitals analysed,' said Dr Roldán, who pointed out that her statement applies to the five hospitals studied. The cause, she suggested, is partly due to 'incomplete equipping of the hospitals' high-energy units' as well as doctors' preferences, because the application of radiotherapy 'varies among the hospitals studied, even when an equal number of treatment machines are available for use'.

It was also found that patients generally started their first cancer treatment on time and without inappropriate delays, '… even though the application of radiotherapy treatment often exceeds appropriate time limits, and varies depending on the hospital in which such treatment is applied,' she added. That excess of time may be caused by the fact that most of the patients receive treatment combined with surgery, radiotherapy and chemotherapy, she suggested.

The researchers suggested that health authorities should adjust the material means necessary for the treatment of cancer in Andalusia, and improve the introduction of cancer treatment protocols, agreed and based on scientific evidence.

Cancer is the second main cause of death in our society after cardiovascular diseases. However, it is estimated that in the 21st century, cancer will become the leading cause of death.

contents

World premiere at MEDICA

A robot-assisted therapy for hand and finger rehabilitation after strokes

Over 15 million people are affected by strokes annually, and about five million of these (source: WHO 2004) are left with lasting damage. Around half of the patients are of working age. Motor disorders – particularly hemiparesis – are the most common neurological deficits caused by strokes (up to 80%). More than 50% of stroke patients show residual paresis, especially affecting the arms and hands. Most patients see an improvement of these neurological deficits in the weeks and months after suffering a stroke. However, these improvements tend to be very variable and depend particularly on the size and localization of the brain damage. On the one hand improvement is dependent on the recovery of functional neurons in areas surrounding the damaged part of the brain, on the other it depends on the phenomenon of neuroplasticity – the brain's ability to develop modified organ structures (functional and structural changes) in response to morphological changes.

Apart from established treatments, such as physiotherapy and ergotherapy the latest research points towards robot-assisted physical therapy as the most successful way to help shorten length of therapy and generally improve its quality. Whereas there have already been significant improvements of motor function achieved through robot-assisted rehabilitation for the upper extremity compared with conventional physio and ergotherapy for stroke patients, till now there has not been any licensed device available for robot-assisted rehabilitation of hands or individual fingers, due to their high complexity.

Now, the *Amadeo Hand-Rehabilitation-System*, developed by the Austrian company Tyromotion Medical Engineering in cooperation with the University Hospital Graz and the Judendorf-Strassengel Clinic, promises to provide completely new opportunities for rehabilitation of the upper extremity after neurological damage. This system is currently the only market-ready, mechatronic finger rehabilitation device with enables movement of each individual finger, including the thumb, separately and independently of the other fingers.

The Amadeo moves fingers and thumbs according to a pattern predetermined by software. The finger loops can transmit movements of flexion and extension to the fingers either individually, consecutively or simultaneously. Alternating or random movement sequences are also possible but depend on the individual patient's range of movement (interlocking of individual fingers). This is why it is possible to stop or limit the movement of individual fingers. The range of movement can be adjusted separately for each individual finger.

At the beginning of a therapy session the patient is comfortably positioned in front of the device and the hand-arm rest is positioned to support the weight of the upper and lower arm and hand during therapy. Once the fingertips are attached to the finger and thumb loops and the endpoints are set, therapy begins with an automated motion sequence. The patient can be involved in the therapy either passively or actively depending on individual needs. Built-in sensors allow for quantitative recording and evaluation of finger strength.

Details: www.tyomotion.com
E-Mail: david.ra,@tyromotion.com

A JOINT VENTURE FOR SPAIN AND PORTUGAL

By **Dr Eduardo de la Sota**

Grupo Hospitalario Quirón and José de Mello Saúde are sharing a joint venture that aims to create a reference private healthcare group in the Iberic Market. This alliance will enhance quality of care and management of both groups, by 'know how' sharing and synergies implementation.

The Quirón Hospital Group

Nationwide throughout Spain, Grupo Hospitalario Quirón currently encompasses five private hospitals in Barcelona, Madrid, San Sebastián, Zaragoza and Valencia, as well as one assisted centre in Bilbao. In 2010 the group will count three new hospitals in Bilbao, Sevilla and Valencia. Grupo Hospitalario Quirón has a global turnover of €90 million, growing above the market average. With network expansion, a turnover of around €205 million is predicted by 2010, with more than 1,000 beds.

José de Mello Saúde

Founded in Lisbon in 1945, this is now the largest private healthcare group in Portugal.

Today José de Mello Saúde accounts for more than 1,000 beds, distributed in the CUF Infante Santo and CUF Descobertas, both located in Lisbon, and the Fernando Fonseca Hospital (Amadora Sintra), which is a unique case of public hospital with private management in Portugal. The group runs two clinics in Lisbon: Clínica CUF Alvalade and Clínica CUF de Belem.

José de Mello Saúde leads projects for the construction and management of several hospitals in Loures, Cascais, Braga and Vila Franca de Xira.

Tracking TB bacterium from space

TB bacterium have a unique chemical coating and it is hoped that a tiny gas chromatograph mass spectrometer (GC-MS) – a detection device* developed for the Beagle 2, on its mission to Mars – will be able to pick this out from space, in a project run by Britain's Open University and the London School of Hygiene and Tropical Medicine. A £1.34 million grant has been provided by The Wellcome Trust to test the technology.

The idea is that the now light, shoe-box sized GC-MS could, by detecting TB bacterium, raise the low diagnosis rate of this disease in developing countries. (Current use of microscopic examinations for TB fails to detect about 50% of cases, leaving infectious patients not only without treatment, but also to spread the disease).

** The Rosetta mission, which is aiming for a comet, is using a similar device to send back data on its chemical composition.*

A website for breast cancer patients

For women (or friends and relatives of women with breast cancer), the Susan B. Komen website (www.komen.org) contains an extraordinary resource: message boards that contain thousands of topics. In October 2007, over 170,000 message posts on over 20,000 topics. A robust search engine facilitates research on topics of interest, which range from the clinical to commiseration. The experiences of such a large group of participants about treatment options, surgical experiences, radiation therapy, chemotherapy and treatment reactions, and reconstruction are useful for both the patient to the professional.

Registration is free and participation can be anonymous. The site is in English; its constituency is global.

FRANCE: continued from page 1

available to expatriates is confused. In the past, those arriving in France without an E121 card (issued to citizens officially retired in their country of origin) or an E106 or E109 (valid for two years and issued to those who had paid in to their country's state health insurance scheme for two years before moving to France) could join the French healthcare system by paying an affordable subscription to the CMU (Couverture Maladie Universelle).

This entitled them to the carte vitale and consequently the range of standard medical reimbursements. This means, for example, a 70% refund of the cost of a doctor's appointment, which is what French citizens receive.

However, on 31 March 2008, the carte vitale will be withdrawn from any EU expatriates not working or not officially retired. And if their E106 cover has ended, they will have to pay for private insurance, estimated to be at least €2,000 per person per year for basic health cover. When they reach retirement age, they will then be entitled to an E121 and their cover and affiliation to the CMU will be restored. People already officially retired and holding an E121 will not be affected by the new ruling.

However, many disabled people and those suffering from long-term or pre-existing conditions, such as cancer, lung disease or diabetes, will be unlikely to obtain private cover and may be forced to move back to their home countries to try to re-establish their entitlement to medical care.

The change in the law has been further clouded with different help lines and official bodies producing different answers at different times. Some callers were recently being told that health cover would not be available to newcomers to France and withdrawn from those already affiliated, while others were informed that the situation was changing and more news would be announced soon.

In September, a spokeswoman for the French social security ministry (Sécu) said that people resident in France for five years, without interruption, should not be affected by the new rules, as they have officially acquired a permanent right to residency under the Code de l'Entrée et de Séjour des Etrangers (art. L122-1).

However, she added that this had yet to be confirmed and that no formal instructions had yet been given to local authorities to act. Once they had, she said, the new regulations would be applied to those affected 'across the country'. However, even before the change was publicly announced, some local offices of the area health authority CPAM (Caisse Primaire d'Assurance Maladie) began sending out letters to EU expatriates already in the health system, informing them of the ruling and clawing back their certificates of state health cover and carte vitale.

The spokeswoman concluded: 'On ne sait pas sur quel pied à danser.' ('We don't know whether we are coming or going').

At the time of going to press, a statement from the French health ministry was still due to be circulated to all area health authorities (CPAMs).
** Ruling details: http://www.securite-sociale.fr/comprendre/europe/europe/cmu_inactifs.htm*

Health E-forms

Confusion and misinformation about the health E-forms is widespread and many European citizens entitled to them are unaware that they even exist.

They are an instrument by which the transfer of medical benefits from one EU member state to another is facilitated through conventions signed by those member states under provisions in the Treaty of Rome.

Each of the three health E-forms covers a different aspect of that transfer.

E 106 covers the holder and his or her dependants living in another member state by affiliation to its health service for up to two years. To qualify, holders must be taking early retirement and to have worked and paid contributions to the national insurance system in their country of origin for at least two years before leaving to reside in another member state.

E 109 covers a family living in another member state. To qualify, one spouse must remain living and working in the country of origin and be paying contributions into its national insurance scheme.

E 121 covers the holder and his or her dependants living in another member state by affiliation to its health service for the rest of their lives, or until each one qualifies for benefits in their own right. The qualifying conditions are that they must have reached official retirement age (in their country of origin, not that of their host country) and be in receipt of a state retirement pension or a widow's pension, or being paid long-term incapacity benefit.

NANORODS: continued from page 1

professor at the school, said the cells were then illuminated with light in the near-infrared range. 'This light can easily pass through tissue but is absorbed by the nanorods and rapidly converted into heat, leading to miniature explosions on the cell surface. This generates a plasma bubble (bleb) that lasts for about a microsecond, in a process known as cavitation,' explained associate professor Alexander Wei. 'Every cavitation event is like a tiny bomb. Then suddenly, you have a gaping hole where the nanorod was.'

Although the bleb is triggered by the nanorods, Dr Cheng said it is really caused by a complex biochemical process: 'Extra calcium gets into the cell and triggers enzyme activity, which causes the infrastructure inside the cell to loosen, which causes the membrane blebs.'

In laboratory cultures, the team found that far less power was needed to injure cells by exposing the nanorods to near-infrared light while they are still on the membrane surface, rather than after their absorption.

'We like to believe this opens the possibility of using nanorods for biomedical imaging as well as therapeutic purposes,' Dr Cheng pointed out. Dr Wei is currently collaborating with the National Cancer Institute to determine the suitability of the functionalised gold nanorods for future clinical studies.

** Doctoral students Ling Tong, Yan Zhao, Terry B. Huff and Matthew N. Hansen, with assistant professor Dr Ji-Xin Wei and associate professor of chemistry Alexander Cheng.*

THE EUROPEAN STUDY OF SCREENING FOR PROSTATE CANCER (ERSPC)

Professor **Chris Bangma**, Director of the ERSPC and Chairman of the urology department at the Erasmus Medical Centre, Rotterdam (headquarters of the ERSPC) explains the study's background and aims

The ERSPC is the world's biggest study of screening of prostate cancer. It involves up to 260,000 men, 220,000 of them in the age group 55-75 years old. It is being driven by eight European countries and all participants are, like me, members of the Board that is directing this enormous enterprise. The ERSPC aims to answer a pivotal question – whether early screening of prostate cancer in a symptomatic man will benefit the survival of prostate cancer. The answer on this is of course of great interest to all kinds of governments and national institutes in order to advise on screening in the future. We plan to deliver the answer on this very complicated question in about two years' time.

The current drive is to use active surveillance which actually is a treatment modality that has not been used very much in the past. The reason why we are doing this is because, so far, we have found in the ERSPC that a large number of men diagnosed early with prostate cancer appear to have very small cancers that, under the microscope, do not seem to be aggressive and are actually harmless.

They have the features of those cancers that accidentally are found when people die of other causes, when the microscope looks into their prostate. So we call these indolent cancers, or minimal cancers and they would never harm a patient's life. We would more or less prefer not to detect them in a screening study because, of course, knowing he has cancer would affect a man's well-being. So, active surveillance is the method to follow up patients thought to have an indolent cancer, by regular checks of their blood and also the tissue of their prostate, to find out whether these suggested small cancers are actually growing. If so, then we advise radiation therapy or surgery immediately we find that the cancer could be harmful to life.

The number of these indolent cancers is found in 50% of the general population, and we think that by active surveillance we at least can protect 30% of men against treatment or surgery or radiotherapy that might influence their quality of life.

Why is it important to identify groups? Well, we want to go into targeted therapy. Every treatment has side effects – when you talk about radiotherapy or surgery – and, as said, we would like to protect the men who do not need that therapy. The second reason obviously is that treating a patient with radiotherapy or surgery is very costly, and we would like to use the money that can be spared by offering active surveillance to those people that are being treated, those who actually need it.

The PRIAS Project, which stands for Prostate Cancer Research International Active Surveillance, is a combination of words that (only) indicate that it is a tool or a study that can be used to serve active surveillance to the people. We are making use of a web-based tool to follow up and monitor advisers of patients who have the indolent disease. This is a free instrument, accessible to everybody, patients as well as physicians, and it is very easy to use, and can be offered in such a way that patients and families can look into active surveillance, what it is, what it means and whether they want to follow that.

Why is EU funding needed? The project actually aims to spread information on active surveillance as a treatment option among European men in their national languages – offering them a way out when they have small indolent cancers. We are doing this very much supported by the help from patients' organisations, which come under the umbrella of *Europa Uomo*, which is active in 17 to 20 European countries.

The second aim may be even more important – the further development of the prediction of those men who need targeted therapy, intensive therapy, but also, on the other end, indicating better those men with no disease. We are trying to do this with the development of new markers, biomarkers. We have started this already with the *P Mark Project*, so with the European Consortium active in designing these markers, but we want to improve on that. The third partner is the European Association of Neurologists, because we need that association in order to spread guidelines for active surveillance and tell the news and about improvements to the neurological profession. Last but not least, on this unique platform of stakeholders in Europe, we also have been able to interest the marker industries, which, of course, are pivotal in the development in bringing forward markers that are valuable for all these patients in Europe.

Europe's 1st multidisciplinary urology meeting

Major European organisations – including the European Association of Urology (EAU), the European Society for Medical Oncology (ESMO), the European Society for Therapeutic Radiology and Oncology (ESTRO) and the European Organisation for Research and Treatment of Cancer (EORTC) – which are involved in the management of urological malignant disorders, are to hold the jointly organised, first European Multidisciplinary Meeting on Urological Cancers (EMUC) *'Embracing Excellence in Prostate and Kidney Cancer'* in Barcelona, Spain (2–4 November).
Details: www.uroweb.org

The ACP recommends 'flu vaccination for frontline healthcare workers

Influenza infects around 20% of the US population and results in 200,000 hospitalisations annually. It kills about 36,000 citizens

In the USA, only 36% of all healthcare workers are immunised against influenza annually, and now the American College of Physicians (ACP) has added its voice to those of many major professional medical societies that have endorsed and published recommendations for annual immunisation of healthcare workers who are in direct contact with patients. The ACP is encouraging those organisations to establish vaccination programmes, staff and physician education on this immunisation, and much else. However, healthcare workers with contra-indications to influenza immunisation, or religious objections to it, or those who want to opt out and will sign an informed declination, would be exempted.

Transmission of influenza from healthcare workers to patients has been recorded in nearly all healthcare settings. Additionally, multiple studies have shown that around 70% of healthcare workers turn up for work despite having influenza, putting not only other staff and patients at risk of illness, or even death, but which could also cause medical errors by those too ill to work, Vincenza Snow MD FACP, Director of Clinical Programmes and Quality of Care at ACP, has pointed out.

Revised international accreditation standards for hospitals

The Joint Commission International (JCI) has produced a revised set of international accreditation standards for hospitals. Initiated in 1997, the JCI developed out of a need seen by the international community to have standards of care to assure quality and safety for patients.
'When these standards were first devised, organisations around the world were trying to apply the US domestic standards but, due to the nature of those standards with all the rules and regulations from US government agencies, that was not possible to do,' **David Jaimovich MD**, Chief Medical Officer of JCI told *European Hospital* in an interview with *Karen Dente*. The International Standards are a result from a consensus reached by a group of representatives from 19 countries that convened to discuss a global approach.

The current revised international standards, published in August in the third edition of the *Handbook of the Joint Commission International Accreditation Standards for Hospitals*, will form the basis for quality of hospital accreditation starting from January 2008. The emphasis remains in providing a framework for hospitals worldwide to create a safe environment for high quality care. As seen in the previous standards, the updated handbook is again divided into two components, with one section dealing with patient centre standards, the other focusing on healthcare management.

Patient centred standards deal with such issues as patient and family rights, access to care, medication management and use, patient and family education, and anaesthesia and surgical care. As per the changes from the previous edition, '… it is a bigger book with more measurable elements but just a few less standards,' said Dr Jaimovich. 'It has more of a focus on medication management and there is a separate chapter on medication management and use, and anaesthesia and surgery. These are all high-risk areas where we have seen over the years that hospitals tend to struggle the most, 'he explained.

The revised standards include a new section on supervision of continued education of healthcare staff based on the USA's standards. The staff qualification chapter has been enhanced and the communication chapter is new in all areas of communication – written, oral and electronic. This refers to the information necessary in a medical record to provide information from one healthcare professional to another, or one service to another. 'There are certain expectations about privacy and protecting the security of information, especially when passed along electronically, and the standards are very clear on that,' Dr Jaimovich explained.

More information can be found at: www.jcrinc.com/25300. The standards can be downloaded in electronic version from this site.

UK UPDATE

from ***Brenda Marsh***
Editor, European Hospital

Juggling the NHS accounts?

Following various cuts and budgeting and at last an announcement of a surplus of funding in the NHS, government figures indicate that pending maintenance repairs of its properties would cost in the region of £4 billion – eight time higher than the NHS funding surplus. The repairs include fixing heating, roofs, drains, and measures to meet safety regulations, but do not include re-decoration of wards or furniture replacements.

Whilst the Department of Health said these repairs come under a different budget, which has no bearing on the surplus, Shadow Health Secretary and MEP Andrew Lansley CBE (Conservative Party), who obtained the figures, has said: 'The truth is that the NHS surplus, which the government is boasting about, is a sham.' He suggested that the budgets for public health, education and training, as well as basic maintenance and hospital upkeep were 'laundered' to produce the surplus figures.

The Health Minister Ben Bradshaw (Labour Party) said that, whilst urgent maintenance work that will affect patient care is always a priority, occasionally low priority maintenance work (such as a roof repair in an un-used building) was delayed so as not to prevent disruption of patient services.

Despite healthy pay packets, doctors fear the future

British general practitioners (GPs) have, on average, seen their annual income rise to around £100,000 (a 3-year rise since a new contract introduced in 2004), and they have been assessed as the 'happiest' in Europe about income.

This finding came from a small poll of 399 doctors in the UK, France, Germany, Italy, and Spain – conducted by *Le Generaliste* , a French magazine for GPs – which showed that about 57% of UK GPs were satisfied with their pay, compared with 44% of the French GPs, 29% of the Italians, 18% of the Spanish and 12% of the doctors in Germany.

However, the future of family practices concerned 9 in 10 of the participating doctors: 90% in Spain, 87% in the UK, 84% in German, 83% in Italy and less so in France at 79%.

Under the UK pay contract, GPs were also allowed to give up responsibility for night and weekend care, but recently the government has been pressing GPs to provide better access to care, and to extend their surgery hours. This, along with a suggestion that private doctors would be called in if they do not do so, have caused worry for many.

30,000 medical graduates chase 20,000 jobs

Following an independent report by Professor Sir John Tooke that found that thousands of British born medical graduates cannot find jobs due to soaring applications from foreign doctors, all four British countries are looking into the situation, and the government is to examine the issue of applications from beyond the European Economic Areas (EEA).

The report examined recruitment problems following a new training system, and found that overseas applications had increased this situation – for the 20,000 posts on offer, around 16,000 of the 30,000 junior doctors applying were foreigners, and most (13,500) come from countries outside the EEA. However, about 10,000 foreign applicants had come under the UK's highly skilled migrant programme, whilst many others paid for their medical education in this country. Although giving preference to UK graduates would present legal difficulties, this would not be the case for medical graduates born beyond the EEA.

The British Medical Association (BMA) has pointed out that, although medical immigration does need to be controlled, this should not affect foreign junior doctors already in the country, and added that all non-UK nationals currently studying medicine in the UK should be able to complete their entire training here, and those on the highly skilled migrant programme should be allowed to compete for posts on the same basis as UK graduates.

A Department of Health spokesperson said that the proposal only affects post-graduate and specialty training, and does not affect the thousands of NHS service posts for which doctors from beyond the EEA can apply.

The Tooke report had focused on the *Modernising Medical Careers* (MMC) training system, introduced by the health department in 2005, under which junior doctors could cut the current average years to reach consultant level from 14 to 11 years, by trainees heading for a specialty earlier in their careers. However, the professor concluded that meant less broad-based experience, and it would neither encourage nor reward endeavours for excellence. Nor did it allow sufficient flexibility for doctors or the changing employee needs of the National Health Service. The report concluded that doctors should receive more years of broad-based training before embarking on the specialist route.

The report, together with other adverse events relating to job applications, have increased the desire of many doctors' that the profession should have a greater say in health service management.

MANAGEMENT TEAMS New concept leads to greater leadership

Changes in the healthcare sector are presenting increasingly difficult challenges to European hospitals, but, according to the hospital chain Ategris GmbH, based in Mülheim/Oberhausen, these pressures '... might present a chance to open up encrusted structures'. The company reports that it '... embraces Christian values while optimising existing hospital structures' and has worked on a new model of organisation that unites doctors and nurses as management teams

At its two hospitals in Oberhausen and Mülheim (approx. 2,300 employees and more than 1,100 beds) Ategris reports that it has opened up new ways to change those structures for the benefit of patients and employees, while also gaining financial profits. Success at the EKO, a Protestant hospital in Oberhausen – which had been losing money until the new Ategris management achieved a turnaround in its first financial year, 2005 – confirms the company's belief in its approach. 'Combining Christian and entrepreneurial thinking is not a contradiction in terms. The goal is to act responsibly within set parameters. This means using resources in the best possible way to protect jobs and secure business as well as to provide quality treatment and care for patients. The new methods include disbanding the old hospital structures and consolidating traditionally separate areas, such as those of doctors, nurses and administrators.'

Doctors and nurses share management responsibility

In Oberhausen top-level doctors and nurses work together in Management Teams (MTs), exercising clear leadership and communication to all levels. 'This new model was launched in February 2006 for the EKO and has proved its worth. The 15 medical departments at EKO were divided into five management areas. For each of those five departments, one management team is responsible, consisting of a head physician and a head nurse who jointly take decisions. Traditionally, different channels of information and management systems are employed by doctors and nurses, often resulting in flawed co-operation. Mostly, the one who suffers is the patient.

'At EKO, nurses and doctors now co-operate at leadership level to improve patient procedures and can implement according actions. Another benefit of this model is quick decisions: when daily problems or unexpected difficulties occur, there is always a decision-maker on hand. The MT has the knowledge and authority to react immediately – there are not several hierarchy levels of various people having to consult and agree with each other to be able to change something. A unique communication system within the EKO delivers information top-down and bottom-up. The same information at the same time is given to every staff member and therefore misunderstandings and communication gaps are greatly reduced. However, this requires a given culture of co-operation, because a model such as this would be impossible to realise without partnership.'

After implementing the new management structure in Oberhausen, more focus can be put on improving everyday business, which results in better patient care and more efficiency, Ategris explains. 'Thoughts and ideas are shared on all staff levels to improve procedures, planning and realisation come together in one place, making it possible to assess and, if necessary, modify the results of any decisions directly at work level. In other hospitals, decisions are primarily made by management, with the other occupational groups only executing the management's ideas. The principle of MTs, which run the hospital together with the CEO, allows hospitals to bring together all occupational groups. As a result responsibility is taken on by everyone and there is a shared commitment to steer the hospital into a safe future.'

However, a change process like that does not work overnight, Ategris points out. 'Only when people see the benefits will they participate. It also takes more than just the willingness of the people involved to break up traditional work processes; they also need to be willing to learn. Doctors and nurses had to qualify for their new management tasks – preparation for this is neither included in neither the doctors' nor nurses' education. They all took part in an intensive training programme.

'The risk of developing and implementing a whole new management structure in a hospital, with the participation of the various occupational groups, has proved a success and underlines the philosophy of Ategris to create value in all aspects.'

Source: www.ategris.de

Take off in the operating theatre

Engineer **Stefan Wollschläger**, a partner in Visality Consulting GmbH, Berlin, and **Dr Gregor Zehle MBA**, a senior consultant at GÖK Consulting AG, Berlin, discuss the benefits of a strategy transfer from the aviation sector to operating theatre management

Aviation, a sector that for decades has been characterised by continual growth, but also extreme competition and pressure to reduce costs, exhibits structural parallels with hospitals. Airlines, airports and aviation service providers have developed strategies for survival in this politically influenced and fought over environment. Strategies that are successfully employed in aviation can be modified and transferred to hospital management. The example used here is the operating theatre, one of the central proponents for costs and profits, as well as often a hospital bottle neck.

Infrastructural bottlenecks

Aviation capacities are structurally narrowly limited. Runways for take off and landing, air space and parking spaces are scant resources that must be used optimally. European airspace is centrally co-ordinated from Brussels, from where slots are allocated, time windows for take off that must be adhered to. Each airport is simultaneously targeting optimum use of its capacities. Not all aeroplanes can land and take off in accordance with the airlines' wishes; landing sequences, holding patterns and slots must be observed. Parking spaces close to buildings are also rare and comprehensive planning for their allocation is required.

The tool for optimum use of these bottlenecks is flexible planning and coordination, as well as a value-oriented prioritisation of the flight events. Planned runway capacities and parking spaces are continually adapted to the current requirements: changes due to delays, cancellations and weather conditions are the norm in the aviation business. Flight security and the airport management adopt a sovereign role, such that the airlines' interests need to be considered comprehensively in the planning for bottle neck capacities. If an airline wishes to prioritise flights within its fleet, then the value of the flights will be compared. The criteria for this decision-making process are the number and status of the passengers, the relevance of transit passengers for connecting flights and the importance of those flights for competition.

What does all this mean for the management of operating theatres? Available surfaces and pathways are infrastructural bottle necks in the operating theatre area. Comprehensive advance planning relating to capacities is also required in this case. Deviation from the rule is the norm: complications, cancelled operations, emergencies. Therefore, there must an operating theatre management in place that co-ordinates special cases in accordance with agreed rules and ensures that the interests of different specialist units are equally served. To this end, medical or economic determination of priorities can be consulted. Assessment of these measures from an ethical standpoint is the hospital management's job. Prerequisite to this is the presence of a comprehensive medical strategy within the hospital and a moderated synchronisation process between all participants.

High value production factors

Another characteristic of the airline business is the use of high value production factors, in particular the personnel and the aircraft. High costs result in the optimisation target of operating at full capacity whenever possible, in order to reduce individual costs to the minimum – always ensuring that all security requirements are fulfilled.

An aeroplane only earns money when it is in the air. Time on the ground must be kept to a minimum and the passenger, luggage and freight flows must be geared towards ensuring this is the case. Airlines have detailed knowledge on the procedures, costs and duration of the ground processes and have alternative strategies to deal with any deviations from this pattern. In all cases, reaction is immediate. Ground traffic service providers work towards minimising unproductive empty slots and maximising the use of employees and equipment. Flexible employee deployment models and the evaluation of the service performance are essential factors. Furthermore, airlines operate comprehensive, cost-oriented fleet and crew management. For example, should an aeroplane be grounded, then alternative actions are prioritised in accordance with measures of value and dispositive decisions are rapidly taken.

Similar questions are posed for operating theatre management. Equipment and personnel are high value production factors that constitute the added value of the operating theatre. Empty slots endanger cost effectiveness. The primary and secondary processes must therefore be synchronised and standardised in reference models, under consideration of deviations from standard procedure. Flexibility is required in the deployment of personnel and this must be reflected in working times and deployment models, as well as in task profiles. The aim must be to have the capacity to react in the short-term and in a cost effective manner to delays, curtailments and cancellations to operations. Furthermore, a comprehensive disposition for deployment is required, thus optimally using the high value personnel resources. In doing this, employment law and ergonomic restrictions as well as quality assurance must be adhered to.

High competitive pressure

Competition is a defining element in aviation and exists between airlines and, in the interim, now also between airports. The battle for passengers and freight leads some airlines into ruinous competition, in order to use their own capacities to the full. The airlines are gaining less than expected from the creation of added value in aviation. A large proportion of the earnings are made by the airports that are in a position to use their monopolies for profit.

In the battle for each Euro, the airlines have perfected the optimisation of their profits. Prices and capacities are planned strategically: graduated ticket prices, enticing offers and customer loyalty programmes guarantee reservations. The range is differentiated by varying types of service to such an extent that business or first class customers are prepared to pay more than twice the price of an economy ticket.

Another strategy is integration within the aviation sector. Airlines take a share in airports or service providers enter into joint ventures with airports in so-called vertical integration. Horizontal integration is accomplished by airlines joining in alliances and airports taking shares in other airports. The intention of such moves is to minimise risks and increase growth in market force and increase competitiveness.

The parallels with the healthcare market are obvious. The big players are also arming themselves for competition through vertical or horizontal integration. We can make derivations that apply to operating theatre management. Optimisation of the use of resources and financial gains is possible, obviously under due consideration of all medical and ethical standards. One step is the creation of medical focal points, in which operating with high productivity, quality and cost effectiveness is targeted. In order to guarantee the safety of the hospital's location, an edge must be provided and the medical performance protocol developed further, in accordance with the hospital's medical strategy. Finally, why should there not be any differentiation between services and prices based on the nature of the service?

Learning from the mistakes and successes made by others – this is an option for the healthcare sector. The first step in the reorganisation process for a hospital is to work out an individual development strategy, and to derive from this individual targets and measures. The operating theatre should be a special focus of this, as a 'production plant' in the creation of added value within the clinic. An analysis of personal strengths and weaknesses will indicate the path towards change that can be of existential significance.

Dr Mengibar: For me, it is a privilege and a pleasure to be the director of a hospital that is a member of the USP Hospitales group, which is indisputably Spain's leading hospital group and, through it, we have begun making forays into the international sphere, in Portugal and Morocco.

Inasmuch as we benefit from the support of a major hospital group, USP Hospital de Marbella offers superb services in terms of quality, and compliance with standards, plus we're in the vanguard when it comes to medical equipment and hospital information system technology. Our patient records are fully integrated and digitised. We also offer advanced training courses for our staff on an ongoing basis and regularly exchange information with various other hospitals.

USP Hospitales was founded by Gabriel Masfurroll, who is also the organisation's chairman and CEO. The company has a board of directors comprising a general corporate director, a director for Spain, a chief legal counsel, an international affairs director, a corporate marketing and communication director, and a corporate development director. USP also has an executive board comprising a corporate information systems director, corporate infrastructure and a technology director, a corporate human resources director, corporate finance director, and corporate strategic planning director. The board of directors for Spain comprises a medical director, nursing director, hospital director and a director for new products. These various boards provide each hospital with the requisite support, thus allowing for rapid integration into the hospital group and generating synergy that is beneficial for all concerned.

We are part of a corporate group, but it has a youthful and enterprising spirit, and every day it teaches us how to keep growing, and how to ensure that we're delivering clinical excellence and optimal healthcare. Being part of this organisation has also enabled me to become a manager, thanks to the generosity of Gabriel Masfurroll. The company's shareholder structure is as follows: 65% is owned by Cinven, a leading British equity fund, 25% by the founding manager team, and 10% by Caixa Geral de Depositos.

What distinguishes USP Hospital de Marbella from other centre?

It's been four years since USP Hospitales acquired USP Hospital de Marbella, and during that time we've remained true to our objectives, which are to offer a full range of quality healthcare services, personalised and caring treatment, and hotel services that allow for maximum comfort.

We excel in terms of the completeness of the healthcare services we offer, which are always provided in a personalised manner. We handle all cases, regardless of their complexity, in a manner that respects and takes account of a patient's individual needs and problems. In addition to personalised service we also offer healthcare on a multilingual basis. We have an Attentiveness to the Patient department, which visits all patients on a daily basis and which, for foreign patients, handles matters pertaining to repatriation and hotel stay extensions both for the patient and his or her family.

What main services does your hospital provide?

We have diagnostic equipment that integrates the latest medical technologies, thus allowing for virtual

USP Hospitales de Marbella

USP Hospitales is a prominent Spanish hospital group with a network of 31 facilities in Spanish cities. The group also owns a 25% share in Hospitais Privados de Portugal, the hospital affiliate of the Portuguese bank Caixa Geral de Depositos. USP Hospitales acts as a consultant for the bank's six hospitals – in Lisbon, Oporto, Sanghalos, Lagos and Faro. USP Hospitales recently founded the company USP Hospitales Maroc, to launch new products in Morocco, whose government has invited USP to bid on a contract for 13 public sector hospitals.

The USP Hospitales de Marbella, built in 1975, became a member of the USP Hospitales group in 2003. *Dr Eduardo de la Sota*, our correspondent in Spain, asked **Dr Mercedes Mengibar** (right), General Manager of the hospital, what membership of this prestigious group means to her hospital.

radiology examinations, as well as functional cardiology, endoscopy, neurological and neurophysiological investigations, among many others. We also have a complete array of therapeutic equipment – for haemodialysis, interventional radiology, therapeutic endoscopy, endoscopic surgery, minimally invasive traumatology, birthing, and so on.

We employ over 350 people, more than 125 of whom are healthcare professionals.

How would you characterise your patients?

About half of our patients are foreigners. During the winter months, the majority of our patients are from Spain and abroad; during the summer a predominant number of our patients are tourists, mainly from Spain (above all from Madrid and the Basque region), as well as foreigners, mainly from Britain and Germany. Many foreigners vacation in Marbella, so that they can have their annual checkups or undergo specific exams at our hospital.

During the summer, our patients during tend to be between the ages of 20 and 50, whereas from October to May most patients are 50–60 years old.

How do you recruit your medical staff?

One of our main operating premises is to recruit top notch healthcare professionals; towards this end we do not hesitate to invest financial resources and establish sufficiently complete teams that have the capacity to solve all problems, so that any patient who comes for treatment will be assured of receiving quality care.

Without a doubt, the strength of this hospital lies in its staff. We have selected top healthcare professionals who have a specific profile and are well trained, inventive, committed, and ethical, and have a professional attitude, as well as enthusiasm for and a systematic approach to our organisation. Our hospital is an exciting place to work, a place that allows for the delivery of quality private sector healthcare and that is conducive to the professional development of its staff members.

Also, the Marbella region is a great location for a hospital. The city is conducive to a good work-life balance and has a quality of life that you don't find elsewhere.

What research is the hospital engaged in, and what are your future plans for this?

Our current research focuses on arrhythmia studies, cardiovascular risk factors, inflammatory intestinal disorders, foetal therapy, low-intervention birthing, and so on.

A great deal of this research is presented at conferences. For example, one of our staff physicians, Carlos O'Connor, an ENT specialist at USP Hospital de Marbella, attended the annual meeting of the American Academy of Otolaryngology-Head and Neck Surgery in Washington, D.C., where he presented his study 'Rescue snoring surgery with palatal implants after failed UP3', a field in which we are pioneers in Spain. This study was also published in the journal Otolaryngology-Head and Neck Surgery.

What about the hospital's future plans?

The Hospital Master Plan that we are currently implementing here entails an ambitious top to bottom remodelling of the hospital, which began in 2004 and will end in 2008. It involves refurbishment and modernisation of all elements of the hospital's facilities. Upon its completion, the Master Plan will have entailed a capital investment of some 30 million Euro.

We are currently remodelling the emergency, diagnostic imaging and haemodynamics lab area, as well as the arrhythmia and interventional cardiology area, and two in-patient floors.

We have also completely refurbished the intensive care unit (ICU) and the surgery department, which contains a six-bed critical and acute care unit that is divided into separate cubicles, to allow for maximum privacy, and is equipped with the most advanced medical technology. The surgery department has five operating rooms, a delivery room, postoperative recovery area, out-patient clinic, new sterilisation area, and a resuscitation room.

Remodelling of the remaining in-patient floors will begin soon, and once the Master Plan has been fully implemented, USP Hospital de Marbella will have an outpatient functional testing and medical consulting area, an obstetrics ward and an in-patient unit featuring 66 beds and four suites.

We will also implement the USP Plus concept, which involves offering patients, and people accompanying them, differentiated hotel-related services within the hospital. It will provide added value for all of our patients who opt for maximum comfort and quality services, in terms of both the hotel and installation. USP Plus patients will have access to personal transportation services, travel agency services, as well as special room services ranging from a selection of pillows to exclusive restaurant menus.

All of this is being done to achieve excellence in our services and maintain our position as a leading private healthcare provider in the Costa del Sol region.

Also in the pipeline: We will become a university hospital in a few years. Many of our staff members have PhD's and enjoy teaching, so I feel an affinity with them.

How would you characterise your management style?

Management according to values. We are in the midst of a process of change that involves not only our infrastructures but also another, slower process, which is cultural in nature.

This change is being realised via individuals, and in order to regard these individuals as being part of the process, you need to know what their values, beliefs and motivations are. The change will have to fundamentally involve emotions; for to a great extent, managing people is about managing emotions.

The experience of over 15 years as a team leader has taught me that the key to the success of a given project is when the professionals involved make it their own.

Towards this end, and via working groups of professionals at the hospital, we have defined our values, which are identical with those of USP Hospitals. Commitment: determination, involvement, respect, interest, a feeling of belonging, loyalty, fairness. Innovation: anticipation, inventiveness, problem solving, optimisation, and renewal. Dynamism: energy, optimism, efficiency, flexibility, initiative, excellence and enthusiasm. Personality: we are a united group of people who are excited about our project and have shared ethical values.

How does the staff adopt integration concepts, such as quality and efficiency, into their routines?

You can't have efficiency unless you have quality, because otherwise you end up paying a lot for low quality. We have adopted a strategy of 'doing a good job with the tasks we need to accomplish'. Continuous improvement of our daily routines has earned us AENOR UNE-EN ISO 9.001:2000 certification for over 80% of our hospital services, namely admission/appointment reminders, inpatient services, emergency care, surgery/sterilisation, intensive care, radiodiagnostics, patient record management, billing, medical and administrative discharge processes, and the following support services: maintenance management, food service management, and laundry management. This certification will be extended next year to include our haemodialysis, neonatology, hospital pharmacy, and outpatient medical consulting services, which will mean that virtually the entire hospital will be certified.

We are also working on ISO 14.001 environmental certification, and we intend to continue moving forward in this area and plan on obtaining EFQM certification.

At USP Hospital de Marbella, we are aware that this is a process and we intend to move forward with the process of transforming our hospital into a continuous-improvement organisation and a learning organisation.

Accreditation is crucial because we know that you only achieve quality through day by day effort, tenacity, commitment, and harmony; but also on the basis of each action, look and word from each and every member of our team, and by regarding each patient as a unique individual.

In addition, in 2006, for the second consecutive year, USP Hospital de Marbella won the USP Hospitales Champions League, which is an intramural competition that assesses the performance and efficiency of each hospital and that integrates a benchmarking system with a view to exporting each centre's best practices.

What is your view of the current healthcare situation?

Spain has a publicly financed universal healthcare system that provides advanced technology and a high level of expertise, and delivers the same quality services throughout the country.

The past decade has seen the emergence of private healthcare that delivers quality services from a clinical and technological standpoint. USP Hospitales is part of this movement, and we are anticipating increasing demand. In reality, it doesn't matter to people whether their healthcare comes from a public or private sector provider. What they want is a quality system that works well, that provides services rapidly and that doesn't have long waiting lists.

Is there anything else you'd like to add?

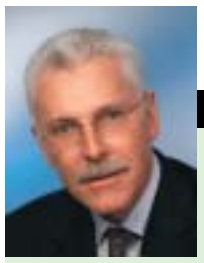
I'd also like to say a few words about our unwavering commitment to social solidarity and our efforts to integrate the hospital into the community. Through our non-profit foundation, known as USP Fundación Alex, USP Hospitales, we work with various institutions to help the disabled. It was established in June 2006 to promote and catalyze research, training and education in healthcare sciences through social action projects, particularly those aimed at children and the disabled.

Our foundation's two main areas of activity are social action and social education, which are united under an umbrella that is associated with two key concepts, namely health and childhood.

Our hospital, and the other group hospitals, participate periodically in various social projects that are realised via this foundation, including the following: 'Messi's best goal: a dream and a life', which involves performing surgery in Barcelona on children from Argentina (in collaboration with the Fundación Leo Messi and Fundación Pequeño Deseo); integration of the disabled into work situations at various group hospitals (in collaboration with Aura and Assido); performing surgery in Seville on African children (in collaboration with Tierra de Hombres); providing support for Hospital de la Fraternidad de Chinguetti in Mauritania.

We also partner with charitable tournaments and provide hospital material and medications for Proyecto Pará, a project that aims to build a hospital and school in the heart of the Amazon rainforest. We also collaborate with the Talita Foundation, on campaigns such as Unicef's 'Unite for Children. Unite Against Aids', and we support and work with numerous NGOs such as Marbella Voluntaria, Aldeas Infantiles, and so on.

Our foundation also has a Spanish language website (www.fundacionalex.org) giving information on its activities.



Its role and responsibility in European countries

In 2008, the European Congress of Radiology (ECR) will include a Special Focus Session titled 'Women in Radiology'. During an EH interview, Professor Dr Maximilian Reiser, President of ECR 2008 (Vienna, Austria) discussed this and other aspects of the new programme

Prof Reiser: Professor Helen Carty, former president of the ECR, gave an excellent presentation in Munich on the role of imaging diagnostics in the detection of child abuse. This generated very positive feedback. She initiated the idea for the 'Women in radiology' session, and that's how it came about. As an example: In the USA, although a female scientist did excellent work, again and again she found her male colleagues were preferred over her. She simply could not advance her career beyond a certain level. However, after she had a sex change, many of the barriers miraculously disappeared!

Self-confident women won't accept condescension, the patronizing 'We are doing something for you' approach. Today, women in radiology – and rightly so – present their issues point blank, albeit not aggressively. Professor Carty will chair the session and Dr Ertl-Wagner (see article below) will talk about her personal experience in 'Life as a radiologist, before and after children'. Other topics are 'Eastern Europe: Are the issues the same?', 'Family-friendly work patterns: How to integrate them in radiology departments', and a female colleague from Austria, who has lived and worked in Sweden for some years will ask: 'Can you be a good parent and a good academic radiologist?'

We will address two major issues: One: What needs to be done to allow women to reach their full professional potential, despite their obligations as mothers and wives? Two: In everyday radiology life we are experiencing a 'manpower-shortage', which is expected to increase considerably. We simply cannot afford to ignore highly qualified, well-trained women.

As for the general agenda of ECR 2008, as usual there will be the scientific and the continuing education programme, but we will also introduce a new programme specifically geared to junior physicians, still in training. Moreover, there are the so-called Categorical Courses that will deal comprehensively and in-depth with one specific topic, for example multi-slice CT, MRI and breast imaging. Finally, there will be those Special Focus Sessions, which will also include, for example, one on fibroid embolisation, which will be presented by a radiologist, a gynaecologist and a patient.

Isn't this an area where there's a certain amount of competition with the gynaecologists?

To some extent that's correct. For the first time we have invited a patient who has even founded a self-help group on this issue. For years she had suffered immensely from severe menstruations and embolisation, but she was able to keep her uterus – which is certainly very important for her, as a woman.

How will your own influence be seen in ECR 2008?

I think by trying to focus more on the patient perspective, in order to counteract the matter-of-fact and technocratic image of radiology. I want to show that indeed we are – and I am convinced of this – a patient-oriented discipline and that we take the emotions, be it of our patients or our staff, seriously.

Furthermore, I introduced something that I hope will be continued by my successor – a new format called 'Radiology meets Partner Disciplines'. This means, beginning with general practitioners, we want to initiate an ongoing dialogue with other disciplines. We radiologists have two client groups: the patients and, even more important in the daily routine, the referring physician. And it is with the latter that we want to enter into a dialogue. We chose two topics as an ice-breaker: peripheral artery occlusive disease (PAOD) and coronary heart disease (CHD). On both topics we will have general practitioners talking about cases and issues that they are confronted within their daily work and a radiologist will explain the available diagnostic and minimally invasive treatments. For this, we contacted the Austrian and German associations of general practitioners and WONCA, the European Society of General Practice/Family Medicine.

Your predecessors explicitly tried to strengthen the participation of East-European radiologists. Are you continuing those efforts?

Currently, Professor Szczerbo-Trojanowska from Poland is Second Congress Vice-President of the ECR. That is a clear signal and it will not be the end of our activities in this regard. A second region of interest is the Far East. The number of abstracts submitted by colleagues from China, Korea and Japan has increased significantly -- altogether, 20% more abstracts were submitted, which meant we had to reject roughly 67%.

On the one hand, the rejection of a presentation or a poster is obviously sad, on the other the rate of rejections is a clear indicator of the attraction and quality of the congress and its standing in the scientific community. In the end, only the top 30% have a chance to present their work. That means we are number one among the international professional congresses – a fact of which we are indeed proud.

You also asked about innovations. I would like to point out sessions for 2008 that focus on technological developments, such as dual energy CT or whole-body MRI as a screening-modality. One panel member will speak about medical ethics, another on cost issues – both categories that illustrate the social responsibility of radiology and the interface with other disciplines. We want to highlight this and how radiology is embedded in the social context and consequently we will present socially-relevant issues such as 'the demographic tsunami'. In the future, we will be confronted with different kinds of diseases and more people who will need nursing care. How can radiology provide answers to these questions? Norway has chosen innovative paths such as mobile X-ray equipment that can be taken to nursing homes. The Norwegians found out that not only patients prefer to be examined in their familiar environments, but also that the mobile procedure is more cost-efficient. We will have presentations from Oslo titled 'The upcoming geriatric tsunami and its consequences to imaging services' and 'Mobile digital X-ray services for nursing homes'.

That means ECR is successfully integrating marginal areas as well as social developments?

Let me put it this way: each year, ECR is becoming more conscious of its social responsibility.

Life's choices

BALANCING WORK AND LEISURE

Radiologist **Dr Myriam Hunink** is a Professor in the Epidemiology and Biostatistics and the Radiology Departments at the Erasmus MC in the university medical centre, Rotterdam, the Netherlands, where she is also project leader for several research projects focused on radiology and epidemiology.

Among her achievements are a Fellowship in Cardiovascular and Interventional Radiology, at Brigham and Women's Hospital, Boston, USA, and a professorship in Health Policy at Harvard School of Public Health, Boston

The Professor is married and has one teenage daughter. She and her husband, Marijn Franx, who is Professor of Astronomy at Leiden University, had posts at Harvard University before coming to the Netherlands.

During a recent interview, *Daniela Zimmermann* asked why Professor Hunink decided to take up her current role in the Netherlands.

Prof. Hunink: The job at Harvard was a highly regarded and well paid position but, to me, these things are secondary issues. For me it's more important to see what potential a position offers. Who will I work with? What are they offering apart from my own position? Can I combine radiology and epidemiology, will that work out? Those were questions I asked myself and, of course, it was a difficult choice! Here at Erasmus MC I have a 50:50 position: Half the time I'm working in the radiology department, the other half in the epidemiology department. That is what I wanted to do, because I feel that real innovative research occurs where disciplines merge. Most people are either radiologists or clinical epidemiologists, but not many combine those fields. Combing those two fields means assessment research of radiological technology (ART). One very nice example of that work is a randomised controlled trial that we completed recently where we compared CTA and MRA for patients with peripheral arterial disease. In our clinic we randomised patients across these two imaging tests as initial test in the workup of the patient. After the initial test, additional imaging tests were sometimes necessary which could include the reference standard angiography. During follow-up we measured the number and type of additional imaging tests required, patients' quality of life, and costs with the aim of deciding whether to use CTA or MRA as initial imaging test for this indication. Apart from designing the trial and supervising the research, I also read the imaging studies as part of routine clinical practice. In this way I am able to merge my clinical work and my research into one effort.

You asked why I decided to come back to the Netherlands. Well, another issue is a question of mentality: In the United States there is a very strong focus on work, success, and wealth, whereas in the Netherlands people try to balance things more: make time for family and friends, sports, and hobbies; do the things you enjoy and enjoy the things you do.

But I did not completely opt out; I still have an adjunct position at Harvard and teach summer courses every year, which is something I really enjoy doing! I feel that now I have the best of both worlds.

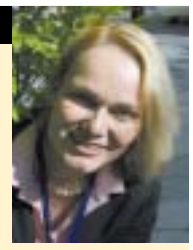
DZ: ***One opinion is that gaining a name in the medical community – maybe even more-so if you are a woman – is connected with living for your work and not caring about any work/life balance, but focusing on the struggle for position. In this case, you are a special case. How can you afford to take that attitude?***

Enjoying life does not mean being unambitious, or not working hard. Of course I'm ambitious in my work and always have been, but ambition to me implies having a positive impact on the people around me, helping others, and improving health care. Becoming a professor was one goal I definitely wanted to reach, but not for financial reasons – I love doing research together with PhD students and I enjoy teaching. I don't have to climb a career ladder anymore. For five years, I was chair of the research advisory committee of the whole organisation at Erasmus MC, which was interesting, but not my job. I am not interested in power, position, and money.

Reaching this attitude today was definitely a process. I had to learn to say no when I recognised that something does not feel good for me. For example, I rarely do any lecturing engagements and I always think twice before I participate in a project that I am not convinced about. And playing games of power just causes me migraine headaches, so I simply don't do it anymore.

Then you are in an enviable position: You reached your goals and are satisfied with that situation. How did you manage it? Was good luck an element that led to your well-balanced life? Did you ever experience any gender bias?

For me, the door was always open. I have never experienced the fact that I am a woman as an issue and I've always been able to do whatever I wanted to do. When moving to the US and back, I always did that together with my husband and we managed to find jobs for both of us at the same time in the same place. So I never had to choose between my family and my own career. But that was not just luck; we did something to achieve that. Nothing came on a silver platter. It's part of networking, saying the right thing at the right time, letting people know that you are ready to move. Finally, if you want to achieve something as a woman in academic medicine I would suggest: Do it with humour, with a smile, stay centred, and most importantly: Be yourself!



Clear goals – even though the priority is 'family life'

A specialist in radiology and neuroradiology, Dr Birgit Ertl-Wagner is senior physician for teleradiology at the Institute for Clinical Radiology, in Grosshadern University Hospital, Munich. She studied medicine at Ludwig-Maximilians University, in Munich, and gained her doctorate for her thesis on neuroradiology at the Max-Planck-Institut Martinsried. She has worked in her profession in the USA, Switzerland and Great Britain. Now aged 37 and with two children, aged 4 and 1½ years, we asked how she manages to juggle a heavy work schedule and family life.

Dr Ertl-Wagner: Balancing children and career is quite a challenge, but my family here in Munich helps me. Additionally, I have a unique function at the hospital: unlike my colleagues, whose responsibilities focus on one imaging modality, mine are more varied. As senior physician for teleradiology I'm in charge of the associated hospitals for imaging diagnostics. Other foci are paediatric imaging and ENT imaging. This broad range of responsibilities offers a certain degree of flexibility, because I'm not attached to one single department. I have a computer at home, so I'm not forced be at the hospital to perform my diagnostic tasks. This means that, even when I am under extreme professional pressure, there's space for me to take care of my children. In terms of family life this arrangement is invaluable.

If you want to balance career and family you have to be open for innovative solutions without losing sight of your objective. After the birth of my second daughter, Hannah, I continued my teleradiology job from home. In addition to the workstation I had a dedicated telephone line between home and the hospital as well as access to the interactive diagnostic portal. I was also in permanent contact with colleagues. Undoubtedly this was not only an untrodden path, but also a difficult one. Imagine there are three emergencies simultaneously and you have to make important decisions very quickly. Nevertheless, I am very glad that I chose that road because it allowed me to take care of my daughter while continuing with my professional life.

EH: You radiate determination, ambition and a clear sense of direction. Have you always known what you wanted to do and how to go about it?

Yes, I've always had very clear goals regarding my academic career. Consequently, I spent several terms in the US during my medical studies and also obtained US degrees, which widened the range of my professional options. I married when I was 25 years old, which means I learned to walk a tightrope between career and family early in my professional life. Nevertheless, during my working life I was also forced to adjust my career path. For example, if you had asked me about my career goals ten years ago I would have said, without hesitation: an academic chair. Based on my academic performance, I was certain that I would be able to reach that goal and therefore went for it in a straight line. Unfortunately, in Germany, to be appointed professor always requires a change of university. That makes it difficult, even for men. This kind of decision often comes up at a time when you are making family commitments. Then you have to carefully consider the pros and cons of a change, whether and how you will deal with it and whether it's worth your while. Then, all of a sudden, on the road you are travelling – which had been straight – you reach an intersection with many roads going in many directions. In my case, one of the road signs said USA, where physicians have many interesting career opportunities. When I reached this intersection I set a priority – and that priority was my family. Life has too many facets to make decisions from only perspective. The challenge is to be creative and also look to the left and right of your road, because that's where the solution leading to your goal might be found

The 91st RSNA

25–30 NOVEMBER 2007 Chicago

CYNTHIA KEEN PREVIEWS THE WORLD'S BIGGEST PROFESSIONAL MEDICAL SOCIETY GATHERING

About 27,000 healthcare professionals from over 100 countries attended RSNA 2006. These included over 5,000 European clinicians. In addition, over 28,000 people from non-US countries manned about 750 exhibition stands.

This year's theme, ***Connecting Radiology***, emphasises the research and education that can emerge when science, technology, ingenuity and patient care are merged within the field of radiology. The conference includes two new major cross-discipline programme tracts: a four-day programme focusing diagnostic imaging and radiation oncology in one specialty each day and a day-long molecular imaging symposium.

The most advanced Italian radiology research programmes will be highlighted in the integrated science and practice session ***Multicentre Trials on Screening and Research***, sponsored by the Italian Society of Medical Radiology.

A day-long mentored case review course on Cardiac CT is being co-sponsored with the North American Society for Cardiac Imaging.

The ***Eugene Pendergrass Lecture*** will be presented by MRI and CT densitometry expert Dr Elias A Zerhouni, Director of the National Institutes of Health, the USA's pre-eminent medical research organisation consisting of 27 research institutes and centres. Dr Zerhouni oversees NIH's annual medical research budget of $27 billion.

The status of past, present and future breast imaging will be the topic of the ***Annual Oration in Diagnostic Imaging***, presented by Professor Lawrence Bassett, head of breast imaging of UCLA Healthcare (Los Angeles).

For The Annual Oration in Radiation Oncology, Dr Allen S Lichter, currently CEO of the ***American Society of Clinical Oncology***, will discuss the cost of cancer care from the perspective of near-term strategies and long-term solutions.

More than 200 scientific sessions representing 16 subspecialties are scheduled for 1,500 presentations. 1,300 educational poster and computer exhibits will be displayed.

A two-day series of refresher courses will be presented in high-res chest CT, gastrointestinal, paediatrics, breast imaging, neuroradiology, ultrasound, nuclear medicine, and interventional radiology.

A variety of special focus sessions include one that presents the differences between European and North American perspectives of radiation dose for MDCT.

Apt for our times, two courses will focus on the role of radiologists following natural or terrorist disasters.

Radiation oncology, in head and neck, gastrointestinal, thoracic and prostrate cancers, will receive special attention in BOOST (Bolstering Oncoradiologic and Oncoradio-therapeutic Skills for Tomorrow) a programme in which each will be discussed by experts in radiology oncology, diagnostic radiology, biology and physics. The focus will be on precision imaging.

Quality control in radiology: As a result of a survey by the RSNA's Continuous Quality Improvement Initiative Committee, a new day-long, multi-session symposium will be offered. The ***Quality Improvement Symposium*** will discuss principles, methods, measurement metrics and examples to provide tools for implementation of a quality control programme that the American College of Radiology and the RSNA would like to see all radiologists undertake. Dr Lawrence S Lau, chairman of the International Radiology Quality Network, will moderate a session demonstrating quality improvement cycles with specific examples. Also associated with the Symposium is a course showing how IT can help to create a systems approach designed to measure and minimise radiology errors.

The international initiative ***Integrating the Healthcare Enterprise*** (IHE), will this year emphasise its ***Image Sharing Demonstration***, which also extends to exhibitors in the Technical Exhibition. One demonstration area will feature products compliant with the IHE Teaching File and Clinical Trial Export (TCE) profile, systems that will send images to the most recent prototype of the RSNA's ***My MIRC Files*** – a new Web-based file system that enables radiologists in academic and clinical practice to digitally store teaching files.

If, despite all this, you find spare time, Chicago is a vibrant city indeed.

MRI IN EUROPE

It's time to end the uncertainty

By **Joe McEntee**, Editor of *medicalphysicsweb*

What a difference a few days can make. The last week in September kicked off with more dire warnings about the potentially disastrous impact that the Physical Agents (Electromagnetic Fields) Directive 2004/40/EC will have on the use of MRI in clinical practice and medical research across the European Union (EU). Fast forward to the weekend, however, and it now appears that common sense is set to prevail and the doomsday scenario - the end of MRI in Europe as we know it – will be averted. 'It looks as if the Directive will be delayed for four years to allow for substantial amendment,' a source close to the matter told *medicalphysicsweb* on the Friday.

For the uninitiated, the controversy surrounding the EMF Directive needs a bit of explaining. The Directive was drafted and proposed by the Directorate-General (DG) for Employment and Social Affairs within the European Commission (the executive branch of the EU) and subsequently rubber-stamped by the European Parliament and the Council of Ministers. As things stand, it must be incorporated within the national legislation of the 27 EU member states by April 2008.

In terms of the underlying motivation, it's hard to find fault: the Directive is intended to protect the health and safety of workers who come into contact with electromagnetic fields – among them clinical and research staff who to carry out MRI procedures. The trouble is, the scientific evidence points to a number of situations in which MRI workers exceed the proposed exposure-limit values for low-frequency, time-varying magnetic fields set out in the Directive. One example is interventional MRI, where the interventionalist is very likely to be positioned within the gradient-coil field to be able to reach the patient.

There are other problems, stemming from the fact that the gradient fields actually spill beyond the end of the magnet bore for most scanner designs. In practical terms, this means it will no longer be possible for an anaesthetist to stand by a patient who is unconscious, or for a nurse to stand by a nervous child. The ultra-low frequency limit will also prevent engineers climbing into scanners to maintain them, without costly magnet ramp-downs. It may even prevent staff walking around most magnets, or standing by magnets and turning their heads rapidly.

The case against

All of these issues, and more, were revisited at the European Cancer Conference (ECCO 14) in Barcelona, Spain, earlier this week. Dag Rune Olsen, chairman of the physics committee of the European Society for Therapeutic Radiology and Oncology (ESTRO), told a press conference on Monday that the eight million MRI patient examinations carried out across the EU every year will have to stop if the Directive is enacted into law in all the member states. 'The Directive sets limits to occupational radiation exposure which will mean that anyone working or moving near MRI equipment will breach them, thus making it possible for them to sue their employers. Even those maintaining or servicing the equipment may be affected.'

A study by Stuart Crozier of the University of Queensland, Australia, into operator exposure to electromagnetic fields from MRI, published by the UK Heath and Safety Executive (HSE) in June, found that anyone standing within about one metre of an MRI scanner in use would breach the exposure limits laid down in the Directive. The EC has accepted the Crozier findings, and says it will consider the HSE report together with the study it has commissioned itself (an interim report is due at the end of October) when deciding whether to amend the Directive or to extend the period before implementation.

Olsen, like many fellow physicists, clinicians and the MRI equipment makers, advocates an evidence-based approach to the EMF legislation. 'Policy-making should be based on sound science, and to my knowledge there is no scientific evidence of long-term adverse health effects of exposure to static or fluctuating magnetic fields that are commonly found during MR scanning. Hasty decisions without scientific support will in this case have a severe impact on medical diagnostics and must thus be avoided,' he noted in Barcelona.

Watch this space

What's certain is that all the legal uncertainty currently surrounding MRI practice in Europe is in no-one's interest – not the clinical community's, not the research community's, not the equipment makers' and most definitely not the patients'. The good news, however, is that the battle for hearts and minds in Brussels, and more specifically in the DG for Employment and Social Affairs, appears to be moving decisively in favour of lobbyists for the MRI community, *medicalphysicsweb* has learned.

Our source confirmed that the *Alliance for MRI*, a lobbying group established by the European Society of Radiology earlier this year, has won round senior political advisers within the Directorate-General. 'They [the advisers] can see the big picture and realize that the Directive [in its current form] is a big problem – political suicide. We're 90% certain that the European institutions will agree to the proposed four-year delay,' he explained.

Word is that the Commission will issue an official announcement on the status of the EMF Directive the week beginning 8 October. After that, the proposed delay to the Directive's implementation must go before the European Parliament and then the Council of Ministers (though legal advisers in the Commission have apparently agreed to accelerate the process with a view to a November sign-off for putting things on hold).

Political machinations aside, assuming the Directive gets parked – and that's still not officially confirmed, remember – the hard work of redrafting will begin almost immediately. It is to be hoped that the conclusions of the Crozier study, as well as the Commission's own investigation into EMF and MRI, underpin an evidence-based approach to any ongoing technical re-evaluation.

• *See also: 'Numerical models map MRI's impact. Watching the directives: big trouble for MRI and Probing MRI-induced electric fields' on medicalphysicsweb.*

Near-infrared contrast agent reveals microcalcifications related to breast and bone cancer

Near-infrared fluorescence mammography works with rays of near-infrared (NIR) light instead of X-rays. Although this is thought to be a very promising technique, there have been no effective contrast agents.

However, John V Frangioni and team at the Beth Israel Deaconess Medical Centre of Harvard Medical School in Boston, Mass., have developed a contrast agent that shows up microcalcifications related to malignant breast tumours. The researchers report in the Angewandte Chemie International Edition 2007, that in validation trials using pigs, their new contrast agent distinguishes specific calcium salts in soft tissues and depicts bones.

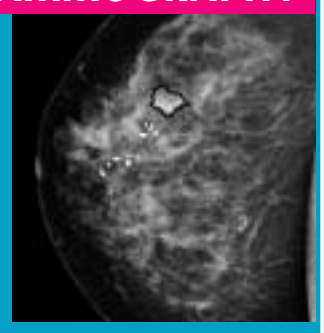
The researchers used the drug pamidronate (a biophosphonate, used to treat osteoporosis and bone metastases in breast cancer) as the basis of their NIR contrast agent. To this they attached a dye that absorbs light and fluoresces in the NIR region of the spectrum. Light in this region of the spectrum penetrates live tissue particularly well and without damage; it is also easy to detect.

Due to the development by Kumar R Bhushan of a simplified, reliable synthetic route to a new pamidronate derivative, the team has synthesised enough of a Pam800 contrast agent to run a trial with large animals. (Intravenously injected Pam800 shows up pig bones with very high sensitivity). When hydroxyapatite is injected into soft tissues, the contrast agent marks only the tiny hydroxyapatite crystals with high selectivity and sensitivity, which could allow it to selectively reveal malignant abnormal tissue, the team point out. The pig trials demonstrated that the use of real-time NIR fluorescence images could even enable image-guided surgery on soft tissues and bones.

MAMMOGRAPHY

Screening

It's time to examine the quality of diagnostic reporting



Switzerland - European experts presented and debates that controversial topic – breast cancer screening programmes – during a September symposium organised by Carestream Health.

Almost all EU countries have established screening programmes, which have lead to an impressive increase in early detection rates compared with those before these programmes began. The conclusion is that the breast cancer mortality rate – the most common cause of death in women – could be decreased continuously. However, the number of late detected carcinomas is still considerable.

Henny Rijken and **Prof. Roland Holland**, of the National Expert and Training Centre for Breast Cancer Screening, in Nijmegan University Hospital, the Netherlands, focused on the role 'quality of diagnostic reporting' plays in a successful screening programme. 'The Netherlands' screening programme is well-established nationwide,' Henny Rijken said. 'We now have to look behind the facts and figures of our current statistics and ask how we can improve the results. That's why we examined the differences in the quality of diagnostic reporting. In the Netherlands, due to very strict rules and guidelines, the technical equipment everywhere is based on the same foundation. However, of course there are differences in the reporting quality – for example concerning recall rates that, in general, can be said to be low. In our opinion, one reason for missing a carcinoma at an early stage could be that the number of women invited for further examinations – which could clarify any uncertainty – is too low. This can be seen from figures coming from areas with an above average recall rate that also have above average detection rates. On the other hand, there are areas where the recall rate is equally high, but with a less optimal detection rate. In that case the knowledge and experience of the radiologist might play an important role for screening success,' he pointed out.

The statistics presented by the Netherlands duo prompted serious discussions about ways to further improve screening quality and therefore save more lives.

Dedicated to mammography

SecurViewDX diagnostic workstation

Hologic will be one of the biggest exhibitors at the *93rd Scientific Assembly and Annual Meeting of the Radiological Society of North America* (RSNA).

Following the recent acquisition of BioLucent and completion of a merger with Cytyc, Hologic Inc – which specialises in diagnostic and digital imaging systems for women's imaging and skeletal health – will have increased its size by over 50% in 12 months. Additionally, the Cytyc merger will place Hologic in top position in nine technology areas serving women's health.

At the RSNA, new products will include the *MammoSite* for targeted radiation therapy. Hologic explains that this 'works from the inside, meaning that a higher daily dose can be used for a shorter period of time – five days versus five to seven weeks. MammoSite places the radiation source inside the lumpectomy cavity (space left after tumour removal). This delivers radiation to the area where cancer is most likely to recur. The therapy is given on an out-patient basis.'

Another product, *Selenia*, accounts for almost 6 in 10 digital mammography systems installed in the USA in 2006. 'FDA monthly MQSA statistics show significant growth in the category – in the last 12 months digital mammography penetration grew 77% (from 1,235 to 2,198 sites),' says Hologic, adding that it also has a strong presence globally. The *Selenia S* digital mammography system has been specifically designed for the screening mammography facility or mobile environment,' Hologic adds. 'This uses the Hologic direct conversion detector, eliminating the need to convert X-rays to light producing an exceptionally sharp digital image with better contrast and detail. Selenia S can easily be upgraded to include all diagnostic tools available.'In the new *tungsten x-ray tube option for Selenia*, the tube is combined with a silver filter that allows images to be acquired at a lower dose without losing the superb image quality, Hologic points out. 'The silver filter's intended use is for imaging thicker breasts with both lower dose and shorter exposure times to eliminate problems with patient motion. Hologic is the first company to introduce the use of the silver filter with a tungsten tube in digital mammography. Systems shipped with the tungsten tube option will be calibrated to have a minimum of 30% reduction in dose, for a 4.5 cm breast, compared to Selenia/Molybdenum systems. Users have the option of choosing even lower dose settings, based on individual site preferences.'

Selenia

The multitude of other products Hologic will present include

- ***SecurViewDX*** diagnostic workstation
- ***Hologic R2 CAD*** that offers sophisticated pattern recognition software to help find early stage cancers with greater certainty
- ***MammoPad***, a breast cushion to reduce discomfort.
- ***Suros ATEC*** (Automated Tissue Excision and Collection) breast biopsy system
- ***Suros Celero***, a new vacuum-assisted spring loaded core biopsy device for breast ultrasound

Self-assessment workshop

Visitors to the RSNA also can sign up for a module or two in the Dr Roland Holland and Henny Rijken Digital Mammography Workshop.

Immune system not affected by radiation therapy

Two commonly used radiation treatments for early-stage, node-negative breast cancer have been found to have no effect on the immune system, and women who receive five-day partial-breast radiation therapy* (PBRT) have improved energy and quality of life compared with women who undergo six weeks of whole-breast radiation therapy (WBRT). These conclusions were drawn from a study, by a team of researchers** led by Dr Kevin Albuquerque, radiation oncologist at the Cardinal Bernardin Cancer Centre, Loyola University Health System, Illinois, USA, Albuquerque, and presented at the Canadian Association of Radiation Oncologists (CARO) 2007 meeting.

WBRT has been the standard treatment for early-stage, small-tumour, node-negative breast cancer. However, both PBRT and WBRT are now commonly used in cancer centres throughout the USA and Canada. Dr Albuquerque added that PBRT is a viable option for women who are eligible, and added that the study could help many women facing treatment.

The study: 30 women aged 45 years+, who had a lumpectomy for early stage, small-tumour, node-negative breast cancer were divided into two groups – i.e. to receive WBRT or PBRT. All the patients partook in psychological tests five times during the study: first, pre-treatment, then three weeks after radiation therapy ended, then six, nine and 15 weeks after therapy.

The tests measured tension, depression, anger, vigour and fatigue; well-being at emotional, physical, functional and social levels; plus aspects specific to breast cancer: appearance, illness, treatment side effects and sexuality. At the time of each test, blood samples were collected to assess natural killer cell activity and the number of circulating lymphocyte subsets, indicators of immune system function.

WBRT targeted the entire breast with large-field radiation, while limiting risk to adjacent healthy tissue.

With PBRT, a catheter is left in the woman for five days. When the patient comes for treatment, this catheter is attached to a machine that delivers a radiation 'seed' for therapy. After each treatment the seed is removed and the patient leaves. No radiation seed remains in the breast overnight.

Six weeks after therapy, said Dr Albuquerque, the PBRT women '… perceived their life is not so drastically changed. At nine and 15 weeks, the PBRT women perceived less stress than the WBRT women. When analysing six-week data for change from baseline, women who had been treated with PBRT had improved energy and quality of life compared with those who had received WBRT.'

** MammoSite brachytherapy*

*** Loyola researchers: Linda Janusek PhD RN and Linda Millbrandt RN; radiation oncologist Dr Philip Lobo, Northwest Community Hospital; Herbert Mathews PhD, professor of microbiology and immunology, and breast cancer surgeon Dr Sheryl Gabram (now at Emory University School of Medicine, Atlanta)*

MAMMOGRAMS OR MRI SCANS?

X-ray based mammograms detect only 56% of early lesions in high risk women compared with 92% when MRI scanning (mostly used for brain scans), according to a study by Christiane Kuhl and colleagues at the University of Bonn (pub: the *Lancet*. 8/07).

Almost all breast cancers begin with non-invasive cancerous cells in the milk ducts. 'If you picked up all cases of ductal carcinoma in situ [DCIS] you'd prevent virtually all cases of breast cancer. Our finding that MRI is superior to mammography in detecting it turns things upside down,' said Dr Kuhl.

During the study, 7,319 women were referred from screening programmes after they had breast cancer or had a family history of the cancer. After scanning, 167 women were diagnosed with DCIS, 92% through the MRI but only 56% by mammogram. In women with the most severe DCIS – most likely to lead to a diagnosis of breast cancer – MRI detected 98% and mammography 52%.

Due to costs and time, generally only younger women at high risk of breast cancer are offered MRI scans. However, there is also concern that more rigorous screening would over-diagnose a condition that, in around 75% of cases, does not lead to cancer.

Some specialists point out that the study was only based on a small sample of women, younger than 50-70 years old – a group in which MRI is more effective due to the denser breast tissue. Others suggest further studies be carried out.

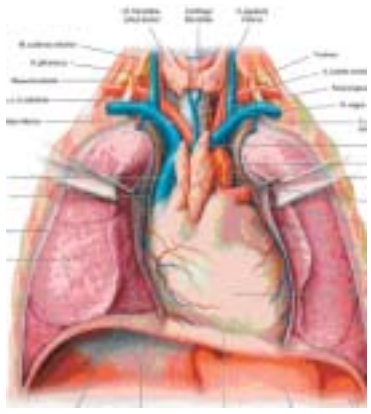
Virtual anatomy

A NEW WAY OF TEACHING AND LEARNING

By Frederik Giesel MD

A comprehensive knowledge of the topographic relationships of anatomical structures is a must for all doctors. Topographical knowledge used to be taught mainly through the preparation of human bodies and was then put into practice and intensified during surgery.

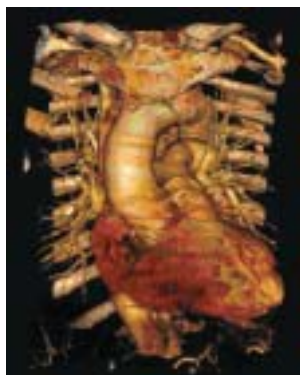
However, in modern medicine non-invasive imaging procedures, such as ultrasound or split-imaging procedures, e.g. computed tomography (CT) and magnetic resonance imaging (MRI), are now also of decisive importance for diagnosis and therapy planning in non-surgical medical disciplines. To meet this increased demand, even at the training stage, imaging procedures will play a more significant role in the way medicine is taught.



a) Organ of the thorax (heart and lung) from the anatomic atlas Sobotta, Elsevier

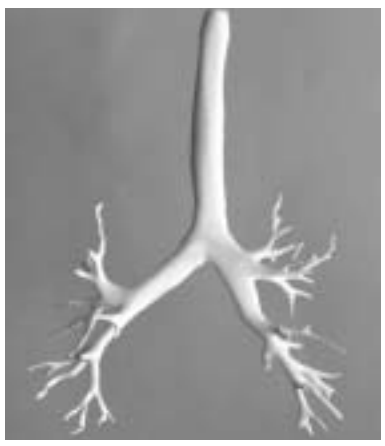
Recently, medical students at the Medical Faculty of University of Heidelberg have been able to learn about radiological split-image procedures right from the beginning of their studies, alongside the more classical learning about anatomy using human bodies. The Institute for Anatomy and Cell Biology recently began to offer a practical course in abdominal ultrasound, along with a 'Virtual Anatomy' seminar, in intensive co-operation with the Radiology Department of the German Cancer Research Centre.

The Virtual Anatomy seminar* aims to train students in their ability to interpret and process CT and MRI images at the computer. As the preparation course and the seminar are run at the same time the students can put the different imaging procedures in direct relation to one another. In addition, the use of powerful computers facilitates visual representations known as virtual preparation with the support of advanced medical imaging software (3mensio, *developed by the software development company 3mensio Medical Imaging BV, in The Netherlands*) (b). Besides this virtual approach 3D print models (supported by VitalRecon) out of digital CT data will enhance the 3D learning in especially in challenging anatomical structures (c).



b) 3D volume rendering of the lung based on isotropic CT data using 3Mensio post processing software.

Both seminars are run like 'hands-on workshops' offering practical exercises under the supervision of experienced tutors and lecturers. Upon the conclusion of the very successful trial phase both seminars are now to become integral parts of the core curriculum.



c) 3D rapid prototyping model based on isotropic CT data.

* *Initiated and developed by Sara Doll and Frederik Giesel MD, of the German Cancer Research Centre, Heidelberg.*

Kindly supported by VitalRecon™ and 3mensio Medical Imaging BV.

The International Brain Mapping and Intra-operative Surgical Planning Society

4TH ANNUAL WORLD CONGRESS

At the opening of the 3-day IBMISPS congress, held in Washington D.C., which focused on image guided therapy, interdisciplinary interaction and intervention, **Babak Kateb**, founder and executive director of IBMISPS, said: 'The ultimate mission for IBMISPS is to bring technology, cutting edge research and medicine to those who needed the best.' A key technology in brain mapping and intra-operative imaging, he added, will be nanotechnology.

John Haller PhD, director of the division of applied science and technology at the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at NIH, confirmed that intra-operative imaging is a high-priority area for the NIBIB.

With an annual investment of $3.8 billion more than 130 nanotech drug or delivery systems are already in development.

One such development is the use of Superconducting Quantum Interference Devices (SQUID's) as a detector to perform magnetic resonance imaging (MRI). This technology relies on the use of super-cooled and very sensitive MRI conductors, resulting in enhanced imaging of biological tissues without the need for radiocontrast agents – which have shown adverse effects, the latest is the possible cases of nephrogenic systemic fibrosis in patients with severe kidney failure seem to be associated with the application of gadolinium.

Furthermore, unlike high-field MRI, that uses precession fields of up to several tesla, the SQUID-detected MRI uses measurement fields that lie in the microtesla regime. 'Such low-radiation devices could be used for research of the foetal brain', explained Lt. Col. Christian Macedonia MD, during his scientific session *Imaging research opportunities directed toward a better understanding of the assembly of the human brain*. They also could be the solution for the challenges associated with the EU directive 2004/40/EC, with its strict electromagnetic field exposure-limit values. Although clinical communities, research communities, industry and patient groups are sure that the European Parliament will agree on a four-year delay or modification of the directive soon, the uncertain future of MRI practice in Europe is actually a big problem.

Deriving from the SQUID technique, NASA currently develops a low-weight, cryogen-free, ultra-low-field MRI prototype-system. Although being developed for space flight this new MRI system could also well be used on earth, as it is capable of imaging patients with metallic implants without significant distortion.

In more than 70 sessions specialists from a range of medical disciplines were informed about other brilliant inventions. The lecturers also pointed up, that existing technology also has a lot to offer.

Dr Mike Modo BSc MSc PhD, Wolfson Lecturer in Stem Cell Imaging, recited on *MRI-guided Transplantation of Neural Stem Cells in Stroke*. Neural stem cells could be used to replace cells that were lost during acute brain damage, e.g. a stroke, or chronic neurodegeneration, such as Parkinson's or Alzheimer's disease. However, transplantation of neural stem cells is still an experimental treatment. Limited survival of the grafts is a major disadvantage and the process is as yet poorly understood. 'But MRI is a core technology to monitor the extension of the suffered brain damage prior to stem cell treatment and helps neurosurgeons to determine, where stem cells have to be transplanted,' Dr Modo explained.

Piotr Walczak MD, of John Hopkins University School of Medicine, picked up the theme. In the Institute for Cell Engineering researchers developed a method that enables tracking of transplanted neural stem cells in vivo by using Bioluminescence and MRI.

The event was a huge success and there was such a wealth of information presented, that the IBMISPS organising committee decided on a one day extension of their next Annual World Congress (Los Angeles. 26-30 August 2008).

PEDS – PROVOTEC Economical Digital System

Provotec GmbH & Co. KG, based in Espelkamp, Germany, reports that its *Prognost XPE table series* is being sold in the USA and internationally. 'The mobile patient positioning table with motorised elevating and floating tabletop allows variable patient positioning as well as the optimal use of modern X-ray tube/image receptor combinations. Using a fixed working height but the advantage of a mobile table with the floating table top than the Prognost XP is the right choice. Neither line cable nor electricity is necessary.'

All versions can be equipped with a Bucky, cassette holder with fixed grid or detector holder for transportable digital panels, and are moveable longitudinal under the table top, the manufacturer adds.

The firm has also extended its product range with PEDS – complete fully digital X-ray systems with ceiling or floor tube stand, generator, DR detector, digital radiographic control console and Prognost XPE table. 'Due to special detector housings the systems can be configured with different types of detectors,' Provotec adds.

The digital radiographic control console provides complete control of all image capture functions within the examination room, as it controls the detector and X-ray exposure equipment while providing upstream connectivity to the hospital HIS/RIS and downstream connectivity to DICOM workstations, archives and printers. In addition, the equipment provides '…excellent post-processing tools for image quality assurance'.

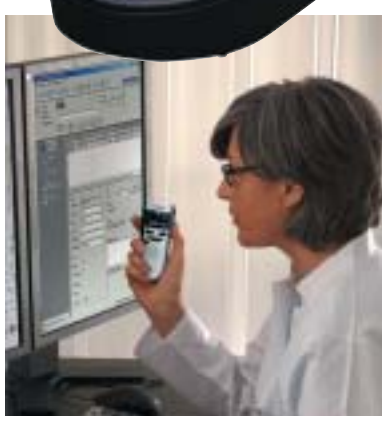
Basic functions:
DICOM Print features,
DICOM Storage SCU, -SCP
DICOM Storage Commitment SCU, -SCP
DICOM Query/Retrieve SCU, -SCP.

A selection of further software packages includes DICOM worklist, MPPS, a barcode reader, advanced image processing software, and stitching software.

The equipment will be on show at RSNA 2007 (Hall A, booth 1977A, in the German Pavilion).


The Prognost XPE table

Dictation on the move



To increase speech processing potential for heavy dictation users, Grundig Business Systems GmbH, of Bayreuth, Germany, recently introduced its first mobile dictation recorder with colour display and *Soft Touch Composite*. 'The *DigtaSonic 420* has a clear, bright colour display that shows all functions as symbols, while menus are available in a choice of nine languages,' Grundig reports. 'The ergonomically shaped, high-quality casing features the new Soft Touch Composite finish and a smooth, rubberised coating designed for extra grip and comfort; while the familiar slide switch makes for easy, one-handed, intuitive operation.'

Grundig Business Systems supports the DSSPro voice standard, which provides not only the highest voice quality but also ensures greater security, the manufacturer adds. 'Voice files are encrypted during the recording of a dictation and a PIN-style password safeguards sensitive recordings from unauthorised access.'

This dictation machine is geared for the power user so can be tailored accordingly. The 128 MB internal memory should allow up to 20 hours of voice recording, with extra capacity available via DigtaCard memory cards. It also can be used as a fully functional desktop USB microphone via the USB interface. As well being mains chargeable, the device can be used with batteries, which ensures even longer dictation periods when on the move.

Details: www.grundig-gbs.com

€900 million for molecular imaging R&D

The Technology initiative „Molecular Imaging“ aims to strengthen the synergies of science and industry in research and development of new technologies in order to significantly improve diagnostic and treatment options, for example for cardiovascular diseases, cancer or Alzheimer's.

It has been agreed by the German Ministry of Education and Research with medical technology and pharma heavyweights *Bayer-Schering Pharma*, *Karl Storz*, *Carl Zeiss*, *Boehringer Ingelheim* and *Siemens*. Over the next few years the ministry will provide €150 million for collaborative projects, and the industrial firms will contribute €750 million to develop new processes.

During the launch of the alliance we asked members of two of the participating companies about their roles.

Be it imaging or therapy – a suitable marker is the key to success

The Bayer Schering Pharma task could be compared with seeking a pin head on a sandy beach: the modified molecular structure of millions of cells has to be identified and made visible with a marker. However, as the firm's research director **Professor Andreas Busch** pointed out, each marker found will advance imaging and therapies.


Prof Andreas Busch

AB: Much in molecular imaging is still a vision of the future, including the identification of suitable markers. But there is high potential that can and will be exploited. That means we are working towards a clearly defined goal and we have the tools to reach it. The initial steps are very similar to those in therapy development: we look for highly specific targets. When researching therapies we also must first know which protein or which receptor will be targeted in order to achieve the desired therapy results. Imaging diagnostics works the same way: we are looking for target structures associated with a certain disease. If we can mark them – the objective of our research – we will be able to detect anomalies at a very early stage. We need molecules that bind to specific locations and carry a signal that can be detected with imaging modalities such as a PET-CT.

EH: ***As a pharmaceutical company how do you benefit from imaging modalities?***

Obviously, our thoughts go beyond mere imaging. Wherever possible we'd apply newly acquired knowledge for therapies, for example, in cancer. Today we already use antibodies – that is, proteins with the potential to detect and bind highly specific cell structures. If you combine those antibodies with a signal transducer the result can be used in imaging. Linking imaging and therapy would allow the steering of the agent to the specific direction of affected tissue. The combination of these possibilities is particularly promising: Imaging can predict whether a drug will impact on the affected tissue. If so, in a second step the drug would indeed impact on the tumour cells and the surrounding healthy tissue would remain unaffected.

The development of new imaging procedures and new therapies has to be hand in glove and is closely linked to research. Consequently we want to involve molecular imaging very early in the development of new products and – the other way round – use new research findings. Key questions are: Which imaging modalities can accelerate the approval process of new drugs? How does the further development of new therapies impact on imaging procedures? These issues will stay with us even beyond our objective – namely to detect diseases early with molecular imaging. We will find the answers, I'm sure.

Karl Storz GmbH & Co. KG, which has specialised in endoscopes and related equipment for over 60 years, produces an endoscopic system that applies both external markers and auto-fluorescence processes to detect early malignant and pre-tumour cell clusters in many organs. **Dr Martin Leonhard**, the company's director of technology management explained that the advantage is that endoscopy allows diagnosis and minimally invasive removal of malignant cells in one session.


Dr Martin Leonhard

EH: ***If diagnosis and therapy could happen in one step, why would a patient need endoscopy?***

ML: Obviously, the different procedures have different foci. The aim of imaging procedures is to provide best possible detection. The current scientific consensus is that optical procedures are the most sensitive. It's highly unlikely that procedures that aren't even known yet will be developed within a six-year programme. There is no detection technology beyond fluorescence, PET-CT or MRI in the pipeline. However, the future might well bring about interesting technologies.

The most important aspect of this initiative – for Karl Storz – is to have constant exchange with developers and manufacturers of new markers, or even CT scanners. There are two different worlds in the medical galaxy: the world of pharmacological markers that can detect substances and tumour-specific mechanisms and add certain labels; in the other world are procedures and modalities to detect and visualise those markers. The latter may be the task of an endoscopic fluorescence-optical procedure.

Don't you already work with markers and tracers?

Currently we are looking at the first generation of molecular imaging. With a fluorescence-optical procedure we can visualise a substance that already exists in the human body and whose concentration was increased to affect the tumour via a molecular mechanism. When it comes to localising minute tumours, fluorescence-optical procedures are superior to MRI, CT and even PET. Additionally, this procedure offers the advantage that a tumour can be removed immediately upon detection. We developed and have an approved system for urology that enables early detection of bladder cancer – in one step we can diagnose and remove a tumour.

We have developed procedures not only for the bladder but also for other organs, including a fluorescence-optical procedure to detect lung cancer and for neurosurgical applications. Procedures for cancer of the colon, oesophagus and ENT are under development. Our vision is to be able to use markers to visualise certain tumour types more specifically. That's also the aim of our partners. There is room for improvement in the precision of the procedures as well as instruments: more sensitive optical detection tools must be developed, miniaturised and made available for medical applications.

Do you co-operate with Zeiss in this respect?

A Karl Storz fluorescence-optical procedure established for endoscopy was transferred in a joint project with Carl Zeiss to surgical microscopes used in neuro-surgery. With this co-operation we want to use locally available expertise in Germany today and in the future. That's positive for all of us involved in the initiative. We consider ourselves a public initiative, which is open to all German firms. Everybody who participates in the initiative will benefit, not just the five founding members. The launch of the initiative may well be regarded as a public call for participation addressed to other companies.

What about competition?

The funded projects will be pre-competition projects. No doubt suitable consortia will be formed. In any publicly-funded project you have to face competitors. For us in endoscopy fluorescence diagnostics our market position is very strong – research shows our market share is 80% for these new technological procedures. We don't need to fear competition.

If this initiative is successful, will politicians also have to follow through?

Indeed. Our competitors are not just across the street; they're all over the world – particularly in the USA. So German research platforms need to be supported.

I strongly urge everyone to look at a healthcare system not just in terms of costs but also in terms of market opportunity. It is a large market that affects the labour market, which is important for Germany's economy as a whole and exporting in particular. The overall economic significance of the medical technology industry is often underestimated. It is important that developing technology from such a pioneering consortium can and will be sold in this country. That is a crucial aspect that has to be taken into account in health policy concepts.

GADOLINIUM-CONTAINING CONTRAST MATERIALS

'Why all the fuss in 2007?' asks **Peter Gross MD**, Professor of Medicine and Nephrology at the C G Carus University Hospital in Dresden

Medical imaging is a first order boom area. In many instances iodine-containing contrast materials (I-CM) are highly efficient in improving the diagnostic power of imaging even further. An I-CM is disposed of by the kidneys. Due to the renal concentrating mechanism, this results in renal intratubular levels of I-CM that are multi-fold (up to 100-fold) higher than their concomitant plasma levels. Healthy kidneys take this challenge in their stride. However, damaged or impaired kidneys (chronic renal failure; diabetic nephropathy; proteinuria; dehydration; presence of hypertension or congestive cardiac failure; old age) will often react differently and go into acute renal failure (ARF is also termed acute kidney injury) temporarily. While the incidence of ARF after I-CM in normal kidneys approaches zero, the incidence may be 3-20% in patients with damaged or impaired kidneys, depending on the number of attendant risk factors. A few prophylactic measures against this ARF have been established: appropriate plasma volume expansion with 0.45 or 0.9% NaCl before I-CM and use of iso-osmolar, non-ionic I-CM (e.g. iodixanol) for the respective X-ray studies or CTs. Nonetheless, the absolute numbers of I-CM induced ARF apparently have not fallen. This appears to be explained by the ever increasing 'load' of risk factors in today's patient population (increasingly old, the increase in diabetes mellitus and more frequent chronic renal failure, etc) offsetting progress made in prophylaxis. Hence the intense search for alternative techniques and CMs

In this context magnetic resonance imaging (MRI) and Angio-MRI, both using Gadolinium containing CM (Gd-CM), have received considerable interest. It became standard procedure to refer patients at significant risk for I-CM induced ARF (after X-ray studies) to Gd-CM involving MRI whenever possible. This appeared justified by research demonstrating a marginal or even non-existing incidence of ARF after Gd-CM in patients with risk factors – as long as a maximal dose of Gd-CM of 0.3 mmol/kg BW was heeded. (At this dose, imaging contrast in MRI is sufficiently excellent).

The 'blind confidence' in the non-toxic nature of Gd-CM in patients with risk factors went further. Radiologists


Peter Gross

proceeded to use Gd-CM for X-ray studies such as angiography and CT. However, Gd-CM had been developed for contrast under conditions of magnetism not radiation (X-ray). Hence technical limitations forced a 2-6-fold increase of the dose of Gd-CM when used 'off-label' in X-ray studies; otherwise adequate imaging would be unattainable. Therefore, it was frequently possible that the upper limit of recommended Gd-CM dose of 0.3 mmol/kg BW would be transgressed. Nonetheless, the use of Gd-CM for X-ray, and often at these high doses, was considered acceptable.

Given these circumstances it is not surprising that a backlash occurred. On the one hand several recent reports suggested that Gd-CM may also occasionally cause ARF in patients with risk factors. It is true that these kinds of ARF are mostly reversible and short lasting; however, they are costly, burdensome and prolong hospitalisation. Above all else, they are in a way iatrogenic. The aura of Gd-CM now has a shadow.

On the other hand, an obviously pernicious new syndrome has been reported, with increasing frequency, mostly in the last two years: Nephrogenic systemic fibrosis (NSF). Its occurrence appears to be limited to only a few – reportedly 2–3 % – of those patients that received Gd-CM while having an estimated glomerular filtration rate (eGFR) <30 ml/min (some say <60-30 ml/min) i.e. in patients with a significant risk factor burden. Conversely, NSF has been almost totally absent from chronic renal failure patients who had never had any exposure to Gd-CM. Those affected by NSF suffer what is vaguely reminiscent of scleroderma. There will be increased and hard connective tissue primarily in the extremities. In some patients the condition may cause an inability to use hands or changes involving the feet may confine them to a wheelchair; in others NSF may progress to involve internal organs, potentially leading to death from pulmonary or cardiac failure.

At this time a little over 250 cases of NSF have been described worldwide. The causation of NSF by Gd-CM has not been proven rigorously and some believe that it is multifactorial in nature. However, the context of NSF and Gadolinium is highly suggestive and hence most physicians are convinced that the relation will turn out to be real. The pathogenesis has remained largely unclear. There is no known therapy that works reproducibly. In terms of potentially triggering NSF, it is uncertain whether or not some of the 6 Gd-CM presently on the market are 'safer than others'. Most observers believe it is rather a class effect of all Gd-CM that is involved in NSF.

German health authorities (BfArM) have embargoed some Gd-CM, meanwhile (Omniscan, Magnevist) when there is an eGFR <30 ml/min. (Omniscan and Magnevist are the 2 Gd-CM with the biggest world market share at this time). In the same context, the BfArM warns against the use of the other Gd-CM. Health Authorities in many other countries have been quick to install comparable measures in the past.

In the future more scientific data will be necessary; we must learn the pathogenesis and we have to find efficient approaches to prophylaxis and therapy. Imaging and contrast enhancement are now essential to physicians and highly advantageous to patients, so their further progressive development must not be slowed by serious adverse events, such as those described here. Towards those ends a registry for cases of NSF has just been established in Germany by the Nephrologische Gesellschaft. In the USA a registry of this kind has been in existence for a little longer (Yale University Medical Centre).

Seeking biomarkers

On the path to customised medicines


Dr Andrew Plump

The term 'molecular medicine' has quickly become synonymous with brilliantly revealing images produced by innovative imaging techniques, new biomarkers and contrast agents. At Merck Research Laboratories (MRL) a team of researchers led by **Dr Andrew Plump**, the firm's Executive Director and Cardiovascular Disease Franchise Integrator, are seeking biomarkers for CVDs, and co-operating with Philips in line with the *High Risk Plaque Initiative**, which aims to identify vulnerable and non-vulnerable plaque. *(*Reported in EH issue 4/2007).* In an interview with *Meike Lerner*, Dr Plump pointed to two major challenges arising from molecular medicine: Understanding a disease and finding better treatment options. The way forward cannot be found by one company working alone, but by combining knowledge and skills.

ML: ***What led to the partnership of Philips, Astra Zeneca, BG Medicine and other firms, and what role does Merck play?***

Dr Plump: The alliance resulted from a concrete concept that all parties developed together. The aim was not only to leverage the results of each company and compare which result could be useful for which company. The initial thought was: "Let's come together and put together a research plan that we can push towards the future". So the High Risk Plaque Initiative was born. This is not a commercial alliance and it is chaired by Dr Valenin Fuster, the gold medal winner of this year's Congress of the European Society of Cardiology. Merck is collaborating with leading external experts to advance the understanding and treatment of cardiovascular disease. CVD is a leading cause of death worldwide, and there is a great unmet need for new treatments. By working together we see strong synergies and we all believe that real progress in the prevention and treatment of cardiovascular disease is going to come from alliances like ours.

The role Merck plays is to find suitable biomarkers, which have at least two functions: First, they act as contrast agents for the molecular imaging of vulnerable plaque and, in a second step, we can use them as tools in decision making for our early clinical studies in developing pharmaceuticals.

How do you find these biomarkers?

The tradition is to take patient cohorts that include people we think have vulnerable plaque and those who we suggest do not have it, and all their individual blood samples are compared. However, we feel that going directly to the blood has limitations because there is blood in the very non-specific milieu. But looking at the plaque – the disease tissue itself – you can get a deeper insight and receive information that blood does not deliver. So Merck is approaching cardiovascular disease in the same way cancer has been studied – by trying to understand the biology of plaque. Our goal is to go to the disease tissue, compare different kinds of plaque and ask what are the biomarkers more highly expressed in the vulnerable plaque; from there we try to find ways of scaling those to either imaging and our long term project, where we are eager to find something in the tissue that reflects what the disease is really about. We want to find the nature of the plaque and then define a therapy for any individual. We actually have access to literally thousands of plaques, due to a collaboration with a partner company.

One of the things we are doing at MRL, for example, is a series of genomic-based experiments to look at what molecular signatures are present in those plaques.

Our ultimate goal is not to have to go into people and remove plaque, but to turn molecular understanding into some biomarkers and/or diagnostics that we could scale in a non-invasive way. That is where we think molecular imaging will go in our future.

Have you already found biomarkers to differentiate plaque?

To be honest: No, not in the way I've described – by looking at the nature of plaque. But we think that, through some of that work, we have made tremendous headway in identifying what we think are very strong candidate markers, which we've begun to study. In fact, we are now looking at drug effects on those biomarkers in small clinical studies, because our aim is to make drugs and then turn our discoveries into diagnostics that can be available to physicians and patients worldwide.

What are the next steps from finding a biomarker to produce a pharmaceutical product?

There are two tiers to that question: The first is that, once we believe we have found a biomarker, we can use that in our internal clinical studies by taking the drug and asking what it does to the biomarker. If the biomarker changes in the right direction and we think it does so based on the expected drug effects, we have a drug that is atheroprotective and we start a Phase III trial.

The second tier is a forecast into the future. We hope that we will not have to go through a long, arduous and extremely costly process – ultimately our goal is to try to drive those biomarkers to places beyond decision making, where they are accepted as surrogate markers. So, looking five or ten years ahead, if we do see a change in a promising biomarker that predicts a positive outcome, the biomarker can act as a surrogate marker. And if we can do that, we can push drugs out much more rapidly and will have more drugs available for patients. To present a conclusion: That development will pave the way for the concept everyone is talking about: The concept of more individualised medicine.

Optical molecular imaging

Shahram Hejazi is President of the Molecular Imaging Group at Carestream Health, Inc. (formerly Eastman Kodak Company's Health Group). He predicts that, when optical molecular imaging enters clinical practice, imaging will begin to shift from radiology departments to other specialty areas and healthcare will change forever.

Carestream's molecular imaging group focuses on life sciences, developing high-performance digital imaging systems, imaging agents, film and accessories for the research and drug discovery/ development markets. The company recently introduced advanced In-Vivo Imaging Systems and novel XSight Imaging Agents, expanding its presence in life science research, while strengthening its position to enter the future clinical molecular imaging market.

During a decade (I was there about 6 years) with Siemens, as head of business development and working on various technologies and sectors, Shahram Hejazi soon became interested in molecular imaging and, specifically, optical molecular imaging. In 1998 and '99 he pioneered market research into its feasibility. 'I knew there was a big thing there.' A few years later he received a call from Kodak's molecular imaging division and decided to move in that direction.

'When it comes to optical molecular imaging,' he said, 'no one has the breadth and the depth of Kodak – now Carestream. Kodak is an expert in optical, CCDs, in lenses. In chemistry, the firm has had 50 years of expertise in dye chemistry for lights; it has 50 years experience in nano particles, because of film. The basic technologies have been owned by Kodak for decades. Some of the stuff that's used in molecular biology research in fact was invented by Kodak, and was licensed out, but all those scientists, all that expertise, sat in the Kodak laboratory. So we brought these under one umbrella, put some R&D resources behind it and got them to develop that. This is not something someone can do overnight. It requires a lot of resources and investment. That's why we feel we have the best – what no one else has,' he told us during a recent EH interview with *Daniela Zimmermann*.

'Molecular imaging is a technology that can detect diseases earlier and help treat them faster. Using optical molecular imaging you could look at a cancer tumour, after it has developed for only a few days, and study the cellular functions and cells that have become cancerous. (Whereas, with CT you'd have to wait for the tumour to grow for months, maybe years, to be large enough to be seen on an image). You can also see changes in the cancer almost on a daily basis. So you don't have to wait for a month for it to grow. You see it from one day to the next day. Because biologists can actually look at cell function, this is a great tool for research – to develop drugs. Traditionally, if you inject a cancer drug you have to wait for a tumour to die and become smaller, which would take a few weeks, or months, and then you can image it again with a CT. With optical molecular imaging you inject a drug, which goes to the cancer site and, after a few hours, you can see what happens. Molecular imaging is very powerful.'

Where does 'optical' molecular image come in; what's needed for that?

'Among our three different businesses is our newly established reagent business – in the pre-clinical world it's called an imaging agent, in the medical clinical world a contrast agent. The first is injected into animals, the other into humans, but it's pretty much the same thing. The reagent is only for research. It does not have FDA approval for use in humans,' he explained. 'So, first you need an imaging agent to inject into an animal's bloodstream. It goes to the area that you want to investigate, such as a tumour, and lights it up. Then you need a system to take a picture of the area. Then you need software to analyse what's happening. Those are the three things you need to develop a molecular imaging diagnosis or process, and that's what we have at Carestream – all three of those: the imaging agent we've just developed internally at Kodak – now Carestream. We own everything. This is very unique for us, because we've been working on this for many years, and now we've just developed this. We also build and develop these systems, and have optical molecular imaging systems across the world.'

The system has some sort of camera?

'You could say it's a digital imaging camera – but a very specialised, highly sensitive one that needs to be in a dark area – which has been integrated into a very complex system, to be able to image a very large area with very high sensitivity. This is scientific instrumentation. Also, our optical molecular imaging system is a multi-modality. Kodak, or Carestream, is the only company that has developed

multi-modality optical molecular imaging, which means you can take an optical image and, at the same time, take an X-ray and, at the same time, if you have injected a radio-isotope into the animal, you can also take a radio-isotope image. So you can combine optical, X-ray and radio-isotope images in the same system. This is like a PET CT, in which you take a PET and you take a CT. The PET gives you functional information and the CT gives you anatomical information. You combine them. That's exactly what we do. We take an optical molecular image for functional information, an X-ray for anatomical information. Combining the two tells you exactly where the signal is coming from. In addition our system also can take a radioisotope image, so you can also inject it with a radio-isotope and get three of the images at the same time. This is like PET CT in some ways, but it's not three-dimensional, it's a two-dimensional picture.'

This is not done with slices?

'There are no slices, just one picture. In that, it's very specialised.'

Presently it is used to develop drugs. Will ever go into clinical use?

'That's a good question. Right now we have spent a lot of resources to develop this system and the imaging agent. Today, optical molecular imaging is used to develop drugs, but it is also used for research into diseases such as cancer, cardiovascular, dermatology, and neurology, such as Alzheimer's and Parkinson's.'

Where will you make money?

'Our vision is that, when these technologies become applicable to humans, that's where the big potential lies; it will entirely change healthcare. All our investment is with that in mind. We want to bring these technologies into the clinical world – and feel that is not too many years away.'

Are any competitors doing the same thing?

'The big three companies – Siemens, GE, and Phillips – are not in optical molecular imaging, so we don't compete with them in this. Our competitors are smaller companies. One, called Xenogen, acquired by Caliper so it's now Caliper/Xenogen, has been in optical molecular imaging for many years. We compete with them.'

What about the optical industry, Zeiss, Leica?

'That industry is not into this, apart from very recently, Olympus, which has just come up with a system that does only optical and is extremely expensive – about three times the price of ours and it's very specialised. But they don't do everything that we do. They don't have multi-modality capabilities – which is very important – and they certainly don't have the chemistry, the imaging agent that goes along with it. We are really the only company that provides the tools for looking at diseases starting from basic research in a laboratory, looking at cell lines, all the way to proteins in a living organsim, such as mice. Therefore we actually build *in-vitro* based systems. We also have systems for looking at those diseases or cells inside animals. That's our in-vivo based system and chemistry. Then the vision is to bring these technologies to the next step, on the human side.

'However, bringing in a new modality into medicine is very difficult and expensive. That's not the path we think this technology is going to take. The path, in which we lead, is through drug development and pharmaceutical companies – almost every large one is a customer. Our systems or products are in all of them, and as they use them to develop their drugs, they'll help the market adoption. This adoption will help us with the US Food and Drugs Administration (FDA) and will put this in the workflow. The adoption, which is the biggest barrier, will be that.'

'There is no reimbursement at all. This, especially in the US, is a huge barrier. It will take many years longer to get to reimbursement than FDA clearance. There is no reimbursement at all, because the pharma companies pay to use our systems and will eventually use them on humans. We are looking towards this.'

So instead of going through the front door towards clinical use, you are going through the back door, via its use by the pharma companies?

'Exactly. It's faster, less expensive, and all the idea leaders who are going to do this today are working with microbiologists and biochemists on animal research. Because the way drug development and discovery is done in the industry is that they begin by looking at cell lines in animals, and then they do it in humans. That's the path that we're taking to shift these technologies into clinical hands.

'Of course, in anything, you must be quick nowadays. But what sets us apart from the rest is that we already have patented technologies, chemistry and imaging agents that no one else has.'

Then, if it comes in to clinical use, you can make that clear to the world.

'Exactly. The point is, how can you get to the clinical field as quickly as possible to make big business? Second, that's where molecular imaging is going to be significant in changing the entire healthcare landscape, through better screening and detection of diseases, as well as improving drug developments and making them much cheaper. Also, it's very important to remember that molecular imaging will take diagnostics and therapies into the hands of specialists. Today, you have to go to a large centre for cancer diagnosis. If you have molecular imaging with personalised medicine, this will go into specialists' hands, for example a dermatology suite. The market is not just in radiology; on the human side it's much larger. Optical molecular imaging will extend medical imaging out of radiology into other specialist departments.'

Radiologists won't love you for that.

'Molecular imaging will open up the field of radiology. I think it will be a better world for both radiologists and patients.'

And what of the pharmaceutical industry if drugs become cheaper?

'Well, drug development will become cheaper to develop, not necessarily the sale price. Today, it takes a billion dollars to develop a drug. If you could cut that by ten times, it would be $100 million dollars. How they then want to sell is another story.'

Will you develop 3-D for optical imaging?

'Yes, eventually there may be some need for 3-D because it may give better quantification; in drug development, for example, you want to know the size and depth of a tumour. But right now I think it's about more of a determination than a quantification. Don't get me wrong; you need to quantify what you're looking at, but the first step is to figure out whether something is there, and is cancerous.'

Finally, Shahram Hejazi was keen to point out that the use of Carestream's imaging agent is not restricted to optical molecular imaging. 'It not only creates light, but can take on MR contrast agents – iron or gadolinium – or take on PET radio-isotope on top of them. You can add whatever you want, in one nano particle; you can have complete image fusion combined with optical. Each of these modalities provides a different benefit. You can have MR and optical.'

Then you just have to correctly interpret what you see.

'Exactly.'

Molecular imaging Still hyping or consolidating?

CONCLUSIONS FROM THIS YEAR'S *JOINT MOLECULAR IMAGING CONFERENCE* by **Dr Soenke Bartling**

Dr Soenke Bartling

In recent years molecular imaging has developed into a hot topic field in medical research, which raised high expectations. Nowadays people say this was only due to an early, typical hype for exciting technologies: 'Molecular imaging needs first a consolidation similar to the crash of a stock market to separate the wheat from the chaff'.

This somewhat describes the attitude at the world-largest molecular imaging conference (Joint Molecular Imaging Conference) held this September in Providence, RI, USA.

A whole bunch of sessions dealt realistically with the problems associated with the introduction of new contrast media into clinical medicine. One inherent problem of specific contrast media became clear here: The inherent characteristic of disease or diagnosis specific contrast media is that they reduce the amount of patients in whom they can be applied – thus reducing their market. While still the enormous costs of their introduction and FDA-approval is as high as with standard – unspecific contrast media have a larger market. Here, policy changes would be necessary to lower the threshold for an introduction into clinical medicine.

Despite these well-discussed problems, as expected, preclinical results were exciting at this conference. The two day pre-conference educational symposium was a good preparation to the research sessions of the consecutive scientific section of the event. Attendees were well prepared and therefore could follow the scientific sessions and identify hot-topics with ease. As expected, not only strictly 'molecular imaging' subjects were discussed in four days of basic research, but also results from neighbouring fields, such as small animal imaging, biology and genetics.

Stimulating results were assembled throughout the conference: A group from the Beth Israel Deaconess Hospital in Boston presented bench-side results from a new, exciting MRI-contrast media, which could be named 'artificial protons'. After radio-frequency excitement solid state devices send back a radiofrequency unique to them, making them easily and highly sensitive to detect.

From Tubingen, Germany, a significant step on the road to the integration of PET with MRI was presented: A method that allows the generation of attenuation correction maps for the PET-part from the MRI. Usually in PET-CT this is generated from the CT-part which is obviously lacking in PET-MRI. Sophisticated image-processing techniques were employed here.

Further, a group from the Massachusetts General Hospital, Boston, used a time-resolving optical tomography approach to increase the resolution of optical imaging, which is still a strong limitation of this technique. The resolution is limited due to scattering of photons in tissue. However, early detected photons that were shorter on the fly did scatter less and hence their origin can be more exactly calculated, increasing the resolution of optical imaging.

A new method of coupling small MRI-detectable VSOP with target specific molecules, such as Annexin V, was presented by a group from Charitè, Berlin. Next to the improved size, the fact that both parts of this nanoparticle are in early clinical trials, or approved for human use, make this approach prone to be one of the first highly-specific contrast media that could be introduced into clinical trials (see p. 8 August/September edition of European Hospital).

In conclusion: Molecular imaging is developing from a new, emerging research field with associated hypes, to a firm and growing research field with large research communities around the world. The fact that international societies are well aware of the translational problems, which are openly discussed, is a good sign that these issues will be appropriately addressed. So, nowadays we can expect preclinical methods in clinical medicine as soon as possible, which might be the close future.

An accumulator-free contrast agent injector

NEW

ulrich medical, established 25 years ago, is an independent medium-size medical technology firm with worldwide sales. Among its products are contrast agent injectors for contrast agents used in computer and magnetic resonance tomography.

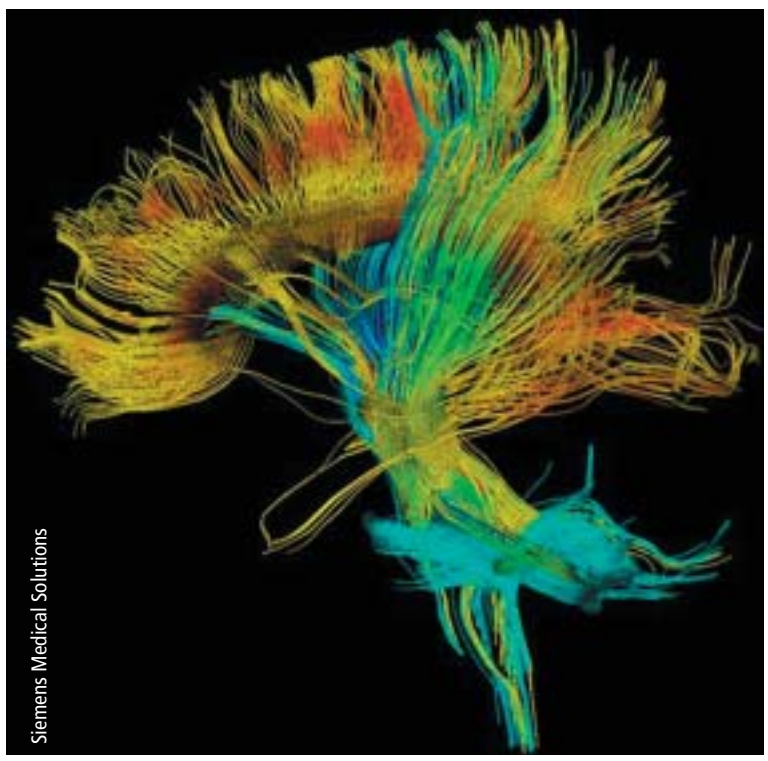
This year the company launched the *tennessee*, a new injector that is accumulator-free and ready for use as soon as needed. 'tennessee is not only applicable for MRI but also for CT and includes a comfortable touch terminal,' ulrich reports. 'The injector avoids permanent, time-consuming charging and handling of heavy accumulators, therefore the daily routine is not interrupted. Due to a smooth workflow the injector is absolutely dependable for both patient and user.'

As in other ulrich injectors, the tennessee is based on a special roll pump system. Therefore, previous loading of syringes is not necessary, the firm explains. 'Injection is directly made from media containers. Due to ulrich's sensor technology for air detection and check valves in the patient hose of the two-part hose system, a safe examination is guaranteed. tennessee is flexible throughout, as well as comfortable and safe, and will ease up the daily workflow.'

Schizophrenia

Imaging water molecules in the brain correlates structural and functional deficits

By **Karen Dente**



Siemens Medical Solutions

Within the sphere of molecular imaging, *Diffusion Tensor Imaging* (DTI) provides information about the diffusion of water molecules in biological tissues. Research published in the *American Journal of Psychiatry* (March 2007) by Dr David I Leitman and colleagues, looked into the neuro-anatomical abnormalities associated with schizophrenia using DTI. The information gleaned from this study allowed them to evaluate the relationship between brain structure and mental function in schizophrenia.

How does DTI work? It gives information about the properties of water diffusion in brain tissue and the integrity of white matter, which are the long axons that radiate from the body of the brain cell, or neuron. The neuronal bodies comprise the grey matter, with axonal tracts making up the white matter covered by fatty myelin sheaths.

This kind of imaging gives information about the integrity of white matter by measuring the diffusion of water molecules. Normally, there is more diffusion of water in the direction parallel to axonal tracts than perpendicular to these, which means it is highly anisotropic. A reduction in this anisotropy of water diffusion, or directionality, is thought to reflect a diminished integrity of white matter, which can be seen in certain diseases affecting the brain.

One theory behind social communicatory dysfunction in schizophrenia is that there are underlying structural changes in white matter integrity on the low-level of visual and auditory sensory input radiations or 'wiring tracts' to brain regions responsible for relaying these on to higher processing levels.

A combined look using this imaging with other tests to see whether individuals with schizophrenia can process physical auditory stimuli, such as certain changes in voice, like inflection, or changes in tone (also known as prosody), have shown a correlation of brain region deficits with functional deficits.

Dr Dan Javitt, a co-investigator, says of this study that it was the first time that anybody had correlated structural changes using brain-imaging studies and linked these with functional deficits in emotional processing, the latter of which has been demonstrated in other studies.

Use of such imaging can help focus on the areas of the brain where the problems are anatomically localised and may lead to early detection and intervention by demonstrating a reduction in white matter tracts in people with schizophrenia before the synapses break down. According to the neuronal disconnection model of the disorder, it is thought that the synapses involving the neurotransmitter glutamate seem to be losing their tightness, resulting in a reduction in the number of synapses. This is known from post-mortem studies.

A result of normal synaptic 'pruning' during adolescence taken a step too far – some scientists surmise.

New studies are underway in the United States to prevent the disorder from becoming chronic in young adolescents by early intervention to stop cognitive deficits seen in some patients from progressing. Along with other tests, imaging will play a seminal role in early diagnosis.

ONCOLOGY

Determination of angiogenesis with MRI enables timely monitoring of therapy

The suppression of angiogenesis is an established procedure used to make a positive impact on tumour growth and the development of metastases – with varying success. Whether the therapy is actually successful and the tumour shrinks, or disappears, usually can only be checked about four to six weeks later, during a control examination. The classic parameters currently used in radiology only allow for the assessment of tumour size and volume, which only become visible after a while, or, in the case of stagnation, not at all.

However, the results of a study on the quantitative imaging of angiogenesis through MRI with measurement of the *vascular volume fraction* promise a significant improvement of oncological therapy monitoring.

Professor Christoph Bremer MD and team at the Institute for Clinical Radiology, at Münster University Hospital (UKM), Germany, has developed this procedure in co-operation with Dr Hannes Dahnke (Philips Research, Hamburg) and is currently working on a clinical translation of the technology. The results, along with a study with optimised measuring techniques for the determination of angiogenesis, are to be presented to specialists at this year's RSNA. Here, Professor Bremer explains the principle and possibilities of the procedure.

> Our objective is to use the method we have developed to determine and measure at a very early stage if and how therapy for the suppression of angiogenesis works. We use iron oxides as contrast media – these remain predominantly in the vessels during measurements and change the MR signal in the respective locations. This change is proportional to the amount of microvessels, i.e. newly formed vessels. This allows us to determine the strength of blood flow in the tumour and therefore gauge how aggressive it is. This process may sound quite banal, but it is highly complex regarding both the contrast medium and imaging technology in the MRI. With normal settings the MRI only delivers anatomical images that allow us to see the tumour, but we need to know how many microvessels are in the tumour.
>
> The significant issue here is sequencing technology, which we have been researching with our partners for many years and which now allows us to achieve stable measurements that, apart from images, also deliver reproducible figures. We use a sophisticated T2/T2 measurement for this, which allows us to compare values at different points in time. To achieve truly valid figures we had to spend considerable time optimising the procedure – but now we are definitely on the right track. Part of these results will be introduced in detail at the RSNA.
>
> We are currently testing the imaging of angiogenesis via MRI on small animals. However, at the same time we are also carrying out the first studies on human patients. We have data on the vascular volume fraction of patients with acute myeloid leukaemia, which help us to further develop the technology for therapy monitoring in humans.
>
> The new procedure could potentially give us an enormous time advantage for therapy management. In theory, depending on therapy, we should be able to monitor success within the first 24 hours from the start of therapy. Experimentally we have been able to produce good results within three to six hours after therapy has begun and were able to retrace a vascular thrombosis.
>
> The determination of angiogenesis is currently not the only option to monitor therapy; there are procedures in molecular imaging using PET and PET-CT that follow a similar objective. However, by comparison, our MR based procedure is less complex and easier for the patient, as there is no exposure to radiation. Additionally, the contrast medium – iron oxide – is fed into the haemoglobin metabolism and therefore does not put a strain on the body. These are competing procedures and the so-called quantitative 'MRI' is a promising alternative, which – and these are dreams of the future at this stage – apart from the measurement of new vessels, also has the potential to show cell movement in the tissue, which can play an important part in both tumours and stem cell transplantation.

Christoph Bremer

Hippocrates meets Medusa's head

Informed consent in radiology today

Fide splendet et scientia

By **Dr J Larsen MD FRCR**, Consultant Radiologist at Braunschweig Hospital, Germany

Contemplating patients' views on radiological investigations and procedures leaves me worried: While radiologists may feel plagued by the issues surrounding informed consent for their activities in which the relationship with their patients is often brief and episodic, we cannot deny that some of these have led to devastating outcomes. In fact, most would agree that the spectrum of radiological activities is wider ranging today than anyone would have foreseen even twenty years ago and that we are no longer able to predict all possible circumstances that may occur during the frequently complex diagnostic and therapeutic measures that have been adopted. This article reviews current thinking on informed consent, highlighting key concepts and problem areas.

Informed consent is the key process at the medico-legal interface. While the total number of law suits is small, considering the total number of studies performed, with 8% of respondents stating involvement in malpractice suits in the context of use of intravenous contrast media leading to neurological impairment or death, obtaining consent is integral to medical practice today. In 1914, Justice Benjamin Cardozo

developed the legal doctrine of informed consent, i.e. that a competent adult should have the right to control their medical care. Doctors are obliged to respect this and disregarding it constitutes an assault.

Different types of consent, applying to different types of procedure, exist. One must distinguish so-called implied from express consent. For example, we may imply consent when a patient willingly climbs on to an examination table, while express consent must be explicitly a statement that requires the patient to be informed. Legal precedents have evolved into two principal court approaches: The prudent physician, or reasonable practitioner concept, uses a standard set by a physician testifying as an expert which the particular case is tested against. By contrast, the later concept of the prudent or reasonable patient standard is more demanding, placing the physicians standard with the court (1972). It is determined as what a reasonable patient would have wanted to know, based on the personal knowledge and experience of jury or judge. However, there is no need to disclose all known information on a procedure and these concepts have evolved with time. A trend towards the prudent patient standard is evident and growing, but legal uncertainties remain.

The current practice in radiology departments across the world is variable and considerable discrepancies exist with respect to legal requirements. This is due both to differences in attitudes, perceptions and opinions as well as practicalities. Specifically, consent forms have been found to lack important detail, being too complex and frequently poorly understood. In a cross-sectional readability study, sample texts exceeded the standard by 2.8 grade levels. Nonetheless, considering, for example, contrast media administration, when standardised information is given, 5% of patients raise questions leading to 1% refused uses and the use of an alternative agent in another 1%. Misconceptions also exist: The long-believed theory that informing patients of particular risks of procedures may heighten their anxiety, in turn making the occurrence of complications more likely, has been refuted by Hopper who found that a significant increase in anxiety only occurred when patients were not being informed about what was going to happen to them. Finally, misconceptions also exist on the patient's side: In a recent study by Akkad, only 41% of individuals questioned believed that it was the purpose of the forms to make their wishes known.

The issue of informed consent is clearly complex and must be seen in the context that the patient-

doctor relationship has evolved into a legal contract to provide the best possible care. Obtaining consent has thus become part of a physician's responsibility, requiring disclosure of risk-benefit assessments (paraphrased from Hetts 1995).

Various problems, legal and medical, remain and are subject to controversy. The conceptual legal approaches have already been mentioned. Specific requirements between states, nationally and internationally, may be considerably different.

For example, there are varied regulations in place about who should obtain consent. In Germany, doctors themselves are called upon, while in the UK the task may be delegated, although the ultimate responsibility remains with the radiologist. Equally, it is not self-evident who can actually give consent, i.e. who is able to comprehend, understand and consent, or refuse. Bush has coined the term 'specific patient standard' for this requirement, while Munn refers to the situation of a patient who does not want to be informed as 'patient-requested non-informed consent'. Furthermore, there is dispute regarding for which procedure consent is required: Clearly, if it carries a material risk, i.e. that a complication is either common or serious, when its occurrence may constitute a major life event, informed consent should be obtained.

However, different views exist as to what represents a significant incidence, i.e. one that requires the patient to be informed. Perhaps we should consult with patients even for simple diagnostic procedures involving, for example, ionising radiation, especially when CT is concerned. Nonetheless, the extent of any information given may be at different levels, depending on the procedure: giving contrast media may demand less than the administration of sedation or vice versa? There is agreement that full consent must be obtained for all interventional procedures such as drain insertion, percutaneous biopsy and catheter angiography. How exactly consent is obtained, how much information is given and the time point at which consent is obtained are again debatable. Both written and oral formats are valid, often supported by patient information sheets provided in advance. However, on post-procedure testing of four degrees of counselling no statistical difference has ever been found between a written statement of common risks (level 2) and counselling about all known risks by a physician (level 4). Principal information should include the nature of the procedure, the anticipated result, alternative measures available, recognised benefits and risks, including any risk should the patient decide not to proceed with the suggested examination or intervention. The patient will then have to evaluate these factors, balance them and decide. Obtaining consent even a day prior to major, complex procedures may be too late (German Federal Court 2007). Special considerations apply in the following circumstances, but are beyond the scope of this review: Use of non-approved or recycled devices, emergencies (3% of cases), patients with limited understanding due to intellectual, language or illness-related difficulties (11%), sedated patients, intimate examinations, imaging in the context of research and teaching (in particular relating to incidental findings of pathology), minors (2%), screening and detainees. However, such discussion is to some extend esoteric since practical limitations of time and staffing supervene. Hopper has estimated that counselling about all known risks by a physician may take as much as 7% of professional time.

Comprehensive advice as how to cast these considerable details into a usable consent process has been given, amongst others, by Bush in 1994, by Berlin in 1997 and again by The Royal College of Radiologists (RCR) in 2005. It appears prudent to first determine any legal requirements at your place of work. A workable consent process would then include a written policy, written procedure information and consent forms that consider readability standards, aiming at an 8th grade level of understanding. Information given should be basic, including common risks and risk factors. It may be helpful to teach patients to recite procedural risks (White 1995). Considering the dynamics during the consenting process as a dialogue, radiologists should perhaps obtain consent themselves. Hetts suggests that, by doing so, doctors are seen as an individual committed to providing the best care humanly possible. The process requires proper documentation, particularly in the context of non-informed consent. We should finally be consistent in the use of our policy. In addition, guidelines, as given by the RCR, should be non-prescriptive and will assist in determining the level of consent required for particular diagnostic and interventional procedures, reflecting current practice but considering global or general standards that may supersede community standards. In the end, obtaining informed consent is particular to individual cases and comes down to making a judgement and taking a decision.

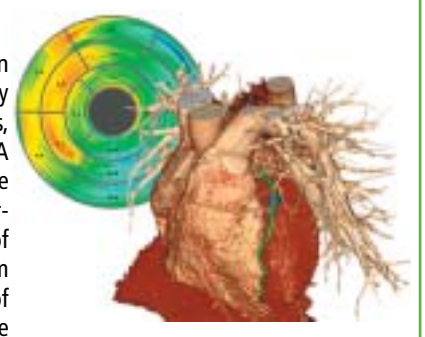
In conclusion, if we do consider the most personal features of the patient-doctor relationship integral to obtaining informed consent, we may consider the most anecdotal evidence. In my own experience, I have seen patients most at ease, and myself most satisfied, when we could talk in good time and somehow outside the constraints of today's busy radiological practice. So, we should perhaps make this the rule, approaching patients open-mindedly, considering their needs and engaging with their views and offering ours or, as a long-running British Telecom advertisement campaign said: It's good to talk.

A referenced version of this article is available upon request by contacting the author at jlarsenmd@hotmail.com.

On show at RSNA 2007

New clinical applications and streamlined workflow with Visage PACS/CS

Visage PACS/CS, a scalable PACS solution based on web and thin client technology with fully integrated clinical applications, is to be demonstrated at this year's RSNA in Chicago, along with a comprehensive portfolio of life sciences products and services from Visage Imaging, a subsidiary of Mercury Computer Systems Inc. The firm will also launch a major new release of *Visage Cardiac Analysis*, a comprehensive CT cardiac application based on thin client technology.



Visage CS Cardiac Analysis has integrated tools for comprehensive multi-phase 3-D analysis of coronary arteries and left ventricle on thin clients

'Visage Imaging's completely integrated Visage PACS/CS solution enhances the entire clinical workflow, with advanced tools for 2-D, 3-D, and 4-D image review and interpretation, post-processing, data management and image distribution,' the company reports. 'The image data as well as the applications within Visage PACS/CS are not bound to specific workstations and become instantly accessible anywhere, anytime within the PACS workflow.' The system is a truly thin client-enabled PACS solution, Visage Imaging emphasises. 'It provides virtually instant data access and superb 3-D performance anywhere inside and outside the hospital enterprise, on existing workstations, PCs, and laptops. The latest version of Visage PACS/CS provides greatly improved performance also in Wide Area Networks (WAN) and over slow DSL lines, thus enabling very efficient remote operation across distributed imaging centres, providing better services to referring physicians, and opening new ways for reviewing images efficiently from home.'

The new version of Visage Cardiac Analysis includes new tools and optimisations, such as calcium scoring, myocard segmentation, wall thickening computation, improved reporting, and efficient manual editing. 'This makes Visage Cardiac Analysis the only comprehensive and integrated cardiac analysis application that is not bound to a specialised workstation. The Visage PACS/CS platform allows for sharing data and applications across radiology and cardiology departments, and helps to unleash the true potential of the latest scanner technologies and diagnostic tools.'

According to its maker, the PACS/CS will also feature new and optimised tools for radiology, cardiology, neurology, oncology, surgery, and other subspecialties, such as application-specific display and post-processing protocols, saving and sharing of annotations and post-processing results, volume analysis of lesions and structures in 3-D, improved automatic bone removal, and many others.

Radiology in Israel

Professor Moshe Graif, President of the Israel Radiological Association, Chairman of Radiology at The Tel Aviv Sourasky Medical Centre, and Chair of Radiology at the Faculty of Medicine, Tel Aviv University, in conversation with *Daniela Zimmermann* of European Hospital

Professor Moshe Graif

Comparing radiological practices in Israel with those of Europe and the USA, Professor Graif explained that his country combines both. 'Usually most radiologists do their fellowships in the US, so they follow American radiology model. On the other hand, our economical and political systems are closer to Europe. So you learn in one part of the world, but practice in another. Usually it's a compromise between two situations.'

'The American radiologists operate in a different setting. There is a fee for service system and they are compensated for every procedure – while the services in Israel are incorporated in the hospitalisation cost. This enables them to generate more revenues and consequently purchase more equipment and hire more staff. In the actual settings in Israel, it's very difficult to follow strictly all practice recommendations. However, I guess that European radiologists are gradually adopting American models and working patterns. More radiologists and administrators go to the States to take part in academic meetings or fellowship programmes. Most of them participate regularly at the RSNA and they publish more in American professional journals. The ECR meeting in Vienna and the JFR meeting are becoming very similar to the RSNA.

'As I mentioned previously, working patterns in Israel are also influenced by the European models. Take, for example, the close clinician-radiological contact. In Israel, all wards meet the radiologist once or twice a week on a regular basis, in some hospitals they may meet on daily bases. We have a continuous dialogue and exchange of information.'

Isn't information exchanged by reporting as good as exchanging information face to face?

'Insufficient clinical information is a common problem almost everywhere and is known to affect the quality of the report. Information is more inclusive when you discuss it directly with the clinician, and you can have a better exchange of ideas and maybe suggest an alternative diagnosis.'

Is a lot of research carried out in Israel?

'Yes, but it's getting harder to carry out research, because the increasing workload reduces the time designed for research.'

Are you trying to influence your government to change this?

We do, but it's very difficult because most governments, ours included, tend to decrease their healthcare costs; our expenditure is about 8.5% of the gross national product (GNP).'

That's nothing compared with America.

'Of course, I think Germany is around 11-12%, and England is in the order of 7.5 % of the GNP. So, we're somewhere in a mid-low position in this respect.'

Nonetheless, you try to access more money for research?

'Usually the research is carried out by private companies and entrepreneurs that take the initiative. They may purchase radiological services that will help to develop their projects. There are two main types of research. Research into development of radiological equipment or software tools is one. This requires beta sites to test their equipment. Pharmaceutical research is the other type, where you are asked to conduct or take part in clinical studies examining the effectiveness of a therapeutic agent.'

I'm sure Israel's constant military conflicts influence radiology in terms of trauma, in which you must be experts.

'We are trained in trauma, because when you are exposed to it repeatedly you acquire experience, and you do it far better. So we develop models for working with trauma.

A multi-casualty event (MCE) usually creates huge chaos and the first time you find yourself in such a situation, the confusion may have a significant impact on your performance. But once you get into routines, the patient care is definitely improved.

I remember my first time. Every doctor and medical personnel in the area rushed to the hospital. There were hundreds of doctors and nurses; their cars couldn't be parked and were scattered around the hospital premises. Everyone was trying to do his best but the co-ordination was compromised. After several events, only the essential staff arrived to the hospital grounds. Everyone was familiar with his tasks and the protocols those who shouldn't be there according to the plans, stays at home and we call them if needed. It's much more efficient. There is a briefing procedure after each event. Every sector, doctors, nurses, technicians and administrators is represented at the briefing. Everybody's together, whatever time it is when the event is declared finished. We go through the event and try to point out mistakes and difficulties encountered with the purpose to avoid them in the future. Those are very effective methods.'

Did experts from Israel help with the trauma situation in Madrid?

'I don't know; although we usually volunteer to share our experience. Much of our data is available in the literature as articles or books and helps to establish schemes and routines for hospital preparedness.

' Fortunately, in Europe, this expertise is less needed at the moment. A traumatic event which occurs sporadically, as in Spain, it is not sufficient to maintain the necessary skills.'

LightSpeed VCT XT saves resources

The Cardiocentro Ticino in Lugano, Switzerland – a tertiary care centre specialising in treating patients with coronary artery disease – carries out around 300 major operations and 2,000 invasive coronary angiographies annually. Six months ago, the hospital acquired state-of-the art equipment, including GE's LightSpeed VCT XT.

'Acquisition of the GE VCT was done in conjunction with the purchase of a major package, containing updated echocardiographic equipment and solutions for the electrophysiological and cardiac catheterisation laboratories,' said Dr Francesco Faletra (above), Director of the centre's cardiac imaging unit. 'Since the installation, our team has performed 2,100 examinations using the new system. The LightSpeed VCT is an ideal solution for screening patients with atypical chest pain and low to intermediate risk of coronary artery disease because this technique has a high negative predictive value. We now examine patients by carrying out a cardiac VCT scan instead of an invasive coronary angiography, which saves valuable resources: the invasive catheterisation laboratories can now be used primarily for angioplasty.'

Due to technologies like SnapShot Pulse, the dose for a CT scan with LightSpeed VCT can be reduced by up to 70%, ranging from 1.5 to 4mSV. 'That enables us to study even asymptomatic patients, provided they show a high-risk profile, which is a real benefit. Moreover we can repeat an examination after six months or a year to track coronary plaque after pharmacological treatments, or a change in lifestyle,' he pointed out.

Next to the quite user friendly software the VCT enables heart scans in 10 seconds, thus optimising the workflow in the radiology department. 'With the new system we achieved great results - we expect even more in the future,' Dr Faletra predicted.

Demand for PET/CT systems soars

Dr Thomas Beyer: 'PET/CT is a non-invasive imaging modality that captures anatomical and metabolic data in a single scan'

No stand-alone PET units have been produced and sold for about two years, which means those who had already purchased a PET will now want a PET/CT*, according to Dr Thomas Beyer, International Manager of Clinical Sciences Nuclear Medicine & Pre-Clinical Imaging at Philips Medical Systems. 'Physicians are demanding PET/CT systems because they are impressed by the quality of this imaging modality. However, in Europe, recognition of and reimbursement for PET/CT in Germany and Austria lag behind, even though, worldwide, it is now an established, standard procedure in oncology.'

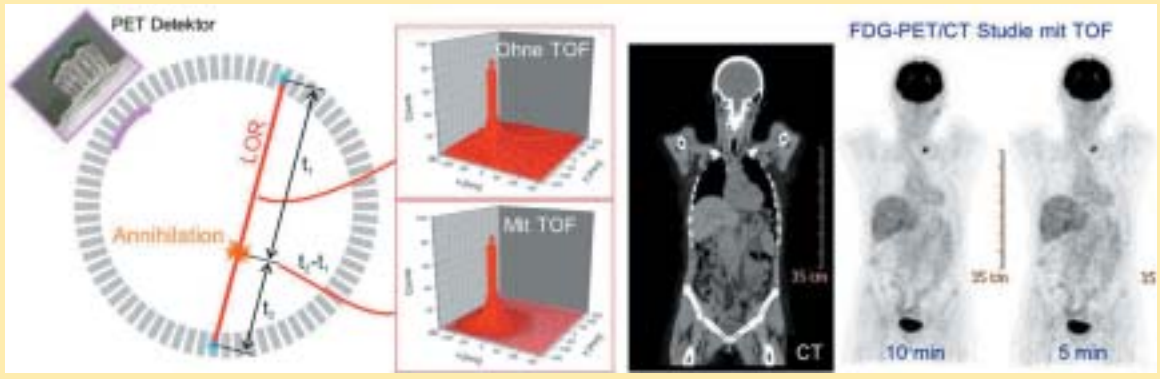
In this field, it is used in the diagnosis of lung, oesophagus and colorectal carcinoma, lymphoma and melanoma as well as ENT and gynaecological tumours. However, PET/CT is also increasingly used to clarify cardiological and neurological issues. In terms of percentages, usage is 90 % oncology, 7 % cardiology and 3% neurology.

The future

Very soon PET/CT systems will provide the full range of examination protocols already possible with stand-alone CTs and PETs — for example, triggering the scan according to the heartbeat, which reduces movement artefacts. We also anticipate protocols for radiation therapy planning. More than likely, PET/CT scans will become faster, which means very soon whole-body scans will be performed routinely and in less than ten minutes, thanks to technological developments, which include more sophisticated time difference measurements, for example the time of flight functionality.

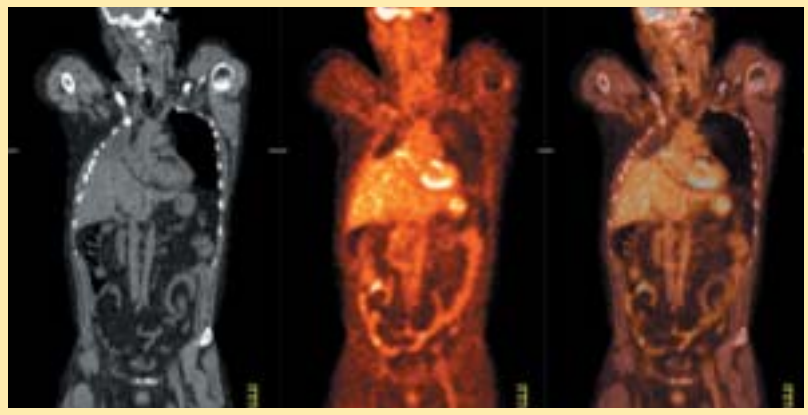
**Positron emission tomography in combination with computed tomography*

In modern PET/CT systems targeted time of flight and fast crystals with high light efficiency provide images with superior diagnostic value. With the time of flight functionality the signal can be reduced spatially which in turn leads to an enhanced signal to noise ratio. Consequently PET/CT systems can generate images with improved signal (for example 10 minutes) or reduce scan time (e.g. 5 minutes). Example: Patient with subclavicular metastasis.



COURTESY OF ST LUC HOSPITAL, BRUSSELS, BELGIUM

CT, PET, PET/CT coronary view
A 44-year-old patient with a lung tumour, after combined radiation/chemotherapy. A follow-up PET/CT scan was performed. The images show an active lymph node close to the subclavia, as well as reactive rings around the lung emphysema in the right thorax. Intrinsic overlays of anatomical and metabolic data allow better diagnosis of benign and malignant changes.



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When imaging work at hospitals in Europe is disrupted by a building project; equipment breakdown or upgrading; a sudden surge in imaging demand; the need to clear a waiting list becomes urgent, or if a special imaging project is necessary, a fully equipped mobile unit can be delivered – complete with a CT, MR or Cardiac Cath system.

This fleet of mobile units, supplied by Alliance Medical Interim Solutions (AMIS), part of the Alliance Medical group, which has been supplying diagnostic imaging services since 1989, can be delivered for use over a period of one week, or even a year.

Alliance also points out that the hire of an AMIS mobile usually costs less than sending patients to other medical sites, and that hospitals '… gain greater flexibility and save valuable time'.

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Details: www.alliancemedical.co.uk

New on the market

A radiation-free system for lung function monitoring

The VRIICU-System

Although modern respirators present ever increasing features to enhance and simplify ventilation therapy, methods to quantify the efficacy of ventilator changes are limited. Often, to adjust settings the clinical staff relies primarily on pulse oximetry, arterial blood gas analyses, or calculated values of compliance and resistance. Due to immobility and critical health states, diagnostic imaging of the lung is often carried out using portable bedside X-rays.

Now, however, a non-invasive and radiation-free device that enables frequent monitoring of lung and respiration functions at the point of care (PoC) has been launched. Called the *VRIICU-System*, this first of a kind diagnostic imaging system utilises *Vibration Response Imaging* technology. Developed by GE Healthcare and Deep Breeze Ltd, the VRIICU-System was presented at the Annual Congress of the European Society of Intensive Care Medicine (ESICM), and is on sale in Europe.

In practice: A patient is monitored by simply applying a pair of sensor-mats to the back. During an examination, which lasts just twenty seconds, the sensors pick up vibrations, resembling the distribution of air throughout the lungs. The software transforms collected data into a dynamic picture, providing a visual representation of distribution of vibration.

During the R&D phases the new system was used by **Dr R Phillip Dellinger**, Professor of Medicine at the Robert Wood Johnson School of Medicine, and Medical Director of the Critical Care Division at Cooper University Hospital, New Jersey. "To have the ability to get a living, breathing picture of how the vibration distribution is changing in the lungs is absolutely novel,' he told EH. 'Nothing compares with it. Maldistributions and disturbances of vibration are indicators for a lung abnormality. This safe monitoring system shows pathological alterations in vibrations as differentiated signals on the display. Complications like airway obstructions, false intubation or the development of pulmonary oedema can be detected in an early stage. It allows us the potential for prompt diagnosis and treatment as one continues to track a therapy's efficacy in bedside follow-ups. If the abnormality is treated sufficiently, the vibration patterns will return to a more normal appearance. At the moment, the necessary treatment must be done by the medical staff but, maybe in the future, when the technology will be established, technologies such as this might assist in computerized therapy.

'The VRIICU system can be directly connected to any respirator, complementing the ventilator's measurements and allowing a new dimension to lung monitoring, i.e. distribution of lung vibration. Monitoring capability on current ventilators is restricted to information assessed in the ventilator circuit outside of the patient. With VRI you can also see what is going on inside the lung and how respirator changes effect the internal distribution of vibrations. I think that has great potential to assist us in better ventilating the patient.'

Dr R Phillip Dellinger

Medical errors occur in any part of the treatment process and typically involve the wrong medication, improper treatment, or incorrect or delayed test results. At its annual partner meeting in Berlin Philips reinforced its commitment to use its leading global position in healthcare speech recognition to drive technology advancements towards reducing medical errors and improving patient safety through verbal information capturing in the electronic patient record (EPR).

Spotlight on patient safety

Last year the European Commission, DG Health and Consumer Protection, observed: 'The health sector still lags behind other industries and services that have introduced systematic safety processes'. The Commission recommended: '…optimise the use of new technologies, for example, by introducing electronic patient records'.

'What is a record without information?' asked Marcel Wassink, CEO of Philips Speech Recognition systems at the partner event in Berlin.

PHILIPS/PAUL NEUKAM

In fact, the lack of adequate information at the point of care is a common cause of medical errors. A survey launched by the EU Directorate-General of Health and Consumer Protection found that almost four in five EU citizens classified medical errors as an important problem in their country. In Italy, where 97% believed that errors in medical care were an imminent issue, medical errors result in up to 90 deaths a day. In Germany, 38,000 patients are believed to die annually due to bad teamwork and communications, or poor IT support. In the UK, 850,000 medical errors are reported each year.

In his opening speech at the Berlin event, Marcel Wassink underlined that the current level of medical errors is not acceptable: 'These numbers are a clear call to action for governments, healthcare organisations and technology providers,' he said, emphasising that fast and accurate information in EPR systems can save lives. 'A health record, however, is only as good as the information it contains.'

Where is the information?

According to Philips, a change of paradigm is needed to improve information availability in electronic health records. Physicians must be enabled to interact verbally with the EPR. Today, they can already capture all clinical information just by dictating their reports and have speech recognition convert those spoken words into information. This clinical information can be made available to all members of the multi-disciplinary clinical team. Instead of reviewing single data points the clinician is presented with a larger more comprehensive set of information that includes important trends in the patient's condition – much to the benefit of patients and treatment quality.

As clinical knowledge is estimated to double every 18 months, the EPR must also work as a knowledge base for diagnosis and treatment. Given the massive volume of medical research, it is impossible for any physician to keep up with all new developments. A new study on a specific condition, or its treatment, might have been published just the day before the physician sees a patient. A knowledge base integrated into the EPR will help physicians find the link to these new research results.

Marcel Wassink

Reporting from Philips Annual Partner Meeting BERLIN 27–28 September

Meet the expert. Visit Medica 2007 Hall 15 Booth E39

Piloting physicians

In Berlin, Philips presented a concept demonstrator that incorporates the technologies of Map of Medicine (Medic to Medic), Health Language and Elsevier. Together, the companies will develop speech recognition applications that benefit from content integration, such as coding databases and medical path technology. The latter provides physicians with pathways for best-practice treatment guidance, to help close the gap between research and clinical practice.

Dr Nick van Terheyden, Chief Medical Officer for Philips Speech Recognition Systems, pointed out that physicians are trained to identify conditions based on the occurrence of signs and symptoms. But as medicine expands, and the number of diagnoses increases, it becomes harder to use this information to identify specific conditions and their cause. As medicine is undergoing an explosion of information, technology must be utilised to assist the clinical team in prioritising information, highlighting key data and guiding the care process. 'Otherwise the unacceptable rate of errors will continue to occur and costs continue to increase, without a corresponding improvement in outcomes and quality of care,' he added.

Dr van Terheyden, who was involved in developing one of the first EPR systems in the US, is convinced that if the EPR is able to provide real-time access to clinical information, the physician can become much more of a pilot, navigating and taking decisions as critical and relevant information is presented to him in a clear and effective way.

'Speech recognition and electronic patient records are reality. Although there is still much to be done to bring existing technologies to the workplace, the impressive results achieved in many hospitals show that the healthcare sector has embarked on a mission to establish modern information capturing technologies that help increase patient safety and the accuracy of treatment,' said Dr van Terheyden.

… News … News … News … News … News … News … News … News …

SpeechMagic is Citrix Ready

SpeechMagic has received *Citrix Ready* status after successfully completing verification testing that proved joint system compatibility. Ken Staples, partner manager at Citrix Systems, Inc. said, at the Philips' annual meeting of speech recognition partners, that Citrix users can now also deploy industrial grade speech recognition on thin clients, because joint engineering efforts with Philips have resulted in the first Citrix Ready speech recognition technology. 'Citrix Ready products are verified for deployment in Citrix Application Delivery Infrastructure, and officially endorsed by Citrix to customers and resellers,' he added.

3M integrates SpeechMagic

3M Health Information Systems' document creation products will soon be 'powered by SpeechMagic', to provide customers with leading-edge documentation solutions that bring simplicity to the complex process of medical reporting. Nancy Larson, President of 3M Health Information Systems, Inc. said: 'Our customers are now provided with speech recognition technology that leverages decades of experience and know-how from the world's largest healthcare speech recognition deployments. Together, we will enhance information management in hospitals, because today information drives an organisation's ability to manage revenue and resources, comply with regulations, and ultimately, to improve the quality of patient care.'

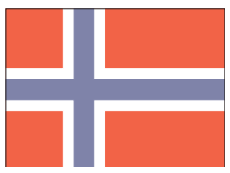
Philips expands service offering

Philips announced new professional services, which allow the SpeechMagic integration partners to capitalise on the company's unique know-how and expertise in healthcare documentation. From integration to implementation, Philips will enhance the support for its partners, helping them to maximise the success of their solutions that are powered by SpeechMagic. With its partners, Philips aims to boost productivity in hospitals and provide physicians with better information for improved quality of care.

Reports from the field

End user presentations at the Philips partner event provided insight into industrial grade speech recognition deployments in hospitals. (New case studies are also available at *www.philips.com/speechrecognition*)

Norway



SpeechMagic saves Norway's Sykehuset Telemark HF (STHF) hospital almost €900,000 annually, money that is invested in better patient care. The hospital even trains medical students in speech recognition-based reporting at the world's first academic SpeechMagic training centre.

Before speech recognition, turnaround time for medical reports could be somewhere between one and thirty days. However, Norway's Health Ministry demands that 80% of the discharge summaries are sent to the general practitioner (GP) within seven days of a patient's release from hospital. Something had to change. 'Before speech recognition we could meet the seven-day deadline in less than 65% of the cases, now it is over 90%', said Espen Behring, speech recognition project manager. 'There are only very few hospitals in Norway that can show such figures.'

Norway is seen as one of the most advanced countries in the world in terms of implementing technology to increase the efficiency of healthcare processes. In recent years, a number of highly successful speech recognition projects have triggered new installations throughout the country – with hospitals from all over Scandinavia looking at Norway for efficient healthcare documentation – powered by SpeechMagic.

United Kingdom

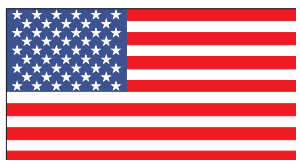
Aberdeen Royal Infirmary in Scotland has implemented SpeechMagic for 65 radiologists, in what is considered to be one of Britain's largest deployments of front-end radiology speech recognition. Featuring an HL7 interface, the system seamlessly integrates with the Radiology Information System, allowing the radiologists to achieve same-day reports turnaround.

In her presentation, lead radiologist Dr Olive Robb, of the Aberdeen Royal Infirmary, raised the question of whether healthcare facilities can still afford to work without speech recognition. 'We certainly can't and wouldn't want to,' she responded.

Today, doctors scan the barcode from a patient's patient record into the RIS, which automatically pulls up the corresponding patient data and adds it to the report. The patient history can be accessed from the dictation screen – a powerful feature allowing physicians to compare and check their results against previous findings. The dictated report is immediately displayed onscreen to let users move easily back and forth within a document. For standard findings they can even use predefined text blocks, which are inserted by voice commands. The report is available for correction and validation the moment the doctor presses the stop button on the recording microphone.

'Physicians no longer have to wait for reports to return from the transcription department, verify them (sometimes weeks after the consultation) and, in between, answer phone calls about unfinished reports,' Dr Robb said. 'We were completely surprised by the lack of difficulties with the implementation and acceptance of our new speech recognition system. The technology has reached a level that allows doctors the full responsibility of report creation.'

USA



The Children's Hospital Boston, MA, with a total transcription volume of 14 million lines annually, implemented speech recognition by following the Six Sigma method. This has led to faster report availability and significant cost savings: 91% of reports are produced in less than one day, productivity increased by 33% and work sent to overflow vendors reduced by 28%. The hospital expects a cost-saving potential of US$16,500 per month, according to Mary Radley, director of Medical Record Services from the Children's Hospital.

Canada

Dr Steven Rosenthal, associate director of the emergency department and director of Medical Informatics at the Montreal Jewish General Hospital, presented a wireless speech recognition installation with PDAs. 'The documentation process has improved amazingly,' he said. Physicians can now access up-to-date patient information and dictate their reports on their PDAs. Completed dictations are immediately streamed to the speech recognition server and, prior to the physician leaving at the end of their shift, final reports are available.

Welcome to the Speech Recognition Country Germany

More than 200 healthcare IT providers integrate Philips SpeechMagic into their applications, including global leaders such as SIEMENS, GE Healthcare, AGFA, Carestream Health and Philips Medical Systems. It is the first time that Philips has invited its partners to Germany, following the company's increasing activities in that market.

'Germany is one of the most speech recognition-friendly countries in the world,' said Holger Ladewig, CEO of Kuhlmann-Informations-Systeme GmbH (KIS). The company, which last year was acquired by Philips, is a leading supplier of medical reporting solutions in Germany, Austria and Switzerland. 36 out of 38 German university hospitals, 500 general hospitals and 500 medical practices are using KIS solutions for faster and more efficient report creation, according to Ladewig.

Marcel Wassink, CEO of Philips Speech Recognition Systems announced in Berlin, that the company will use the added capacity, available from the KIS acquisition, to provide new professional services to its integration partners and to meet the exploding demand for its speech technology. 'We are currently growing at a rate of 35% annually,' Marcel Wassink pointed out. 'In Germany, 80% of radiologists who are using a radiology information system are working with our speech technology.'

The more than 150 experts who attended the Berlin event came from all over Europe, the USA, Canada, and even Chile and Australia.


Rob Thornton

Highlights were the many end user presentations from hospitals that provided insight into how large-scale speech recognition deployments can change the way healthcare is delivered.

Rob Thornton, commercial director for Philips Speech Recognition Systems, pointed out that currently speech recognition is advancing from creating text to capturing information. 'In close co-operation with our partners, we will help solve the issues related to information capturing through helping realise more efficient, accurate and convenient workflows,' he said.

Thornton noted that over the last few years, the character of the annual partner event has turned from discussing the benefits of speech recognition to presenting results and lessons learned. 'Speech recognition has entered the mainstream,' he concluded.

Claire Betis, marketing manager for Canada-based Crescendo Systems summarised her impression of the event in her blog on *www.speechrecognition.wordpress.com*. She wrote: 'The professional speech recognition community is definitely here to stay, making noise and growing. In Berlin this year, Philips and partners clearly reinforced their commitment to the healthcare sector in the long term.'

LAUNCHED

One of Europe's biggest e-health projects

Following an agreement between **Wolfgang Pföhler**, Chairman of the Management Board of German company Rhön-Klinikum AG, and **Professor Erich R Reinhardt**, Member of the Managing Board of Siemens AG and President of Siemens Medical Solutions, the hospital group is to install Siemens' WebEPA, an intra-facility electronic patient file, to link its 46 hospitals and respective medical care centres — which treat around a million patients annually.

Working with Soarian Integrated Care (Soarian IC), Siemens will provide the software for the WebEPA in one of the biggest e-health projects in Europe.

This WebEPA roll-out follows its successful testing in a pilot project at Herzzentrum in the Leipzig University Hospital and Parkkrankenhaus Leipzig-Südost – both Rhön-Klinikum facilities. After this, an extension to the out-patient area, particularly for general practitioners (GPs), is planned.

The software components include reports, images and medical data relating to findings, a module for consultations among physicians as well as a 'master patient index' (MPI) allowing identification of patients beyond a facility. The firms see this joint development as the opportunity to establish a market standard for an interoperable structure spanning the various healthcare sectors.

Siemens has already implemented some 5,000 electronic patient files as part of a pilot project, for in and out-patient areas, in the entire Limousin region of France.

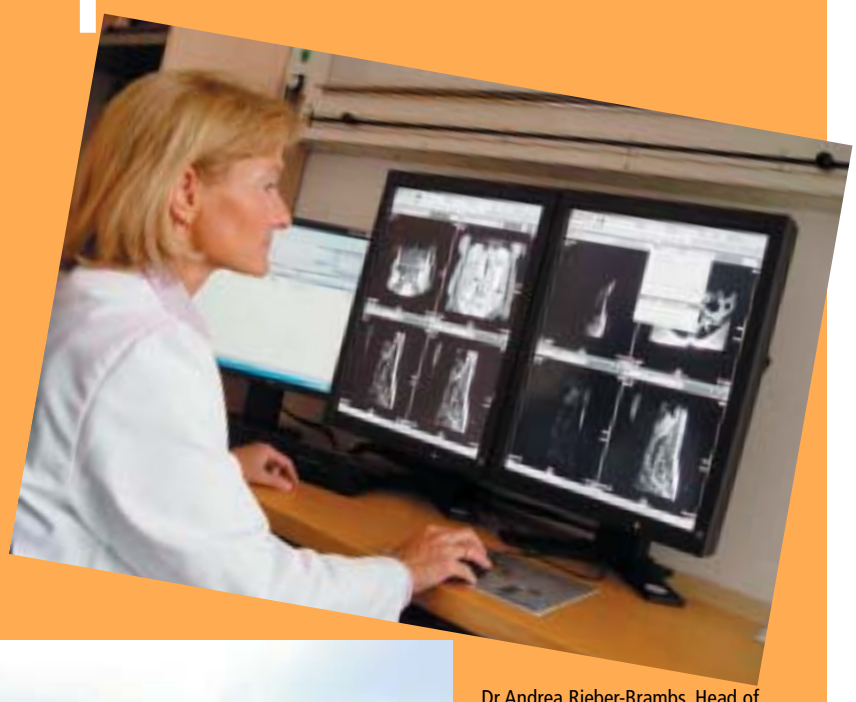
The company also reports that a screening programme for the early detection of diabetic retinopathy with 213,000 registered patients has been under way for over a year in Scotland.

In Germany, Siemens will conclude framework agreements for connectors (interfaces between existing information systems and central telematic services) and field tests will be launched next spring.

Rhön-Klinikum has alsojoined with other hospitals, public facilities and the Fraunhofer Institute of Software and Systems Engineering (ISST) as part of the electronic case file (eFA) project, to form an open consortium, and has chosen Siemens as its industrial partner, and both are now working on the specification for the eFA. In future the WebEPA will pool all data of a treatment case based on the eFA standard, Siemens reports, adding that it expects the eFA to make an important contribution towards the telematic infrastructure being planned by the German Federal Ministry of Health.

Digital networking four hospital locations

Germany – The Munich Municipal Hospital is network four hospital locations in Bogenhausen, Harlaching, Neuperlach and Schwabing, and facilitate the digital production and storage of X-ray images along with individual patient data and diagnosis results, using *GE Healthcare's Centricity RIS/PACS*. The system will enable the hospital's network to work largely without X-ray films and paper – estimated to reduce steps in the workflow from 30 to around seven.



Dr Andrea Rieber-Brambs, Head of the Department for Diagnostic- and Interventional Radiology and Nuclear Medicine

Along with standard display options, Centricity allows the user to run through over 2,000 images in a few seconds, to enlarge them or use them for 3-D reconstructions, simplifying procedures such as colonography, analysis of vascular structures, CAD and more.

Munich Municipal Hospital

E-psychiatry

The uses of the internet in psychiatry have increased in recent years, and there is evidence that professionals, patients, families, institutions and other agents benefit from it. More information and more communication between those who share the mental health network generates quality, efficacy and efficiency in mental health services delivery. Nevertheless, different researchers have obtained their own conclusions.

My 'Student Counselling Virtual Pamphlet Collection' is a directory of educational material produced by university student-counselling centres located literally around the world. With the advent of improved data compression and transmission technologies, multimedia is becoming more prevalent. Visiting-lecture series at the University of Chicago, for example, can be listened to and watched live over the Internet.

Internet resources: Here, we

Thomas Kramer and Robert Kennedy (USA) pointed out the following internet uses:

Traditional literature: Traditional journals are increasing going online. The British Medical Journal was among the first, soon followed by the American Journal of Psychiatry and many others. Traditional literature can be searched via various MEDLINE sites, but perhaps the most complete is PubMed, at the USA's National Library of Medicine.

Reference Material: This includes treatment guidelines, for example. The American Psychiatric Association and the 'Expert Consensus' series are online. There is also information specifically for patients - or for psychiatrists to give to patients. Drug information from the US Pharmacopeia can be obtained from InteliHealth at Johns Hopkins.

refer to resources that exist only on the Internet and are not just online versions of information in print. Psychopharmacology Tips, provides practical psycho-pharmacological information, culled from Ivan Goldberg's psychopharm mailing list, on over 400 topics. There are also publications that are only available online. A good example, in the news lately because George Lundberg moved there from JAMA, is Medscape. Another category of Internet resource is compiled by patients rather than physicians. One of the first was Pendulum, started by a group of bipolar patients.

Virtual Communities: There are resources that emphasise interaction more than information. Interpsych is a group of mailing lists (or 'listserves')

Dr Eduardo de la Sota Guimón examines the potential of the internet in mental health

that focus on different aspects of psychiatry, e.g. psycho-pharmacology or child psychiatry. Behaviour OnLine offers a variety of specialised bulletin boards featuring experts in those areas. Psycho-Babble is a bulletin board of mine for mutual education and support, frequented mostly by patients. At Concerned Counselling, there are different 'real-time' chat rooms, again used primarily by the public.

On-line Psychotherapy:
Right now, the cutting edge of psychiatric use of the Internet is online therapy. It's controversial, but is happening. Metanoia has a directory of providers (and related information) in the US. http://www.metanoia.org/imhs/ongoing.htm

According to James R Alleman (2003), although the prospect of online mental healthcare raises obvious questions, it also offers an opportunity to make cost effective services available to many who might not otherwise have access. By understanding issues such as confidentiality, emergencies and lack of face-to-face contact, psychiatrists can determine if this area of treatment is right for them. People who are troubled are beginning to turn to the Internet to seek psychotherapy. Avoiding the embarrassment and inconvenience of a face-to-face appointment, patients can easily find a therapist and receive professional counselling via a computer in their own home. One researcher's database of online 'e-therapy' resources has already grown to 300 private practice Websites, as well as a number of online clinics through which another 500 professional therapists can be contacted (Ainsworth, 2002). When surveyed, online patients seemed happy with their treatment (Ainsworth, 2002) and, judging by the rapidly growing professional membership of the International Society for Mental Health Online (ISMHO), there are also respected therapists convinced they can do good work over the Internet (ISMHO, 2002). Since the World Wide Web cannot be unspun, there is every reason to believe that people, especially the young and computer-literate, will continue using it to seek mental health services.

Lange et al (2006), published an article concerning evidence about the effects of internet-based psychotherapy in improving symptoms of post-traumatic stress disorder. They found one RCT (25 people) that compared internet-based psychotherapy versus waiting list control for five weeks. It found that, at five weeks, internet-based psychotherapy significantly improved intrusive symptom score from baseline compared with waiting list control (mean reduction: 11.0 with internet-based psychotherapy *v*3.6 with waiting list control; $P < 0.04$) and reduced avoidance score (mean reduction: 9.6 with internet based psychotherapy *v*2.9 with waiting list control; $P < 0.03$). The RCT gave no information on adverse effects. The authors concluded that there is some evidence from one small RCT that internet-based psychotherapy might be effective.

Although many people use the Internet for health information, this is not as common as sometimes reported, according to Baker et al (2003). Effects on actual healthcare utilisation are also less substantial than some have claimed. Discussions of the role of the Internet in healthcare and the development of policies that might influence this role should not presume that use of the Internet for health information is universal or that the Internet strongly influences healthcare utilisation.

Recently, Hsu et al (2005) concluded from their study in San Francisco that access to and use of e-health services are growing rapidly. Use of these services appears to be greatest among people with more medical need. The majority of subjects, however, do not use any e-health services. More research is needed to determine potential reasons for disparities in e-health use by race/ethnicity and SES as well as the implications of these disparities on clinical outcomes.

Powell & Clarke (2006) pointed out that 18% of all internet users had used the internet for information related to mental health. The prevalence was higher among those with a past history of mental health problems and those with current psychological distress. Only 12% of respondents selected the internet as one of the three most accurate sources of information, compared with 24% who responded that it was one of the three sources they would use.

The IT revolution

To meet an ever expanding demand for faster, more efficient healthcare delivery, and therefore better IT solutions, companies are in hot competition internationally. In an interview with *Daniela Zimmermann*, **Dr Andrea Fiumicelli**, Head of IT at Agfa HealthCare, discussed his company's aims and position in this vibrant healthcare market

Two healthcare issues drive Agfa HealthCare's strategies, Dr Andrea Fiumicelli explained: demographic evolution and medical evolution. In terms of the first, he pointed to the estimated population increase to nine billion people by 2050, a figure that includes the increased percentage of over 60-year-olds from 10-20% worldwide, bringing with it increased workload and cost. 'Because healthcare spending for the aged is four or five times that for 10 to 60 years old, this is a major issue for society worldwide,' he added. Demographics are driving the healthcare business, and as populations boom, the demand for healthcare will explode. Our challenge is to meet this increased demand with ever evolving technologies, to the benefit of patients and clinicians alike, delivering solutions that boost overall healthcare effectiveness and efficiency and thereby help curb cost.'

In terms of medical evolution, Dr Fiumicelli pointed out: 'Not only has and will the volume of patients requiring treatment increase but, as medical science evolves, it brings with it increased complexities. Although 15-20 years ago doctors, and even nurses, were rather specialised in orthopaedics, general medicine, intensive care, patient cases as well as the revolution in drugs, this is becoming increasingly more complex. To make the right diagnosis and provide the right treatment a multi-disciplinary approach is necessary; medical teams today must collect several pieces of information from the lab and many other departments to provide ever improving diagnostic results. Having said that, data sources are larger and each data source contains a bigger amount of data. So the fact that medicine is becoming really multi-disciplinary and is challenged to manage an enormous amount of data, make these the two core issues that drive our business strategy.'

With those in mind, he focused on the role of IT in future healthcare, and referred to Agfa HealthCare's co-assets, '… the first is its 100-year historical asset built around imaging – the technologies, intellectual property, you name it – to record images on film, with printers, on computer radiography plate, any technology. The second asset is related to IT applications, and I stress the word applications: We have the people, the know-how, technologies and intellectual property to provide applications, solutions and services to automate clinical workflow and to administer everything, from patient admission to transfer and billing. In the past 15 years we have also learned to be independent and to connect to the thousands of IT solutions, most of them legacy systems that do not comply with standards because they've been around for 10-15 years".

DZ: ***Talking about connectivity, no company has yet produced the complete electronic patient record (EPR) – is this part of your strategy?***

AF: 'Yes. EPR solutions are a fundamental base for dealing with both the demographic and medical evolutions of the future. They provide an answer to increased data management and cross-border information sharing, and help reduce often complex information gathering procedures faced by many clinicians.

Practically, the EPR will make more and more sense over time, once the most relevant information can be accessed on one screen. Technically there are three major issues: the capability to collect meaningful data, provide data integrity and maintain data security. The first layer is to get the information; second to structure that, meaning a big image manager, master patient index, to structure data from the lab, radiology, pathology, nuclear medicine etc. then the rendering – i.e. sorting it all in a useful way. The user doesn't care about having 500 gigabytes of data; he wants basics, in one second, on one screen, in a simple way. Finally, the information must be managed securely.

'In Berlin, for example, we have implemented all of this, so that the Vivantes hospitals can access the patient record on one screen – and so can a nurse or general practitioner (GP), depending on security status. The next step is for GPs in Berlin to access information about chronic disease management, and because there's a single data repository, we can easily provide that data to GPs, who can return information to the hospital for long-term delivery. So the EPR is a reality. Frankly, with a little bit of pride, Agfa HealthCare has

Industry specialists collaborate on the Asklepios Future Hospital Programme

In response to growing pressure on healthcare systems, Asklepios Clinics initially joined forces with Intel and Microsoft to establish the *Asklepios Future Hospital* (AFH) Programme. Up to now, over 20 companies have joined this venture – including Bosch, the healthcare insurance company DAK, Hewlett Packard, T-Systems, CompuGROUP, McKesson Technology Solutions, SAP, B.Braun, Conworx, Dimension Data, DOCexpert, Dräger Medical, EMC, MCS, Fujitsu Siemens Computers, Fujitsu, HanseVision, Lufthansa Systems, Patrise, SyynX and Welch Allyn.

The AFH Programme pursues an integrative approach to improving the quality and cost-effectiveness of healthcare treatment by setting new standards, Asklepios reports. In the AFH Programme, innovative technological solutions are developed and tested with selected co-operation partners from industry, healthcare, organisations and associations. The programme focuses on cooperation with a range of market and thought leading solution partners, and is deliberately designed as an open and dynamic programme.

Information technology serves as a driver and impetus for AFH, in which new technologies form the basis of solutions for innovative hospital environments. The wide-ranging projects focus on overcoming communication barriers by establishing seamlessly secured, interoperable communication between all healthcare service users, and on cost-effective solutions and improvement of patient treatment quality. The programme adopts a consciously integrated approach, involving the consistent reorganisation of an entire clinic and later extending to all Asklepios clinics. Analyses and tests examine the quantifiability, ease of integration and transferability of individual projects and solutions to other hospitals.

'The Asklepios Future Hospital Programme has the potential to support, accelerate and secure processes of reform in national and international healthcare systems on a sustained basis', said Uwe Poettgen, CEO of Asklepios Clinics and co-initiator of the programme. 'The AFH aims at setting new standards of quality and efficiency within the healthcare system.'

AFH / BERTRAM SOLCHER

The Industry-Alliance in European healthcare *Front row, from left*: Thomas Bengs (Fujitsu), Hugo Rückerl (Fujitsu Siemens), Gary York (McKesson Technology Solutions), Claus Moldenhauer (DAK), Micha Kirchhoff (Bosch), Thomas Breig (Hewlett-Packard), Dr. Tobias Kaltenbach (Asklepios Kliniken), Angelika Gifford (Microsoft), Hubert Haag (T-Systems), Herbert Weber (Intel). *2nd row from left:* Ralf Hartmann (B.Braun), Bernd Jaskotka (SAP), Jan Broer (CompuGROUP), Uwe Pöttgen (Asklepios Kliniken), Christian Herzog (Syynx Solutions). 3rd row from left: Roman Rosenkranz (Conworx Technology), Dr. Walter Müller (Welch Allyn), Scott Filion (EMC), Christina Kade (Lufthansa Systems), Jürgen Fleschütz (Dimension Data), Thomas Scheible (Patrise). *Not in the photograph:* Dr Christian Hauer, Dräger Medical Deutschland.

First projects

OneIT

Initial successes have already been reported. In this project, issue of standardisation for the IT infrastructure of Hamburg's Asklepios Clinics – Europe's largest single-site hospital group – was examined. This resulted in the implementation of a central IT management named OneIT. The objectives were to introduce significant improvements in data protection, security, cost-effectiveness and availability. In view of the size of the Hamburg clinic group, comprising around 5,000 computer workstations that span not only management and administration, but also medical and nursing environments, OneIT became the largest migration project in the German healthcare system.

OneIT has simplified administration and improved security, thus increasing the cost-effectiveness of running the clinic by around one-third. Availability has risen significantly, while waiting times and system failure have dropped. Inter-site working is now straightforward, since any user can log in at any PC.

Telemedicine

The activities of the Asklepios Clinics in telemedicine pursue innovative of inter-sectoral interconnection in healthcare. This field developed from the desire to take internal hospital processes 'outside' and discover useful points of connection.

The key project *Arztportal* (Medical Professionals' Portal) involved the design of a system for exchanging patient data between Asklepios hospitals and the patients' general practitioners or specialists. An online platform handles data management and enables admitting doctors to communicate with Asklepios hospitals and exchange patients' data.

The system enables closure of communication gaps along the treatment chain and provides efficient, simple communication between hospitals and external partners, supplying optimum support for integrated medical care and the medical treatment process of and to the patient. In addition, the project focuses on enhancing the integration of processes between hospitals and external partners.

Source: Asklepios Clinics


Dr Andrea Fiumicelli

delivered the integrated EPR; we have integrated the different multi-discipline data sources discussed earlier. This is a consequence of our clear focus. We have two businesses in healthcare, imaging and IT, in which we want to become the healthcare leader by driving the integration of both worlds.'

Do you mean other firms have too many focuses?

'Our ability to combine imaging and IT makes us different. We have the biggest market share for hospital information systems. We have 1,000-plus laboratory systems in France; a third of French public hospitals are using hospital information systems from us, one third uses IT for billing. Also, in Germany, Austria and Switzerland we are the market leader. At the same time we are a major PACS, clinical applications, Computed Radiography and printing player, meeting ever demanding imaging needs and the ability to integrate these into one effective IT solution.

Can it be said that PACS is a core part of your IT strategy and success?

'Yes, if we look at the bringing together of PACS and the other IT areas in German speaking countries for example, in terms of growth, our PACS business is booming. Our ability to combine PACS and IT in one solution means we use less hardware, so there's less cost for customers. We provide far more productive accessibility of data as a result. We can integrate the laboratory and radiology data in one shot, for example. The benefit for the user is huge.'

Although your film competitors work in a specific field, are they still competitors in IT?

That depends, in every market segment we are competing with different companies – in software –, such as Siemens and GE. In another family of competitors, we compete with firms such as Meditech, McKesson, and iSoft. We also compete with national-based companies, which don't have systems outside their own countries. Each market might have at least 20 or 30 IT application companies working only in data. We compete with them as much as we do with the larger players. Our competitive landscape has changed dramatically since the company decided to become a leader in the healthcare IT field. Traditional film markets are dominated by only a few players, whereas healthcare IT by many thousands.'

Does the buying of iSoft by IBA, the Australian company, affect Agfa HealthCare?

'We are of course continuously monitoring our competitors. We compete with iSoft in England and definitely in Germany, where it started about 15 years ago and was the first to talk about integrating laboratory pathology.'

Let's talk about film.

Film is still important in healthcare and we sell a very significant volume. In the US and Western Europe film has declined and, on the horizon of five years, film will not disappear. There are some emerging economies, Latin America, Mexico, and some Asian countries where film demand is still increasing. So, as a worldwide player, film demand is still significant. However, we have executed our strategy very clearly: through IT – an important asset and we want to protect our value in this area. The film business is important for a company like us. The income is significant.'

Others also back up their IT business with film.

'Of course, but for us, the difference is the percentage we present in IT. We are not backing up our business with film, but are driving its transformation with it.'

Are you a partner with other providers of healthcare solutions?

We are partners with hardware companies because we are an IT applications company. We provide software and services to the healthcare market using hardware or some basic technologies like a database. That also means, in many cases, that we will ally ourselves with providers of the technologies and products we do not produce, to ensure we can deliver a complete package to our customers.

Company acquisition

GE Healthcare has acquired Dynamic Imaging LLC, which specialises in Web-based image and information management. GE reports that the acquisition will add IntegradWeb suite products to its IT list, which provides for healthcare areas such as hospital integrated delivery networks (IDNs), community hospitals, out-patient imaging centers, radiology group practices and general practitioner (GP) surgeries.

Don Woodlock, vice president and global general manager, of Imaging Solutions at GE Healthcare said: 'Dynamic Imaging has a strong track record of innovation and a family of top-rated products that are highly complementary to our existing offering. Their research and development team is equally impressive.'

Alex Jurovitsky, CEO of Dynamic Imaging, added: 'Dynamic Imaging, through its IntegradWeb product lines, has proven to be quite adept at addressing the industry's clinical challenges, across all industry segments. The simplicity and power of our Web-based Picture Archiving and Communication System (PACS) and integrated RIS/PACS, combined with GE's broad suite of IT offerings, will redefine the market's expectation for complete interpretive and review access, by any authorised user, of any imaging study, anytime, anywhere. Applying the capabilities of IntegradWeb to GE's PACS offerings, the newfound flexibility for radiologists and referring physicians worldwide… will be simply astounding.

New technology accelerates diagnosis

By **Guido Gebhardt**

Radiologist Dr Christoph Seifried, and colleagues at Altötting hospital, are among the first to use the new Sectra workstation IDS7/rx. Even before an examination is over the radiologist can commence diagnosis based on the first images transferred from the modality… Step by step, the entire data set is being loaded until all images are available in high resolution. Above all, teleradiology applications benefit. 'IDS7/rx is the ideal solution for multi-site PACS installations,' said Dr Seifried, pointing out that radiologists can access images from different locations – the network covers three sites: in Altötting the teams runs a radiology department and delivers the entire range of diagnostic imaging for the town's hospital. In addition, it services Burghausen Hospital, 20km away, which has no radiology department. The radiology office in Mühldorf is a division of the Altötting office and provides CT and MRI diagnostics for the Mühldorf Hospital.

The Swedish company introduced an innovative web-based technology that uses the available network capacity optimally during image transmission. IDX7/rx was especially designed for effective transmission in environments with fluctuations in network quality or for networks with low data transmission rates.

In complex examinations, image files of organs can be several Gigabytes. Sectra reports that IDS7 can handle huge data volumes and thus allows the integration of such processes into daily workflows without data loss.

The IDS7/rx workstation employs standard tools and also provides 3-D rendering tool, and a wide range of diagnostic tools for data intensive applications.


Dr Christoph Seifried: "The data window of the IDX7/rx offers detailed views of the work list for new patients and previous studies but also of diagnostic results and scanned documents."

Teleradiology

The technology called JPEG2000 provides progressive data transfer, which means the distant user initially receives low-res data sets, then step by step remaining data are loaded with image resolution increasing.

The idea to load the data into a local cache significantly increases the performance of the work station, Sectra explains. The radiologist can immediately access the entire decompressed data set and he can choose between loading an entire work list or only single examinations to process the work list without delay.

At the same time the local cache ensures the data security because the system saves only images but no patient data on the computer. The user is always linked directly to the database and will be alerted immediately when the data set has been modified, for example when a colleague has added notes.

Dr Seifried said he is impressed by IDS7/rx's new functions: it offers an intuitive, Windows-based user-interface that does not require training and thus immediately accelerates radiological workflows.

In October, Sibiu, the European Cultural Capital for 2007, again hosted the Romanian Society of Laboratory Medicine's (RSLM) national scientific congress. We asked various international speakers about the meeting, the value of international scientific exchanges, and particularly for their views on science in Romania today

Romania's 6th National Congress of Laboratory Medicine

Congress President Dr Manole Cojocaru, of the Colentina Clinical Hospital, Bucharest
This congress was undoubtedly a success. Thanks to people that Camelia [Grigore] and I have met at other scientific meetings, we've had real international participation, with invited speakers from many different countries. The conference is a great international networking experience for us and really important for laboratory medicine in Romania, which has made considerable progress in recent years. However, we still need evidence-based laboratory medicine to improve quality control. We probably still don't have enough international collaboration. We should also have more international research projects, but even within Romania we don't share experiences and work together on a daily basis.

I'd like to thank *European Hospital* for giving us this opportunity to show how Romanian laboratory medicine compares with the rest of Europe – and indeed the world.

Dr Camelia Grigore, Head of the Analytical Laboratory at the Paediatric Hospital, Sibiu
Romanian clinical chemistry and laboratory medicine has definitely progressed since I first entered the field 15 years ago, when my lab had just a few glass pipettes and bottles. Today we are considering automatic analysers for samples like CSF. In 200 I would have said that Romania was 25 years behind other countries; now I think it's only 10. Technically, our hospitals are now not bad, but we are still under-equipped. With the introduction of private laboratories there has been an influx of equipment in to Romania, but these are primarily for general practice; hospital laboratory functions haven't been outsourced. One of the biggest problems is lack of money; reagents are so expensive. We have no cytogenetics, molecular biology or mass spectrometry. When there is no everyday practice of subjects it's really difficult to learn the theory. We need to know we are doing things correctly for the 21st century. We suffer from a lack of industry sponsors for exchanges, conferences and training courses. None of the big companies are in Romania, not Abbot, Roche, Bayer, Beckman Coulter etc. We buy their equipment via Romanian distributors – unlike clinical medicine, for which drug companies provide necessary resources for doctors to move forward. I hoped that, once we joined the EEC, things would change and we'd see some European funding; so far I've seen nothing, but I'm still optimistic!

Dr Bernard Gouget, SFBC-EFCC (French) representative, SFBC-Committee on International Affairs; Manager for Public Health, Fédération Hospitalière de France
This conference is a great way for Romanian scientists to network and for other laboratory medicine specialists to see Romania's situation. To advance this field, we need to understand how current laboratory practice, specific health problems and demographics work in each country. All the national societies should make their situation known to the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and probably more importantly, the newly formed European Federation of Clinical Chemistry and Laboratory Medicine (EFCC). The merger of FESCC and EC4 should lead to a stronger Euroepan branch of IFCC. We need professional harmonisation; people can't work alone. We need to promote young scientists, encourage them to travel and attend conferences and become involved with the professional societies. As members of the world's largest organisation in laboratory medicine, we have the responsibility to work toward dissolving artificial barriers and to stimulate the development of a brighter vison for integrated projects. The RSLM is one way to raise the visibility of Romanian laboratory medicine. I know Camelia agrees with this – she often comes to conferences and to work in France. We should consider an annual exchange programme for lecturers. Finding a common ground of collaborations and disourse may well be the key of ambitious projects!

Dr Elmer W Koneman, Professor Emeritus at the University of Colorado School of Medicine, USA
This very happy conference is a great opportunity to share medical knowledge. 300 people registered is a huge success for the RSLM. I'm proud to be an honorary member. Conversations I've had here, with colleagues from several countries, have planted the seeds for potential co-operative efforts to make available educational opportunities for use in hospital and clinical laboratories not only throughout Romania, but in adjacent countries. Practical teaching programmes can be developed to address the time-honoured technologies used in conventional laboratory microbiology, as well as open up the almost unlimited opportunities afforded by the implementation of newer assays in molecular biology and genomics. Next year I'd like to implement half-day, hands-on workshops, although I'll have to adapt my teaching to the Romanian way, so that participants gain maximum benefit. Using the Web, we can potentially make these educational opportunities available in every laboratory facility large and small, with the click of a mouse.

Dr Laszlo Muszbek of Debrecen University, Hungary
This conference is very important event in the life of the RSLM of which I also am an honorary member. Romanian healthcare has seen tremendous improvements over the past 10 years. Romanian laboratory medicine is fast approaching European standards. It's good that this conference incorporates fields of laboratory medicine that are often kept separate – such as immunopathology. Hungary and Romania have a great scientific relationship; we support one another. Sometimes we organise joint meetings. We realise the importance of helping one of the newest members of the EU. Ten years ago we began to work together on the standardisation of quality control procedures and to establish a QC office. Initially, Romania was behind, now we are at an equivalent level.

Professor Svetoslav Handjiev, President of BASORD in Sofia, Bulgaria
This well-organised conference provides a perfect atmosphere for discussion. Laboratory medicine in general is at a crossroads and I'm not sure if, in Europe, we are moving in the right direction – the USA is far more advanced. The profession faces challenges. Industry is producing such performant machines, integrating sophisticated analyses that can now easily be done by a doctor. Clinical medicine is increasingly using point of care testing (POCT). Part of the role of the clinical laboratory specialist is being removed. Conversely, the complexity of laboratory techniques is much greater with molecular and genetic diagnostics and mass spectrometry. Our role is transforming from that of classical analyses to one of interpreter between the laboratory and clinician. We have to ensure that the new generation of medical laboratory scientists are educated in interpretive clinical medicine or the specialty will disappear. Those of us who are university professors must make sure that the training of medical students and postgraduate scientists incorporates as much interpretive medicine as possible.

Professor Michael Oellerich, Director of Clinical Chemistry in Göttingen, Germany
The profession is changing all over the world and financial and social pressure on healthcare systems will also cause big changes. Now is the time to build bridges between sister societies to strengthen our position both scientifically and politically in education, medicine and commerce. We must also support countries like Romania to reach the same standard as the rest of Europe, with books, literature, combined projects and forming partnerships for the 7th Framework Programme (FP7), and personnel exchanges. Under the Marie Curie Fellowship programme it was possible to exchange researchers in particular for initial training. The programme was used according to our experience in particular by young researchers from eastern Europe. These exchanges were very profitable both scientifically and culturally for those involved. The EU continues its commitment to promote these activity within the 7th Framework Programme as Marie Curie Actions as part of the people programme. Marie Curie actions should provide Romanian scientists with a great opportunity.

Professor Enrico Granieri of the Neurology Department in Ferrara, Italy
I've attended four of these conferences and had contact with doctors and scientists in Romania for several years. Such contacts are certainly easier since Romania became more in tune with Europe. I've have been asked many times for my opinion on how things should work in clinical laboratory medicine, specifically in neurology and neuro-immunological pathology and diseases. Young Romanian scientists now have many opportunities to go to other countries – Italy, for example – for further studies in neuro-immunology. The different societies for these specialties, such as the European Neurological Society, provide grants for exchanges to enable different countries to bring practices closer together.

Janet McMurray, Consultant Clinical Biochemist, UK, and Secretary, EC4 Register Commission
I'm at the conference representing the EC4, this is a European register of specialists in clinical chemistry and laboratory medicine held and operated by the EFCC since 1998. The database contains details of all senior professionals who have met the agreed educational and training requirements to be independent practitioners (consultant grade). Before registration is possible, the

AU-Connector transports Olympus to the fast lane

Rising costs, budgets and regulatory requirements have shaken up all medical areas except one – laboratory medicine. Now the wind has changed direction, affecting in-house labs, lab service providers and even manufacturers of related tools, as *Daniela Zimmermann* discovered during a meeting with **Thomas Pracht**, Managing Director of Olympus Life Science Europa GmbH. 'Some of our prime customers are major lab networks and consequently the changes that are currently happening on the lab market affect our business as well,' he explained.

'But, as the saying goes *One man's meat is another man's poison*, the changes may well turn out to be very positive for us because increasing price pressure forces many hospitals to outsource their labs. This will be advantageous for lab networks which can only grow by taking on the hospitals' lab tasks. The networks will have to increase their sample throughput – and that's where Olympus enters the stage: Our strength is the high-throughput segment. Our analysers are installed in labs where over 5,000 samples are processed every single day. In this segment we are the market leader – ahead of Roche. In the 2,000–5,000 sample/day segment we are number two. The current development – fewer providers handle more samples – fits well into our product concept. We have the opportunity to grow with the lab networks – and we'll go for it!'

But like any growth won't this also reach its limits, particularly if and when the consolidation hits the diagnostics sector. What is Olympus's mid to long-term strategy, and what role does automation play in this? 'There is still enormous potential for innovative product developments,' he pointed out, 'and we will continue to focus on automation. However, we do not consider large lab lines a convincing solution. Our approach is to optimize high throughput analysers because, in our opinion, today speed is the crucial problem with many systems. The technologies are good, but they cannot be used efficiently on the slow lines. It's a bit like driving a Porsche along a bumpy country lane. All the sophisticated technology is useless – you simply have to drive slowly. Olympus wants to turn the bumpy lane into a highway in order to optimize existing automation technology. Our highway is called *AU-Connector*. It links the different analysers for clinical chemistry and immuno-chemistry and ensures that all samples are processed automatically – at the speed of a Porsche! In a next step, results will be fed directly into the hospital information system. Today, that is still a problem due to the many standards in the different hospitals. But we are sure a solution is around the corner.'

A further strategic focus, he added, is strengthening immuno-chemistry. 'Unlike Roche, which offers a wide range of services, we specialise in clinical chemistry. But in the future we will also be specialists in immuno-chemistry. That's our goal: to be specialists in clinical and immuno chemistry.'

The company can rely on the well-tried quality of its products and draw on its comprehensive experience in clinical chemistry, he emphasised.

Thomas Pracht meeting with Daniela Zimmermann

'We expect to reach this goal in about five years. We are optimistic because Olympus has a crucial asset: we produce all components for a diagnostic system in-house: hardware, software, reagents. Particularly in immuno-chemistry the development of reagents is an extremely complex process and requires intensive development efforts, which we can afford because we have the know-how and expertise in-house. Thus we can react quickly to market developments – a major competitive advantage.'

Olympus Life Science Europa GmbH - Diagnostics

Based in Hamburg, the firm produces systems for in vitro diagnostics, having a long tradition in clinical chemistry, electrophoresis, transfusion testing and laboratory automation, for markets in Europe, Africa and the Middle East. With the development of its AU3000i immunochemistry system and the consolidated AU-Connector system, Olympus could expand diagnostic services across disciplines and increase the speed and throughput of the systems.

Despite moderate growth in this market, for 2006/2007 Olympus Diagnostics recorded a sales volume of €179.2 million – a rise of 4% over the previous year.

Series of CO_2 incubators provides full contamination control of cell cultures

USA – Thermo Fisher Scientific Inc has launched Thermo Scientific Series 8000 CO_2 incubators for cell cultures, which the firm reports provide stable, precise temperature, humidity and CO_2 control, with advanced decontamination technology. 'A choice of either water jacket (WJ) or direct heat (DH) incubators is offered to meet even the most stringent laboratory and research requirements, offering maximum thermal protection and the flexibility to culture cells with confidence.'

A triple wall construction and large water volume ensures the incubators provide excellent temperature stability and protection against heat loss,' the company adds. 'By holding the temperature for long periods, the (WJ) incubators offer extended protection during power failures. These incubators are lightweight, offering advanced airflow and direct chamber heating, to provide temperature uniformity and stability for an ideal culturing environment. The automatic high temperature decontamination cycle is ideal for overnight sterilization.'

All incubators in this series have a patented HEPA filter airflow system, to achieve Class 100 air quality within five minutes and continuously filter the entire chamber volume, eliminating any airborne contamination.

The incubators have polished stainless steel interiors, coved corners, and shelves and supports that can be easily removed without tools, the company points out. 'The HEPA filter is located just inside the incubator chamber for easy access and simple replacement. With an intuitive user interface and a choice of T/C or IR CO_2 sensors, the Thermo Scientific Series 8000 CO_2 incubators are an ideal choice for researchers in academic, government and clinical laboratories.'

national society must demonstrate equivalence of standards between the national register and the EC4. The primary goals of the EC4 are to stimulate the professional development of members and encourage the ease with which they can find work in EU countries. Of course a by-product of the register is that standards become harmonised throughout Europe and all clinical chemistry and laboratory medicine departments can achieve accreditation. So far, 16 EU countries have been accepted by the EC4. This is the beginning of process for Romania, we don't really know what their level of training is – even in more established EU countries it isn't always easy to find this out!

Dr Claus Muss of Augsburg, Germany

As a physician I work in areas a bit to the side of clinical chemistry and laboratory medicine. My main interest is in preventive medicine, from many aspects, nutrition, environmental medicine, immunology and epidemiology. We've recently started the International Society of Preventive Medicine. We'd like an international standard, but need more data on certain aspects. I'm using this conference to meet other professors and see if we can combine strengths. We need ways of proving risks, showing risk factors, so that we can start to teach people about them. Fundamental lab diagnosis of risk factors can make this a reality. All health services are losing millions of euros a year from chronic illnesses such as obesity, CVD and diabetes. We need to find the right way to project the image of preventive medicine to the general population.

Growing with the lab networks? We'll go for it!

Asked about plans for molecular medicine, he referred to the Olympus acquisition of Advalytix AG about three years ago, which helps to shape that sector. 'We want to jointly develop PCT technologies that will play an important role in decoding genetic material. We expect these research & development efforts to result in a number of exciting diagnostics projects in the next few years. Nevertheless, as far as molecular medicine is concerned, we also co-operate with manufacturers in the in-vivo segment – another area with great potential for the future.'

Does he have a concept about the labs of the future? 'I guess the instruments in the future laboratory will shrink in size yet still be able to handle the demand of one or even several hospitals. Automation will continue, so that only two people will be required to operate the systems. Not necessarily a pleasant outlook but that will be develop, whether we like it or not.'

Last summer's takeover of Bioscientia, the long-established German laboratory service company, by Australian lab giant Sonic Healthcare was closely followed – internationally. When a global player enters a stage that, up till then, has been the exclusive domain of national – often owner-led – actors scepticism and speculations abound. *Who will take the leading role in the German market in the future? Will prices remain stable? Who will win and who will lose?* During a *European Hospital* interview, Dr Lothar Krimmel, Bioscientia's managing director responsible for strategy, marketing and sales, and its director for hospital accounts Andreas Kirchner, put an end to most of the speculations. Nevertheless, they are both convinced that, in the next few years, the German lab market will undergo tremendous changes.

Australia's Sonic Healthcare strengthens European presence

EH: *Isn't the merger of Australia's international Sonic Healthcare and Bioscientia, a global player, deeply rooted in the Boehringer Ingelheim group, something of a 'clash of civilisations'?*

Dr Krimmel: Absolutely not. You said it yourself: Bioscientia was indeed founded by a global player – Boehringer Ingelheim – 35 years ago. So, in a sense, we have returned to our industry roots. The Bioscientia owners and management made a very conscious choice in favour of Sonic Healthcare because Sonic is a physician oriented and physician led company with a clear focus on top medical quality – which is exactly our vision of laboratory medicine. Furthermore, while Sonic Healthcare is playing in the Champions' League of global lab medicine, it does not impose a centralised group strategy in terms of logistics or brand presence, but gives regional labs free rein.

Thus, Sonic is not a mere investor planning to sell the business after a few years for a huge profit, but a strategic partner that is interested in the long-term development of labs in the Sonic network. This internationalisation offers the national members of the Sonic group enormous advantages. Not to mention the fact that the focus on exclusive lab markets in Western countries, with their stable social and political environment and high growth potential, is a business model that is virtually impervious to market risks. Stock market analysts have put their stamp of approval on this worldwide unique concept by 'purchasing' recommendations.

Does this mean other international companies will enter the German market, and if so, what might the impact be?

Obviously, the German lab market is in a phase of rapid consolidation where corporations are involved. However, this is not about profit-hungry listed companies, as the distorted picture painted by many in the media try to make us believe. It is just a normal economic phenomenon. Lab medicine is a relatively young discipline. In Germany its infrastructure was created in the 1960s and 70s by office-based lab physicians. Today, those physicians are about to retire, which means many of their businesses are up for sale. This wave was foreseeable. In view of the increasing importance of lab medicine in diagnostic processes, the labs have grown tremendously in terms of turnover and value and no young physician can afford to buy them. A mid-sized lab easily reports a €20 million turnover annually and has 200 employees – only corporations can procure the necessary cash and carry the risks attached to these volumes.

Do you also anticipate structural changes in this market, for example, regarding relationships with the payers, or co-operation between independent and hospital-based labs?

Andreas Kirchner: Yes, such changes will happen – and very soon. German law now allows direct contracts between lab physicians and medical insurers. In the medium-term we expect such contracts to replace the collective contract system of the National Association of Statutory Health Insurance Physicians. This in turn will trigger a radical change in the client structure: It might – as is already the case in the USA – no longer be the physician, but the insurance company that determines in which lab an insured patient's blood will be analysed. As a company that operates Germany-wide, and enjoys an excellent reputation, we are well prepared for such changes.

From left: Dr Lothar Krimmel (Managing Director, Bioscientia), Daniela Zimmermann (Managing Director, European Hospital), Meike Lerner (Journalist, European Hospital), Andreas Kirchner (Director for hospital accounts, Bioscientia)

Undoubtedly there also will be changes in the hospital-based lab market even though only three to four percent of a hospital budget is earmarked for labs. But the cost pressure on hospitals increases, forcing them to implement structural changes in their lab services. Due to the high quality and cost-efficiency of external lab services, the number of both private and public hospitals that outsource their lab needs undoubtedly will increase. Certainly there is also a counter trend towards centralised hospital labs – but they are cost-efficient only for specialised clinics – and it is particularly in this segment where another trend seems promising: the relocation of independent labs to the direct vicinity of the hospital. These three trends will deeply change the lab landscape.

Which European countries appear to be particularly interesting for foreign investors as well as German labs?

Dr Krimmel: No doubt France is the most interesting because it has the biggest private lab market in Europe with 8,000 'Biologistes' in about 2,500 locations. The market volume is an estimated €7 billion compared with €6 billion in Germany – despite Germany having 20 million more inhabitants. In France, blood sampling is not done by a referring physician but by a 'biologiste', which is an additional hurdle for the patient. Nonetheless, the turnover is larger than in Germany because prices for lab services are markedly higher. This means France is a very attractive market, although still largely closed to foreign investors – a fact that cannot be upheld in view of European law.

In Italy and Great Britain – the other two big countries – health markets are largely government-controlled, so it's difficult for a private company to get a foothold there. However, Sonic managed to acquire TDL in Great Britain. Spain is the fifth-largest lab market and offers interesting opportunities, despite its public health system, since the market consolidation is already quite advanced. In Eastern Europe the insurance systems are still unstable and logistics are difficult. Another problem is the extreme diversification of the Eastern European market. For example, the Polish lab market has a volume of only €400 million, but accommodates almost 8,000 service providers.

In short, in addition to Switzerland, which also has a large private lab market, Germany is currently the most attractive market in Europe. Consequently, this is where the most significant changes will happen. We are convinced that the Sonic model, which is based on a network of top labs, will be highly successful in the turbulent years to come.

Bioscientia

Founded in 1970 as a subsidiary of Boehringer Ingelheim GmbH, the medical diagnostics firm Bioscientia was spun off through a management buy-out in 1995. Currently, Bioscientia GmbH, still headquartered in Ingelheim/Rhine, has 1,000 employees and provides services for 8,000 referring physicians and 400 hospitals. Its international business focuses on the Middle East. When Bioscientia, which recorded a turnover of around €120 million, was taken over by Australia's Sonic Healthcare this year, the firm was valued at €190 million.

Sonic Healthcare

The Australian company reported a sales volume of around €1.25 billion. About €320 million is generated in Europe, where, in Germany, Sonic Healthcare owns Bioscientia and Schottdorf, as well as labs in Switzerland and Great Britain. In the USA, Sonic Healthcare reported a further €350 million in sales, placing this company in the number three position nationwide. The firm's Australian market is reported to be worth €600 million, and now, with its growing European presence, Sonic Healthcare has become an international market leader.

Microscience 2008

UK 23-26 JUNE

Europe's biggest microscopy, imaging and analysis event

London's ExCeL will again be the venue for the biennial *Microscience* international conference and exhibition on microscopy, imaging and analysis in life and physical sciences. Organised by the Royal Microscopical Society (RMS), the 1100 m² of exhibition space is already 85% booked by firms such as Hitachi, Jeol, FEI, Leica, Olympus and Zeiss, will exhibit alongside many other specialist firms in these fields. 'We see Microscience as the Motor Show of Microscopy!' said Rob Flavin, RMS Executive Director.

Leanne Annereau, Marketing Manager for Olympus UK, added: 'Microscience is a key event in the microscope calendar; it's an excellent opportunity for us to network in the microscope community across all areas. Consequently, as a big company we want a big presence; we've booked early and for more space for 2008.'

Details: www.microscience2008.org.uk.

A hundred years of ventilation

On 6 October 1907, engineer Heinrich Dräger received the first ever patent for a mechanical ventilation machine – the Pulmotor. His invention revolutionised ventilation and expanded the range of products offered by Lübecker Bierdruckapparate- und Armaturenfabrik Heinr. Dräger. It might appear hard to equate today's state-of-the-art ventilation equipment, which uses computing and monitoring technology, with that mechanical ventilation prototype, yet the technology behind it remained standard for decades and is still the basis of modern ventilation systems. *Meike Lerner* spoke with hospital specialist **Dr Ernst Bahns** and **Ernst Schubert**, product management director in Dräger's intensive care department, about the success story of artificial ventilation.

Heinrich Dräger's concept for the first Pulmotor was ahead of its time, for he was the first to choose a mechanical principle that could closely copy human physiology. 'Unlike other manufacturers he used time-rather than pressure-controlled mechanical ventilation,' Dr Bahns explained. Patented in 1907, the first model was only a prototype and not generally in hospital use. Only further developments and modifications of the breathing connector and the control mechanism – carried out by his son Bernhard Dräger, and engineer Hans Schröder – made serial production of the model possible, from 1908.

Five years later, around 3,000 Pulmotors were in use; by 1946 the number had risen to 12,000. Over the years the machine was repeatedly modified and sold by Dräger until the 1980s. However, in the mid-70s, the Pulmotor was finally replaced by ventilators in the Oxylog series.

'A significant innovation in mechanical ventilation finally took place at the beginning of the '80s with the arrival of computer technology. This allowed precise control of the flow of breath and upgraded integrated breathing monitoring,' Dr Bahns explained.

Dräger implemented this new technology for the first time in their EV-A series. Although there were monitors that could be connected to ventilators, these were the first artificial ventilators with integrated graphical monitoring. Other manufacturers took another 15 years to do this. 'Since then, it became the general standard in intensive ventilation,' Ernst Schubert added. 'The main motivation in developing ventilation systems further has always been to improve how they are tolerated by patients. An important step in this direction was made at the end of the '80s with the introduction of the new ventilation procedure BIPAP, which made it possible, for the first time, for a patient to breathe spontaneously during artificial ventilation. The patient was therefore given more freedom and the conditions for gas exchange were improved significantly. The result: Reduction of damaging side effects of mechanical ventilation on the lungs and the cardiovascular system.'

As pointed out by Dr Bahns, over the decades, developments in ventilation procedures not only became more patient oriented but also more user friendly.

Today's systems utilise the knowledge of clinical staff – regarding weaning, for example. The correct treatment parameters are usually set according to a certain scheme. Such guidelines can now be put into practice aided by computers that analyse a patient's condition and develop an appropriate treatment plan. Dräger advanced this concept with its SmartCare/PS system: the computer is authorised to implement the actions set out in the treatment plan and control the ventilator. Studies have shown that, on average, this system helps to halve the time a patient takes to be weaned off the system.

In the face of today's increasing hospital workloads, innovative technologies are needed that facilitate high mobility and fast access to patient data. 'The future lies in completely networked systems that integrate across all areas of a hospital – patient monitoring, therapy and information management – and that control these processes via a central cockpit,' Ernst Schubert said, adding that Dräger's Infinity Acute Care System, first introduced at MEDICA 2006, meets those demands.

What lies in the future? 'The technology will be further optimised due to increasingly more intelligent computer solutions,' Dr Bahns predicted. 'But, there have been some surprises in the history of mechanical ventilation over a 100 years, and most probably there will be surprises over the next 100.'

CLINICIP

Presented during a symposium at Langenbeck-Virchow-Haus, in Berlin, the European CLINICIP research project aims to develop a method to improve glycaemic control during intensive care and provide a low-risk monitoring and control system that can control the metabolism of the critically ill


B.Braun Space

Increased blood glucose levels is not only a problem for diabetics; hyperglycaemia and insulin resistance are common in critically ill patients. 'Recent medical studies have shown that strict glycaemic control and the implementation of an intensive glucose management protocol have contributed to reduce mortality and morbidity and shortened the length of patient stays in the ICU,' said Dr Martin Ellmerer, Scientific Co-ordinator of the CLINICIP project at Graz Medical University. However, the control process has had to be carried out manually: a very time-consuming method, which also puts great responsibility on nurses, who must make intuitive decisions about the insulin dosage and thus face the risk of hypoglycaemia. 'An adaptive control algorithm integrated into a system solution as it is being developed by the CLINICIP project team will reduce the workload and increase the safety and efficiency of insulin therapy. There is a great need for this solution in hospitals worldwide,' Dr Ellmerer pointed out.

International and interdisciplinary teamwork

13 partners from seven European countries are working together on this project. Mainly they are from scientific or medical backgrounds, but also include s industrial partners such as B.Braun, which will use the project findings in its product design.

B.Braun predicts that the decision support system will be able to record therapy data, display trends and suggest insulin doses. It will also offer intelligent alarm monitoring. The idea is to optimise insulin therapy through an integrated control algorithm that automatically calculates the optimum insulin rate and suggests the time for the next glucose measurement. The system issues an automatic warning as soon as that measurement procedure must be carried out manually. Infusion data from enteral and parenteral nutrition pumps, which are influencing the insulin rate calculated by the control algorithm, will also be taken into account automatically.

'We are currently in the feasibility study phase with a prototype, and we are optimistic that we will be able to provide the system in the foreseeable future, as we can count on the technology of our intelligent B. Braun Space infusion system. This platform is the essential basis for a challenging therapy like tight glycaemic control in the daily clinical routine,' explained Dr Doris Röthlein, Senior Scientific Manager at B. Braun, adding: 'The CLINICIP project is a perfect example of how clinicians, scientists and the industry can work together productively for the benefit of patients.'

The CLINICIP project is co-funded by the EU through the IST program under FP6, project reference IST FP6-506965.

Partners include B. Braun Melsungen AG; the Institute of Spectroscopy in Dortmund; Cambridge University, UK; Leuven's Katholike Universiteit; Prague's Charles University; the Graz Medical University; London's Royal Brompton Hospital; SensLab GesmbH, Gambro Dialysatoren GmbH, Roche Diagnostics; Joanneum Research GmbH, and the Institute of Applied Physics in Florence.

14 November World Diabetes Day

By **Heidi Heinhold**

Born in 1891, Canadian Sir Frederick Banting was destined to become a medical scientist and Nobel Prize winner for work that led to the discovery of insulin. World Diabetes Day, held on his birthday, aims to sensitise the public – including potential patients – to this condition.

Worldwide, around 245 million people suffer Diabetes mellitus. With 5.3 million of them in Germany, the country's Diabetes Association estimates a further number of unknown cases to be around two million – patients in the early stages of the disease suffering from unspecific symptoms who are not yet aware of their problem. A questionnaire in the FINDRISK system listing eight risk factors can help doctors, nurses and patients to assess the risk of someone developing diabetes mellitus. This model, developed by Professor Jaakko Tuomilehto (Helsinki, Finland) and colleagues, was tested in a study involving over 4,400 patients and has been internationally recognised as reliable.

The risk factors, which have been assigned points on a graded scale, are:

- age
- family history of diabetes (including uncles, aunts and cousins)
- waistline (women >80cm, men >94cm; it has been medically proven that fat in the abdominal area has much more bearing on metabolism than in other parts of the body and hence poses a risk for diabetes
- lack of exercise (recommended minimum 30 minutes a day)
- wrong diet (daily consumption of fruit, vegetables and whole-meal bread is recommended)
- medication for high blood pressure (can abet the development of Diabetes mellitus
- a history of high blood sugar levels
- high BMI

Depending on the point score (from 7 = low risk to < 20 points = highest risk; lifestyle changes recommended from 7-11 points, preventive medical check-ups such as glucose tolerance test and lifestyle changes recommended from 12-14 points, blood sugar test and professional help recommended from 15-20 points, from < 20 points laboratory diagnostics to rule out an existing disease and medical control) the probability of developing Diabetes mellitus type 2 within the next ten years increases.

Diagnosis – the main problem

The main problem is establishing the diagnosis. According to a recent study by the Feinberg School of Medicine at North-Western University people showing several symptoms of depression are 60% more likely to develop type 2 diabetes than others. For the first time ever, the effects of chronic depression, which tend to worsen as time goes by, along with the effects of individual episodes of depression and their link with diabetes, have been examined. In both cases it was possible to show an increased risk (see also *http://archinte.ama-assn.org* for study details published in the *Archives of Internal Medicine*).

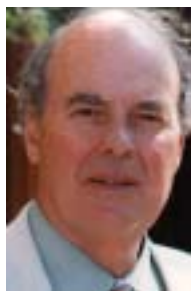
Unspecific symptoms such as abnormal fatigue, lack of drive, loss of appetite, loss of cognitive capacities, depressive moods, weight loss, problems with wound healing and recurring infections, along with falls (cause: hypo- or hyperglycaemic crises) can point towards latent diabetes mellitus. Doctors, nurses and diabetes advisers should be aware of the *Findrisk* check and carry these out, particularly for patients who complain about these symptoms, and rule out any other cause, then detect and treat diabetes mellitus at an early stage. This should impact positively on the course of the disease and prevent dramatic developments and the risk of follow-on diseases – and ensuing costs for those.

The Image project

Michael Hall outlines the work and aims of IMAGE – the Development and Implementation of a European Guideline and Training Standards for Diabetes Prevention

The prevalence of type 2 diabetes is dramatically increasing all over the world. In the European Union, evidence shows that the standards for its prevention vary greatly between the Member States. By sharing best practice and raising standards in the prevention of type 2 diabetes throughout the EU, the progression towards type 2 diabetes can be reduced so making a significant contribution to controlling the diabetes epidemic. Although several prevention management concepts currently exist in various EU countries that can be implemented into clinical practice, EU-wide strategies are still lacking.

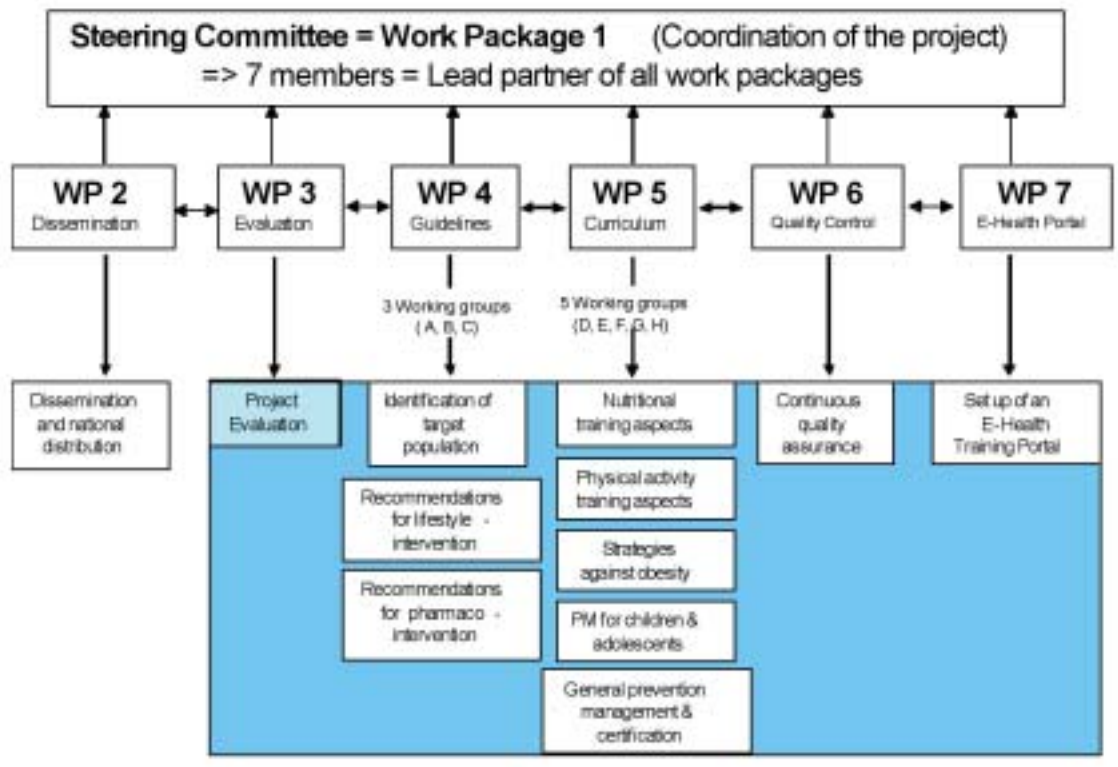
Therefore, the IMAGE Project, initiated by Dresden's Technical University, was submitted to the European Commission (EC) under the *Call for Proposals 2006* and was subsequently recommended for co-funding as one of the largest projects in the public health sector.


Michael Hall

Aim

It is widely recognised that effective primary prevention is the key to reducing the epidemic in type 2 diabetes. The IMAGE project will help to address this through the development of four specific objectives:

- A European-wide *guideline for the primary prevention of type 2 diabetes* to improve information and knowledge about preventing type 2 diabetes and its complications. The aim is to produce a guideline that is practice-oriented, readily available and useful to all healthcare professionals working with people who are at high risk of diabetes.
- A *European curriculum for training* prevention managers/educators; these healthcare professionals will be equipped to respond quickly and



Project structure

ADVANCE – Blood Pressure Lowering in Patients With Type 2 Diabetes

Prof Bruce Neal is a Senior Director at The George Institute for International Health, Associate Professor of Medicine at the University of Sydney and Chair of the Australian Division of World Action on Salt and Health.

The results of the blood pressure lowering arm of the ADVANCE (Action in Diabetes and Vascular Disease) study, the largest ever trial conducted in people with type 2 diabetes, were recently reported in the Lancet.[1] The main finding was that the routine administration of blood pressure lowering with a perindopril/indapamide (4.0mg/1.25mg) combination produced significant reductions in major vascular events and mortality amongst patients with diabetes. Specifically, treatment reduced the combination of major macrovascular (mainly heart disease) and microvascular events (mainly kidney disease) by 9% (p=0.041), the risk of death from any cause by 14% (p=0.025) and the risk of death from cardiovascular causes by 18% (p=0.027). The effects on vascular events included a significant 14% reduction in coronary events, and a significant 21% reduction in renal events.

There are three aspects of the result that are worth particular consideration. First, ADVANCE was not a "hypertension" trial – there were no blood pressure criteria for study eligibility and the treatment was similarly effective in people with and without hypertension. Second, ADVANCE was a pragmatic trial – the perindopril-indapamide combination was administered as a single daily tablet without titration to a blood pressure target. Its effects were evaluated on top of a background of care selected at the discretion of the responsible doctor and reflective of usual practice in each of the 20 countries involved. This included substantial use of other preventative treatments of known benefit (including ACE inhibitors, antiplatelet drugs and statin therapy) with good control of other risk factors (average HbA1c was 6.9% and average LDL cholesterol was 2.7mmol/L at the end of follow-up). The ADVANCE trial provided clear evidence that the perindopril-indapamide treatment was effective on top of these other therapies which are widely used in the European clinical setting. Finally, the study treatment was very well tolerated. ADVANCE participants were given a six week run-in period on perindopril-indapamide prior to starting the study but if they tolerated this (and 87% did) then discontinuation of treatment because of intolerance was very uncommon during the subsequent four years. Average adherence at the end of the follow-up period was almost identical in the active treatment and placebo groups.

This trial provides a very firm basis for the uptake of this intervention strategy in the European setting and it is anticipated that national and international guidelines will be modified to accommodate the study findings. Most patients with type 2 diabetes would be expected to benefit from this therapy with health gains anticipated irrespective of initial blood pressure levels, across a broad range of patient types, and on top of other current treatments. With rates of diabetes in the European Union growing at an alarming rate this study has significant implications for the avoidance or delay of much serious morbidity and mortality. A second component of the ADVANCE trial evaluating the role of intensive glucose control strategies will be reported next year. Hopefully this will bring similarly good news for the prevention of serious vascular complications of diabetes.

effectively to the increase in type 2 diabetes, its burden to society and to individuals and their families who are at risk of diabetes.

- *European standards for quality control* which will include a European wide system of continuous evaluation of primary prevention programmes
- *A European e-health training portal* to ensure that evidence-based health information is available to both prevention managers and all healthcare professionals, so helping to reduce inequalities in health across the EU.

Achieving these objectives will realistically improve the EU ability to respond rapidly to the drastic increase in the social and economic burden related to type 2 diabetes. By addressing health inequalities and health determinants across all policies and activities in Europe, the project will be of major importance in the prevention of diabetes and the promotion of health.

Timeframe and work-flow

The three-year project started in June 2007. 32 organisations and institutions from 13 EU countries, plus Serbia, Ukraine and Israel, are currently involved as partners in the IMAGE project. Partners will work in seven work packages to achieve the project's objectives.

* ***Acknowledgements*** *- This article arises from the project IMAGE, which has received EU funding, in the framework of the Public Health Programme.*
Details: www.image-project.eu

Glucose monitoring
A EUROPEAN PERSPECTIVE

Professor Oliver Schnell, of the Diabetes Research Institute, Munich, reports on discussions and findings of a panel of diabetes experts who met this summer in Switzerland

Globally, diabetes is increasing at the rate of an epidemic. In most patients, the targets for glycaemic control of diabetes, recommended in guidelines of scientific associations, are still not achieved.

Long-term optimised diabetes management in the range of near-normoglycaemia cannot be reached without the implementation of self-monitoring of glucose monitoring (SMBG). Simply measuring HbA1c is not enough: Patients with identical HbA1c-levels may have significantly different glucose profiles (Figure 1). Both severe and smooth glucose excursions of glucose levels may result in comparable HbA1c values.

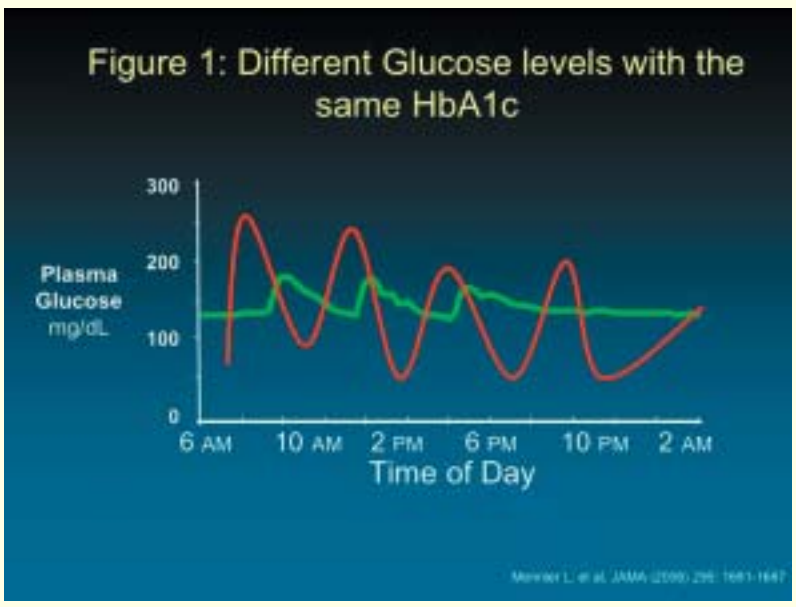
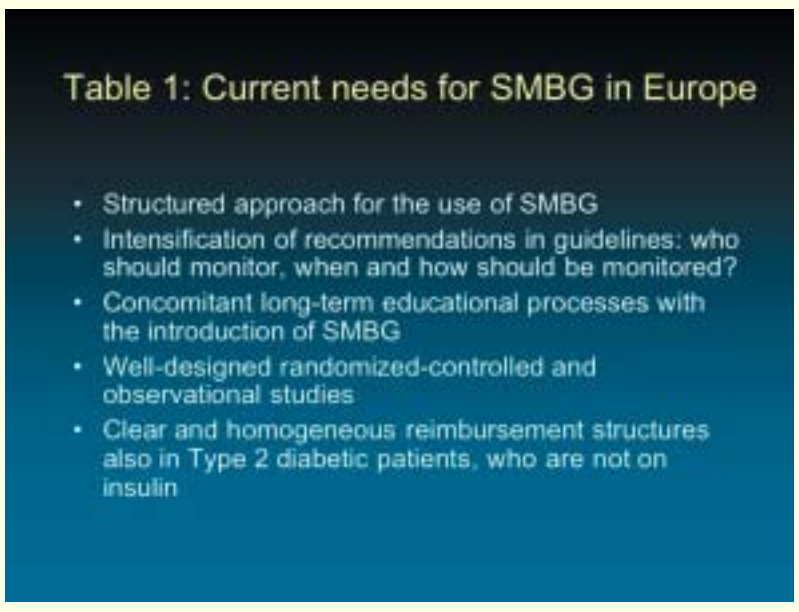


Table 1: This could counteract the tendency to reduce reimbursement on SMBG to the disadvantage of the 50 million diabetics who live in Europe



For the treatment of patients with diabetes type 2, the Global Guidelines of the International Diabetes Federation (IDF) for the European Region recommend self-monitoring of blood glucose (SMBG) in all newly-diagnosed type 2 diabetics. SMBG is also advised for people with diabetes type 2 on insulin and oral agents. The guidelines emphasise that SMBG is an integral part of self-management.

Despite the new global guidelines, Europe is still missing a homogeneous, structured and evidence-based approach across the national borders. To explore the country-specific role of glucose monitoring a *Diabetes Expert Panel* was held in July 2007 in Basel, Switzerland. The Panel provided an innovative forum for debate and gave insights into the practice of self-monitoring of blood glucose in different countries.

Representing Scandinavia, **Professor Kari Harno**, from Helsinki, said: 'The Finish Office of Health Technology has given full support to the use of SMBG for all diabetics.' In addition, Finland's 2007 guidelines point out that SMBG is essential for all diabetics. 'Compared with total healthcare costs for diabetes, the value of the test strips only amounts up to 2-4% of the entire costs,' he added.

In Switzerland, SMBG use was threatened in 2004, when the government decided that type 2 diabetics without insulin are ineligible for reimbursement of SMBG supplies. Professor Peter Diem, of Berne, Switzerland, pointed out: 'It took a joint effort of patients and physicians to achieve a revision of the governmental decision. Today, all type 2 diabetics in Switzerland have access to SMBG supplies.' He attributes the success of the campaign to the fact that a joint effort was taken to provide the government with supporting evidence, including a Swiss-based cohort study. Today, including diabetics without insulin, 400 test strips per year are reimbursed.

Professor Bruno Vergès, of Dijon, France, presented data from the National ENTRED Survey 2004. In this, only 58% of type 1 diabetics tested at the recommended frequency of ≥3 tests/day. In type 1 diabetes, reimbursement of SMBG strips and meters is supported and 98% of people perform SMBG. Guidelines recommended SMBG 'several times' a day in type 2 diabetics with insulin and for educational purposes in those without insulin.

Professor Antonio Ceriello said that comprehensive national guidelines on SMBG are published by Diabetes United Kingdom. These include detailed recommendations for frequency of testing. However, local primary care trusts (PCTs) also publish their own regional guidelines for general practitioners (GPs). Generally, local PCT guidelines are restricted by budgetary constraints that limit the number of prescriptions written by GPs.

In Italy, local authorities publish their own guidelines and prevent standardisation of SMBG practices across regions. In a recent questionnaire, diabetics were asked about their SMBG practices. Up to 16% of type 1 diabetics and 21% of type 2 diabetics never check their blood glucose levels, Prof. Antonio Ceriello reported.

Professor Peter Kempler, from Budapest said: 'In Hungary, most type 1 diabetics are managed in specialist diabetes care centres, while type 2 diabetics are treated mostly by GPs.' since meters and strips are prescribed mostly by specialists, the access of type 2 diabetics to glucose meters is largely limited.

Professor Oliver Schnell, of Munich, Germany added: 'Recent legislation governing the law on healthcare for patients with public insurances has supported the reimbursement of meter testing strips for most diabetes patients.' Currently, the diabetes community is awaiting the release of SMBG reimbursement guidelines from the German Institute for Quality and Efficiency in Health Care (IQWIG).

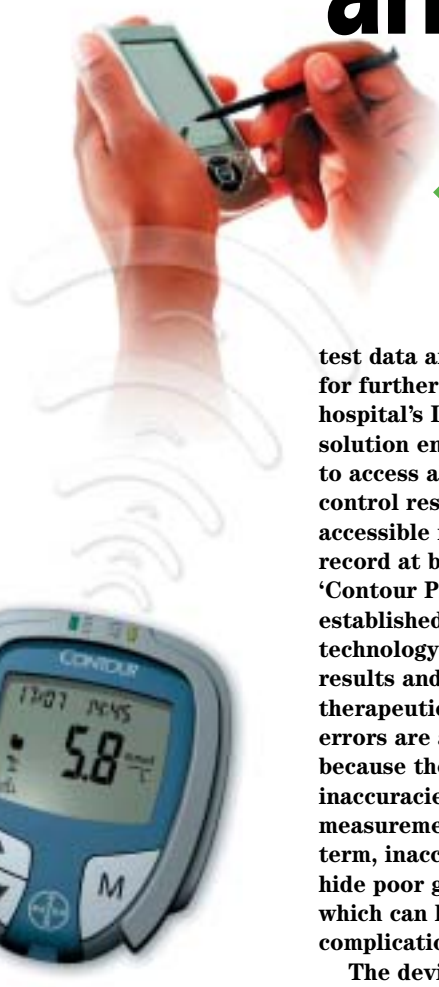
Another key element for Germany is that insurance companies are keen to enrol patients into Disease Management Programmes (Damps), which include strict guidelines for healthcare providers to follow.

Anne Felton, President of the Federation of European Nurses in Diabetes (FEND) and Vice-President of the International Diabetes Federation (IDF), reported that a major barrier to successful SMBG is the lack of patient knowledge in what to do with their SMBG measurements. 'Patients need training so they know what to do if they get an abnormal blood glucose measurement,' she pointed out; adding that fear of hypoglycaemia is another major barrier to treatment intensification by patients.

Currently, local-specific views on SMBG in diabetes appear to be a major obstacle in the implementation of well-defined use of SMBG throughout Europe. The Expert Panel made a call for future well-designed studies that assess the specific outcome of SMBG in diabetes.

Details: International Diabetes Federation. Global Guidelines for Type 2 Diabetes. 2005, www.idf.org, last access 11/9/07

Wireless blood glucose testing arrives



NEW

The first wireless POC (Point of care) blood glucose and bedside testing solution for hospitals was launched by Bayer Healthcare during the 43rd Annual Meeting of the *European Association for the Study of Diabetes* (EASD) in Amsterdam this September.

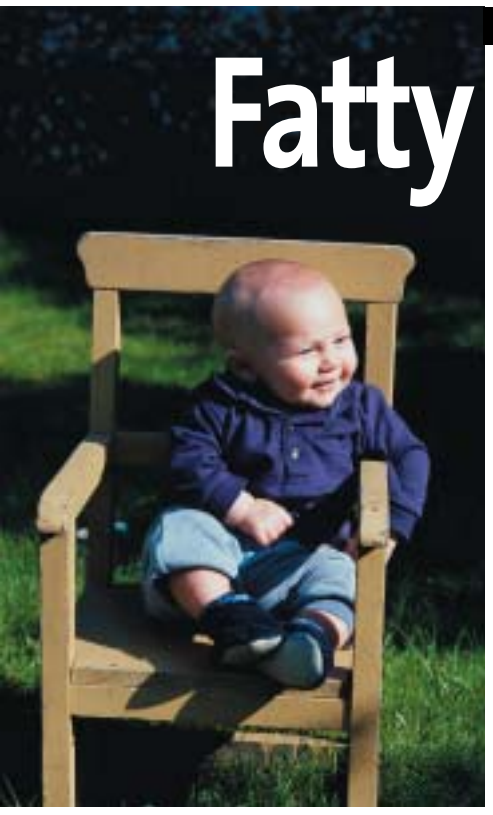
Called *Contour pro*, the new system uses a secure Bluetooth connection to transmit, from the point of care to a PDA, the test data and patient's key data for further processing within the hospital's IT system. 'This solution enables the hospital staff to access all patient and quality control results and provides an accessible real-time patient record at bedside,' Bayer reports. 'Contour Pro possesses the well established "no coding" technology that delivers accurate results and therefore improves therapeutic success. Coding errors are a major problem because they can lead to inaccuracies in blood glucose measurements and, in the long term, inaccurate readings can hide poor glycaemic control, which can lead to serious complications.'

The device manages not only glucose, but all POC bedside testing data, and has no maltose or galactose interferences, Bayer points out. 'An automatic interference correction electrode provides superior stability with common reducing substances.'

In Europe, the Contour Pro blood glucose monitoring system will be launched in selected areas early in 2008.

Full details:
www.viva.vita.bayerhealthcare.com

Fatty acids may shield young from type 1 diabetes



Omega-3 may protect children at high risk of developing type 1 diabetes, according to a study published in the *Journal of the American Medical Association*.

The incidence of type 1 diabetes among 1,770 children at high risk of developing this disease, with increased omega-3 intake associated with a 55 per cent reduction in risk, was investigated by researchers at the University of Colorado, in Denver, the University of Florida and Roche Molecular Systems. 'Our study suggests that higher consumption of total omega-3 fatty acids, which was reported on the FFQ, is associated with a lower risk of islet autoimmunity (IA) in children at increased genetic risk of type 1 diabetes,' said lead author Jill Norris, at the University of Colorado. 'This association is further substantiated by the observation that a higher proportion of omega-3 fatty acids in the erythrocyte membranes is associated with a decreased risk of IA in a subset of this same population.'

The authors explained that type 1 diabetes mellitus is an autoimmune disease characterised by the destruction of insulin-producing beta cells in the pancreatic islets. 'Although it is not yet known what initiates the autoimmune process, it is likely that both genetic background and environmental factors contribute to the disease process.' To investigate the potential dietary contribution in the development of type-1 diabetes, the researchers examined whether consumption of omega-3 and omega-6 fatty acids was associated with the development of pancreatic islet autoimmunity (IA). Dietary intakes were evaluated using a 111-item food frequency questionnaire (FFQ) completed annually by the children's mothers. Two-year-old children were recruited and followed for a 6.2-years average. Children were identified as having a high risk of type 1 diabetes by either possessing a high diabetes risk HLA (human leukocyte antigen) genotype or having a sibling or parent with type 1 diabetes.

To investigate the risk of IA related to the levels of polyunsaturated fatty acids in red blood cell (erythrocyte) membranes, a case-cohort study was also carried out with a subset of 244 children. During the follow up period, in the total study population the researchers documented 58 positive cases of IA and, after adjusting for confounding factors that included HLA genotype, family history of type 1 diabetes, caloric intake, and total omega-6 fatty acid intake, found that total omega-3 fatty acid intake was inversely associated with a 55% reduction in IA risk.

In the case-cohort study, omega-3 fatty acid content of erythrocyte membranes was associated with a 37%t decreased risk of IA. Levels of the three marine omega-3 fatty acids eicosapentaenoic acid (EPA, 20:5n-3), docosahexaenoic acid (DHA, 22:6n-3), and docosapentaenoic acid (DPA, 22:5n-3) were combined with the plant omega-3 alpha-linolenic acid (ALA) to estimate the total omega-3 fatty acid intake.

No direct mechanistic study was performed by the researchers, but they suggest that the benefits of the omega-3 fatty acids may be due to their anti-inflammatory properties, and their ability to reduce oxidative stress. 'Overall, our data suggest that ingestion of omega-3 fatty acids throughout childhood may decrease the risk of IA,' they concluded.

If a new clinical trial - *The Nutritional Intervention for the Prevention of Type 1 Diabetes* – confirms that anti-inflammatory doses of DHA during pregnancy and infancy could inhibit early islet inflammatory events key to the development of type-1 diabetes, the researchers think omega-3 fatty acids supplements could become a mainstay for early intervention to prevent type 1 diabetes from developing.

Source: Journal of the American Medical Association (26/907. Vol. 298, N. 12). Omega-3 Polyunsaturated Fatty Acid Intake and Islet Autoimmunity in Children at Increased Risk for Type 1 Diabetes. Authors: Jill M Norris, X Yin, M M Lamb, K Barriga, J Seifert, M. Hoffman, H D Orton, A E Baron, M Clare-Salzler, H P Chase, N J Szabo, H Erlich, G S Eisenbarth, M Rewers

The all new electrosurgical unit

BOWA is establishing itself as a complete supplier of medical technology; the firm provides equipment both for complex procedures and for standard operations, enabling hospitals to equip themselves its entire product range.

Bowa's latest release is an electrosurgical unit designed to cope with any case in ambulatory, clinical and day surgery centres.

The all new *ARC 200* has a power range up to 200 W and incorporates the firm's well-known ARC Control that regulates power output only to the necessary minimum, irrelevant of tissue type, cutting speed and surface. 'In combination with the Argon beamer ARC PLUS the ARC 200G is extended into a superior HF-workstation with a reliable ignition even below 10 W – a great addition for any endoscopic tower,' Bowa points out.

Tissue-saving lung resection in malignant diseases

By Thomas Kiefer MD, Head of Thoracic Surgery, PTZ – Pneumological-Thoracic Surgery Centre, Ortenau Klinikum Offenburg-Gengenbach, Offenburg

During operative therapy for bronchial carcinoma the surgeon is always faced with two seemingly diametrical demands: Maximum radicalness whilst preserving as much healthy lung tissue as possible.

Up until the 1960s pneumonectomy was the procedure of choice for operative therapy of bronchial carcinoma. With increasing experience and access to scientifically gathered data there has been a move away from this type of therapy. Today, lobectomy is the standard surgical procedure. Whenever possible, pneumonectomy should be avoided. Some Thoracic surgeons even refer to pneumonectomy as a 'disease'.

However, for a large group of patients removal of a pulmonary lobe is not possible due to their limited pulmonary reserves. To be able to offer these patients the option of receiving resectional treatment – and therefore a potential chance of a cure – parenchyma-saving resections have been developed. The basic prerequisite for an oncologically radical operation in bronchial carcinoma – apart from systematic lymphadenectomy – is the resection of an anatomical unit. Therefore, removal of the tumour alone is not an oncological operation.

So which arsenal is at the thoracic surgeon's disposal to tackle the abovementioned dilemma? On the one hand there are lobe resections, which prevent a pneumonectomy by, for example, anastomosing the Bronchus intermedius to the remaining primary bronchus or the tracheal bifurcation after removal of the right upper lobe with a bronchial sleeve. Thoracic surgeons talk about sleeve resections with these types of parenchyma-saving procedures.

In the case of segment resection, the situation would theoretically allow for removal of a lobe due to the location of the tumour, but because of the limited pulmonary reserves of the patient the procedure cannot be considered. Whereas there is now a broad consensus that oncological, long-term results achieved with sleeve resections are on a par with the standard procedure, there is no such agreement over segmental resection.

Both surgical procedures – sleeve resection as well as segmental resection – require a lot of surgical experience, precise anatomical knowledge and a perfectly well-rehearsed team, along with an infrastructure that allows not only for the successful implementation of such complex surgical interventions but also for the appropriate peri-operative management, which is just as important.

The resection of pulmonary metastases provides a different kind of challenge. In this case, achieving oncological radicalness does not entail the resection of anatomical units. The complete removal of a metastasis surrounded by a small seam of lung tissue suffices. However, lung metastases are not always ideally and typically situated near the lung surface and, unfortunately, lung metastases occur all too often in multiples; in some cases, such as in thyroid- or osteosarcoma metastases – there can be ten or more of them. However, in these cases the thoracic surgeon also has a procedure available that allows him to preserve healthy lung tissue: Laser resection. An Nd:YAG laser with a special long wave has been developed for this procedure which facilitates cutting the tumour precisely out of the surrounding lung tissue whilst at the same time achieving aerostasis and haemostasis. This means that there is no need for sutures and clamp, which would tighten the healthy lung tissue and therefore impair respiration.

Neuropelviology

Forging links between neurology and surgery

Surgery in the lower pelvic region often involves injury to or severing of nerve tissue. As in chronic diseases of the nervous system, the result can be pain, sensory disturbances or loss of function. Up to now the poor view of the nerves, partially formed of fine interwoven networks, has been one of the major problems – exacerbated by the strict division of skills between neurologists and surgeons, which has not facilitated a holistic way of thinking. Professor Marc Possover, (left) senior consultant at the Gynaecology and Obstetrics Clinic of St. Elisabeth Hospital Cologne-Hohenlind, Germany, has addressed this problem and founded a new discipline, which he calls neuropelviology and has patented. This field has already produced incredible and groundbreaking results for patients. In an interview with Meike Lerner, Prof. Possover explained new procedures that have developed in the context of neuropelviology, such as laparoscopic neuronavigation (LANN) and the possibilities of implanting neuroprostheses

As the pioneer of neuropelviology, would you outline what this field includes?

Prof. Possover: Neuropelviology pools the expert know-how of surgery and the expert knowledge of neurology. The true pelvis is a region that concerns many specialists: surgeons, urologists, gynaecologists, vascular surgeons; they all operate in this region, which is difficult to access, but they have only slight knowledge of the nerves encountered there - with dire consequences, for the nerve plexus transmits very important information including pain impulses, sexual activity and how full the bladder or rectum is. About 20%-40% of women patients suffer from bladder voiding disorders after radical removal of the uterus as a consequence of a tumour.

'There is therefore a need to deal with this. First, the nerve plexus has to be made generally visible, because in conventional surgical procedures via laparotomy it is concealed from the surgeon. This can be done by laparoscopy, in which the nerves are magnified fivefold – you can then see even tiny nerves of a millimetre or so in size.

'Furthermore, the whole procedure can be performed by keyhole surgery with a maximum of three incisions near the navel.'

How do you find out the function of the nerve you have exposed?

'Neuropelviology uses a technique called laparoscopic neuronavigation (LANN). The nerve seen is subjected to an electrical impulse and the reaction assessed. If, for example, it is the sacral root S2, which in humans is responsible for, among other things, erection, the penis will erect. With a nerve leading to the rectum, the large intestine contracts when stimulated.

This technique proved its worth in neurosurgery quite a long time ago. However, neurosurgery is concerned only with the spinal cord and brain, and less with the true pelvis. Consequently, a few years ago, I was the first person to use the method in this region. First of all it led to being able to reduce complications occurring even in radical operations, such as hysterectomy, for example, where it reduced the likelihood of bladder voiding disorders from forty percent to not quite one percent. Clearly you damage nerves less if you can see them.

'But considerably more is possible. In laparoscopic implantation of neuroprostheses (LION), a procedure I developed, selected nerves are fitted with an electrode. The function of nerves can then be selectively influenced and striking effects obtained: in pain therapy, for example, an electrode, combined with a pacemaker, is connected by laparoscopic implantation to the nerve and the latter is then "turned off" with regular electrical impulses. In treating phantom pain in a patient whose leg had been amputated, I thus blocked the sciatic nerve and consequently eliminated the pain. This patient can now live without analgesics. I also use this procedure for pain therapy in polyneuropathy. Around six million people in Germany suffer from polyneuropathy, about two million of them due to diabetes. Patients are virtually free of pain after implantation, and that increases quality of life enormously for those affected.

'Thanks to LION, nerves can not only be blocked but also stimulated, and that is really a medical breakthrough, since it means that functions lost owing to multiple sclerosis or paraplegia can be restored. Neuroprostheses in these cases force physical function, so to speak.

'I performed the first operation of this kind in February 2006 at St. Elisabeth Hospital Cologne-Hohenlind: and now the muscles concerned with closure of the bladder and rectum contract at the press of a button. The patient, a woman, controls voiding with a remote control; she is no longer incontinent nor does she need a catheter. In men I have not only been able to restore bladder and rectal voiding but also erection and ejaculation.

'I have operated in China on children with open spina bifida. Many of these children die before the age of fifteen of the consequences of chronic urine retention. In one young female patient I exposed the sacral root and inserted electrodes and cables. The girl controls her body functions by selecting different programmes on a kind of remote control, which is connected to the stimulator: programme one for voiding the bladder and program two for voiding the rectum. Neurosurgeons obtain similar results by putting electrodes on the spinal cord, a complicated and risky procedure that, in the meantime, has been forbidden in the USA. The patient runs the risk of dying if inflammation arises. By contrast, in LION, the stimulator and the cable are placed in the pelvis, so that inflammation from bedsores, or external injuries, are excluded.

How widespread has this revolutionary method become?

'At present I am training gynaecologists in exposing the nerve pathways in the true pelvis, in order to make it possible to conserve the nerves in future operations.

'The technique could become established as an additional training module for neurosurgeons. My work met with considerable recognition at several neurosurgery congresses; the procedure has been recognised in the meantime by the FDA, which is why I am optimistic that in the medium term it will become more widely known in Europe.

What are your future objectives with laparoscopic implantation of neuroprostheses?

'Presently the procedures are still aiming to achieve control of bladder and rectal function, erection and ejaculation. I work with French researchers from the CNRS (*French national scientific research centre*) and INRIA (*French national institute for research in computer science and control*) who are currently developing wireless electrodes, which I shall use in the future. With the electrodes used hitherto there are still defects caused by the cables breaking.

'However, far and away the most significant project is the exploration and stimulation of the nerves responsible for moving the legs. With colleagues in surgery I'm working on influencing standing up, standing and moving the legs. I have already performed the first implantation in a paraplegic patient. This patient is now able to move his left leg by stimulation. Now if several neuroprostheses were connected to the appropriate nerves and the latter were stimulated remotely by computer, in the future this procedure could make it possible for paraplegics to walk. That's still a dream but one that might become reality one day.

ORTHOPAEDICS The German Congress of Orthopaedics and Trauma Surgery

Despite the very varied nature of the scientific programme for *The German Congress of Orthopaedics and Trauma Surgery (Berlin, 24-27 October)*, Congress President Professor Joachim Hassenpflug, with Prof. Kuno Weise MD, President of the DGU, and Siegfried Götte MD, President of the BVOU, had ensured the presentations addressed representatives from both medical disciplines. Using the theme *Look to the future – or you will live in the past* the congress aimed to promote awareness amongst colleagues of the Bone and Joint Decade, established by the World Health Organisation, and to emphasise the importance of musculoskeletal diseases and injuries. 'The macroeconomic loss caused by direct treatment, as well as indirect expenditure for the consequences of diseases and injuries in our medical disciplines, is around €100 billion a year, i.e. around 5% of the gross domestic product. 40% of all work days lost through sickness is caused by musculoskeletal diseases. Experts predict a further increase due to the expected demographic developments.' Many of the detailed scientific topics, e.g. *Accidents and Diseases in the Aged,* and *Complex Situations in Endoprosthetics*, and the sessions on diseases of the spine or pain therapy, were dedicated to this topic.

Professor Joachim Hassenpflug

Siegfried Götte MD

Prof. Kuno Weise MD

During lunchtime lectures, renowned personalities spoke on subjects well beyond their own fields, to expose exciting perspectives – for example doctor and theologian Manfred Lütz explored *A Zest for Life – Risks and Side Effects of Health*; for the *Erich Lexer Lecture*, Prof. Kuner recollected one of the founding fathers of both medical disciplines; in the *Pauwels Memorial Lecture* Prof. Tillman focused on the causal histogenesis of diseases of the musculoskeletal system; the *Healthcare Market as an Engine for Growth* was examined by Prof. Nefjodow, and a lecture on *The Healthcare System and Demography* was delivered by Prof. Raffelhüschen. On the final day Professor Heydemann spoke on *Learning from Innovations of Nature* and Professor Holman looked at *Interrelations between Physical and Mental Activity*.

MINIMALLY INVASIVE HIP REPLACEMENT

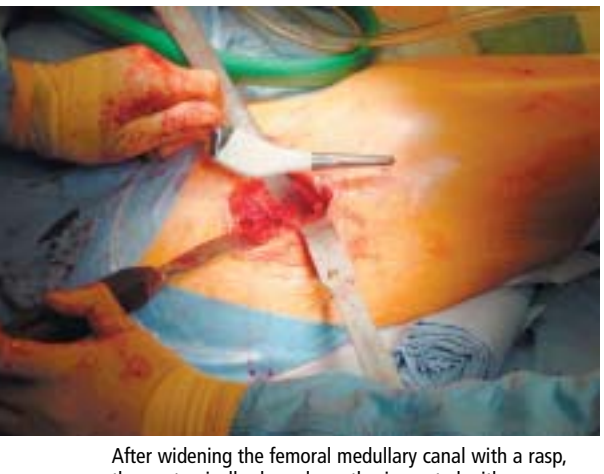
An anterior approach with the additional support of CT assisted 3-D planning software

By **Dr Sebastian Radmer**, of the orthopaedics and rheumatic surgery department at Immanuel Hospital, Berlin

User interface of the 3-D planning software: The view in all three planes facilitates accurate matching of the cup and stem, and thus the centre of rotation can be more easily reconstructed

Extracting the femoral head

Viewing the bony acetabulum by means of specially curved retractor hooks. Preparation of the acetabulum is done with the angled milling cutter



After widening the femoral medullary canal with a rasp, the anatomically shaped prosthesis, coated with hydroxyapatite, is introduced into the femur

Implanting a total hip prosthesis is a major surgical operation that involves severe pain and significant blood loss. Minimally invasive techniques for implanting these prostheses have recently been arousing increased interest. The aim of minimally invasive surgery (MIS) is not primarily to shorten the incision but to lessen tissue damage. It is a question of avoiding structural damage to the muscles, by their being split, bruised or torn, and damage to function, from muscle origins being detached. Blood loss and postoperative pain are supposed to be reduced and as a result the period of rehabilitation is said to be not so long.

However, high standards of safety and the longevity of the implant must not be compromised by reduced intra-operative visualisation. This means precise pre-operative planning to facilitate positioning of the implant with accuracy. Planning is in general performed using templates on conventional X-ray photographs, with factors such as different enlargement, angles of projection that are not always accurate and representation of the total volume clearly reducing precision. The aim of our study was to investigate both the clinical results after implantation of a THP via an anterior minimally invasive approach, and the clinical application of 3-D planning software.

117 consecutive patients attending our clinic (mean age 74.8 (41-83) years) received a total hip prosthesis (Hilock Line cup, Arcad stem, SPS and SPS modular stem, made by Symbios, Yverdon, Switzerland) in a prospective study. All patients underwent spiral CT pre-operatively for 3D planning. The data were processed on an external workstation for 3D planning using special software (SYMBIOS® 3D Hip Plan), and produced an exact view of the acetabulum and femur in all three planes. After establishing the pelvic axis and determining the original centre of rotation, first the acetabular cup was positioned, followed by the stem.

Surgery was performed with the patient supine, and access was via a minimally invasive anterior approach which used the space between the tensor fasciae latae, the gluteus medius and minimus lateral muscles and the sartorius and rectus femoris medial muscles. Specially curved retractor hooks and an angled milling cutter were used during the operation. All the patients were investigated pre-operatively using the Merle d'Aubigné Score and monitored in the same way at 3, 6 and 12 weeks post-operatively, and conventional X-ray checks were also performed post-operatively. Pain was assessed daily up to the 7th post-operative day using the Visual Analogue Scale (VAS).

The surgical technique was able to be performed on all the patients, and the incision length was on average 7.9 cm. Mean operating time was 69 minutes, and mean blood loss in 24 hours was 365 ml. The mean value for pain on the VAS was 7.9 pre-operatively, 2.5, three days post-operatively and 1.4, seven days post-operatively. The mean pre-operative Merle d'Aubigné score was 10.2. Post-operatively it was 15.4 after 3 weeks, 16.9 after six weeks and 17.2 after 12 weeks. The CT plan relating to the cup could be implemented precisely in 108 of the 117 patients (92.3%). In three of the 117 patients, (2.6%), an individual stem was implanted as no modular stem could provide adequately in this respect. The plan was able to be implemented in 101 (88.6%) of the other 114 patients. All the prostheses were implanted without cement, and no stem burst occurred. A total of six complications arose: one prosthesis infection, two wound healing disorders, and three instances of irritation of the lateral femoral cutaneous nerve. No signs of loosening were detected on X-ray.

Sebastian Radmer

Implantation of a THP via the minimally invasive anterior approach is a safe procedure that allows the components of the prosthesis to be correctly positioned. It is equally possible to treat muscular patients and obese patients using this type of approach. Blood loss is slight, patients clearly suffer less from post-operative pain, and the duration of the rehabilitation required is considerably reduced. It is particularly useful to be able to combine the minimally invasive approach with a pre-operative 3-D hip plan: pre-operative simulation of various implants and their positioning is thus possible and the centre of rotation of the hip can be optimally determined and reconstructed. Complications that might possibly occur intra-operatively can be identified before surgery is undertaken, and avoided.

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Uncemented AMC Uniglide knee arthroplasty

K U Brust, of the Division of Surgery, Oncology, Reproductive biology and Anaesthetics, Faculty of Medicine, Imperial College London, UK, and **G Bontemps** of the Fabricius Klinik, orthopedic department, Remscheid, Germany, report on mid- to long-term results

The AMC Uniglide Prosthesis

Unicompartmental Knee Arthroplasty (UKA) is a commonly used, successful treatment for both medial and lateral compartment knee osteoarthritis (OA); over the past decade its use has increased in younger, more active patients. The AMC Uniglide system offers a cemented and an uncemented device; however, there is still a reluctance to use the uncemented alternative as they are thought to be not as satisfactory.

In the younger patient both the polyethylene and the prosthesis/bone fixation has to withstand greater forces and hence is at increased risk of failure. Our study compares the clinical and functional outcome of the cemented (Fig 1) and uncemented versions of the Uniglide and focuses on the issue of reliable prosthesis/bone fixation.

Method

The Uniglide aims to afford congruent surface area contact together with physiological kinematics by replicating the normal morphology of the femoral condyle. This construct, together with unrestricted movement of the polyethylene bearing on the tibial plateau, gives intrinsic stability and helps protect the implant-bone fixation. The Titanium Nitride coating on the articular surface of the Uniglide is wear and corrosion resistant, reducing the coefficient of friction thereby reducing polyethylene wear. The surface of the uncemented implant has a titanplasmaspray (Fig 2) and thin electro-chemically applied calciumphosphate coating to accelerate component/bone osteo-integration.

We performed 477 cemented (patient age 60-94 years, mean 71) and 137 uncemented Uniglides (patient age 40-79 years, mean 65) from Jan 1991 to Dec 2003. Both groups were gender matched with patients studied for a mean of eight years (2-14), four percent were lost to follow up. All patients were assessed functionally using the Knee Society knee scoring system and radiologically with plain X-rays (FC Ewald).

Results

The knee score (pre/post op) for both groups are as follows: for the cemented 35/94 and uncemented 36/94 respectively. Function Score (pre/post) cemented 52/90 and uncemented 54/92 (Fig 3). Range of movement was increased by 16° for the cemented group whilst for the uncemented the increase was 20°.

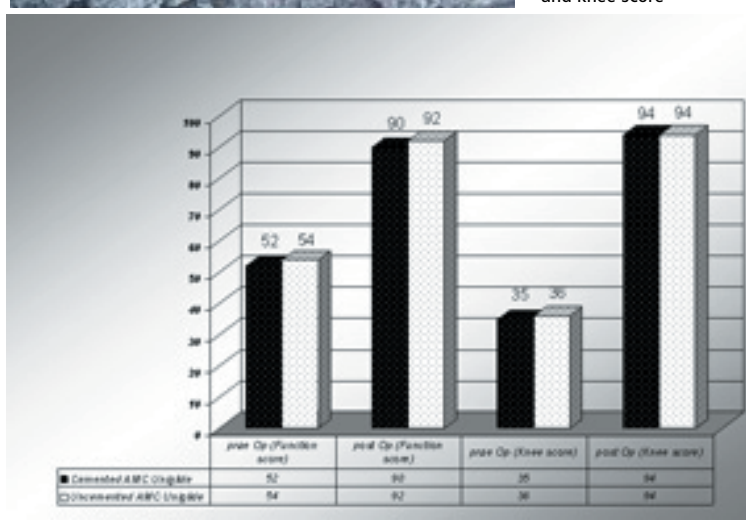
Patient assessment (cemented/uncemented) was rated as excellent 72%/75%, good 20%/18%, fair 5%/5%, poor 3%/2%.

Two percent of the cemented group required revision due to component loosening, compared with 1.5 percent in the uncemented group. The radiological assessment showed less radiolucent lines at the bone component interface in the uncemented group.

Conclusion: The Uniglide prosthesis gives excellent results in both groups with the knee and function scores showing similar improvement. The loosening rate in the uncemented cohort is lower despite the higher physical demands in this younger age group (mean 6 years).

The uncemented prosthesis is a successful alternative for younger patients (< 70 years) and is a very attractive option that bolsters the minimally-invasive surgical approach used in UKA.

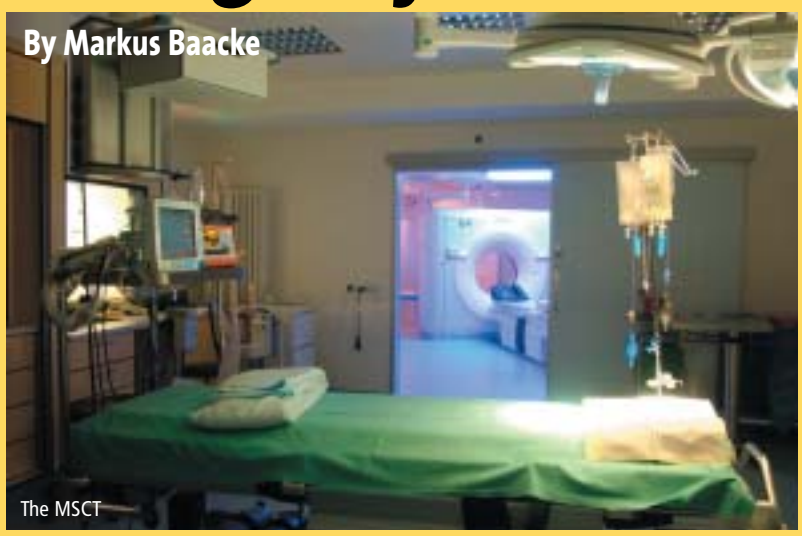
Surface for cementless implantation



AMC Uniglide function and knee score

The 64-MSCT in the emergency room

By Markus Baacke



The MSCT

Markus Baake

For $2^1/_2$ years we have had the opportunity to use a 64-MSCT in our emergency department at the Brüder-Krankenhaus Trier, the biggest institution of the Brothers of Charity and academic teaching hospital at the University of the State Capital of Mainz. We still respect the great speed in which we receive images of outstanding quality and exhaustive precision. Despite the extensive achievements of the technical devices a continuous process of learning was needed for all participants to transfer the material improvement to beneficial results for patients themselves. Due to the shorter diagnostic period, and in the absence of published evidence for the use of the CT scanning in the first phase of treatment, we felt inclined to establish a new algorithm for the priority-oriented use of the *64-MSCT*. Our intention was to avoid unnecessary radiation exposure due to uncritical use of a full body scan.

History

Although the CT-scan is recommended as the diagnostic gold-standard for injuries of nearly all body regions, so far - due to evidence-based criteria – it was obsolete for a patient with low blood pressure (BP), which means the majority of cases. The protocol we used implied the use of the MSCT-scan following standardised criteria even in patients with low BP.

Methods

All emergency room patients between June 2005 and June 2006 were documented prospectively and all trauma patients aged between 16 and 70 years were enrolled in the study. The basis of documentation was the standard form of the German trauma board (Polytraumaregister), extended to circulatory instability. We classified circulatory instability in three severity codes:

Grade - I = to be compensated with volume substitution

Grade - II = to be compensated with volume substitution and catecholamine

Grade - III = not re-compensable.

Results

The mean ISS (*injury-severity-score*) of all 45 documented patients was 36 (16 to 75). The average primary treatment time (emergency room time) was 64 minutes (38 to 175min). 32 patients (46%) suffered from hypotonia grade-I during the CT-scan; 8 patients (14%) had a hypotonia grade-II and just one patient (1.8%) had an unrecompensable hypotonia and died (without CT-scan) before reaching the operation theatre. So far, we found no patient threatened by operating a CT-scan during haemodynamic instability.

Conclusion - The use of the 64-MSCT for primary diagnosis of the severely injured and even haemodynamic unstable patient improves the diagnostic speed and significance of radiological findings. Endangering patients in this new emergency room protocol was not found.

Knee replacements

Demanding design, sophisticated technique and constantly improved materials guarantee lasting osseo-integration, writes **Norbert Kamps**, consultant engineer for aid provision and medical technology in Germany

Norbert Kamps

Replacing the function of human organs using exogenous materials has gained significance in recent years. In particular, there has been enormous progress in the technique of implanting artificial knee joints – knee endoprostheses – so that, with the development of new materials and prosthesis design, better results are being achieved. Durability of the prostheses has improved, while the rate of complications has dropped. Recent findings concerning reactions to foreign bodies and the biomechanical response in long-term use have led to many clinical studies of new materials.

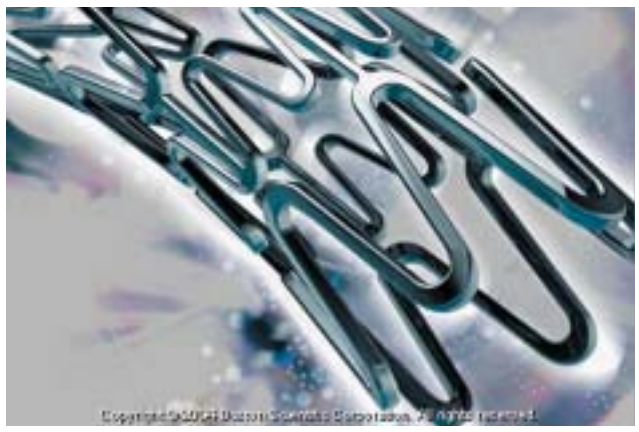
An endoprosthesis used to replace a joint needs to not only withstand the natural physical load (compression, traction forces and shear stresses acting on it can amount to many times the body weight) but must guarantee the best possible replacement of the natural bone in terms of bone remodelling and mechanics. This is the precondition of osseo-integration, i.e. tolerable and permanent incorporation into the bony structures. Osseo-integration is determined by the design of the prosthesis, but the material of the prosthesis also plays a crucial role. There are therefore different models of knee replacements.

Bio-inert, bioconductive and bioactive materials are used depending on the form of strain and the area of use in the joint. Bio-inert materials, such as aluminium oxide or zinc oxide ceramics, are used for articulation surfaces. Bioconductive materials, such as titanium alloys, are used when bone accretion is desired. Bio-active materials, such as hydroxyapatite coatings (HA coating), are used for cement-free prostheses etc, since they ensure accelerated bony integration and thus a very solid bond. With metals (e.g. titanium, steel alloys), plastics such as PMMA (polymethyl methacrylate) or polyethylene are used. Today, the quality of the materials is defined in extensive regulations (e.g. ISO standards), but it may vary considerably between individual manufacturers. Abrasion and fatigue in particular are a major challenge to the materials used. Sliding and micro-movements lead to abrasion when the combination of materials is inappropriate and consequently to more or less severe complications caused by wear and tear. These reactions to foreign bodies essentially limit the present life expectancy of an endoprosthesis, so that this issue was, and still is, the focus of research and development. Today a large percentage of all aseptic loosening of prostheses is assumed to be due to reactions involving abrasion.

Knee replacements require optimised design, taking into consideration biomechanical demands, little bone loss, the simplest possible implantation technique and the least abrasion possible. Greater loading and improved life expectancy of the prosthesis were achieved by constantly enhancing materials. As a consequence the indication can be extended to ever younger groups of patients and quality of life can be increased. Another major challenge is the reconstruction of the damaged joint in as anatomically correct a manner as possible. New materials and optimised production techniques have opened up new perspectives here, as well.

Contact: hilfsmittel.kamps@arcor.de

Taxus produces similar outcomes in men & women



Results of a gender-specific study to assess the efficacy of the Taxus paclitaxel-eluting coronary stent in women undergoing coronary revascularisation were released at the European Society of Cardiology Congress by interventional device developer Boston Scientific. Named Taxus Woman, the study indicates that paclitaxel-eluting stents have similar clinical outcomes in women and men, despite the higher risk profile in female patients.

The researchers analysed pooled results of women enrolled in trials to evaluate the performance of the Taxus stent compared with a bare-metal stent used in control patients with coronary artery disease. The women's results were compared with the corresponding endpoints in men.

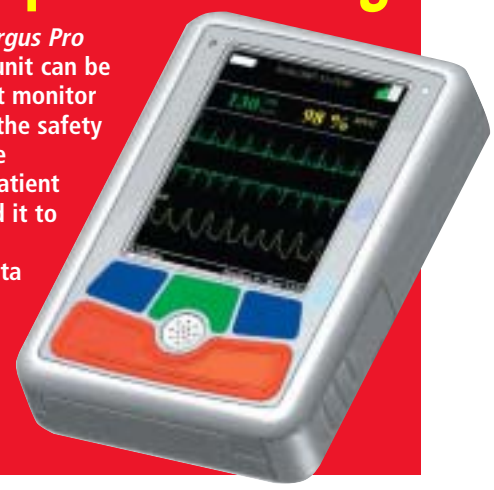
According to the Massachusetts-based firm, there were no other significant differences in baseline demographics, and lesion or procedural characteristics between the Taxus and bare-metal stent groups in both genders.

Telemetric recorder with 12-lead ECG and SpO2 monitoring

The *Argus Pro Telemetry TM-1*, with small, strong casing and a brilliant 3.8-inch colour screen, is the first telemetry recorder to feature diagnostic 12-lead ECG – with real-time display of all 12 leads – as well as SpO_2 monitoring.

When needed, the user can print the complete ECG with a fully automatic interpretation via the Argus Pro central station, or transmit it to the *Schiller data management system* (SEMA or SEMAnet) for storage, the manufacturer reports, adding: 'This not only saves extra work if your patient requires a resting ECG, but you can also very easily measure and assess the ECG both within and outside the clinic via a Web server solution.'

Due to the full integration in the *Argus Pro* monitoring network, each telemetry unit can be monitored from any Argus Pro patient monitor and also send alarms. 'This increases the safety of your patients. By pressing the large emergency button on the TM-1, the patient can initiate an alarm in time and send it to the central station before a critical situation occurs. In this way, latest data transmission technology ensures safe but still inexpensive monitoring.'
Optional: Voice instructions for the patient.
Details: www.schiller.ch



EU approves use of implantable defibrillator

The US firm Boston Scientific reports that it has received the Conformité Européenne (CE) Mark for its *Confient implantable cardioverter defibrillator* (ICD), the company's first branded cardiac rhythm management device to treat sudden cardiac death.

Containing wireless capability, the Confient ICD has been designed to reduce right ventricular pacing.

World Heart Day '07

Stimulating the public to *Team Up for Healthy Hearts!* this September's global event was supported by major international team sports stars, including the UK's Liverpool Football Club captain Steven Gerrard MBE and Brett Lee, fast bowler for the Australian cricket team. 'As an Australian Government Healthy Active Ambassador, it's my role to motivate everyone, young and old, to get healthy and active,' the cricketer explained.

Worldwide, thousands of people took part in events to encourage more exercise. In Ireland, for example, over 400 groups of families and friends teamed up for walks. Other activities included health checks, runs and fitness sessions, public talks, stage shows, scientific forums, exhibitions, concerts, carnivals, and sports tournaments.

The most useful EU-supported venture

The Eastern Lithuania Cardiology Project (ELCP)

By **Andrius Vagoras**

Dr K Mazurkevicius, ELCP Manager

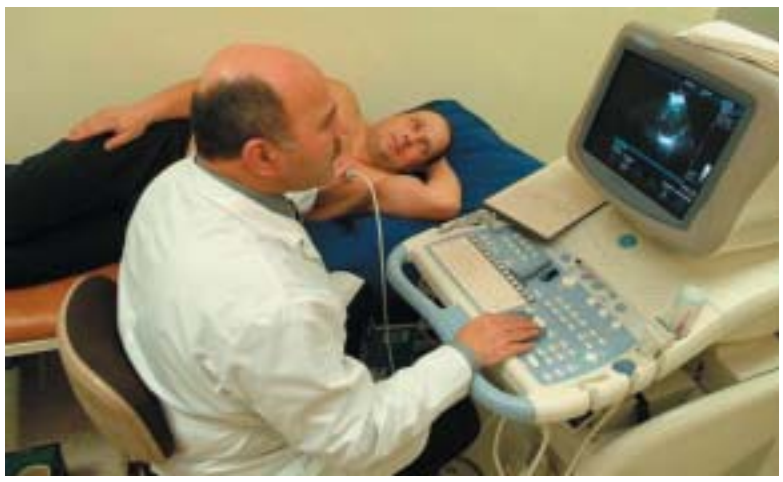
The Eastern Lithuania Cardiology Project (ELCP) – an integral inter-institutional regional project sponsored by the Lithuanian Government and the European Structural Funds, which began in 2004 – will end this year. In May, those who voted on the Lithuanian EU Support official website (a specially organised event, focusing on all EU-supported projects in all fields) nominated this project as the most useful among all EU-supported projects. It is worth mentioning, that the ELCP was the very first in the medical field in the Baltic countries to be supported according to the Single Programming Document. Geographically and demographically it covers one third of Lithuania. Considering its success, it is now clear that the project will expand to cover the entire country. The project managers are proud that Latvian colleagues are very interested to begin their own projects based on ELCP experience.

By the end of November approximately €20 million will be spent to achieve numerous project goals; the most important of these include reduction of cardiovascular diseases (CVD), related mortality and morbidity, as well as improvement of quality and accessibility of healthcare services among the population of the eastern and south-eastern regions of Lithuania. Despite many economical and political changes here, mortality and morbidity levels due to CVD in Lithuania still remained one of the highest in Europe and was three times higher compared with the average of the 'former' EU countries before May 2004.

Lithuania's eastern region is the most problematic and depressed area in the entire country – in terms of lowest social and economical levels; lowest incomes; the multinational composition of the region, having Lithuanian, Polish, Russian and Byelorussian populations, and the environmental hazard of its proximity to Ignalina's atomic station. Epidemiological data shows that health indices in this region are worse than the country's other regions.

Presenting the award: Finance Minister R Sadzius with Dr Mazurkevicius

Additionally, inherited from the Soviet period, the infrastructure of healthcare services, with one characteristic feature – the very broad gap between 'big centre' healthcare service capabilities and professional level, compared with the 'small periphery'. All this has two unfavourable consequences. First, a disproportionally high concentration of doctors/specialists in the 'big centre' and second: the disproportionally high patient numbers sent by general practitioners (GPs) working at the periphery to the doctors/specialists in the big centre. 'Our University Hospital's workload was enormous. Cardiologist consultations have reached 300 thousands annually, which means almost every tenth man in Lithuania has visited our hospital for cardiology care. It has become clear that we must change the infrastructure as soon as possible,' explained ELCP director Dr K Mazurkevicius.



Typical cardiology department in a Lithuanian district hospital

Important features: complexity and interconnection

No such work can be done alone; this project is not an exception. It unites 40 partners and incorporates all three levels of the Lithuania healthcare system. 21 primary healthcare centres, distributed in 15 administrative districts of eastern Lithuania, will adapt to the project, with digital ECG recorders and digital stethoscopes used by GPs in every small surgery, and transferring results to the special ELCP database. Every cardiology department in all 15 district hospitals should be equipped with modern cardiac ultrasound equipment, a bicycle stress testing system, Holter's monitor system and event recorder. 'By placing all that equipment in district hospitals, as well as very close to the GPs, we expect to unload a major part of cardiology consultations from our Vilnius University Hospital to all 15 district hospitals. We expect to reduce the cardiology waiting list at the district hospital to one week and not longer at the university hospital if such a consultation is necessary,' Dr Mazurkevicius predicted.

The ELCP also intends to upgrade cardiology services at the Vilnius University Hospital. This includes establishing a state-of-the-art endothelium function evaluation

CHANGING HORIZONS FOR THERAPIES, MEDIAL PROFESSIONALS

Health telematics

Professor Michael Nerlich, Director of the Emergency Surgery and Telemedicine Department at Regensburg University Hospital

Telematics appears to offer solutions for certain complex therapies – and for issues that will become central as populations further swell with age.

The different constellations of actors in this nexus of telecommunications, IT and medicine are physician/patient, patient/private care organisation and the triad hospital/care/rehabilitation with family physician and patient.

At the recent Telemedicine in Cardiology Symposium in Regensberg, Germany – organised by Forum MedTech Pharma e.V., a member of the network 'Bayern innovativ' network, and chaired by Professor Michael Nerlich, those stakeholders discussed the present and future of health telematics and presented their visions, current prototypes and pilot projects. Some concepts were either similar or followed a common approach, albeit with different equipment, particularly for chronic conditions such as coronary heart disease (CHD), diabetes and lung diseases.

All systems shared a common objective: cost reductions while optimising quality and patient benefit. For example, Siemens Medical Solutions estimates that the electronic patient record (EPR) will reduce time-consuming and expensive processes from 25% today to 10% in the future. Moreover, close co-operation between hospitals and GP surgeries may reduce average waiting time from 35 minutes to ten minutes. However, that potential improvement requires substantial up-front investments in IT infrastructure and equipment. Thus the Siemens solution is modular and can communicate with different hospital information systems (HIS).

Certain legal aspects need resolving, such as the prohibition of remote treatment, and documentation requirements plus privacy issues. The patient rights acts raise crucial questions regarding liability.

The aged need electronic assistance

The consultancy firm Frost & Sullivan has forecast a €300 billion telemedicine market. In view of demographic changes it is no surprise that everyone in industry, healthcare, politics, professional associations and research institutes are interested in this development. Recent modifications in healthcare systems have upgraded the out-patient sector. Different approaches are applied to ensure medical safety in this sector. Home monitoring patients with chronic diseases is one option that is already established for CHD. However, post-surgery and post-discharge home monitoring is also gaining importance.

Home monitoring does raise a number of important questions – for example, regarding mortality reduction, therapy costs and length of treatments. To find answers to all these question, the Berlin Charité, in partnership with an industrial concern and two health insurers, founded the 'Partnership for the Heart' telemedicine project.

Moreover, five Fraunhofer Institutes developed a telemonitoring system for cardiovascular diseases. When designing the services and the organisation, the developers had to answer some very basic but crucial questions: Who will offer the services - hospitals, general practitioners, out-patient services, emergency centres or medical call centres? How should services be structured and processes designed?

New roles discussed at the symposium included telenursing

The USA and northern European countries have already gathered extensive experience with home monitoring, and found out, for example, that home visits were significantly reduced and patients also felt safer. More patients were cared for than by traditional in-patient services and the geographical presence was expanded.

Telemedical solutions support independence and competency of patients and turn them into a co-provider of medical services. The patients' acceptance must be complemented by concrete benefits for the medical staff.

New professions in telemedical nursing

Dr Barbara Klein, of the Fraunhofer-Institut für Arbeitswirtschaft und Organisation, in Stuttgart, pointed out that in 1999 one nurse cared for nine patients; in 2015 the number will have increased to 17 patients. Special job profiles and qualifications for the new telemedical professions are needed and indeed a curriculum for a 'telemetric-medical data manager' is currently being designed. This new profession will serve as an interface with filter function between physician and patient. The job profile not only consist of technology-

laboratory. This will enable early assessment of atherosclerosis and early risk stratification. Cardiac perfusion and viability will be assessed using SPECT and multi-slice CT with the fusing option. The hospital's cardiology service will have additional units for interventional procedures and beds for intensive care.

For comprehensive cardiac care, two cardiac rehabilitation centres and Kaunas University Hospital (a cardiac arrhythmia centre) were included in the project and all the partners interconnected via high-speed networking capable of maintaining real-time diagnosis of ultrasound images supported by ECG and sound from a digital stethoscope. All patients presented at any ELCP partner institution will have a personal electronic patient record (EPR) at the project's common 24 TB capacity database, which has 20 terminals for telemedicine. The network is planned to be multipurpose. First, it will provide immediate and precise assessment by university-based specialists of tricky cases presented at any of the 15 cardiology departments in district hospitals. Routinely organised teleconferences will enable management of patients' cases and peer consultations. Virtual interconnection is supported by four mobile teams settled in four mobile intensive care ambulances, working on duty round o'clock and covering the whole region.

Another project – same goals

Even before planning the ELCP project it was clear that one project is not enough. The Eastern Lithuania Cardiology Project alone will create an additional workload - 50 new jobs are estimated - and that is a half the problem. 30 of those jobs are for cardiologists capable of managing a district cardiology department. 'It was the most challenging task. Actually we were revising and interviewing almost every single internal medicine doctor, closely related to cardiology by his/her everyday practice in each of our 15 district hospitals, and we have selected 30, who wanted to continue their medical education and rearrange their speciality to cardiology.'

Another Single Programming Document-supported Project was introduced almost at the same time as ELCP and special traineeship at Vilnius University was organised. After three years training, 30 former internal medicine doctors have graduated in cardiology and, after successful examination will be licensed to practice cardiology.

AND PATIENTS

By **Anja Behringer**

oriented tasks, e.g. recording a patient's technical and medical status, but also interpersonal tasks such as alleviating a patient's fear of technology and gaining his/her cooperation, as well as offering counselling, advise and help. The project aims to establish new options for diagnostics and therapy and prepare staff for these new tasks.

Cardiology is one area where these new professionals will be needed. The transfer of biometric data or remote call-up of diagnostic information from medical centres are just two likely tasks. Health telematics will ensure patient care in remote rural areas via a central hospital, or home care of chronically ill patients.

A further project of the Fraunhofer innovation clusters 'Personal Health' is developing a job profile for a 'Community Medical Nurse', to support a family doctor (GP). This nurse could tend a patient at home and, if necessary, communicate with the GP via computer video or audio connection.

Ideas and projects abound – financing is not so easy. Additionally, lack of reimbursement structures and legal issues still slow down the implementation of electronic services. All players in the healthcare system expect the introduction of the EPR to immensely boost innovation.

NEW

Compact portable ECG promises earlier diagnosis

A compact portable, easy-to-use ECG machine, the MAC 400, was launched in Europe by GE Healthcare at the recent European Society of Cardiology (ESC). As part of GE's new compact line, the machine has been designed to help physicians whether hospital-based or in private practice, and could prove invaluable in emerging countries.

The firm reports that the MAC 400 has the same quality and clinical excellence of the Marquette 12SL algorithm in its premium ECG devices, allowing for various patients' configurations and quicker cardiac assessment.

Announcing GE Healthcare's big push for 'early health' in India earlier this year, Joe Hogan, President and CEO GE Healthcare said 'Today, 70-80% of the resources in healthcare are devoted to managing symptom-based, advanced disease. If we can move from a "see and treat" approach to healthcare to one where the focus is on predictive healthcare we can dramatically reduce the costs to patients of late-stage treatment. Shifting resources to develop technologies that allow healthcare providers to diagnose disease at the earliest possible stage, when there can be many treatment options, is better medicine. It also makes simple economic sense.'

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MODERNISATION: Meeting legal requirements

A Meiko TopLine 40 E being installed and connected to existing hospital supply and waste disposal systems

During modernisation previously installed machines in contaminated hospital sluice rooms must comply with the same Medical Devices Act requirements as new machines, the specialist firm Meiko Maschinenbau GmbH & Co points out. 'Specifically, a complete 'master device file' with workshop drawings, a risk and hazard analysis, as well as complete technical documentation, must be compiled. Hygiene performance must also comply with the latest medical knowledge. 'Meiko's unique TopLine rapid modernisation system meets all these requirements.'

The TopLine 40 E can be accommodated in all available recesses and alcoves supplied with or without a plinth, at the customer's option extended to include a slop sink with rim flushing if required. Meiko also adds:

- **Operation of an already installed slop sink with rim-flushing is easily to combine with the TopLine 40 E bedpan washer.**
- **The work surfaces for these appliances can be supplied in any length and with a variety of hygiene radii.**
- **Meiko's new cleaning and disinfection machine can be connected to a hospital's existing central steam supply pipe.**

MEIKO at MEDICA

Full details of this Offenburg-based company's range and services can be obtained during MEDICA in Düsseldorf, Germany (14–17 November) in Hall 12, stand A 65. Or visit: www.meiko.de

Modernisation completed

INFECTION SOURCE: WATER

Pathogenicity of coagulase-negative staphylococci is underestimated

That tap water carries pathogens such as legionella or pseudomonas aeruginosa is well known, writes *Heidi Heinhold*. However, new research results show that bacteria that were previously considered non-pathogenic, such as coagulase-negative staphylococci (CONS), can be present in hospital water and are transmitted by the water

The enzyme coagulase transforms fibrinogen to fibrin in blood plasma. It is produced by staphylococci, e.g. staphylococcus aureus. Therefore this group of bacteria is called *coagulase-positive*. On the other hand, *coagulase-negative* staphylococci (CONS), e.g. *Staph. epidermis* on the skin, do not produce coagulase.

In the past, CONS were considered non-pathogenic. However, recent studies indicate that these environmentally resistant and ubiquitous bacteria may play a crucial role in causing nosocomial infections since they are often present in liquids that are common in hospitals. Their pathogenicity may be increased by increased saline concentrations, for example in dialysis liquids. Moreover, they develop antibiotics resistance, which they can pass on to the next generation via the mecA gene.

Method

104 cold water samples were examined for API ID 32 STAPH CONS. In addition, an anti-biogram was performed and the mecA gene was identified in order to determine possible antibiotics resistance. The ability of the identified strands to survive in distilled water, tap water, 1 x PBS and 10 x PBS (PBS = phosphate-buffered saline) was determined.

80 of the 104 samples were taken in four hospitals with dialysis facilities in south-western Germany. 24 further samples were taken from stagnating water from an eye wash fountain in the institute for hygiene at Tübingen university hospital, in Germany.

32 samples were tap water from the municipal water system; seven samples consisted of softened water; the water of 26 samples had undergone reverse osmosis and 39 samples were dialysis liquid. The following factors were determined: bacteria load, CONS (gram-positive and gram-negative colouring), methicillin resistance (oxacillin and 17 other antibiotics), *mec*A gene and the ability to survive in different saline concentrations.

Results

78.8% of the water samples tested showed bacterial contamination, including all 32 tap water samples (= 100%, incl. all samples from the eye wash fountains). All seven (= 100%) of the softened water samples were contaminated, as were 84.6% of the reverse osmosis water, 12 of 19 samples from dialysis liquids (63.1%) as well as 9 from 20 samples from post-dialysis liquid (45.0%).

In 23 of 104 water samples (= 22.3%) a total of 114 CONS strands were identified. 34.7% of the CONS did not show resistance to any of the test antibiotics. All isolates showed sensitivity towards oxacillin, ampicillin plus sulbactam, cefazolin, cefuroxim, imipenem, rifampicin, clindamycin, ofloxacin and cotrimoxacol.

The ability to survive was shortest in the distilled water (2.8 ± 1.1 days); in tap water it was 3.4 ± 2.4 days, in 1 x PBS the bacteria survived 6.3 ± 3.9 days and in water with the highest ion concentration 10 x PBS 6.7 ± 3.6 days. This means that CONS' ability to survive increases with increased saline concentration.

Conclusion

The study shows that over one fifth of different types of hospital water (22.3%) were contaminated with one or more CONS. The high percentage of CONS load points to the fact that potentially all water systems are colonised by bacteria. CONS, being present in a hospital's water system, may be breathed in from running tap water, taken in orally or transmitted by smear infection.

Detection of CONS in dialysis liquid is highly alarming and means that the current concept of CONS as being spread via human skin along central or peripheral catheters into the bloodstream, with following nosocomial infection in the form of CONS bacteraemia, or via colonisation of nasal and anal mucosa has to be expanded. Obviously, CONS originating in the water system are a more frequent cause of nosocomial infections than previously thought.

** D Worlitzsch, et al: Detection of coagulase-negative staphylococci in hospital water systems. Hygiene Medizin 2006; 31 (12)*

CLOSTRIDIUM DIFFICILE

1. Research: Hungry bacteria cause disease

C. difficile are common, but pose a threat if they grow in abnormally large numbers in the intestinal tract, which can occur after people take antibiotics or other antimicrobial drugs that reduce benign bacteria in the intestine, but do not destroy *C. difficile*. This results in diarrhoea, and at worst, deadly colon inflammation.

The discovery by US researchers that hunger drives *Clostridium difficile* bacteria to cause disease may result in the development of new treatments against nosocomial outbreaks caused by these bacteria. Professor Abraham Sonenshein, of the Sackler School of Graduate Biomedical Sciences, Tuft University and the Tufts University School of Medicine, USA, explained: 'The genes responsible for toxin production only seem to be expressed during periods of nutrient deprivation. This is consistent with the view that most disease-causing bacteria express their pathogenicity when hungry.' Studies of the bacteria's genetic makeup may result in the development of methods to keep *C. difficile* in check. Presenting his findings at a meeting of the *American Society for Microbiology*, in Toronto, the professor added: 'If we find a way to shut down toxin production in the hyper virulent strain, we might have a new way to treat the disease.'

2. US experts team up to tour troubled hospitals

Project CDAD: Outbreak Prevention and Control, an educational programme designed to help healthcare providers in North America to prevent and control *Clostridium difficile* associated disease (CDAD) in their hospitals, was showcased at the *45th Annual Meeting of the Infectious Diseases Society of America* (IDSA), in October

Designed by medical education firm *Robert Michael Educational Institute LLC*, the project brought together a team of leading infectious diseases experts who have had first-hand experience in managing *C. difficile* outbreaks. This team is to visit hospitals across the US that are dealing with a *C. difficile* outbreak and present a one-hour continuing education lecture. The experts will also spend a further 1-2 hours with key personnel, at the site, to discuss specific problems the institution is having with CDAD. This programme is provided free of charge.

The Institute provides a variety of educational programming such as national and international symposia, teleconferences, live meetings, enduring print materials, and interactive internet programmes. In a programme jointly sponsored by the Institute and the Postgraduate Institute for Medicine, which is supported by an educational grant from ViroPharma Inc, continuing education credit is offered for physicians, pharmacists, and nurses.

Details: http://www.rmei.com.

Devices dedicated to efficient hand washing

The 134-bed private hospital Dr R Schindlbeck private hospital in Herrsching am Ammersee, Bavaria, which also has a large out-patient department, provides 110 units for use after hand washing by staff, patients and visitors. From the Katrin range by Metsä Tissue, Finnish producer of paper towels and dispensing systems, they consist of paper towel rolls and dispensers. Lieselotte Lederer, head housekeeper at the hospital since 1992, said she has seen numerable paper towel dispensers come and go over the years, but since using the 'Katrins' there have been significant improvements and 'extremely positive feedback', including compliments for their design and the technical and hygiene concept (e.g. the dispensers are touch free and only one sheet at a time flows from role to dispenser; the paper absorbs water quickly and thoroughly and is skin-friendly).

As a result, this hospital has become a test site for Metsä Tissue's new generation of paper towel dispensers in hygiene-sensitive areas such as the ICU or dialysis, heart catheter or endoscopy departments, where hands must be washed frequently. 'These new dispensers are designed for high-quality folded paper especially developed for hospital use,' Metsä explains. 'They deliver single tissues touch-free, and these automatically unfold when removed by the user.'

Dr Peter Sautner, the hospital's Medical Director added: 'The paper is even softer and more pleasant to the touch than before, and it soaks up moisture very quickly and thoroughly and protects the hands. Consequently, it is used more often. In addition, high absorbency ensures that in stressful clinical life, drying the hands, which is such an important aspect, is not neglected.'

The manufacturer explains that a specially developed technology, with air pockets, accounts for the softness and absorbency and also prevents easy tearing of the paper. The sheet size is sufficient to dry hands, and although only about 9g of residual moisture usually remains on wet hands after a wash, each towel can absorb 16g of moisture.

The hospital's managing director, Robert Schindlbeck (son of the founder), had long found expenditure on paper towels to be exorbitant, particularly because other dispensers had thrown out wads of towels. 'No one seemed to unfold the sheets,' explained Lieselotte Lederer. 'They'd use several towels at once. Surplus towels from a dispenser landed on the floor, and were wasted and ugly.' This rubbish also made an extra job for the cleaners, she added.

Over the past year, the new dispensers have reduced paper towel consumption by about 50%. This not only represents cost saving, but also reduced work and a more pleasant wash rooms.

At this eco-certified hospital, technical director Helmut Grünert said that, before using the Katrin dispensers, every month three to four of those used had to be replaced because they had been either vandalised or had broken due to wear and tear. He also pointed out that the Katrin mounting device is compatible to those of many other systems, so no new holes needed to be drilled in tiled walls.

The hospital is now considering testing Metsä Tissue toilet paper dispensers, which also can be locked to prevent paper thefts.

Phone for technical and other details: +49 25 92 660
Website: www.metsatissue.com

Use that toothbrush!

AHA says good oral care prevents dental-related heart problems better than antibiotics

Since the 1950s, the *American Heart Association* (AHA) has urged a large number of people to take antibiotics before dental work or other procedures that could flood the bloodstream with bacteria. This antibiotic intake was thought to prevent infective endocarditis. However, since examining the latest evidence, the AHA is emphasising routine oral care and only recommends pre-procedure antibiotics for certain people, according to a report in the *Harvard Heart Letter* (October).

Infective endocarditis occurs when bacteria invade the innermost layer of the heart's chambers. Though not common, it is hard to treat – and can make heart tissue prone to other infections, damage heart valves and lead to heart failure, stroke, or heart rhythm problems. The organisms that kick off endocarditis live in your mouth, among other body areas. Having invasive dental work causes a temporary rise in the number of bacteria in the bloodstream. The Harvard Heart Letter points out that no large trials have tested whether taking antibiotics before dental work actually prevents endocarditis, but that, if antibiotics do help, the effect is so small that the risk of side effects from the medication outweighs the benefits for most people.

The AHA now recommends antibiotics before dental procedures only for those with an artificial valve; those who have previously had endocarditis, or those who have had a heart transplant and developed a valve problem. Those with congenital heart problems may also need antibiotics depending on whether and how those defects were repaired.

Details: http://www.health.harvard.edu

The healing environment

Maximilian von Eiff (right), of the Centre for Healthcare Management in Munster Germany, presents the effects of better surroundings on patients, visitors and hospital staff

The healing environment approach is a comprehensive concept targeting the elimination of stress factors for patients as well as their visitors that would otherwise minimise patient's wellbeing, impair the healing process, or even violate their dignity/privacy.

The world's developed healthcare systems are showing tendencies towards medical hospital care that is marked by patient-oriented performance, organisation and service structures. The goal of such care concepts cater for

- Patients' individual characteristics (personality structure, attitude towards disease, social background, mental capacity)
- Personal expectations with regard to humane treatment.

Risks of hospital stays

The origin of the healing environment approach is, first, the empirically proven recognition that a patient is exposed to health-threatening risks during a hospital stay that are avoidable through proper organisation, attitude and behaviour:

- 128,000 wound infections in German hospitals annually cause costly aftercare, longer stays and troubles for patients and their families.
- 44,000 to 98,000 deaths in US hospitals each year are caused by 'adverse events' and 7,000 deaths are 'adverse drug events'.
- Patient falls, undetected dehydration and uncontrolled medication administering cause complications and require costly aftercare that worsen the outcome for patients.

Second, the healing environment approach is grounded in part on the observation that diagnosis and therapy processes – many times due to costs – are not ideal in the sense of pain and fear-free treatment, short stays, and quick convalescence; fast track surgery, consisting of minimally invasive surgery techniques, pain-management, anaesthesia control, diet plans and management of the entire process are still an exception.

The third reference point of the healing environment approach pertains to surroundings: In most hospitals, the emotionally influencing functioning conditions (e.g. sanitary facilities, placement in a multi-bed room), the décor (colours, shapes), noises, smells and treatment processes, communication and behaviour all take on a negative effect on the wellbeing, state of immunity and compliance of the patients.

The healing environment approach also assumes that you can find care situations in most hospitals that

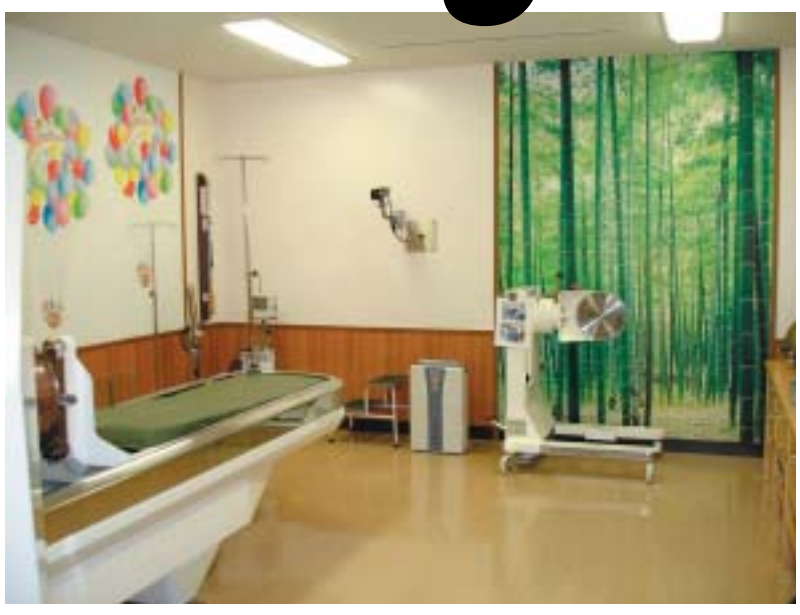
- endanger patients unnecessarily
- lengthen stays
- foster iatrogeneous risks and nosocomial infections
- worsen the patient's outcome because of feelings such as fear, disgust, embarrassment, subjection and obstipation.

The discoveries especially gain meaning with regard to a paradigm shift of the physician-patient relationship: The traditionally very structured physician-patient relationship with the dominant technical and social competence of the practitioner is changing through the role of the patient, who is more informed and thus more demanding (second opinion, demanding information and service).

The healing environment approach assumes that through a co-operative style of the physician-patient relationship the self-confidence of patients can be improved; the willingness to be actively involved in fighting the disease (compliance) and therefore mobilising self-healing forces supports and accelerates healing success and opens up the chance to procure a healthy lifestyle (Life-Cycle of Care Approach).

The patient's ever rising demand for information in the sense of current, future, understandable, individual and comprehensive information, as well as the increasing demand for individuality and diagnosis-depending privacy, can be deduced from changing societal norms and values, or in some countries (e.g. Japan, Singapore, USA) to co-payment requirements.

The image of hospitals is changing from healing facility to hotel. Likewise the societal attitude has changed: In the past it was considered normal that one's privacy was shared by fellow sufferers; today privacy has gained the highest significance in a case of illness.



Nature motifs in calmative colours in an x-ray room in the National Vascular Heart Center, Osaka

Stress factor: 'hospital'

During a hospital stay, patients experience stress that is caused by and/or amplified through environmental influences (and not through the disease itself).

Triggers for healing inhibiting stress are painful procedures, loss of self-determination, depersonalisation through the bureaucratic system, limited mobility and the interruption of social contact.

A significant part of stress is generated by limited building functionality that inhibits process organisation, does not allow for privacy, produces disruptions, does not allow for private gatherings of visitors and also does not grant an outside view of the natural environment.

For the patient him/herself stress experiences present, on the one hand, an emotional sense of medical quality and, on the other, stress experiences can influence other negative emotions that can be reduced to four components:

- The psychological component includes worrying thoughts, as well as feelings of helplessness, fear and sadness.
- The physiological component encompasses changes of activity of the entire body; including high blood-pressure, pulse rate, muscle tension and constipation.
- The neuro-endocrine component refers to the changes in the hormonal system (e.g. cortisol, adrenalin) that influences the cardiovascular system.
- The behavioural component of stress describes behaviour phenomenona such as passivity, social isolation, verbal/emotional derailment, insomnia and non-compliance with therapy requirements.

Generally, the body's own reactions to stress (e. g. increased adrenalin) are there to help humans deal with threatening situations on a short-term basis. But, stress reactions consume energy and lead to bodily exhaustion. Stress reactions increase neuro-endocrine activities and stimulate the central nervous system. Consequentially, the immune system is repressed, which in turn heightens the danger of infection and the quality of the healing process suffers. Thus the healing process of stressed patients takes much longer (Kiecolt-Glaser et. al., 1995); this leads back to the stress hormone cortisol. On the other hand, if a patient experiences a pleasant hospital environment, norepinephrine levels decrease; as a result the patient experiences less pain, sleeps more peacefully, feels less anger, does not suffer muscle tension and has a reduced stroke risk (Rabin <1999>).

Stressors and anti-stressors

Notable stressors with significant effects to patient well-being, healing process and healing results, are noise-level, interruption of privacy, unpleasant smells (sweat, faecal odours) of fellow sufferers, emergency measures on another patient and pain.

Noises

The World Health Organisation (WHO) recommends a maximum noise level of 35 dB for patient rooms with a maximal nightly noise level of 40 dB. By comparison, the actually measured average noise level in hospitals comes to about 68 dB, with peaks of up to 80 and 90 dB.

Noises starting at 38 dB already lead to fragmented sleep, increase pulse rate and blood-pressure (Berg <2001> and Blomkvist et. al. <2005>).

Noises in neonatal intensive care units cause a decline in the oxygen-level and require an additional supporting oxygen therapy. Noises lead to insomnia, raised blood-pressure and pulse rate, as well as respiration (Slevin et. al. <2000> and Zahr/de Traversay <1995>).

Accessing nature

In various studies, virtual and physical accesses to nature (trees, plants, water...) have proved stress-reducing and an aid to healing (Tkayanagic <2005>). Abdominal surgery patients, placed in a room with a view of the natural environment, needed far fewer pain-killers, displayed more stable mental conditions and had shorter hospital stays than patients who only had small windows with views of walls (Ulrich <1984>; Ulrich/Zimring <2004>).

Patients and family members who spent visiting hours in nicely cared for gardens (components: water, plants, trees, light, places to sit) showed a higher satisfaction with their stay than patients who did not enjoy such possibilities of relaxation and individual undisturbed communication (Whitehouse et. al. <2001>).

In a Healing Environment, overhead paging or announcements should not be made; it was discovered that it scared patients.

Single-bed rooms

Measures to create healing-supportive environments are rejected by most hospital sponsors, in relation to disproportionally high investment and operating costs, as well as not proven effects on process and outcome quality.

Counter evidence was produced by the Fable Hospital model project on evidence-based design in hospitals that shows the following connections:

- Large one-bed rooms (as the general layout) reduce disrupting noises, eliminate unpleasant influences through fellow patients, uphold privacy, enable self-determination and a peaceful visit by family and friends. Nosocomial infections were drastically reduced.

The Philips 1.0T MR allows parents to stay very dose to their children

If you assume that 5-10 % of all patients contract nosocomial infections and thus incur avoidable costs in the realm of US$ 4,000-7,000, an investment in single-bed rooms not only improves the overall image but also lowers costs.

- Single-bed rooms with complete technical infrastructure enable the flexible adjustment of technically equipping the room according to the patient's condition. Cost incurring and risky relocation (loss of information) are avoided. It was estimated that the Fable-project would reduce costs by US$3.8 million a year compared with conventional design (four people wards), assuming relocation costs of US$250-300, and a reduction of such relocation of up to 80 %, with an estimated 19,500 patients a year.

Images and art

Patients conceive images of rural landscapes and nature (ocean surf, streams, meadows, forests, mountains, etc.) as calming: Stress is reduced; pain is significantly less perceived.

By contrast, abstract art is perceived as threatening and frightening. The reason: the depiction is ambiguous and calls for interpretation. An image showing an empty chair causes associations of impending death in seriously ill patients (Malkin, 2006).

Conversely, hand crafted art exhibits cause a positive reaction in patients and visitors.

Conclusion

The healing environment approach is a holistic concept that aims to avoid exposing patients and their visitors to stressors that will inhibit the healing process; for this, effects should be mobilised that will support the overall outcome. Research in this field is carried out in the following areas:

1. Connection of patients/family to nature
2. Social and emotional support
3. Elimination of stressors in the hospital environment
4. Positive distractions
5. Patient information and behavioural change (patient education);
6. Medical process, structures and outcome quality (e.g. Fast Track Surgery).

The basic pillars of this approach are evidence-based design, patient-focused organisational culture and medical capability.

A healing environment

- creates rituals and organisational help that encourages patients' healing supportive behaviour
- enables learning and dealing with disease and recovery
- elevates compliance in the sense of positive attitude towards the healing and the rehabilitation process.

Effects:

- quicker subjectively experienced recovery and mobility
- shorter stays
- lower costs for hospitals and patients
- higher patient and healthcare worker satisfaction.

Lightening up the environment for patients and staff

'*Is professional lighting for the bathroom a luxury*?' asks specialist lighting manufacturer Derungs Licht. 'The D[lite] **vanera** bath is something quite special. Its secret lies in the prism profiles and in the cylindrical lighting strength. The effect is impressive. Brightened walls and indirect light on the ceiling allow the room to appear free and inviting. The impression of light in the room is the best possible and faces, objects and colours can be viewed free from shadows and true to life. The evenly distributed glare-free, well-screened light therefore creates a comfortable, cared for and charming atmosphere.'

The manufacturer adds that although these are well-designed and hand-crafted products, it will 'not cost the earth' to provide

- Soft and homogeneous room lighting
- Reduced shade effects to prevent mishaps
- Sophisticated and almost shade-free lighting that facilitates the perception of the floor when entering the shower area of a bathroom
- Shade-free reflection of the different parts of the human face
- Sophisticated color reflection properties that give a proper perception of colours.
- Improved self-perception for patients and residents
- Bathrooms as a little oasis of well-being
- A high level of safety through splash protection according to IP 24
- Wash basin, mirror and lighting are perceived as one aesthetic unit
- Luminaires that have a compact, slim and linear design.

Guide launched to develop nurses' business skills

UK – The Royal College of Nursing (RCN) has launched a new guide to help nurses understand business and financial practices in the country's National Health Service (NHS). The RCN reports that *Nurses' Business: 'An introduction to costing and coding healthcare*' has been put together with the help of frontline nurses, NHS managers and financial experts to provide nurses with the tools they need to thrive and survive in the modern NHS.

Topics covered in the RCN guide include:

- **The concept of 'Payment by Results'**
- **Bidding for extra money or a new project**
- **Understanding clinical coding.**

NEW

Dr Peter Carter, RCN General Secretary said: 'Business skills and clinical skills are two sides of the nursing coin. Nurses work in a huge range of healthcare settings and not only are they delivering patient care, but they are also major players in delivering change. Nurses need the skills to make a business case for keeping a particular service or saving a specific post and better business skills would also enable nurses to better shape and lead the modernisation process. I hope this guide helps demystify the financial and business practices in the NHS and, by doing so, gives nurses the confidence to stand up and speak out about the business decisions affecting their workplaces and their patients.'

The guide can be downloaded from:
http://www.rcn.org.uk/publications/pdf/003187.pdf

Burned out or bored out of your mind?

By Heidi Heinhold

A survey by the Gallup Institute (Potsdam) revealed that only 15% of Germans consider their job satisfying; 16% have mentally handed in their notice and 69% are 'working to rule'. Explicit research studies into the living and working conditions of nurses were carried out in 1993-'94 by the Institute for Employment Research, Nuremberg.

'Bored-out' causes, symptoms, backgrounds

The symptoms are similar, the causes oppositional. Just as excessive demand can lead to stress reactions followed by complete exhaustion, being under-challenged can result in boredom and a sense of total exhaustion. Result: employees who have already mentally handed in their notices because they are not given work challenges due to operationally necessary routines. They develop techniques that make them appear stressed, while actually switching to other ways of occupying themselves. These phenomena can also be observed among nurses.

Routines can be meaningful: They make work and its results easy to plan and measure – for healthcare institutions as much as other workplaces – and performance more calculable. Some workers like and feel safe with set routines. However, as said, routines can become a problem for those they make feel either under-challenged or overworked.

According to Swiss management consultants Peter Werder and Philippe Rothlin, 'bored out' is a syndrome typically found in the service industries, where people must 'deliver not waffle'. They drew this conclusion after questioning about 100 executives in banks, insurance companies, administration and PR.

Nurses could check their susceptibility to the concept of bored out syndrome by answering the questions in the box supplied by Werder and Rothlin.

What can you do if the test has 'diagnosed' bored out?

Over the course of our lives today's interests may become tomorrow's boredom area. No employer can realistically cover all their employees' interests. The social relationship between employers and employees has changed, not least due to the arrival of large, global businesses. Employees must work to cover their living costs. A change of job, if it cannot be achieved internally, entails high risks.

So, you're bored out? What can you do? Take stock.

- Is routine the real cause of your dissatisfaction, exhaustion and boredom, or are problems in your private life affecting your perception of work?
- Discuss and try to establish whether certain routines, of which you cannot see the point, are actually necessary. Perhaps other colleagues feel the same about them, but have never been mentioned it.
- Ask how your work interests have changed and in whether a move to another department would make sense, then see if that is possible. Sometimes people only discover what their real interests after being in a job for some time. You could show your ability to learn if you adopt a change in direction.
- You could simply work on how you perceive your work – without mentally handing in your notice. You could evaluate your private life whilst valuing your job as an important contribution towards earning a living.

The worst solution is to mentally hand in your notice followed by a 'work to rule' attitude, which could be the first step from being bored out to burned out. In that case it would be more courageous and honest to start the search for a new job – which is not without its risks.

QUESTIONNAIRE

- At work, do you do spend time on private matters?
- Are you under-challenged or bored?
- Do you occasionally pretend to work, when having nothing to do?
- Are you tired/exhausted in the evening even if the day is not stressful?
- Are you unhappy with your work?
- Do you find your work meaningless?
- Could you complete your work quicker than you do?
- If you'd prefer a different type of job, are you afraid to move because you'd earn less?
- Do you send out private e-mails to colleagues at work?
- Do you have little or no interest in your work?

If you have answered more than four questions with 'YES', then you are probably 'bored out' – or at least at risk.

Source: Rothlin, P., Werder P.R.: Diagnosis Bore-Out, Wirtschaftsverlag, March 2007

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