**PET scanning the heart cuts costs**

**USA - Using positron emission tomography (PET) scanning rather than other types of imaging as the first tool to diagnose heart-vascular blockages is more accurate, less invasive and saves money, according to researchers reporting at the American College of Cardiology’s Annual Scientific Session in March.**

**Results of the study provide a rationale for PET scanning to become the initial diagnostic test for assessing a patient’s risk of heart attack, said lead researcher Michael Merhige MD, clinical associate professor of nuclear medicine and Joseph Oliverio, certified nuclear medicine technologist and clinical instructor of nuclear medicine - both at the University at Buffalo (www.buffalo.edu), and affiliated with the Heart Centre of Niagara at Niagara Falls Memorial Medical Centre.**

**’Often PET scanning is the last test to be used, but Professor Merhige said, however, he added: ‘Because it is more accurate and provides a clearer picture of the state of the heart, it could decrease the use of angiograms (costing about $4,800 each) and bypass surgery by more than 50% if used as the first-line test with patients. Currently cardiologists conduct a range of tests, including stress tests and single photon emission computed tomography, or SPECT.’ But he added that false readings from SPECT often put patients through angiograms that turn out to be normal. ‘PET avoids most false positives, as well as false negatives, because the images have higher resolution.’**

**There is not much peer-reviewed literature that compares PET to SPECT (the current standard), so coronary PET scanning is considered experimental in this field, although some 25 US centres are thought to use it for cardiac assessment, and one has done so for about a decade.**

**The researchers compared costs and results for SPECT of 102 patients, with PET scanning of 2,159 patients. All the patients continued on page 2.**

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**Drug reduces body weight plus cardiovascular risk**

**The drug rimobonabant helped to substantially reduce the bodyweight, waist circumference, and risk factors for heart disease in obese people, according to results of a phase III randomised trial presented at the Scientific Sessions of the American College of Cardiology in Orlando, Florida in March and published in The Lancet (15/4/04). Effects of the cannabinoid-1 receptor blocker rimobonabant on weight reduction and cardiovascular risk factors in overweight patients.'**

**The first year results of the RIO-Europe study were presented at the European Society of Cardiology meeting in August 2004). The RIO-Europe two-year phase III study of rimobonabant involved 1,507 people from Europe and the USA, and was led by principal investigator Luc Van Gaal MD, Professor of Diabetology, Metabolism and Clinical Nutrition, and colleagues at the University Hospital Aarzew, Belgium. ‘The RIO-Europe findings demonstrated that in addition to maintaining body weight loss, two-year treatment with rimobonabant 20 mg/day compared with placebo reduced waist circumference, improved metabolic profile and reduced the number of patients meeting the National Cholesterol Education Programme (NCEP) criteria for metabolic syndrome, thus diminishing cardiovascular risk factors in patients studied,’ Professor Van Gaal concluded.**

**In an accompanying comment in The Lancet, Uberto Pagotto and Renato Pasquali, of the Department of Internal Medicine and Gastroenterology, Sant Orsola-Malpighi Hospital, Bologna, Italy, wrote: ‘The results, and those from the other ongoing clinical trials with rimobonabant, might presumably help us to better tackle obesity and related metabolic and cardiovascular dis ease. When additional drugs are available, we will also have the possibility to individually target the therapeutic strategies according to phenotype characteristics and to the pathophysiological mechanism inducing the disease.’ Report: page 12.**

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**Med-e-Tel 2005**

‘eHealth is becoming the third industrial pillar for healthcare, behind the pharmaceutical industry and medical imaging, to reach an estimated 5% of all healthcare expenditures by the year 2010’, said Professor Jean-Claude Healy, Director of eHealth strategy at WHO, at the opening of the Med-e-Tel conference and trade show held in Luxembourg (April), which attracted over 400 representatives from healthcare, the industry, academics and government representatives from nearly 50 different countries. Several European Commission co-funded ehealth projects were also exhibited, alongside above 50 companies, projects and media showcasing vital signs monitoring, archiving and communicaton systems, digitisation of clinical data, electronic data capturing, sharing, medical software solutions, and decision support systems. The conference programme covered teleconsultation, ehealth implementation in developing countries, distance education, standardization and interoperability, ethical issues, use of handheld devices in hospitals, image transfer and internet ehealth applications. A special session was dedicated to European eCT for Health research. The International Society for Telemedicine & eHealth (ISfTeH), presented national ehealth experiences and programmes from Brazil, Croatia, El Salvador, Finland, Georgia, Poland, South Africa, UK and Ukraine - and also represented members from Denmark, Germany, Norway, and Russia on its exhibition stand. For details and proceedings: info@medetel.lu. Med-e-Tel 2006 is scheduled for 5-7 April in Luxembourg. Details (available soon): www.medetel.lu or contact info@medetel.lu to register. Further telemedicine reports: page 20.
PET SCANNING THE HEART CUTS COSTS continued from page 1

were matched by the extent of coronary artery disease. Data was also compared from the 102 SPECT patients with data from a PET group. The PET group showed that the average cost of management of a patient with coronary artery disease was also lower - by 25%.

Whilst Prof. Merhige said bypass surgery and angioplasty with stenting and coronary bypass surgery. In the PET group, the average cost of management of a patient with coronary artery disease was also lower - by 25%.

One of the aims of the programme, added Dr E M Armstrong, Chief Medical Officer of Scotland, is to ensure that patients are seen and treated by ‘... trained doctors rather than, as at present, by doctors in training’, and added that young medical graduates will need to acquire the requisite skills and competences to achieve specialist accreditation over a shorter period than previously.

The UK Government’s Health Minister John Hutton explained that, because the country is moving to a structure where 90% of patient treatments will be provided in primary care settings, rather than hospitals, more trainee doctors need to spend time in places such as general practitioner (GP) surgeries and the patients’ ‘Walk-in Centres’ now provided in many of them.

‘The UK is at the forefront of worldwide educational practice’

A Foundation Programme Curriculum for junior doctors has been launched by the United Kingdom’s Department of Health, as part of its Modernising Medical Careers programme. In this programme, new programme trainees will have to demonstrate competency in traditional medical care - as well as in communication and consultation skills, patient safety and team working.

The programme includes:
● The framework for a structured two-year training programme that will give trainees a broad range of career placements across a broad spectrum of specialties, including accident & emergency, obstetrics & gynaecology and anaesthetics.
● That with each year: (1) Trainees will be given the opportunity to have experience in primary care and (2) Trainees will provide opportunities for experience in smaller specialties and academic medicine, not normally available at this stage of training.
● Explicit standards of assessment and structure supervision for trainees, where an educational supervisor will oversee each trainee and each post will benefit from a dedicated clinical supervisor.
● The requirement for trainee doctors to gain a range of skills, including communication, the undertaking and use of research, time management and use of electronic data. Each of these skills will be assessed through an agreed method prior to completion of the programme.

‘For the first time, doctors will have the opportunity to explore a range of career options, while ensuring that their acute clinical and professional skills are secure and robust,’ Sir Liam Donaldson, Chief Medical Officer for England, pointed out. ‘This is very much a curriculum for patient safety, ensuring that at the end of their two years of training doctors are both confident and competent and that we are delighted that the UK is leading the world in innovations in medical education.’

‘I draw and paint’, Rasheda Ali said, and her father. Her younger son, Nico, had been playing with Ali, in his boxing ring, then asked her: Why is Popi shaking hands and slurred speech. So I thought a lot of other parents have experience in primary care settings, rather than hospitals, more trainee doctors need to spend time in places such as general practitioner (GP) surgeries and the patients’ ‘Walk-in Centres’ now provided in many of them.

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CONTROVERSY: the nurse-surgeon

Nurse-surgeon training in the UK, the lead story in European Hospital’s February issue, produced a lively response because other European countries are also training nurses to undertake certain surgical procedures to address their lack of qualified surgeons. The concept is not entirely new. In the 1970s the Netherlands introduced training for ‘operation assistants’, and the USA has had ‘registered nurse first assistants’ for 15 years. A ‘surgical assistant’ course began in Germany in 1999, and the first course for surgical assistants in cardiology was introduced this March.

EH correspondent Holger Zorn reports

The General German Medical Council, the umbrella organisation that represents German doctors, was not prepared to make a statement on this subject. However, the Marburger Bund (Marburg Association) - with 80,000+ members the largest organisation in Europe representing salaried doctors - was more forthcoming: Unfortunately, doctors (particularly hospital doctors) must carry out an increasing volume of non-medical work. But surely, the solution cannot be to remove their real medical work - particularly since it is diffuse to recruit sufficient numbers of medical and nursing staff to begin with? It would make far more sense to relieve doctors of many documentation-related administrative tasks - about a third of their workload. Non-medical staff, i.e. nurses, could carry out, for example, infusions therapy, which they used to do.

Dr Udo Wolter, a member of the Marburger Bund and President of the Brandenburg Medical Council, who specialises in hand and emergency surgery, is against nurse-surgeon training, arguing that, due to the ruling by the European Court of Justice on hospital working hours (being on-call is considered time worked), assistants are left with less time to assist and learn to operate. ‘Assistance through qualified doctors is the most important form of further training,’ he said, adding that this must be ensured for future needs in general and specialist surgery. Although the nurse-surgeon training aims to improve and continuously ensure the quality of surgical assistance - and provide surgery at a lower cost - young doctors could miss chances to pass their medical qualification in surgery: No cardiac surgeon commenced his/her career with an organ transplant.

The Catholic Institute for Nursing, Marienhospital, Osnabrück provides conventional nursing training and, since 1999, has offered a course to train as operating theatre assistants (OTA). In March, Ulrich Barlag, Head of the Institute, and nursing academic, announced that in a new course, nurses working in operating theatres will be trained as second and first assistants for surgical interventions in cardiology, e.g. removal of a leg vein or preparation of the internal thoracic artery.

Nine CAs (Chirurgie-Assistant) were trained during a pilot phase in 2001, and over 200 enquiries for places have been received for the first regular course, which will begin later this year. To qualify for acceptance, applicants must be familiar with all aspects of instrument handling. The six-month course will cover theory and practice. Subjects: anatomy and physiology of the lower extremities, diseases of the arterial and venous systems and treatments, water and electrolyte metabolism plus blood coagulation and anticoagulation; intra and postoperative complications and wound-healing problems; the basics of HF surgery and the legal status of surgery assistants. A written exam will follow forty hours of theoretical study.

The operating theatre programme is based on that for specialist surgery training for doctors. Typical vein removal will be demonstrated and practised on dummies and the students will be taught stitching and knotting techniques. They will also assist surgeons by removing leg veins in preparation for a bypass for 80-100 cases, all closely monitored by a mentor. Nurses who successfully complete all the categories will receive a certificate.
An unnecessary rein on medical innovations, or a wise insurance for patients’ protection?

HEALTH TECHNOLOGY ASSESSMENTS

The press says it’s a miracle cure, so why can’t I (or - as relevant - my brother, mother, child) have it now? The answer is not simply through a new technology or treatment may have been the subject of successful studies, it must go through a Health Technology Assessment (HTA) before clinical use because, in many EU countries, medical insurers will not reimburse for procedures that have not had an HTA. We asked Dr Matthias Perleth, of the Department of Medicine at the AOK Federal Association (AOK-Bundesverband, Stabsstelle Medizin) to explain how an HTA system works and its potential.

Depending on the country, an HTA is initiated by different institutions. In Germany, for example, this is the role of the joint federal committee - comprised of doctors, hospitals, medical insurers’ and patients’ representatives - which completes an application for the inclusion of a new technology, Dr Perleth explained. Following various discussions in different committees, a recommendation is then made. So, initially, the HTA is a tool for health politics - used to assess whether the costs of a procedure are likely to be covered. In essence, an HTA is a data review.

‘Is an HTA on for new procedures? And is it always based on existing data?’

‘This hasn’t really been resolved. On the one hand, new technologies should be assessed as early as possible, for the potential benefit of patients. However, to carry out HTAs we need clinical studies. A good example is Kyphoplasty, which helps to repair and stabilise vertebrae affected by fractures. Because this procedure carries certain risks, the firm marketing it has imposed very limiting conditions as to who is allowed to carry it out, and also stipulates that it should only be used to treat new, recent fractures. However, because kyphoplasty is so attractive it’s being used for other indications, such as for older osteoporotic fractures, but the results are not as good as those achieved with new fractures - which we hardly ever get to see.’

‘Could a preliminary HTA be carried out, and then reassessed in a few years?’

‘That’s something we could think about. Despite the dilemma about available data, the HTA should support decision-making, especially when a procedure is still new. If the statutory medical insurers do not reimburse for a procedure its use will be very limited, then hardly any data can be gathered. That’s why differentiated decision models are increasingly discussed. Initially, a procedure can be financed within the framework of certain test trials, before a final decision about its use is made. This allows us to prevent unjustified expansions of indication at an early stage. ’

‘How all this is being handled in detail depends on the decision-making structures in any particular healthcare system. In Switzerland, for example, there is a very different range of decision-making options. Sometimes a procedure may only be allowed in certain hospitals, or a clinical study has to be carried out over a certain period of time before another evaluation is made. In Germany we have the added problem that everything is currently in a state of flux, due to the introduction of DRGs and the revision of the OPS-Code. HTA procedures must be further developed and data generated at an early stage, so that information can be updated constantly - something already occurring in other countries, at the National Horizon Scanning Centre in the UK, for example (see box). This centre produces and regularly updates dossiers when studies on certain technologies are published, and that’s mostly three to five years away from them being introduced to the market.

‘The classic HTA is a retrospective assessment, as existing data is being analysed. It carried out during the development of an innovation, an HTA can be completed at a much earlier stage. We can establish reciprocity between the institution carrying out the HTA and the institution developing the new technology, be it a university or a company, and use this reciprocity. There was a joint project, with the university and industry in Hanover, in which scientists at the university went to look at projects developed by companies, then gave their feedback. In this way we can ensure we have a user evaluation, as well as clinical evaluation on which to base an HTA. But quite often today’s available data is just too bad for a meaningful HTA. The second, important point of doing HTAs during the development of innovations is that you can answer the question: Is this actually potentially meaningful technology? at a very early stage of development. Does industry play along with this? Not really; they tend to want to keep things close to their chests. This is where a market economy-based way of thinking conflicts with scientific requirements. In Germany, the term innovation brake is used a lot - as soon as yet another great innovation has failed approval by the federal committee, and the statutory insurers decide against financing a new procedure, change the characteristics of funds. This is always accused of being against innovations and of not giving enough consideration to patients. However, these tend to be technologies for which there have never been any meaningful clinical trials. This is why we need to improve communication, particularly as HTAs carried out as new procedures are being developed, give companies more reassurance about the innovations they are bringing to the market.

Based on an interview with Annette Bus, Health Technology and Assessment Manager, AOK-Bundesverband.

HOW DOES IT WORK?

The National Horizon Scanning Centre (NHSC)

The NHSH aims to provide the Department of Health (DOH) in England and Wales with advance notice of selected, key, new and emerging health technologies (including changing applications and uses of existing technologies) that might require urgent evaluation, consideration of clinical and cost impact or modification of clinical guidance.

Its activities encompass health technologies in the broadest sense and include pharmaceuticals, devices, diagnostic tests and procedures, surgical and other interventions, rehabilitation, and therapy, public health and health promotion activities.

Two processes are used to identify advances, up to five years before their launch into the National Health Service (NHS):

1. Focused routine scanning This is designed to identify urgent, significant advances, regardless of clinical specialty. Primary, secondary and tertiary information sources are regularly scanned, by networking with research units and commercial developers, by extensive searching of specialist and general medical and pharmaceutical literature, news and financial reports, licensing agencies, and selected internet sites and databases. Individual health professionals and researchers are welcome to propose technologies that may need the centre’s attention.

2. Specialty based work programme A specialty review programme ensures that all clinical specialities and technology types are allocated time for an in-depth investigation of new developments. This programme involves liaison with the Royal Colleges and other professional bodies to identify gaps in the centre’s identification phase and (b) help to prioritise technologies in that specialty.

Filtration and prioritisation of technologies

Once technologies have been identified, trivial developments are discarded and related technologies are grouped together. A search for additional information, including contacting commercial developers and clinical or technological experts in the field, is then undertaken to enable an assessment of potential significance. The criteria for selection to the NHSc’s final list is that the technology is:

● emerging and likely to be available to the NHS in the next 3 years, or
● it has an application that is new, or
● it represents a significant change in indication or use of an existing technology
● or it is a part of a group of developing technologies that, as a whole, may make a significant impact.

In addition, if it is thought that there may be:

● significant health benefit if the technology is widely adopted, or
● a major cost impact if the technology is widely diffused because of moderate to high unit costs and/or patient numbers and/or service reorganisation or training requirements, or
● indicators that the speed of diffusion of the technology may be inappropriate given the available evidence (either too slow or too fast), or
● significant ethical, social, political or legal issues, or other issues and concerns related to the use of the technology, or
● current guidelines and clinical guidance will be unusually affected if the technology is adopted.
UK - All surgeons must be registered with the General Medical Council (GMC), but not all are trained in plastic surgery. In addition, some private clinics that offer cosmetic surgery are neither registered nor regulated. On top of this, many non-surgical cosmetic treatments are not regulated - and are often carried out by non-surgeons. Quite apart from patients’ distress caused by ‘botched’ treatments, the question of unfair costs on publicly funded hospitals arises. Breast augmentation*, the third most common cosmetic procedure in the USA (1st nose reshaping 2nd liposuction), is also widely used in Europe. Infection complicates 2-2.5% of breast implants, and is the leading cause of later material illness. Then, if the augmentation was carried out in a private clinic, due to the high personal cost many patients may seek remedial care (including surgery) in a publicly funded hospital. The situation has been a vexing issue for a considerable time.

A report by The Healthcare Commission, which inspects the country’s national and private healthcare providers, advised greater scrutiny of non-surgical procedures, e.g. treatments with injected fillers and Botox, and it also advised that specialist training in cosmetic surgery should become mandatory. Another report, by an expert group set up by Sir Liam Donaldson, the UK’s Chief Medical Officer, found no firm evidence that patients were being harmed, but concluded that better regulation is needed due to the growth of new and different procedures of all types. Sir Liam, who agreed that specialist training programmes, to be organised by surgical training bodies, are needed, and that detailed information about which practitioners and procedures are accredited should be made available. ‘Standards in cosmetic treatment must be as high as other areas of healthcare,’ he said, announcing that non-surgical procedures will now be regulated, like surgery, by the Healthcare Commission. This means that legal action could be taken against providers who have not registered and/or followed the rules.

‘The safety and quality of cosmetic and aesthetic procedures need to be kept under regular review, not least to understand and respond to new developments,’ added Simon Gillespie, head of operations at the Healthcare Commission.

NEW CONTROLS FOR COSMETIC CLINICS

Breast implant complications: Professor Brigitte Pittes and colleagues at the Plastic and Reconstructive Surgery Unit, University of Geneva Hospitals, Switzerland, have described the development of breast implants and reviewed the myriad risk factors for infections, and discuss clinical features such as toxic shock syndrome, capsular contraction and late infection occurring months - or even years - after implantation. The team also outline diagnostic and management strategies for implantation problems. See: The Lancet Infectious Diseases. February 2005, p. 94-106.)

BM Editor

REGULATION

Assessment

Information is provided to the DoH as technology briefing, in about four pages, which describe the technology; patient group (with estimated patient numbers); current diagnostic or treatment alternatives; estimated unit cost of the technology (if available); current research evidence of clinical and cost effectiveness; details of any ongoing or related research activities, and an overall horizon scanning impact assessment in terms of estimated clinical, service, and financial impact. (Briefings: http://pcpoh.bham.ac.uk/public/health/horizon-technology.htm. Information used in writing the briefings changes rapidly and the level of evidence presented and conclusions made above a technol-oogy’s potential impact must be treated with caution, the National Horizon Scanning Centre points out.

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STAFF MANAGEMENT

Most hospitals must now report on the origin, cost and usage of all equipment and supplies. However, far less is known about a hospital’s most important and expensive assets: employees. Despite financial pressures, DRGs, and the ESGH judgement, which aims to end stress (particularly for junior doctors) discussion of the economical and effective use of personnel is frequently avoided; or can evoke emotional reactions. Yet dialogue on demand-oriented staff planning could not prevent job losses but also begin processes from which everyone would benefit. We know something must change. The questions are: What? and How? In an EH interview, Dr Burkhard Scherf and Hans-Joachim Schütt of Dr Scherf, Schütt & Partner, a consultancy specialising in the effective use of hospital staff, described current research, evolving philosophies and constructive procedures that could provide the answers.

An employee is not like a packet of plasters - we are not talking about objects - and more than just money is at stake,’ Dr Scherf pointed out. ‘It’s about people, about a special, medical work ethic, and about staff. That is, what types of services are provided, how much they cost and colleagueship. This is where the conflict between economic concerns and the energy for change in all departments involved? Dr Scherf continued. ‘In the first step, the assessment of actual requirements, the objective is to predict quantitatively and qualitatively the need of demand. Only when these are established can we tailor staff rotas. One thing is clear: the traditional model, where existing job head counts are filled with hours, is no longer feasible.

The second step involves assessing which working hour models are best suited to cover staff demand. Rigid forms of working hour models are not suitable, because they entail, for example, overtime during particularly heavy periods of demand and wasted time during down periods. So we need different lengths of shifts and working hour models. Surprisingly, many hospitals still do not make use of the options offered by the BAT (A collective labour agreement covering public sector workers in Germany, Ed). We also have to examine the kind of part-time work would be feasible. Usually, part-time nurses are in a relatively high proportion, which lends itself to flexible, demand-oriented staff planning. However, part-time work is much less common for doctors, although sometimes doctors say they would prefer to work 70% or 80% of the time, rather than full-time. In that case, the loss of net income is not always so severe, because a drop in taxation offsets it.

The third step is about handling working hours and actively controlling working time accounts. What is the proportion of overtime and down times compared with other medical areas? What information is needed to establish a sensible work rota? Absence management is another important subject. Holidays or training days are not natural disasters: they are foreseeable. The only thing that cannot be predicted is staff absence due to acute, short-term illnesses, but this is only a small proportion of staff absence. Many of those responsible for planning staff rotas feel a little isolated. They have to work around areas of conflict between economic concerns and colleagueship. This is where answered not only from the perspective of headcount but also from the aspect of what qualifications the available staff must have. One also has to account for a variety of particular events that may affect a hospital. A good rota means that personnel are not simply spread evenly but that over and under capacity is avoided.

As asked about the introduction of computerisation in staff planning, SSP pointed out that it is important, but that the fourth step is initially about conceiving and establishing a flow of information that works. Then software can be used. ‘Many companies that aimed to introduce a software solution before considering steps one to three of the process now say: “We’ve landed ourselves with software which is merely automating the inefficient processes we had to begin with!”’

Asked whether staff planning software could be reached, although we need some idea, otherwise we’d never be able to work out whether standardised DRG lump-sum payments are sufficient. In terms of economic benefits of this kind of project, SSP explained that the introduction of efficient staff planning combined with software-controlled time management in different hospitals can save between €250 and €150 per employee. The big margin between the highest and lowest savings potential results from the fact that all depended on how well these hospitals were prepared for demand-oriented staff control. However, it shows the great potential of this planning.”

Facing such massive changes, the keyword is surely change management. You cannot NOT have change management,’ said SSP. ‘Hospitals have always carried out change management, although not always consciously. Even though many of the staff in many hospitals support the process of change, hospital areas on the whole still have a very high need for professional control over change.

Due to the strong distinction between commercial issues, care and medical services, they pointed out that there is still not the right awareness of change management. Another problem is that different medical fields may have only rudimentary, interdisciplinary co-operation. There is also a lot of catching up to do regarding leadership, they added: ‘Many hospitals’ hand at the issue of co-operation from a purely medical aspect. However, to effectively introduce change, along with all other organisations, hospitals need a certain quality of leadership. There is a reason behind strong hierarchies in medicine. For example, in an operating theatre there is no room for long discussions on whether to do something this way or that way - you need clear decisions. But not all changes in hospitals relate to decisions about life and death.

‘Change,’ SSP concluded, ‘can only succeed if there is a common awareness of need and if all those who are involved - doctors, nurses, everyone - along with their active involvement in that change.’ (*Amounting to 70% of hospital costs in some countries). Interview by Annette Bus
Market-oriented performance measurement

The impact of deregulation and internationalisation on the structures of healthcare systems have made market-oriented performance management and controlling a central challenge for today’s hospital managers. Professor Rainer Sibbel, Chairman of the Institute of International Health Management and Director of its MBA - International Hospital Management Programme for healthcare professionals, at the HfB Business school of Finance and Management Frankfurt, describes the status quo, advises on a transfer of traditional accounting methods and approaches, and adaptation to alternative approaches accepted in industry, could strongly contribute to market-oriented performance management, by means of an integrative approach. The essential advantage is that it measures financial or output-related success factors, and also, according to the cause-and-effect-relationship, systematically considers resource and process related impacts as drivers and early indicators. So the BS combines the external market-based view and an internal resource-based view. Further on, this concept not only claims to be a complex ratio system, it should be seen as a complete management system that helps to transfer a vision into strategy and concrete actions. The essential advantages for hospitals are that the basic design of the BS is flexible enough to appropriately consider specific peculiarities in market conditions and hospital service delivery. On the one hand the BS offers the opportunity and impulse to derive and implement a market-oriented strategy and to navigate its implementation. Typically, hospitals’ economic as well as material goals can be combined in

continued on page 8

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Brussels - The former European Society of Anaesthesiology (EAA) and the Confederation of European National Societies of Anaesthesiologists (CENSA) have been amalgamated into a single organisation - the European Society of Anaesthesiology (Details: www.euroanesthesia.org President: Hans-Joachim Pribe). Although predominantly a European Society, ESA has Affilete Members in many countries and, due to a new Society Membership category, ESA’s 5,000+ individual members are expected to swell to over 60,000 anaesthesiologists.

The Society aims to raise standards in this field by promoting education, research, scientific progress and data exchange between European anaesthesiologists. A further aim is to improve safety and quality of care for patients undergoing anaesthesia.

ESA Annual meetings

Euroanaesthesia meetings are accredited by the American Medical Association and the Union of European Medical Specialists (UEMS) for continuing medical education (CME) credits. Some 5,000 members and non-members attend, from over 65 countries.

MARKET-ORIENTED PERFORMANCE MEASUREMENT

continued from page 7

the highest level of strategic objectives. From the perspective of customers, many different groups of clients e.g. patients, doctors or other external stakeholders, can be considered and judged separately. Specific requests and conditions for offering such interactive services can be considered completely on the process level. The potential perspective reflects, in particular, the interests of employees, as well as the relevance of infrastructure or even of modern information and communication technologies. The integrative role is attached to the BS in market-oriented performance management based on the feature of translating vision and strategy and linking strategic and operational management level.

The BS is connected to various operational systems and instruments, especially in accounting and controlling. It unifies traditional and modern concepts and methods by perspectives and cause-and-effect-relationships and directs them to strategic critical factors of success. So it offers a promising integrative approach to support and implement market-oriented performance management.

However, the main success factor and premise for implementation is a qualification of management and its perception of hospitals as market-driven, competitive and complex service providers in a very important growth market.

Details - MBA - International Hospital Management Programme: www.hfb.de

EUROPEAN HOSPITAL Vol 14 Issue 2/05

THE NEW EUROPEAN SOCIETY OF ANAESTHESIOLOGY

ESA publishes the European Journal of Anaesthesiology (EJA), provides research grants, fellowships and awards programmes (e.g. grants for ten young lecturers from East European countries to attend the annual meeting), and organises the examination for the European Diploma in Anaesthesiology and Intensive Care, as well as a hospital visitation programme.

The society is linked with the Society to the European Union of Medical Specialists (UEMS) and the European Board of Anaesthesiology (EBA), to promote and protect its members and, through its National Anaesthesia Society Committee (NASC), ESA is also linked with the World Federation of Societies of Anaesthesiologists (WFSA).

Administration is handled by an Executive Director and seven staff members based at the society’s Brussels HQ. An Interim Board of Directors, Interim Council and the General Assembly will govern the Society in 2005. However, a new Board of Directors and new Council will be elected later this year, to take office in 2006.

60,000 members predicted

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MARKET-ORIENTED PERFORMANCE MEASUREMENT

continued from page 7

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However, the main success factor and premise for implementation is a qualification of management and its perception of hospitals as market-driven, competitive and complex service providers in a very important growth market.

Details - MBA - International Hospital Management Programme: www.hfb.de

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continued from page 7

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Money and mammography
Could a fully digital breast imaging service be financially viable?

USA - North-Western Medical School has used Activity Based Costing (ABC) to analyse five major services provided by its mammography section: screening, diagnostic, breast ultrasound (US), intervention- al procedures, and reviews of external mammograms.

The ABC analysis revealed that only two services showed a profit, screening mammography and inter- ventional procedures. There was no consistent relationship between the financial contribution of the service and the mammography volume and therefore no economy of scale. This suggested that the more a service is provided, the greater the financial loss. When indirect costs were included in the cost structure all the mammography programmes in the survey registered losses.

The report pointed out that the term ‘mammography’ refers not to a single examination but to a set of diagnostic procedures, the most common and familiar being screening mammography, in which the examination consists of two standard views of each breast interpreted by the radiologist. The ACR published standard for diagnostic mammography defines it as a problem-solving breast evaluation, which is indicated by a particular concern. However, using computer-aided diagnosis in screening mammography may increase the inexperienced image reader’s sensitivity to breast cancer and so give more false-positive interpretations. This leads to an increase in the number of diagnostic mamograms and a reduction in produc- tivity. Diagnostic mammography on the other hand is a much more compre- hensive examination and consists of customised views of the breast depending on the findings of concern and may involve tailored or compre- hensive imaging analysis. Often associated with diagnostic mammog- raphy the interpretation of outside mammograms can be time-consum- ing. In a negative financial outcome for diagnostic mammography these three examinations, each with a loss per procedure, were often grouped in the number of diagnostic mam- mograms and a reduction in produc- tivity.

Breast centres with a good reputation, US, and interventional procedures. Breast centres with a good reputation, US, and interventional procedures.

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Breast centres with a good reputation, US, and interventional procedures. Breast centres with a good reputation, US, and interventional procedures.
Electrochemotherapy is a combined treatment of chemotherapy and high voltage electric pulses for local tumour treatment. The effectiveness of some chemotherapeutic drugs, with an intracellular target like DNA, which also has difficulties in crossing the cell membrane (e.g. cisplatinum and bleomycin) can be greatly potentiated by simultaneous application of high voltage electric pulses. High voltage electric pulses, which can be as short as 100 microseconds, are delivered locally to the tumour via appropriately designed electrodes. The electrodes ensure electric field distribution in the tumour tissue that triggers cell membrane electroporation (see European Hospital vol 14 issue 1/06, page 8 - Electroporation by B. Miklavčič and A. Macek Lebar). Namely, the cell membrane that is exposed to a sufficiently high electric field undergoes structural changes that increase its permeability. These changes thus allow introduction of molecules (drugs, DNA/RNA) that otherwise cannot penetrate, or have difficulties in penetrating the cell. It has been demonstrated that electrochemotherapy is an effective local treatment and can be used for local control of tumours, irrespective of their histological origin. Recently, a medical device called Cliniporator has been developed, with the support of European Commission under the 5th Framework Programme, and standard operating procedures are being prepared for treatment of skin and subcutaneous lesions (www.cliniporator.com). However, further technical development is needed for the treatment of deep-seated and endoluminal tumours.

Early-stage cancer detection

Biomarkers lead the way - and may even trigger a preventive treatment approach to cancer in the future. Report by Karen Dente, our US correspondent

In 2003, the US-Food and Drug Administration (FDA) stated that ‘...some cannot prove the value of a tumour marker that can’t be seen’. But with biomarkers indicating disease detectable in a blood or urine before full-blown cancer becomes visible, researchers hope that cancer potentially detectable in the blood could become noticeable by conventional means.

Dr Judah Folkman, the founding father of angiogenesis - the theory that tumours rely on the sprouting of new blood vessels to survive and grow - has been advocating anti-angiogenic therapy to treat cancer for 30 years. Anti-angiogenic therapy relies on the principle that blood vessels feeding a tumour are inhibited from growing, thereby cutting off the vital supply of nutrients and oxygen needed by the tumour cells. These agents have been approved for use in treating cancer along with chemotherapy, radiation and surgery, as a fourth arm of treatment. Due to their lack in causing major harmful side effects commonly seen with chemotherapy, Folkman has proposed the use of these agents in treating patients before the tumour is actually seen, but when certain biomarkers indicating disease become prominent. There are several known biomarkers indicating disease, but many remain elusive and much more research is needed to understand how a tumour switches from a small harmless entity to a lethal growing cancer. A few years ago only a small number of conferences worldwide discussed biomarkers. Today, there are many, many more, and, last December, the FDA acknowledged the demand for biomarkers by establishing a new agency - the Critical Path Initiative.

Why all the sudden fuss and interest in biomarkers? In order for novel therapies to be approved for useful application in humans, pharmaceutical companies must first jump through some hoops at the FDA, whose guidelines require that a drug is shown to be efficacious in what it sets out to achieve. A cancer drug must lead to an improvement in outcome, be it in a prolonged duration of disease-free survival following a cancer diagnosis, or an increase in overall survival time, often measured in months. But how does one measure the success of a new drug in preventing cancer that has not even grown to a stage at which it can normally be detected? This would require knowing certain markers that indicate the growth of cancer before it becomes visible. A principle does seem to have been applied to statins - the cholesterol-lowering group of drugs used to prevent cardiovascular disease. Physicians prescribe Lipitor, a statin, to treat levels of LDL, HDL, cholesterol and C-reactive protein visible in blood, to avert the possibility of a future heart attack in at-risk individuals. They would not wait until a heart attack occurs. In oncology the available option is to wait until it is often too late, i.e. when the cancer is at an advanced stage and even surgery cannot lead to a definite cure. With electrochemotherapy Folkman has been advocating finding biomarkers for cancer to facilitate a possible prevention of cancer to facilitate a possible prevention of the in-situ stage.

The advent of anti-angiogenic agents has potentially useful for early cancer diagnosis, since a relative change in the gene expression of angiogenic regulators proteins, including VEGF, bFGF, PDGF, PF4, and endostatin, can be detected in the blood throughout its developmental stage. If the observations seen in mice can be effectively translated into humans, the chip may offer an ultra-early indicator of disease at the in-situ stage.

Last year four new anti-angiogenic agents were approved by the FDA, and Avastin (bevacizumab), an anti-VEGF factor and potent inhibitor of angiogenesis, manufactured by Genentech, has been shown to be effective as a means of treating colon cancer that has spread beyond the confines of the large intestine. This was FDA-approved in February 2004, and by all European countries in January 2005.

Dr Folkman hopes that, with the advent of anti-angiogenic agents such as Avastin, which do not have the adverse side effects of conventional chemotherapeutic drugs, patients can have a good treatment alternative with less harmful side effects, which may even be combined with reduced doses of the traditional cancer treatment. ‘Patients that are on less toxic therapies do not have bone destruction, a very common problem that causes diarrohea, they travel, gain weight up to 20 pounds, keep their jobs, and have a wholly different lifestyle’, he observed.

Further reading
2. The first examples of the use of electrochemotherapy with bleomycin that reported good antitumour effectiveness were published in 1991. This was achieved by simultaneous application of bleomycin at the in-situ stage.
5. The article reports results of electrochemotherapy with cisplatin to 10 patients with malignant melanoma who, in electrochemotherapy treated nodules, a 77% long-term control rate was obtained. The results demonstrated, for the first time, that electrochemotherapy with cisplatin is highly effective in treating cutaneous and subcutaneous malignant melanoma nodules. This was published in Electrochemotherapy: advantages and drawbacks - J Cancer Ther 26: 863-867, 2000.
6. The article summarizes basic principles of electrochemotherapy with bleomycin and all clinical data that were published so far. Detailed report on antitumour effectiveness of electrochemotherapy with bleomycin is available in the reference below.
7. Further reading
8. For more information on the Cliniporator, please visit the company’s website at www.cliniporator.com.

Figure 1. A cutaneous tumour nodule of malignant melanoma (1.8x1.3 cm in diameters) was treated by electrochemotherapy with bleomycin. Bleomycin was injected intratumourally and immediately prior to the application of high voltage electric pulses. Judging of the tumour nodule was performed by four applications of electric pulses, using needle electrodes. The tumour nodule responded with complete regression. Superficial skin was present up to eight weeks after treatment. The complete regression is in complete response 12 weeks after treatment.

Figure 2. A cutaneous tumour nodule of malignant melanoma (0.9x0.7 cm in diameters) was treated nodules, a 77% long-term control rate was obtained. The electrochemotherapy was performed by simultaneous application of high voltage electric pulses, which can be as short as 100 microseconds. The tumour nodule was injected intratumourally and immediately thereafter injected intratumourally and immediately thereafter injected intratumourally and immediately thereafter injected intratumourally and immediately thereafter injected intratumourally and immediately thereafter injected intratumourally and immediately thereafter injected electroporation.
New initiative aims at clarification and education

CVD and women

There appears to be little medical, or public, awareness or understanding of cardiovascular disease (CVD) in women, because CVD is often still viewed as a 'male disease', and cardiologists frequently under-diagnose and under-treat women because the symptoms may differ between women and men.

Cardiovascular disease (CVD), which includes coronary heart disease and stroke, kills more people of both sexes than all cancers combined. However, according to public awareness surveys, women think cancer - particularly of the breast - is a greater risk for them. The truth is that CVD kills a higher percentage of women (55%) than men (43%) in Europe and accounts for more deaths than all cancers combined.

It is also notable that although men suffer strokes, women are more likely to die as a result of a stroke. To address this, at a recent meeting of its 49 national cardiac societies the European Society of Cardiology (ESC) launched the Women at Heart initiative, aimed at clarifying and under-treating women because the symptoms may differ between women and men.

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CARDIOLOGY

Device minimises ventricular pacing

Italy - A new pacemaker has been launched that promotes a patient’s natural cardiac activity by pacing the right ventricle only when AE block occurs. ELA Medical reports that its second-generation pace- maker, Symphony AAIa SafeR 2, is not ablation dependent.

The new device promotes the patient’s intrinsic electrical conduc- tion by drastically limiting the amount of unnecessary, often detrimental, pacing to the right ventricle, the firm said: ‘This is also the primary objective of Medtronic’s Managed Ventricular Mode (MVP). AAIa SafeR 2 manages to reduce ventricular stimulation to 0.1% in patients with intermitt- ent atrioventricular conduction. This represents as little as 1 min 30 sec ventricular pacing per day or 9 hours per year!’

Permanent checks on a patient’s natural conduc- tion allows the pac- ing system to deliver right ventricu- lar pacing when normal conduction of the cardiac impulse to the ventri- cle does not occur. When intrinsic Parkinson-White syndrome, the system automatically switches back to physiologic AA pacing.

ELA Medical also reports that its new Leadless Cardiac Defibr- illator (ICD), which will also feature the advanced pacing mode, will be launched later this year.

Cryoablation

A safer therapy for children with arrhythmias

Italy - Freezing abnormal electrical pathways in the hearts of young patients may be a safer alternative to zapping them with powerful radiofrequency probes to treat tachy- cardias and other arrhythmias, according to Dr Fabrizio Drago (above), of the Bambino Gesù Hospital, Rome. ‘If you have a child with a supraventricular tachycardia due to a re-entry circuit, or a target very close to the atrioventricular node, or the His bundle, try to do a cryoablation first. Then, if it is unsuccess- ful, you can do a radiofrequency ablation. If there are no other alterna- tives,’ he advised in his paper pub- lished in the Journal of the American College of Cardiology (5/4/05).

The use of a catheter probe chilled to -75°C Celsius to destroy or ablate abnormal electrical circuits in adult heart arrhythmia patients is becom- ing increasingly popular, but Dr Drago’s work is the first study of its type to involve children. Currently, radiofrequency ablation, which uses a probe emitting very powerful electric or magnetic energy, is the treatment of choice for these patients.

When the higher ablation of electrical pathways in the heart can create new problems, including atrio- ventricular block, an option is the transmission of electrical signals from the upper to lower chambers through the atrioventricular node. Whilst radiofrequency ablation is per- manent, cryoablation has the poten- tial to reverse some of the problems during the procedure. Cardiologists can set the freezing probe to -30°C Celsius and test its effect on the patient. If a problem appears in the heart’s electrical pattern, the probe can be removed and the chilled nerves can recover. If the test freeze appears successful, the probe temper- ature is then lowered to -75°C Celsius to achieve a permanent ablation.

Twenty-six paediatric patients (age range 5 to 20 years) were treated; 16 had tachycardia and 10 had Wolff- Parkinson-White syndrome, a condi- tion in which electrical signals to the heart’s pumping chambers arrive too early, thereby interfering with normal pumping action. No permanent cryo- related complications or adverse out- comes were reported. The procedure was successful in 24 patients (92 per- cent). However, during follow-up (range: 1 to 22 months), arrhythmias returned in seven of these 24 patients.

This report is important because it describes the first single-institution experience about the use of cryoabla- tion in a paediatric population in an attempt to eliminate re-entry circuits located near the atrioventricular junction without any complications. This is the critical point,’ said Dr Drago. ‘Our acute success was very high, but we had many recurrences, maybe more than those reported in adult patients.’

However, Dr Drago considers the higher rate of recurrences is an acceptable trade-off for improved safety in young patients, compared with the usual experience with radiofrequency ablation. ‘We think that, when dealing with children, it’s better to do a procedure with a little lower success rate and no risks, than to carry out a procedure with a high-er, longer success rate, but with the risk, even if low, of severe compli- cations,’ he explained.

The study was not a randomised, controlled trial, he added, and it did not directly compare cryoablation to radiofrequency ablation. It also reports the experience of only one hospital.

USA - A guideline to help identify patients at risk of a heart attack in the near future, but who show no signs of cardiovascular disease, was presented in a symposi- um at the 54th Annual Scientific Session of the American College of Cardiology (ACC) in New Orleans. The concept is based on identification of subclinical atherosclerosis, then incorpo- rating information from a cardiovascular new and emerging biomarkers.

‘The Galveston Heart Study found derived from traditional risk fac- tors for heart disease, with the addition of biological and clinical additional relevant factors,’ said Dr P J Shah, chair of the ACC’s Task Force Editorial Committee, which devised the guideline. Almost all males aged 45+ years, and women of 55+ years are encouraged to be screened for subclinical atheroscle-rosis. Only ‘very low’ risk people, i.e. non-smokers with cholesterol lower than 200 mg/dl, blood pressure under 120/80 mmHg, and no history of dia- betes or family history of heart attack would be exempted.

Two methods are widely avail- able to help evaluate any subclin- ical atherosclerosis: coronary calcu- lus score via a CT scan, and ultra- sound used to measure plaque burden in coronary arteries, and assess thickness of the carotid artery wall and presence of plaque, which correlates with an individual’s total burden of arterial plaque build-up or atherosclerosis.

The guideline proposes a new test as a coronary calcium score (CCS) of zero or carotid intima-media thickness (CIMT) lower than 50th percentile. If the person has no established risk factors, he/she is categorised as Lower Risk and advised to test in five years.

If any traditional risk factors exist, those people are categorised as Moderate Risk and are recommended, according to exist- ing guidelines as well as a further test in 1 year.

Those with a CCS greater than zero, or a CIMT higher than the 50th percentile, are classified as positive for subclinical atheroscle- rosis, and fall into three sub- groups:

- Moderately High Risk - With a CCS greater than zero but less than 100 and less than the 75th percentile, or a CIMT between the 50-75th percentile and no discern- able plaque build-up.

- High Risk - With a CCS greater than the 75th percentile or over 100 - aggressive lifestyle modifica- tions are recommended to lower target low-density lipoprotein (LDL) cholesterol. If the CCS is greater than 400 or over the 90th percentile, additional testing for myocardial ischaemia is recom- mended. High Risk patients with no evidence ischaemia are still given an even lower LDL goal than patients with less extensive atherosclerosis (LDL less than 70). Very High Risk - Those who pre- sent an abnormal test for ischaemia. Recommendation: coronary angiography, and very aggres- sive lifestyle measures.

‘We are not saying we’ve discov- ered a magic wand to eradicate heart attack,’ said Dr Mortezza Naghavi, chair of the American Association for Eradication of Heart Attack (AAHA), and chair- man of its Task Force. ‘The initiative calls to foster an environment of searching for more cost-effective and simplified approach to identify those at dif- ferent stages of progression toward a future heart attack, long before one occurs. We are not there yet.’

Cardiovascular screening

Researchers at the University of Portsmouth have launched a new and emerging biomarker, Cardiac progenitor cell - Very rare cells, explained research team member Dr Kenneth Chien, ‘which accounts for why they haven’t yet been reported - which might one day lead to novel treatments to repair damaged hearts.’

Unlike mature cardiac cells, progeni- tor cells retain the ability to reproduce themselves. But only a few hundred of these cells remain in the heart after birth, and that number decreases with age.

Reporting in the journal Nature (Laugwitz K L et al, Nature 433, 647 - 653, 2005), the researchers said they had identified the 1, which is expressed in progenitor cells and, by tracking cells in develop- ing mice, they linked adult cells expressing G1 with a population of embryonic cells that can produce heart muscle. In the lab, hundreds of progeni- tor cells, which had been removed from the animals after birth, produced millions of cardiac-muscle cells. The team reported they had also identified the same cell types in the human - mainly in its pumping chambers.

Both stem cells and these progenitor cells have potential use in repairing cardiac damage. Although stem cells appear to have an unlimited capacity for self-renewal, and progenitor cells undergo a finite number of divisions, the progenitor cells have a big advantage over stem cells: they can be prompted by scientists to become fully special- ised, which is a key use of chemical or hormonal stimuli.

In theory, if progenitor cells could be collected from a cardiac patient, then grown and differentiated into the patient’s heart tissue, regeneration of a dam- aged heart cell could result. However, for now, isolating a substantial number of progenitor cells is the biggest technical challenge.

Drug reduces body weight plus cardiovascular risk

The RIO-Europe two-phase year III study of rimonabant (see page 45) returns this week with Luc Van Gaal MD, Professor of Diabetesology, Metabolism and Clinical Nutrition at the University Hospital Antwerp, Belgium, involved 1,507 patients with abdominal obesity and abnormal blood fat levels, high blood pressure, or both. They were randomly assigned 5mg or 20mg of a drug called rimonabant, rimonabant (the first in a new class of therapeutic agents called selec- tive CB Blockers) or a placebo once daily, in addition to a calorie controlled diet. The treatment groups included 920 patients (61%) completed the one-year follow-up: 379 in the 5mg group, 363 in the 20mg rimonabant group and 178 in the placebo group. Weight loss was significantly greater for patients treated with 5 mg or 20 mg of rimonabant compared with place- bo, at one year, with the difference of patients who completed treatments with 20mg of rimonabant achieved 5% or more weight loss, and 33% reduction of 10 kg or more euting weight loss.

Patients on 20 mg of rimonabant had greater improvements than placebo in waist circumference (average reduction of four cm), and cardiovascular risk factors including cholesterol, insulin resist- ance and blood pressure.

However, researchers had worked on the premise that, because cannabis smokers experience extreme hunger bouts, cannabinoids stimulate appetite, a means of blocking the brain’s central cannabinoid (CB1) receptors could result in food overeating. The researchers cloned the human cannabinoid receptor then expressed it in mice and observed that animals with potential inhibitory activity against this receptor were then screened for inhibitory activity, and rimonabant reduced consumption against this receptor. ‘We are not saying we’ve discov- ered a magic wand to eradicate heart attack,’ said Dr Mortezza Naghavi, chair of the American Association for Eradication of Heart Attack (AAHA), and chair- man of its Task Force. ‘The initiative calls to foster an environment of searching for more cost-effective and simplified approach to identify those at dif- ferent stages of progression toward a future heart attack, long before one occurs. We are not there yet.’
Germany - Eleven participants, who took part in a new seminar held in Heidelberg, this April, were awarded 22 CME credits and a certificate.

Explaining their motivation for setting up the three-day course, radiologists Hendrik von Tengg-Kobligk, Sebastian Ley, Julia Zaporozhan, Frederik L Giesel, and Hans-Ulrich Kauczor, director of the Radiology Department, at the German Cancer Research Centre (DKFZ), pointed out: ‘With the mushrooming of Multislice CT installations across Europe, radiologists are challenged to include a large number of high spatial resolution images (up to 2,500 images per patient), and sometimes functional data, in a diagnostic reading. Whole body MRI examinations are also on the horizon. All this information needs to be put together and visualised in a ‘condensed’ form for a fast and target-oriented interpretation. Even if a Picture Archiving and Communications System (PACS) is available, it is still primarily a viewing station, lacking dedicated 3-D visualisation and segmentation capabilities. Furthermore, some diagnostic tools lack performance for advanced processing of imaging data. Within a clinical environment, PACS offers several viewing stations to facilitate the handling of digital data load and interaction with clinical partners. However, to answer more detailed or complicated questions, and to satisfy the interest from clinical partners offering 3-D and functional analysis, additional hard- and software is needed. Therefore, an increasing number of radiologists purchase dedicated workstations that allow fast creation of maximum intensity projections (MIP’s), curved MIPs, axial, coronal, sagittal, oblique or curved multi-planar reconstructions (MPRs), volume rendering (VR), fly-through and segmentation of vessels and bone. Additionally, overlying soft-tissue can be removed with ‘one-click’ and measurements on segmented 3D volumes can be performed. Frequently, once a workstation has been installed, there is not enough time for the staff to read the manual (often 500 pages), thus the more advanced applications and complicated post-processing steps cannot be routinely used. Since many new post-processing applications can improve image quality and facilitate diagnostic interpretation by the radiologists a higher acceptance of the results by the clinical partners might be achievable today’s radiologist need to adhere to upcoming standards.’

The participants worked on ten dedicated post-processing workstations in a mix of theory and skills training. Talks focused on the acquisition of Multislice CT, challenges of optimal contrast media injection, dosing, theories behind different post-processing techniques, as well as IT and the legal aspects of image archiving.

Hardy Schumacher and Dittmar Boeckler, from the Vascular and Endovascular Surgery Department, University of Heidelberg, lectured on the relevance of imaging and post-processing for surgical planning and follow-up, and short lectures, delivered by Benedikt Pruemer, of Clemenshospital, Muenster, and the organisers, covered relevant post-processing steps for clinical applications in the lung, heart, head and neck, vascular system, colon and bone.

Next ‘hands-on’ workshop: 6-8 October 2005
Language: German
Details: www.dkfz.de

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ical imaging (CT, MRI, and US). Today’s MRI is far more than just another imaging technique (PET, NIR) in detail. It is not an evaluation of PET and NIR in detail. Scoring’s view on the clinical imaging techniques, such as stimulated acoustic emission, require only small quantities of this agent to produce pathology-specific enhancements.

Researchers at Schering AG demonstrate that Gd-specific antibody can be used as highly specific tumour-seeking agents for MRI. How to develop such magic bullets didn’t make it into real medicine. Not because they where not specific enough, the commercial aspect still dominates its practicability. MRI is not a very sensitive technique so far in the research of the molecular imaging technology in medical care, ‘Bill Clarke explained. ‘We can design new generations of imaging agents - like DatScan - work. They enable us to take critical diagnostic agents and make these available to physicians to help them understand if they have obtained a good quality image or to show them the best way to read an image and the use very sophisticated computer systems.’

‘In our initial trials we found out that we could raise Parkinson’s diagnosis to almost 96% sensitivity and specificity by adding our software to the process of reading DatScan images. So, whilst I’m aware that innovatively. Highly effective imaging agents can not only help to educate physicians, but also help them actually read images and make a diagnosis.\’

The potential for earlier diagnoses of diseases and monitoring, at a molecular level, their response to therapies, promises a revolution in medicine. We interviewed Bill Clarke, Executive Vice President and Chief Technology & Medical Officer at GE Healthcare, about DatScan, a molecular imaging agent that is already influencing physicians’ decisions about therapies for Parkinson’s patients.

A MOLECULAR IMAGING AGENT AT WORK

‘To see in days, weeks or, in some cases, a month, whether a disease is actually responding to therapy, means a profound change in medical care,’ Bill Clarke explained. ‘We are absolutely confident we can use this new generation of early diagnosis and then follow the response to therapy of a number of important diseases, such as Alzheimer’s or early congestive heart failure. And we have an answer right now! In Europe we’ve introduced a new molecular imaging agent for Parkinson’s disease. It examines the dopamine system in the patient’s brain’s neurons. In Parkinson’s these brain’s neurons die and the process of reading DatScan images to almost 96% sensitivity and specificity by adding our software to the process of reading DatScan images.'

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\[\text{Image} 658x711 \text{ to } 801x853\]
THE COMING ERA OF GENETIC MEDICINE

By Stefan G Ruehm MD PhD, Associate Professor of Radiology, at the David Geffen School of Medicine, UCLA, California

With advances in radiology over recent years medical imaging has become more precise, meanwhile even allowing for functional and metabolic analysis. It can be expected that imaging with genetic and molecular markers will play an important role in the foreseeable future. New developments in contrast media research, with the design of biologically specific contrast agents for a variety of imaging techniques, and for magnetic resonance imaging in particular, are expected to further contribute to the accuracy of medical imaging.

Molecular imaging may be characterised as the in vivo visualisation of specific biological processes at the cellular or even molecular level. It aims at the detection of early underlying biochemical and genetic alterations responsible for various disease entities rather than late changes as demonstrated by most current diagnostic imaging tools.

Excellent soft tissue contrast, high anatomical resolution and multiplanar imaging capabilities qualify MRI for molecular imaging. Compared with positron emission tomography (PET), with or without computed tomographic imaging (PET/CT), MRI does not require coregistration of molecular activity with anatomical structures. In addition, the lack of radiation exposure further favours the use of MRI. However, relatively large and potentially toxic concentrations of imaging markers are commonly necessary to visualise molecular events, representing some of the challenges faced by molecular MRI.

For a successful implementation of molecular MRI the following criteria should be fulfilled:

- sufficient MR contrast to depict changes on a cellular or molecular level
- favourable safety features of the contrast agent / molecular probe
- usefulness of the probe with proven validation for basic science or clinical application.

The current probes for molecular MRI combine either a paramagnetic or superparamagnetic contrast compound with a ligand. The ligand binds with high affinity to a molecular target or receptor, which usually serves as an imaging biomarker, allowing assessing the presence or severity of disease. Targets may range from copies of DNA to multiple intra- or extracellular proteins or metabolites. The capacity of a probe to detect the target molecule follows the rules of classic pharmacology. Therefore, the route of administration, distribution and delivery to the target, followed by elimination through metabolism or excretion, need to be considered. As the ligand-receptor interaction is dynamic in nature, the correct timing of the imaging data acquisition is crucial. Usually molecular contrast agents require a 24-hour period after administration until a significant amount of the probe has accumulated at the target to provide sufficient signal for MR imaging. Therefore, registration of pre- and postcontrast data sets is usually required. Image resolution and speed of data acquisition are further important determinants for the depiction of signal changes.

A substantially different means of imaging molecular events is MR spectroscopy. This relies on the detection of a spectroscopic peak at a certain location, generated by a metabolite that is produced by, or heralds, alterations on a molecular level.

Clinical Applications of molecular MRI include oncologic imaging, detection of thrombosis as well as imaging of inflammatory and/or rheumatoid disease. In addition, genetic and cell-based therapies are likely to benefit from molecular imaging.

Molecular MRI holds promise to enhance tumor detection, to provide accurate staging, to monitor therapeutic response and to survey for recurrent disease. The primary goal in oncologic imaging is to improve the detection of malignant cells, both at the primary site of origin and at locations of metastasis. As a common characteristic tumor growth is paralleled by the de novo formation of blood continued on page 16.

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High-field MRI catalyses new diagnostic approaches

The dynamic core of the unit is the machine’s massive ‘motor’, an enormous magnet that weighs 30 tons, and holds some 420 kilometres of superconducting wire. It has a magnetic ‘field strength’ of 7 tesla. Tesla is named after the famous inventor Nikola Tesla, and is a unit of magnetic flux density that describes the strength of the magnet. A 7 tesla magnet is 140,000 times stronger than the earth’s magnetic field. To put this into perspective, a 7-tesla magnet is strong enough to turn a compass needle with a strength of 0.00005 tesla.

“The total amount of stored energy in this magnet is about 80 mega joules and 80 mega joules is about something in the order of 40 pounds of TNT,” said Joseph Helfpenn, Professor and Director of the Center for Biomedical Imaging. In 1991, Dr. Helfpenn built the first 3 tesla magnets, which explained that the size of the magnet is crucial to MR technique, where bigger units equate to more detailed images.

To produce their minutely detailed images, MRI machines detect the movement of atomic nuclei in a magnetic field. Lower-field-strength magnets mostly detect variations in the physical characteristics of hydrogen atoms in water molecules. Since water makes up about 70% of the body, it is the most visible of all body tissues. Physicists have now found out how to make the most out of this with the 7 tesla magnetic strength; scientists can measure other elements that make up central compounds in the body, such as phosphorus and carbon. This allows them to detect metabolism in action, such as the movement of chemicals used to transmit neural signals. The increased power of the new imaging machine has provided insights into the discovery of the aetiology of MS. Since the advent of high-field MRI, MS diagnosis and treatment has undergone a major shift from a purely clinical diagnosis to one that now uses imaging in conjunction with clinical diagnostic evaluation, easier-stage diagnoses and earlier treatment.

Cutting-edge MRI and other technologies have developed to the point where they can render extremely detailed pictures of what is happening in the brain on a molecular level. MRI is non-invasive and allows us to make diagnoses we couldn’t make before, and it allows us to see whether the treatments we are giving are effective or not,” said Dr. Grossman.

A multiple sclerosis (MS) researcher, Dr Grossman hopes that high-field MRI will help researchers find answers to some of the most challenging questions of our time.

“Inflammatory disease, the hallmark of many neurological disorders, is four times more sensitive in diagnosing MS than clinical reporting of brain shrinkage,” Dr Grossman points out, adding that looking at NAA in elderly patients could potentially provide a window on aging in the brain.

At the Biomedical Imaging Center, Georgi R McGinness MD, Associate Professor of Radiology, is also benefitting from the high-field MR machine available in New York.

The department is looking at the lungs of firemen, also benefiting from the high-field magnet. “That’s the one area that I think has been a major shift from a purely clinical diagnosis to one that now uses imaging in conjunction with clinical diagnostic evaluation, earlier-stage diagnoses and earlier treatment,” said Dr Helpern.

“Potential benefits of lymphotropic superparamagnetic nanoparticles have been extensively discussed in the radiological and oncological literature. They show the potential for widespread clinical application in order to stage nodal malignant disease, particularly in the presence of prostate cancer. Clinical investigations have demonstrated that MRI with superparamagnetic nanoparticles can aid in the non-invasive detection and staging of malignant disease. These are iron-based contrast agents, which are designed to target malignant lymph nodes smaller than the threshold size of 10 mm that is commonly used for lymphoma detection on conventional cross-sectional imaging.”

In addition to oncological applications molecular MRI based on the use of superparamagnetic iron particles has been extensively investigated for the early detection of atherothrombotic disease. It has been shown that activated macrophages, which are part of the disease process, can be labeled with iron particles, presumably by macrophage phagocytosis. These initial results suggest that molecular MRI might provide a role for the advanced detection of inflammatory disease, the characteristic hallmark of atherothrombotic disease, macrophage infiltration, and to monitor treatment response.

Current MRI techniques aimed at the detection of arterial or venous thrombosis would benefit from a more specific approach to depict clot. As many clinically significant thrombotic events occur in small arteries that are below the resolution of current fast MR sequences, for example distal coronary vessels or peripheral pulmonary arterial branches, it would be desirable to provide a specific marker to improve the detection of small thrombi without the need for contrast injection.

With the development of clinical applications for gene therapy molecular MRI may play an important role for monitoring and quantifying the amount of gene delivery to an area of interest. In vivo imaging of gene transfection is widely employed and might benefit from in vivo tracking of transgenic cells. Molecular MRI might be especially useful for imaging of gene therapy of the brain. Clinical investigations have demonstrated that large sections of the men’s lungs were actually not functioning at all.

Dr Helpern compares 7-Tesla MRI to the discovery of the electron microscope.

It is the regular X-ray what the electron microscope is to the original bend light microscope. To him MR technology is nothing less than revolutionary, and he is proud that NYU is at the center of this rapidly growing technological advance.

The 7-tesla unit, with 30 ton magnet, was built in England and delivered by boat, then flatbed truck. Traffic was stopped on Manhattan’s 38th Street to allow delivery at the medical center. To support its massive weight, and provide a shield to contain the magnetic field, a bed of concrete 14-feet thick had been laid on the ground floor of the Center. 420 tons of steel was needed to build the octagonal shield that now surrounds the 7-tesla, to protect other technology and people in the building (it could even demagnetise the credit cards of pedestrians passing on the street).

Funding for the enterprise was received via a $2 million grant from the National Institutes of Health.

In October 2003, a PACS - AGFAS IMPAX combined with a RIS by Siemens was installed at the Department of Radiology of the Allgemeine Krankenhaus. IMPAX is an application that runs on PACS servers and includes a list of advantages (a central database, all examinations saved in one system) that make it very interesting and not always the desired response time.

Presently PACS has been partially implemented in three of the clinics.

- university hospital for radiodiagnostico
- trauma surgery
- X-ray therapy
Over 70 modalities are connected in the PACS network. In addition, approximately 30 diagnostic stations with two flat screens each

continued from page 15
vessels. MRI probes aimed to specifically detect molecules mediating inflammatory disease have been employed to assess tumor growth and malignant progression.

Similar to FDG-PET, an imaging modality which measures increased tumor metabolism to highlight areas of tumor, a contrast agent based on (Gd-encapsulated liposomes has been developed. With ligands bearing carbohydrate conjugates at the liposome surface. Targeting of tumor cells with liposomes is attractive for two reasons. Firstly, high concentrations of the MRI contrast material can be achieved at the tumor site. Secondly, liposomes can be used to deliver drugs. Thus, the simultane-
ously high concentrations of drug and delivery of chemotherapeutic agents appears feasible. Possible drawbacks are the relatively large size of the liposome challenging the entry into the extravascular compartment and the immunogenic potential of the liposomes.

An approach to monitor tumor progression in vivo by MRI has been developed based on a superparamagnetic probe specific to cells expressing a molecule (Synaptotagmin I) that binds to apoptotic cells. Since the degree of programmed cell death after radio or chemotherapy has been shown to correlate with the development of tumors, apoptosis imaging has been a research topic.

The advent of superparamagnetic conjugated to synaptotagmin showed good correlation with apoptosis both in vitro and in vivo.

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With the development of clinical applications for gene therapy molecular MRI may play an important role for monitoring and quantifying the amount of gene delivery to an area of interest. In vivo imaging of gene transfection is widely employed and might benefit from in vivo tracking of transgenic cells, particularly when modified treatment regimens are evaluated. Transfection techniques allow the investigation of the time course of the presence of a transgene in the body. A target agent delivered to cells. This allows even the visualisation of the presence of single cells. With the further advancements in the development of cell-based therapies, e.g. the

transplantation of cardiac myocytes to restore myocardial function, the demand for specific and non-invasive imaging strategies is likely to increase.

The enormous potential for molecular imaging of disease that most diseases are caused by alterations on a molecular level that may be detected by sophisticated imaging modalities. In contrast to current diagnostic imaging algorithms molecular MRI moves far beyond the structural foundation of traditional imaging techniques. Molecular MRI aims to reveal the biochemical and genetic sources of the disease in addition to the mere display of anatomy and physiology. The synergy of refined MRI tech-
niques and new, targeted contrast agents will determine the success of molecular MRI. It is very likely that molecular MRI will open a wide range of novel applications, not only for the assessment of disease, but in screening for pre-disease states, which might be comprised of genetic factors, or the early signs of genetic disease. In the consumer-driven health care environment imaging faces a bright future. The geneticist is likely to become a necessary to prove the value of these high tech imaging techniques with regard to new and better patient outcomes and cost.

Links: sruchm@msnuedu.edu
the never ending story

Helga Fischer (right), radiographer at the University Hospital for Radiodiagnosistics at the Allgemeine Krankenhaus, Vienna, and former Vice-President of Austria’s RTA Association, which focuses on MR, lectures and workshops for imaging processes, describes experiences, covering a year and a half, with a PACS system, and suggests ways forward.

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**Personalised medicine**

Dr Burkhard Ziebold, of Roche Diagnostics

On average, some 30% of patients do not experience any sustained alleviation of their symptoms from their prescribed medicines - a dis-astrous figure for healthcare costs. One of the reasons for these less than ideal effects is that a single drug is used to treat a large num-ber of genetically different individ-uals who present with a common clinical picture at the phenotypical level. It is surprising that a drug does not produce the same effect in all the recipients.

Roche has developed tools that suffer specific side effects, so they must switch to a less effective type of treatment. What is needed is a more targeted treatment that pro-duces the specifically desired effect in the patient.

"Personalised medicine" is based on a molecular understanding of the causes of disease in an individ-ual and is conditional on the availability of more effective treatment for ill-nesses. The type of metabolism that a person possesses is an important aspect in this adapted drug treatment. People metabolise active substances in dif-ferent ways, therefore, a treat-ment and selection of drugs tai-lored to the individual is crucial to a successful outcome. It avoids the situation where patients receive inappropriate treatments and incorrect dosages - which in turn can lead to serious adverse drug reactions.

Highly specific diagnostic meth-ods are needed to provide doctors and patients with practically useful information about their health in a customised treat-ment. The so-called Amplichip CYP450 found in Roche Diagnostics is currently the only diagnostic tool capable of helping to avoid inappropriate drug reactions or toxic effects in patients.

**Management: a new paradigm for clinical laboratory scientists**

Clinical chemistry raises a strategic health issue. Clinical laboratory scientists must adapt to technological challenges by keeping pace with changing analytical methods, as well as to economic challenges through innovative management networking, to be able to incorporate within their practice all the emerging disciplines in laboratory medicine, whilst committting themselves to the priorities of quality and safety.

The environment in which medicine laboratory is practiced has undergone a paradigm shift in the midst of the medical, legislative, regulatory, technological, sociological and economic upheavals that have forever changed the practice of medicine. In addition to the traditional laboratory sciences, laboratory managers need to possess broad knowledge of clinical medicine, the legal and regulatory framework, together with administrative knowledge and experience. Their managerial responsibilities involve the directing of quality testing for patient care with concomitant high levels of expertise in finance and personnel management meeting the increasing need for new qualifications. They must play a leadership role in enhancing the image and increasing the visibility of laboratory medicine.

Laboratory managers are therefore faced with new responsibilities. Leadership and managerial skills are essential, mainly due to the areas covered by the advances in biological and medical science: the variety and volume of testing, exponential growth in the number of tested tests, new instrumentation, automated data processing and information management systems. Economics and governments are accelerating these changes in a predatory environment. Competition, mechanisms for consolidation among laboratories and service agreements have won new frontiers. Often regarded as a threat, these mechanisms are also seen as an opportunity by those who are willing to think creatively. At the same time, public expectations have never been higher and, paradoxically, funding has never been under such pressure. The task facing laboratory managers is therefore an extensive one, encompassing technology, science, human resources and finance with the specificity that these include a patient care component. The monograph Managing changes in the clinical laboratory, produced by the International federation of clinical chemistry and laboratory medicine (IFCC) Education and Management Division, aims at preparing the clinical laboratory scientist for the changes affecting laboratory management. It draws attention to opportunities for new missions, help to revolutionise how we examine biological samples. Our next step will be to develop simple, small diagnostic devices. Future generations may be able to use these as the basis for hand-held systems that can perform diagnostic functions that currently need a laboratory test. The research, carried out at the University of Wales College of Medicine, involves researchers at Cardiff University, the University of Bangor, the Gower Cancer Institute, and London, and in collaboration with the University of Warwick and laboratory in the USA. The Biotechnology and Biological Sciences Research Council (BBSRC) is the UK funding agency for research in the life sciences. Sponsored by Government, BBSRC annually invests around £200 million in a wide range of research that makes a significant con-tribution to the quality of life for UK citizens and supports a number of important industrial stakeholders including the agriculture, food, chemi-cal, healthcare and pharmaceutical sectors. Links: BBSRC http://www.bbsrc.ac.uk. Professor Paul Smith smithph@swan.ac.uk. This research is featured in Business (A495), the Biotechnology and Biological Sciences Research Council (journal).
Apart from MEDICA, held in Düsseldorf, the annual European Congress of Radiology (ECR), in Vienna, is the most important event of the year for our European Hospital team. This year, there was an added reason to look forward to the biggest European imaging convention: in joint cooperation with the ECR and bsbh, the congress and event management company, we held the 2nd Hospital Administrator Forum. Whilst the magazine has focused, for several years, on one of the most exciting and innovative developments for hospitals today: the combination of radiological diagnostics with IT and networking, the Forum presented an opportunity to promote, communication between radiologists and hospital administrators, not only through our pages, but during a live event.

About 110 radiologists, hospital doctors, IT managers and industry representatives from 27 countries - hailing from Australia to Switzerland - assembled to discuss subjects such as ‘Successful Hospital Management - Facing the Challenges of Hi-tech and Financeability’. The fact that a comparatively small forum managed to attract participants from 27 nations with very different experiences of healthcare systems underlines the importance of constructive dialogue - an opinion shared by leaders of the ECR, as well as its President, Professor Antonio Chiesa. Welcoming the debate on hi-tech and finance he said: ‘The time has already come in which hospitals no longer rely solely on doctors - an opinion they also share. Doctors understand that a modern hospital is defined not only by its highly professional medical teams, but also by state-of-the-art equipment, informatics applications, and innovative programmes. Administrators play a key role in this changing world, where progressively reduced resources are met with rising costs. With an increasingly older and more numerous population, these obstacles prove a hefty challenge.’

In his ‘Radiological Innovations: between hi-tech and finance ability’ lecture, Professor Maximilian Reiser MD, Professor and Chairman, University of Munich, Department of Clinical Radiology, at Grosshadern, Germany, and mentor and moderator of the forum, added: ‘Radiologists and hospital managers should make every effort to convince financial decision-makers that investment in medical technology and an IT infrastructure can improve the quality of healthcare and at the same time reduce costs. The one-sided orientation and support for pharmaceutical research and development has long been proven as an expensive error.’

An answer from the other side of the fence swiftly followed. Professor Jörg F. Debatin MD, MBA, formerly director of the radiology institute at the University Clinic, Essen, and currently Medical Director and CEO at the University Medical Centre, Eppendorf, Hamburg, responded, in a relaxed though proactive manner: ‘Healthcare is rapidly evolving from a totally non-transparent and hardly process-regulated system to a competitive market. To survive in such a market, hospitals will require the conscious development of marketing and sales strategies. These should be based on a product portfolio defined by quality, profitability and unique selling propositions. However, the basis of marketing and sales strategies must lie in providing transparency to the customer - the patient - regarding outcome quality and pricing of healthcare products.’

Dr Volker Hüskens, CEO at the University Hospital, Cologne, Germany, and Dr Helmut Ringl, of the Department of Diagnostic Radiology, University of Vienna General Hospital (AKH), Austria, discussed technology, the implementation of new IT systems and the implications for hospital staff.

Dr Hüskens emphasised that hospital processes should be organised to allow doctors to concentrate on medicine, and that IT departments should do what they are best at: being technical advisors to all departments and for all processes. concentrating on the practical aspects of PACS implementation, Dr Ringl advised on the avoidance of mistakes when making decisions on purchasing these systems, which he described as ‘brilliant instruments’ when they work properly.

Professor Peter Bogner MD, Vice-director of the Institute of Diagnostic Imaging and Radiation Oncology, University of Kapuváros, Hungary, described the hard work involved in setting up an IT project to link nine institutions of different size and competence. With a background of exclusively public funding and the involvement of the Hungarian national medical insurance body, the hospitals decided against a common, central archive accessible by everyone. Hence, he said, they are now looking for a suitable model that allows transparency and transport of data in a secure, protected manner.

Henio Sobiszewski, Regional Manager Central Europe, Toshiba Medical Systems Europe (TME), and Kim Egger, Sales Director Healthcare, of the Netherlands-based finance firm De Lage Landen, which specialises in asset financing and vendor finance programmes, introduced a model that enables independence from public funding. This demonstrated how, by establishing a limited company, the complete modernisation of a radiology department in a Polish hospital became possible. The concept had not only liberated employees from enforced models of working hours but also had ensured that capital could be acquired.

Later, in a relaxed atmosphere, complemented by a buffet on the top floor of the Ares Tower, discussions flowed on until quite late. Its conclusion, even by those unamnious: the exchange of knowledge and opinions at the Forum should continue. So, we are looking forward to the Hospital Administrator Symposium 2006.
**Pilot projects**

**Anja Behringer** reports on the 2nd Telemedicine Forum, organised by Tele Medical Systems AG (TMS)

**Germany** - Telemonitoring complements, but does not replace traditional, time and staff intensive home visits or regular visits to surgeries. Clearly structured, reproducible communication between doctors and patient, based on modern technology, initially requires the development of appropriate and efficient telemonitoring programmes (DMP). This scientific approach then has to be applied, said Professor Karl Lauterbach MD, director of the Institute for Health Economics and Clinical Epidemiology at the University of Cologne, Franco Renzo, President of TMS (based in Switzerland), described the way in which this firm’s system can address and combine subjects such as heart-pasports, DMP and telemedicine: ‘...as long as the interests of different groups can actually be reduced to a common denominator...’

Indeed, controversy developed from the start, at the Regensburg forum, as well as the upcoming Washington electronic patient files: Whereas Roland Sng, head of the board at AOK Baden-Württemberg and member of the board at Initiative D 21, stressed the importance of introducing new IT-systems, stating: ‘Patients should never look at their files without supervision, because they may find some rather unpleasant things,’ whereupon, Karl Lauterbach vehemently demanded: ‘They must!’

Christa Stevens, Bavarian Minister for Employment and Women’s Issues, spoke of Ingolstadt, a pilot project in which patients are the ‘master of their data’ - aimed to reduce mistrust. ‘One develops a different approach to one’s health,’ the minister said, before describing another 24 current projects on the teleconsultation, telemedicine, telemonitoring and teletherapy as well as electronic treatments. Christa Stevens then introduced the model project Donaustauf, which involves tele-monitoring for 900 patients.

Professor Michael Pfeifer MD, Medical Director of the Hospital Donaustauf, near Regensburg, described the first practical experiences with telemedicine and telemonitoring for patients with chronic pulmonary disease (COPD) and bronchial asthma. It transpired that because of the specific, personalized readings to the treatment centre can be carried out by patients that are not that helpful but also the first positive experiences led to the model project run by AOK Bayern, the Munich-based health insurer, monitoring of 900 patients with COPD and asthma.

In the first phase of the project aims to prove that long-term telemedical supervision is possible and is acceptable by patients, and to improve and stabilise pulmonary disease, defined by the number of hospital admissions and exacerbations of the disease. The project also aims to support not only patients but also the doctors treating them, who will be provided with the current status of the patients, clinical data and clinical data - or who can actively demand these data - with the help of the patient. The Telemedicentre (TMZ) is staffed 24/7, so that patients can contact someone at any time with questions about the system or their illnesses. Active telephone contact with the patient, through the TMZ, is initiated if there has been no contact and no transmission of results for over three days, or when results on lung function look critical. Based on the results of the Asthma-Knowledgew-Test for asthmatics and the modified Asthma-Knowledgew-Test for COPD patients, knowledge has increased among asthmatics about how they are dealing with their illness and how they cope with emergency situations. During the trial, there has also been a general improvement in knowledge about the illness among patients with COPD. ‘It is more likely to identify and treat patients with COPD, which will be a great advantage as the number of patients suffering from COPD will increase in the future.’

So far there has been no evaluation of the medical progress of the illness among the study group, but a number of emergency and hospital treatment and uses of drugs. The primary objective of the first phase of the model project was to see if it was feasible and acceptable to carry out a care programme based on telemedicine for chronic obstructive pulmonary diseases. In other projects, the efficiency of the programme with regards to clinical parameters such as the reduction of the exacerbation rate and hospital admittance is being examined. These insights should indicate for which patients a monitoring programme based on telemedicine is sensible and effective.

Everybody agrees on the general need for a decision framework for telemedicine. However, detailed, legal points will continue to remain the responsibility of the medical doctor. For example, Dr Manfred Zipperer, Head of the Action Forum Telemedicine in Healthcare, pointed out: ‘It is to be foreseen that telemedicine will be integrated into the organisational and financial framework.’

**Sana’s new flagship**

**Installing a $70 million network**

A ‘hospital of short distances’ is being built by the Sana-Klinikum Emmenhard Hospital of Munich & Co KGaA, based in Stuttgart, Germany. The company reports that the aim of the new Sana-Klinikum Emmenhard GmbH is to set an example for top medical services, optimum patient care and despite the ongoing economic restrictions of the German healthcare system - economic success. The new Sana clinic is to be heavily based on the implementation of new information technology. A network has to provide a telephone network for both medical communications, and a computer network based on a multimedia platform. The chosen technology supplier is Cisco Systems, which includes 250 WANS, such as exacerbation rate, number of the medical progress of the illness, number of hospital, number of emergency and hospital treatment and uses of drugs. The primary objective of the first phase of the model project was to see if it was feasible and acceptable to carry out a care programme based on telemedicine for chronic obstructive pulmonary diseases. In other projects, the efficiency of the programme with regards to clinical parameters such as the reduction of the exacerbation rate and hospital admittance is being examined. These insights should indicate for which patients a monitoring programme based on telemedicine is sensible and effective.

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**Seamless integration of WLAN and Ethernet-Backbone**

Voice-over IP, i.e. the ability to transmit telephone conversations according to internet protocols (IP), is not limited to the fixed world: According to ISDN, many WLAN base stations cover the comprehensively, wireless radio network. This is seamlessly integrated with the global telecommunication networks, which is why all services and quality characteristics, from voice-over IP to multimedia and quality of services, are available in the WAN, without any restrictions. This makes telecommunication mobile.

Cost-intensive maintenance - essential with conventional telecommunications technology - is not required for the IP telephones. This is why Michael Willmann quotes voice-over IP as a very instructive example of how technology used in an intelligent way can transform modern healthcare institutions, hospitals, whilst simultaneously lowering administrative costs. ‘The unique advantage of the system used by the clinic has been working with Cisco Systems equipment since 1999, so will not require expensive relaying technology for the next 10 years, which will see telemedical monitoring of 900 patients with COPD and asthma.

So far there has been no evaluation of the medical progress of the illness amongst the study group, but a number of emergency and hospital treatment and uses of drugs. The primary objective of the first phase of the model project was to see if it was feasible and acceptable to carry out a care programme based on telemedicine for chronic obstructive pulmonary diseases. In other projects, the efficiency of the programme with regards to clinical parameters such as the reduction of the exacerbation rate and hospital admittance is being examined. These insights should indicate for which patients a monitoring programme based on telemedicine is sensible and effective.

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In view of the pressure put on the system by the law, he stressed the importance of ‘...at least complying with the basic legal requirements.’
It is one of the world’s biggest investments in IT for healthcare. But what will it really cost? Report by Peter Howieson

UK - The NHS in England is a complex environment, with over 50 million potential patients, 1.2 million staff, 14 million transactions in a typical week, 10,000 service-level agreements, and over 60 Royal Colleges and bodies. (Scotland has a separate organisation).

As reported in previous issues of European Hospital, back in 1998 the NHS unveiled its strategy to modernise its IT Systems to help improve services back, and in 2002 the Government set up the National Programme for IT (NPfIT) in England, with £2.3 billion to be invested over its first three years, which have now ended. The plan aims to connect over 30,000 general practitioners (GPs) manage both the National Booking Service and the National Prescription Service. In May 2004 the Government earmarked £2.3 billion for the next three-year period to include the cost of buying new systems and the training and education needed to help staff to adapt to new ways of working. Funding for future years will be handled as part of the Government’s annual spending review. The total value of contracts awarded (covering 7-10 years) is over £6 billion. Further central funding will be needed to cover supplier contracts for their 10-year lifetime. However, central funding will not cover all aspects of the NPfIT’s delivery, but it is not yet clear what proportion of funding will need to be found. Contractors will be key, with a number of subcontractors involved in more than one service. As reported in European Hospital, in May 2004 Eastman Kodak Company’s Health Imaging Group was selected as one of the digital solutions suppliers for the NHS NPfIT. Kodak is part of an alliance led by Computer Sciences Corporation (Capital Care Alliance). The system will feature: • Computer Radiography (CR) machines that enable physicians to capture x-ray images digitally • A PACS to store and distribute radiology images • A Radiology Information System (RIS) to manage all information stored in the PACS. As seen in figure 2, Accenture won the (December 2005) two ESP contracts for the North East and Eastern regional clusters, with a combined value of £2.2 billion. In February this year, Accenture signed up four new IT suppliers, to assist with the IT infrastructure in those clusters. Cognos will supply ReportNet, a web services-based reporting tool, to assess disease trends, bed availability and waiting lists. EMC Documentum will supply a platform of content management services, to provide quick/easy access to a wide range of content and documents including X-rays, doctors’ notes and research materials.

DataBank Europe will provide software to warn of potential adverse effects of drugs at the point of care (POC). Information software will be used to enable faster/easier access to various legacy systems that track patient data for the electronic care records system.

However, sounding a negative note in February this year, Mike McGrath, chief financial officer of Accenture, said the scale of problems with its NHS government contract had now reached a magnitude where they had to be revealed to the market. There had been delays in deployment of a new assessment care system, he said, and talks were now taking place with NHS Trusts on different deployment plans. Losses of £110m to £150m were expected on the contract in the current fiscal year and losses would continue at a lesser level in 2006. However, he added that the contract was expected to turn the corner and start to become profitable in 2007.

MAQUEET

How did an ICU reduce patient complications and ventilation hours, while saving $US 4.5 million per year?

Find out in Critical Care News. Get your free copy. To register your interest go to www.criticalcarenews.com

Table 1. National Application Service Providers (NASPs) are responsible for buying and integrating IT systems to be used nationally, such as the NHS Care Record Service.

<table>
<thead>
<tr>
<th>Service Contract</th>
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<th>Value (£m)</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>NHS Care Records Service</td>
<td>BT</td>
<td>£620m</td>
<td>10 years</td>
</tr>
<tr>
<td>Choose and Book (E-booking)</td>
<td>Atos Origin (formerly SchlumbergerSema)</td>
<td>£65m</td>
<td>5 years</td>
</tr>
<tr>
<td>N3 (the New National Network)</td>
<td>BT</td>
<td>£530m</td>
<td>7 years</td>
</tr>
</tbody>
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Table 2. Local Service Providers (LSPs) are based around five regions, formed from ‘clusters’ of strategic health authorities. The five regional clusters are: London, North East, Southern, Eastern and North West & West Midlands. LSPs are responsible for all contracts and services to be used locally. Local Service Provider (LSP) contracts have been awarded to:

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<tbody>
<tr>
<td>LSP, London</td>
<td>Capital Care Alliance (led by BT)</td>
<td>£996m</td>
<td>10 years</td>
</tr>
<tr>
<td>LSP, East of England</td>
<td>Accenture</td>
<td>£934m</td>
<td>10 years</td>
</tr>
<tr>
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Bio-hazard!

Bacteria flourish in warm, damp laundry rooms inadequately laundered sheets, gowns, uniforms, towels, etc. means contamination is quickly spread. During the SARS outbreak in Taiwan for example, a hospital laundry worker was thought to have been a significant source of the infection because the hospital lacked hygienic laundry equipment and appropriate laundering procedures.

Audit: Understanding the laundry process in its entirety, so that the right processes can be identified for the demands of a specific environment.

Equipment: Reviewing whether the right equipment is in place, from specialist barrier washers for decontaminating infected materials that are used in sensitive patient environments, to straightforward tools, such as closed trolleys for transporting clean linen.

Control: Continuous reviews of the microbiological quality of the linen, levels of decontamination, etc. (Electrolux works with specialist laboratories, such as the Pasteur Institute, to verify hygiene standards).

Barrier washers - in one way, out the other

Electrolux also reports that its barrier washers, designed for laundries with stringent hygiene demands, provide a reliable defence against the spread of germs, bacteria and dust particles in the laundry process. ‘The barrier washer is built into a wall, physically separating soiled from clean laundry. Laundry to be processed is loaded into the front of the machine and unloaded from the back or side. As a result, the Electrolux barrier washer is the ideal solution for fighting nosocomial infections in health care institutions. When it comes to hospital laundry hygiene, there’s no room for compromise’ the firm emphasises.

Electrolux Laundry Systems is a part of the Electrolux Group, which employs over 100,000 people to produce and distribute powered appliances for kitchen, cleaning and outdoor use (e.g., refrigerators, washing machines, cookers, vacuum cleaners, lawn mowers, etc.). The company sells over 55 million products annually in over 150 countries.

Further details: www.electrolux.com/laundrysystems

Seeking insight into pulmonary hypertension

Biotecnologist Dr Soni Pullamsetti (29), of the University of Giessen Lung Centre, has won the Rense-Bauhart Foundation Research Award for her work on Pulmonary Hypertension (PH), for her paper focusing on ‘Increased levels and reduced catalysis of asymmetric and symmetric dimethylarginines in pulmonary hypertension’, which provides new insight into the molecular mechanisms of PH, and may serve as a basis for new treatment options.

Dr Pullamsetti, from Hyderabad, India, is one of the first graduates of the University’s International Graduate Programme ‘Molecular Biology and Medicine of the Lung’, which commenced in 2002. In a pilot study, under the direction of Dr Ralph Schermuly, Soni Pullamsetti, used observations with nitrogen oxide (NO) in patients with pulmonary hypertension and healthy lung donors. ‘Many studies have proved the central role of Nitric Oxide (NO) in the blood vessels of the lung. It widens the vessels, improves perfusion and gas exchange. In pulmonary hypertension the activity of NO is reduced. The reasons are not yet clear,’ Dr Pullamsetti explained. NO is in a continuous balance with its opponent ADMA (asymmetric dimethyl-arginine), which constricts lung blood vessels.

Soni Pullamsetti received the €5,000 award at the 46th Annual Meeting of the German Society of Pulmonary Medicine

Marketing beyond future challenges

Maquet Critical Care (MCC) has been awarded the 2005 Frost & Sullivan (F&S) Leadership Award in its ‘Global Ventilators’ category. ‘The Global Ventilator market is a highly fragmented industry with over 80 manufacturers fighting for a piece of the pie,’ explained the international business consultancy F&S. ‘Though the top four players corner almost 80% of the global market, the times to come will be much more challenging, when Brazilian and Chinese makers (which imitate higher technology offerings) flood the market. These new players will play in terms of presence across segments, price points and countries. However, the nature of presence and differences in business strategy will yield the divergence in performance.’

Maquet, which produces medical equipment and systems for the operating theatre, critical care, cardiology and intensive care facilities, is a division of Getinge AB, which has some 6,600 employees worldwide and reported sales of $1.5 billion in 2004. In its Strategic Analysis of World Mechanical Ventilators Market F&S concluded that, having overcome many hurdles, MCC had ‘edged out’ competition to firmly rise to the position of leadership in its industry, and continues to invest in numerous parameters relevant to its customers. ‘The recipient has dis- played an outstanding excellence and leadership in the market leadership process, including the identification of market challenges, drivers and restraints, as well as determining the most effective methods of addressing these market dynamics,’ said F&S. ‘Furthermore, the top four recipient leaders have continuously demonstrated solutions for monitoring market changes and for implementing strategies.’

F&S pointed out that the firm’s strategy was right on target to cater across price points and care areas, unlike most other Tier I vendors who use multiple brands. This has helped it bolster the brand name and provide commonality of parts, training & servicing to users.

This is an enviable position to be in, in the era where customers demand user-friendly and modular systems.

Vasa, the recipient has continually almost a hundred thousand units.

EUROPEAN HOSPITAL Vol 14 Issue 2/05
Space travellers and bionic hearing

New P50 Tips for the Biomek 3000, NX and FX and Multimix liquid handlers have been introduced by Beckman Coulter, which reports that the disposable, non-conductive, narrow-length tips enable pipetting from the bottom of deep labware, for maximum retrieval of valuable samples, and are ideal for work in both 96- and 384-well formats, e.g. for compound library profiling and assay development, MALDI-TOF plate spotting, sample pooling, plate replication and hit picking. They pipette a volume of 50 µl with barrier and are certified as RNase/Dnase-free.

Smart safety tester

An electrical safety tester, made by Rigel Medical, the UK-based biomedical test instrumentation specialist, has been upgraded to include enhanced technical features. The firm reports that the new portable Rigel 266 Plus ‘... offers dual functionality in either fully manual or semi automatic mode for medical safety testing requirements in accordance with IEC/EN 60601-1, MDA DB9801, and ANSI/AS 320,’ adding: ‘Test routines are easily selectable via a large rotary switch and dedicated soft/pad keys, which allow the user to select individual single fault conditions, quickly and easily.’ Additionally, to test medical equipment, leakage measurement sequences can be selected without power-up/down delays. ‘The regrouping of single fault conditions in the semi automatic mode reduces the number of required power breaks by up to 80%, saving even more time,’ the firm points out. ‘A large LCD display also gives a clear indication of test results and single fault conditions, AC or DC measurements, and pass/fail limits.’ Free download software for record-keeping is also available.

Hearing aid reflected in an astronaut’s helmet. Circed: Buzz Aldrin

When medical physicist Valentin Chapero (45) was Managing Director of Siemens Audiologische Technik GmbH (1996-99) turnover trebled, and when, from 2000, he became responsible for Mobile Networks, a division of Siemens AG, its three-year turnover rose by almost 80%. In 2002 he became CEO of the Phonak Group, where he has demonstrated a similar pattern for success, by stimulating the design of innovative products and expanding sales and distribution channels. Certainly he has a flair for publicity. Recently, the firm’s new digital hearing aid, Savia, was launched at the Research and Technology Centre (ESTEC) of the European Space Agency (ESA), in the Netherlands. There Dr Chapero spoke, via a live link, with Russian cosmonaut Salizhan Sharipov, at the International Space Station (ISS). Then, onto the stage stepped 75-year-old astronaut Buzz Aldrin, Doctor of Astronautics and member of the first manned lunar landing mission (1969). Why? Dr Aldrin used a Savia hearing aid: ‘When your life has depended on effective communication between earth and the moon, your expectations remain extremely high!’ he told the gathering.

Phonak reports that Savia, a group of six in-the-ear (ITE) and three behind-the-ear (BTE) models that can be remote controlled, is the first hearing aid to implement digital bionics that enable users ‘... to hear as Nature intended, in all situations, including successfully rising to major challenges such as understanding speech in echo-filled environments, or when there are multiple noise sources. Digital bionics also ensure that the most sophisticated features of natural hearing, such as the ability to locate sound sources accurately, are restored automatically by Savia. Localisation is a key element of what is perceived as natural hearing and biologically speaking is the task of a design masterpiece, the human ear.’
<table>
<thead>
<tr>
<th><strong>April</strong></th>
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| 2-4 London, England  
14th Annual Congress of the International Society for Cardiovascular Pathology  
Hosted by the British Society for Gastroenterology  
www.bsg.org.uk |
| 2-8 Davos, Switzerland  
Musculoskeletal Diseases  
www.docguide.com |
| 4-7 Harrogate, England  
BES 2005: 24th Joint Meeting of the British Endocrine Societies  
www.bes2005.co.uk |
| 1-5 Lisbon, Portugal  
Symposium on Fiber Optic Lasers  
www.rommedica.ro |
| 19-23 Athens, Greece  
123rd Congress of the International Society for Computer Aided Surgery  
email: annemarie.kruse@ki.au.dk |
| 7-11 Lisbon, Portugal  
ICCM 7 - International Conference of Nuclear Cardiology  
www.iccm7.com |
| 8-12 Belgrade, Serbia  
6th World Conference on Breast Imaging - WBIC 2005  
www.esmrmb.org |
| 13-17 Vienna, Austria  
10th World Congress of the European Society for the Study of Inflammation  
www.escardio.org |
| 21-25 London, England  
Symposium on Endovascular Research  
www.isge2005.org |
| 27-29 Haridwar, India  
3rd International Meeting on Visualisation and Image Processing for Science and Medicine  
www.isbi.org |