EUROPEAN HOSPITAL

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

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Welcome our NEW Snap Cap . . .

VOL 15 ISSUE 1/06 FEBRUARY / MARCH 2006

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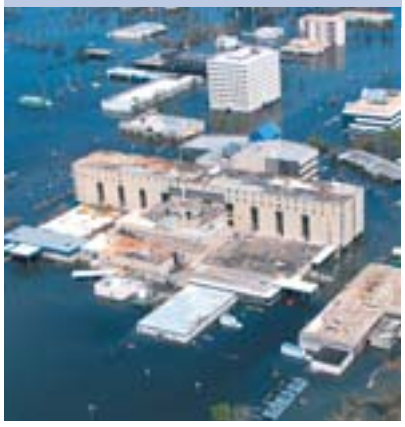

Security alert!

Security in hospitals is not easy. Thousands of patients, visitors, members of staff, as well as delivery and removal people, come and go, and with so many strangers inevitably on the scene, a perfect cover for opportunistic thieves is created, so the theft of small items is not uncommon.

However, in Britain, a series of thefts of expensive hospital equipment, some of which had to be dismantled before removal, has escalated in the last 12 months. This has led the UK's National Health Service (NHS) security staff to issue a bulletin to hospital security managers to be on the alert.

Suspicion has grown that these thefts may be part of a lucrative trade in expensive medical equipment between organised criminals and developing countries. The NHS Counter Fraud and Security Management Service are working closely with the police, who are reported to be investigating around 30 similar thefts of medical equipment.

Thieves target scanners and endoscopy equipment

Size is not necessarily a problem

Thieves obviously find smaller equipment more portable, e.g. hip replacement instruments (value: £10,000) stolen from a hospital where, a year earlier, five laptop computers (value: £15,000) were stolen - and the eight endoscopic devices (value: £300,000) stolen as recently as December.

However, in February last year, two ultrasound scanners (value: £170,000), delivered for use in the out-patients maternity department at West Middlesex University Hospital, London, were stolen two days later. The department had been locked and evidence of a break-in was not found, giving rise to speculation that a stolen hospital swipe card had been used for entry. *(The equipment: SSD Aloka 3500 Model Number MO2935 - serial number: 102935, and SSD Aloka 5000 Model Number MO2741 - serial number not recorded, but this system was equipped with a curvy linear trans-abdominal probe, and was the only machine of this type, in the UK, to have a Panasonic DVD attached).*

Other thefts in 2005 include:

May - Thieves made off with £80,000 worth of cardiovascular equipment from Addenbrooke's Hospital, Cambridge.

July - A £35,000 cardiovascular scanner was stolen from North Durham University Hospital.

October - (and in nine months of activities) thieves targeted Leicester General Hospital and Newcastle's Freeman Hospital, stealing endoscopy equipment. In 2004/05 Leicester hospitals reported 31 thefts of hospital equipment. The

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Catholic medics and human rights

***Poland** - Many medical workers may soon be ethically challenged by a decision made in Europe's Court of Human Rights regarding a woman who had been refused an abortion there. Although under communism abortion was available, it is only allowed, in this largely Catholic country, if a mother's or unborn child's health is threatened, or if the pregnancy resulted from rape or incest. A spokesperson for the Polish Federation for Women and Family Planning said that only around 200 legal abortions are performed annually there.*

When the already visually-impaired woman, who lives on a disability allowance, became pregnant with her third child, eye specialists were said to have advised that her sight was at serious risk. However, a termination was not authorised by them, nor by a gynaecologist.

Her hope is that the European Court of Human Rights will rule that her rights have been violated

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FDA strengthens device monitoring

*Following a 12-month examination of the way medical devices are monitored for safety after approval, the USA's Food and Drug Administration (FDA) has launched a new programme to 'transform and strengthen' current monitoring of new technology as well as existing products. The **FDA Center for Devices and Radiological Health's (CDRH) Postmarket Transformation Initiative** aims to identify, analyse and act on problems more quickly, and alert the public sooner about potential medical device issues.*

The Initiative will focus on: Developing an electronic reporting system for adverse medical device events; ways to identify medical devices including standardized and globally accepted names; ways to improve device information in patient records; improved internal collaboration on post market safety issues; and identifying opportunities to improve medical device safety via collaborative efforts with professional organizations and the medical device industry.

Initially, the CDRH's Medical Device Postmarket Safety Program report, and accompanying recommendations for possible ways to address areas that need improvement, will be reviewed.

Cardiovascular disease

European Union's 25 countries spend €169 billion

CVD care: Malta and Ireland spends the least

The UK & Germany represented over 50% of all EU CVD costs. This expenditure took up 15% and 17.1% respectively of their healthcare budgets. The UK's CVD proportion of total health spending was the EU's highest.

Other countries spending over 15% of their healthcare budget on CVD: Slovakia, Estonia, Lithuania, Czech Republic and Poland.

By contrast, the lowest proportion of the budget spent on CVD was by Malta (2%) and Ireland (4.4%).

Countries in the European Union spent €169 billion in 2003 on cardiovascular disease (CVD), according to research from a team at the Health Economics Research Centre, Department of Public Health, University of Oxford, England, just published on-line by the *European Heart Journal*. This study is the first to assess the economic impact of CVD in the 25 EU member states.

The CVD healthcare cost to each man, woman and child in the EU is estimated to be €230, (USA estimate: €715 per head) which took up 12% of all the healthcare expenditure, accounted for 126 million hospital bed days, 268.5 million working days lost and severely hampered the daily activities of 4.4 million people - one in every 100 EU citizens.

The two million deaths from cardiovascular disease (CVD) in 2003 represented €24.4 billion of the total bill and a loss of 2.18 million working years.

The analysis covered total health-

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Now, tell us more about your work, so that we can plan future publications with your needs in mind. Please put a cross ☒ in the relevant boxes.

1. SPECIFY THE TYPE OF INSTITUTION IN WHICH YOU WORK

☐ General hospital ☐ Outpatient clinic ☐ University hospital

Specialised hospital/type

Other institution (eg medical school)

2.YOUR JOB

☐ Director of administration ☐ Chief medical director ☐ Technical director

Chief of medical department/type

Medical practitioner/type

Other/department

3. HOW MANY BEDS DOES YOUR HOSPITAL PROVIDE

☐ Up to 150 ☐ 151-500 ☐ 501-1000 ☐ more than 1000

☐ None, (not a hospital/clinic)

4 . WHAT SUBJECTS INTEREST YOU IN YOUR WORK?

☐ Surgical innovations/surgical equipment
☐ Clinical research/treatments/equipment
☐ Ambulance and rescue equipment
☐ Physiotherapy updates/equipment
☐ Nursing: new aids/techniques
☐ Hospital furnishings: beds, lights, etc.
☐ Hygiene & sterilisation
☐ Linens & laundry
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☐ Radiology, imaging/high tech advances
☐ Intensive Care Units/ management/equipment
☐ Pharmaceutical news
☐ Speech therapy/aids
☐ Laboratory equipment, refrigeration, etc.
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☐ Nutrition and kitchen supplies
☐ Waste management
☐ Hospital planning/logistics
☐ Hospital Purchasing
☐ Medical conferences/seminars

Other information requirements - please list

ESPECIALLY FOR DOCTORS:

Please complete the above questions and we would like you to answer the following additional questions by ticking yes or no or filling in the lines as appropriate.

What is your speciality?

In which department do you work?

Are you head of the department? ☐ Yes ☐ No

Are you in charge of your department's budget? ☐ Yes ☐ No

How much influence do you have on purchasing decisions?

I can only present an opinion ☐ Yes ☐ No

I tell the purchasing department what we need ☐ Yes ☐ No

I can purchase from manufacturers directly ☐ Yes ☐ No

Do you consider that your equipment is

out-dated ☐ Yes ☐ No

relatively modern ☐ Yes ☐ No

state-of-the-art ☐ Yes ☐ No

Do you use/buy second-hand equipment? ☐ Yes ☐ No

If so, what do you use of this kind?

Is your department linked to an internal computer network? ☐ Yes ☐ No

Is your department linked to an external computer network? ☐ Yes ☐ No

Is your department involved with telemedicine in the community? ☐ Yes ☐ No

Do you consider your department is under-staffed? ☐ Yes ☐ No

Are you given ample opportunities to up-date knowledge? ☐ Yes ☐ No

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

This information will be used only in an analysis for European Hospital, Höherweg 287, 40231 Düsseldorf, Germany, and for the mailing out of future issues.

EH 1/06

Telemed screening for diabetic retinopathy

The United Kingdom's *Diabetes Retinal Screening Service* is a national screening programme that aims to screen 80% of the diabetic population by 2006 and 100% by 2007. The National Health Service (NHS) Purchasing and Supply Agency (PASA) has approved software from three companies for use in the programme.

The first major screening programme - to monitor the sight of 12,000 diabetics over a 12-month period - has successfully used secure messaging telemedicine to transfer digital images of patients' retinas, combined with an electronic patient administration system, between computers used by opticians, hospitals and a screening administration centre within primary care trusts (PCTs).

This screening programme uses *OptoMize iP* software, developed by Cambridge-based university spin-off company Digital Healthcare, which specialises in software for diabetic retinal screening programmes and ophthalmology. The firm's installations are used in hospitals and optician practices in the UK, as well as in private practices, hospitals and universities in the USA, with satellite usage in European countries, Australasia and the Far East.

Alison Johnson, Head of Priority Clinical Services Development at Chorley & South Ribble PCT, pointed out that the software enables the use digital photography for retinal screening, in line with national diabetes screening requirements. 'Our screening staff can use the software to manipulate and analyse images of each patient's retina, and monitor changes by comparing retinal images taken at different points in time. They can also print the images to share with patients, involving them in their treatment. This is much more effective than conventional eye examinations with slit lamps, and film-based retinal images which can be less detailed and deteriorate over time. The software is also fully-automated so the screening administration staff can check patients' progress through the system, and after screenings, they can automatically generate reports to patients and GPs, or referrals to ophthalmology clinics if further investigations are needed.'

Details: www.digital-healthcare.com

The programme involves Preston and Chorley & South Ribble Primary Care Trusts, the Royal Preston Hospital and Chorley District Hospital, as well as 17 opticians practices across Preston, Chorley, Leyland and surrounding villages. It is encouraging all diabetics, over 12 years old, to have a their eyes screened.

The software has been installed on 48 computers in various locations across Central Lancashire so that patients can choose to be screened by an accredited optometrist in their locality or at a hospital eye clinic. Results are transferred electronically between the computers on the same network.

Janet Ashcroft, Health Improvement Manager at Preston PCT, said that the built-in information system handles data well '... so we have the capacity to provide a screening service annually instead of every two years.'

Liam Sweeney, using OptoMize iP software at Digital Healthcare, to check for diabetic maculopathy

Reimbursement for bowel endoscopy

Czech Republic -.The Ministry of Health has issued a reimbursement policy for PillCam SB capsule endoscopy, produced by Given Imaging Ltd. This decision provides reimbursement for around seven million Czech citizens covered by the Vseobecna zdravotni pojistovna insurance company. The policy covers its use for suspected small bowel disease including bleeding, tumours and Inflammatory Bowel Disease (IBD) following a negative gastroscopy or colonoscopy.

Gavriel D Meron, president and CEO of Given Imaging, said: 'We continue to work closely with officials from the Ministries of Health in those countries where PillCam is not yet reimbursed and anticipate additional policies to be issued in 2006.'

Based in Yoqneam, Israel, Given Imaging specialises in products to detect gastrointestinal disorders. The firm reports that PillCam SB video capsule endoscopy is now marketed in the USA and more than 50 other countries, making it available for around 260,000 patients worldwide. Additional capsules for visualisation of the stomach and colon are under development.

Source: Given Imaging Ltd.

Security alert!

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total value of stolen endoscopy equipment is estimated at around £250,000.

October - A 19 inch flat screen monitor, used for imaging CT scans and transmission for diagnoses to consultants in other hospitals, was stolen from Stobhill Hospital, Glasgow.

As far back as February 2003, NHS trusts were sent the first alert that valuable endoscopy equipment was being targeted by thieves. However, the NHS Security Management Service recently issued a reminder that endoscopy equipment appears to be particularly vulnerable to theft, and that staff must be particularly careful about their swipe cards. The trusts have also been advised to review their security measures, and many report an increase in CCTV surveillance.

Cardiovascular disease

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care estimates - primary, outpatient, emergency and in-patient care and medication - plus the costs of unpaid care and lost earnings due to illness and premature death.

In-patient care accounted for €60 billion (57%) of the healthcare costs. Pharmaceutical expenditure at €28.4 billion represented 27%, with primary, outpatient and emergency care absorbing 16%.

A breakdown of the contributions that the various types of CVD made to the total costs showed that coronary heart disease and cerebrovascular disease accounted for nearly two thirds of all CVD deaths and 47% of costs. So, other CVDs, such as high blood pressure or other forms of heart disease, contributed an even higher proportion to the economic burden, the researchers report.

The study also revealed the hidden costs of informal care for the first time - an estimated €29 billion with 2.98 million CVD sufferers receiving 2.95 billion hours help from unpaid carers. Around 1,375 million people were involved in providing unpaid care to patients with coronary heart disease or cerebrovascular disease alone.

The study identified considerable variations between countries in the overall burden of CVD and the percentage CVD took up of each country's total healthcare expenditure (see box).

The researchers emphasised that the aim of the study was not to judge whether countries were spending too much or too little relative to others, its real use is to enable comparisons to be made within countries, and the EU as a whole, of the burden imposed by different diseases. 'This should help potentially to prioritise scarce resources.'

There have been few cost-of-illness studies evaluating the impact of other diseases in the enlarged EU, although estimates for diabetes range from €32 to €61 billion.

WORK ANALYSIS

The problem is ubiquitous: Due to their workload, medical teams cannot accomplish their tasks to everyone's satisfaction during regular working hours. Is the solution to raise staffing levels? More politics? At a political level a framework could be created but its actual implementation must occur within a facility, because that is where work schedules are drawn up, writes Denise Hennig, reporting on a work analysis system produced by Documix GmbH, of Grebenhain- Bermutshain, Germany. The system, available in the German language, is currently utilised at the Katholische St Johannes Gesellschaft, Dortmund (comprising four hospitals), Karl Olga Hospital, Stuttgart, and the Lungenklinik Hemer.

Medical personnel may perform several tasks that lie outside their professional scope, which, quite often, could be performed more cost-effectively by other employees. Nurses, for example, might become involved in cleaning, food distribution, clerical work and transportation, whilst doctors might take on wound and/or patient management and administration. Using overqualified staff for these tasks is not only a significant waste of resources (see table) and finance, but could also demotivate physicians or nurses who must undertake activities unrelated to their professions. Providing more appropriate personnel for those activities could alleviate the problem.

Improving patient care, job satisfaction and personnel costs

The solution lies in reporting and work analysis. Traditional procedures, such as self-reporting or multi-moment analyses, provide only marginally useful results if medical or nursing activities last only four to eight minutes. The answer lies in data capture on mobile digital equipment, such as the Documix DocuLine. About the size of a pocket calculator (14 x 7 x 1.5 cm) this device has a keypad, display and integrated bar code scanner.

During their shifts, staff members use the device to enter all services provided to each patient. The software 'DocuKeeper' transmits this data to the ward computer, which contains the entire data management, e.g. patient records, etc. A further programme, DocuAnalyst, analyses the services data, and the results suggest where changes and adjustments to work structures could be useful.

The percentage of activities not directly related to professional qualifications varies from profession to profession. The analysis can show not only which activities are often interrupted due to external demands on a staff member, but also illustrates the interdependence of the various groups. On some wards, for example, the permanent presence of nurses during visiting times could create problems if not enough staff is available to tend patients in need.

Peak times and off-peak times

Certain activities are sometimes performed too quickly, simply due to the workload, whilst during quieter periods tasks can be performed with full concentration. A constant swing from extreme peaks to off-peaks and back creates additional and avoidable staff stress.

Once reliable measurements of workflow and durations are obtained, the staff should discuss those facts, together, to make realistic work allocations. The degree to which these have been adopted can be assessed during follow-up measurements. An important side effect is that costs can also be assessed.

It is a hospital's task to make and implement the necessary decisions. Adjusting the workforce structure is a more sensible solution than making staff redundant, and it is a solution from which, in the end, everyone will benefit:

- Physicians and nurses are relieved from non-profession-related activities
- The hospital will save on personnel costs
- Patients will be better cared for because medical staff can focus on core tasks.

Additional benefits: improved documentation, precisely calculable personnel costs for individual DRGs, or empirically supported patient paths that will be useful to other departments. Using the analysis, the PPR (Pflege-Personal-regelung) regulation regarding care personnel requirements) or LEP (Leistungserfassung für die Pflege) reporting of care services data can be verified.

However, the most important issue is not the technology (even the most sophisticated data collection will end up in the bin if results are not implemented) but the will and capacity of a hospital to manage change.

Details: www.documix.de

Further management features: EH pages 9-11

Savings potential through substitution of tasks in the care area

Basic data		Personnel costs	
No. of beds	Nursing staff, full-time equivalents	per full-time	For full-time employees
250	120	40.000	25.000

Activities to be substituted	Percentage that can be substituted	Savingspotential
Supporting activities (cleaning, distributing meals, ...)	7.50%	135.000 €
Clerical	16.99%	305.730 €
Transport	8.90%	160.200 €
	33.39%	600.930 €

Sensible staff management could save over 30% of personnel costs annually

Brussels, Belgium 21-24 March 2006

THE 26th INTERNATIONAL SYMPOSIUM OF INTENSIVE CARE AND EMERGENCY MEDICINE (ISICEM)

The annual ISICEM meeting is the largest of its kind, attracting almost 5,000 participants from more than 80 countries. Using various presentation formats, including standard presentations, plenary lectures, tutorials, pro-con debates, workshops, round tables, and meet-the-expert sessions, an international faculty of some 200 experts in the field of intensive care and emergency medicine provides participants with a state-of-the art review of the most recent advances in the diagnosis, monitoring, and management of critically ill patients.

By **Jean-Louis Vincent**, Head of the Department of Intensive Care, Erasme Hospital, Free University of Brussels

The field of intensive care medicine is vast and it is no mean feat to design a programme that accurately reflects all the developments of the preceding 12 months. However, after much discussion and cogitation, an international team of scientific advisors carefully draws up the programme and all participants will find something or interest. Simultaneous sessions are held in several conference rooms so that as much as possible can be covered during the four-day period. As a taster, here is a small selection of the many topics that will be covered during the 4-day meeting (full programme: www.intensive.org):

- Continuing advances in our understanding of the pathophysiology of sepsis and ARDS and development and use of new treatment modalities
- Application of current modes of mechanical ventilation for patient with acute respiratory failure and physiology and prevention of ventilator-induced lung injury
- Recent results with non-invasive haemodynamic monitoring systems
- A new look at some old controversies, including colloids versus crystalloids, dopamine versus norepinephrine, when to transfuse, etc.
- Aspects of ICU management, including cost-effectiveness analyses, quality-of-life, and information technology
- Benefits and limitations of medical emergency or outreach teams
- The impact and management of major disasters, both natural and unnatural

Intensive care medicine is one of the fastest growing hospital specialties with new and important pathophysiologic, diagnostic, technologic, and therapeutic advances appearing so often that, despite improvements in the dissemination of these developments, via email and internet, it is sometimes hard to keep up with the latest 'best' practice. The ISICEM provides a valuable forum of continuing education, enabling participants to learn in a cerebrally and socially stimulating environment. In addition to the high quality presentations, the possibility for participants to interact, discuss and debate with colleagues from ICUs in other countries and continents adds much to the success of the ISICEM. The aim of the meeting is that each participant will have learnt something new to take home and apply in his or her ICU.

We look forward to seeing you in Brussels in March for what promises to be another inspiring and motivating ISICEM.

The typology of conflicts in the ICU

By **Élie Azoulay** MD PhD, of the Medical Intensive Care Department, Saint-Louis University Hospital, Paris

Intensive care units (ICU) are inherently stressful units. Indeed, patients' severity and uncertainty in prognoses are responsible for symptoms of anxiety and depression in family members. Family grief, excessive workload and the complexity of every decision-making process lead to fatigue and burnout in nurses and doctors.

Conflicts could be defined as reported by Studdert et al. as 'dispute, disagreement, or difference of opinion related to the management of a patient, involving more than one individual and requiring decisions or actions'. Even though conflicts might threaten the quality of care and have serious repercussions on daily ambiance, only a few studies report on the incidence, determinants and implications of ICU conflicts. Nurses, physicians, patients or family members can detect conflicts. They can be measured during an interview or by a questionnaire survey, and either during an ICU stay or after a patient's discharge.

There are three main axes of conflicts: between caregivers and family members, which are characterized by distrust, inhibition of communication and family dissatisfaction. Intra-team conflicts with chaotic ambiance in the ICU that expose clinicians to burnout and to providing contradictory information to the family. Finally, intra-family conflicts that have been frequently reported at the end-of-life (EOL), a situation that creates inertia over making decisions.

Most of the information currently available on ICU conflicts comes from the EOL literature. However, several sources categories of conflicts have been identified. Namely, conflicts regarding poor communication, expected outcomes, coping problems, life sustaining therapies preferences (goals of therapy, level of care) and conflicts regarding symptoms control. Additionally, intra-team conflicts might be related to staff behaviour and lack of leadership and coordination, as well as during EOL care, when a family decision maker is not available.

Physicians and nurses perceive their teamwork climate differently and several studies have reported intra-team conflicts. Lack of communication has been highlighted. In addition, during EOL care, discrepancies have been reported, nurses being more pessimistic than doctors, more often correct in the judgment of dying patients, but proposed withdrawal in patients who survived. Nevertheless, conflicts are not the rule at the EOL.

According to the methodology used, the prevalence of conflicts varies. For instance, in a large US-study reporting 179 patients for whom a recommendation was made to withhold/withdraw life support, only 8 patients (4%) refused physicians' recommendations to limit life support. Conversely, in a longitudinal study specifically aimed at identifying conflicts in 102 dying patients, Breen and colleagues performed 400 interviews with caregivers and found conflicts in about 80% of the cases. In 48% of cases these were between family and caregivers, in 48% of cases within the caregiver team, and in 24% of cases within the family. A less dramatic, but nonetheless harming picture, was reported by Abbott et al.

Given the paucity of ICU studies, clinical implication and relevance of conflicts are still unknown. Conflicts could be perceived as only devastating, or also useful, according to the solutions clinicians adopt to reduce conflict rates. For instance, in the specific context of EOL care, conflicts could result in a non-ethically acceptable decision-making process, in non-respect of a patient's preferences and values, and in family dissatisfaction that will impart their decision-making capacity. Moreover, in a situation where the ICU becomes like a jungle, there is probably a risk of non-effectiveness of interventions aimed at improving end-of-life care.

Prevention of conflicts remains a major challenge. However, as a first step, a descriptive study on the typology of conflicts in a large number of ICUs will help identify clinical implications of conflicts, and also possible targets for interventions aimed at reducing ICU-conflicts. Intensive communication in the ICU seems to be a key component of prevention. Nurses reported the need to improve communication skills, for unit-level conferences and staff debriefing meetings. In addition, restoration of leadership and open discussions among all healthcare team members, during EOL decisions, is mandatory. Communication with family members will also help them cope with the distress of having a loved-one dying in the ICU, and empower them to share decisions. Recently, the effectiveness of intensive communication with family members was suggested, and demonstrated.

The Ethics Committee from the ESICM is currently designing the international *Conflicus* study, a one-day prevalence study on ICU-conflicts that will first define ICU-conflicts using definitions relevant for a large panel of investigators. Relevant situations of conflicts will be listed also. After this definition step, the prevalence of the identified situation, during a 24-hour study period, will be reported and targets for preventive strategies identified.

Contact:
elie.azoulay@sls.ap-hop-paris.fr

Oscillation system moves mucus

The *Vest Airway Clearance System* (which is technique independent and treats all lobes of the lungs simultaneously) helps to mobilise pulmonary secretion via high-frequency chest wall oscillation.

Used in the USA for several years, over 80 clinical trials have demonstrated the effectiveness of high-frequency chest wall oscillation (HFCWO) therapy for patients with a variety of conditions. In addition, several peer-reviewed studies have demonstrated the Vest system's ability to clear mucus more effectively and help maintain or improve pulmonary function better than conventional chest physiotherapy.

Connected by tubes to an air-pulse generator, the vest is rapidly inflated and deflated to compress and release the chest wall. During this HFCWO the rapid chest movement mimics 'mini-coughs', which dislodge and thin mucus, moving it along to the central airways.

To date, the system has been prescribed for respiratory complications associated with over 350 diseases and conditions, e.g. secretion clearance dysfunction associated with cystic fibrosis, muscular dystrophy, chronic obstructive pulmonary disease, and cerebral palsy. The maker also reports that It also has been successfully used to maintain healthy lung function in post-operative, ICU, and post lung transplant patients.

The manufacturer adds that, in clinical outcomes studies, the system is associated with improved secretion clearance; stabilised or improved pulmonary functions; improved exercise tolerance; reduced incidence of pneumonia and related hospitalisations; higher patient satisfaction and therapy adherence, and reduced healthcare costs.

Details: www.thevest.com
Or: Edwin_simons@hill-rom.com

More flexible vital signs monitoring

Maquet's new Cantellus system is a flexible, highly mobile patient-monitoring system designed to provide full control over the patient's vital signs anywhere in a hospital and during patient transportation. Windows-based and modular, it can be used as a stand-alone or as part of a network. The system ensures integration into clinical information systems, and with various ventilators and anaesthesia systems, and is designed to simplify user-customised configurations for the bedside monitor, transport monitor, and at the central station.

Cantellus Panel, a compact bedside unit, incorporates a PC and monitor and, Maquet reports, it is particularly suited to patient monitoring in the operating theatre (OT), post-op or recovery, the ICU and the CICU. Cantellus Transport offers the same functionality, and is lightweight (less than 4kg) and robust.

Each networked monitor provides bed-to-bed communication, and the Cantellus Central Station provides remote view and control of over 64 beds.

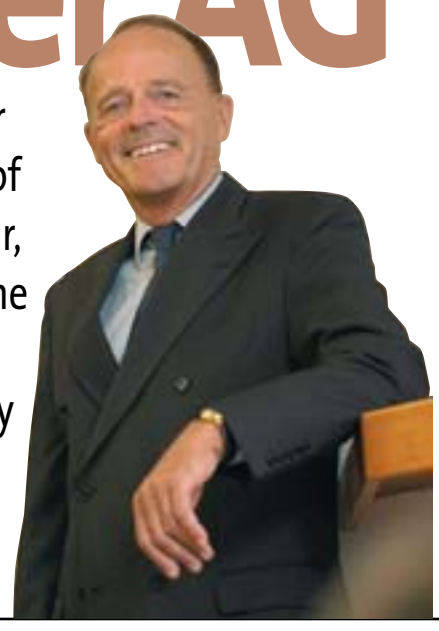
The memory capacity for trend storage exceeds 48 hours and up to 5,000 events can be saved.

Maquet points out that the system uses unique Parameter Boxes to store, analyse and compare cardiopulmonary data, and adds: 'Since the parameter boxes are independent of the actual monitoring unit and remain with the patient during transport, time-consuming disconnection and recalibration is not necessary.'

COMPANY PROFILE

Schiller AG

Alfred E Schiller, founder and managing director of Schiller AG, based in Baar, Switzerland, describes the rise of his company and its place in today's highly competitive intensive care market



Alfred Schiller founded Schiller AG in 1971 and three years later introduced his first product - a pocket-sized electrocardioscope, which has been built on successively over the years. The electrocardiography product range extended, and in 1984 the firm was the first in the world to develop a six-channel EEG with automatic interpretation and measuring. 'This system promoted us into the top league,' Alfred Schiller reflected, during our interview. New cardiopulmonary diagnostics products, lung function measuring systems and non-invasive blood-pressure measuring equipment, as well as Doppler-ultrasound scanners followed, and later came patient monitoring and defibrillation (in 2000, Schiller acquired *Brucker Medical*, a French firm specializing in external defibrillation and patient monitoring in extremely high magnetic fields).

Patient monitoring is covered by some of the larger manufacturers. We asked whether the firm therefore focused on in a particular area within that sector. 'Our specialty is extremely high miniaturization, which is particularly important when patient monitoring equipment needs to be mobile, for example in accident and emergency medicine. Unlike systems supplied by our competitors, our mobile intensive-monitoring-system *Argus Pro LifeCare* has an inbuilt defibrillator. The advantage? You cannot always get an ambulance close enough to an injured person; sometimes you must walk the last few hundred metres - then it's obviously an advantage to have less to carry around.

Does this system sell well internationally?

'We have 21 sales and production enterprises worldwide, spread over all continents, from which we serve the different markets. The procedures are regionally different. Countries such as Germany have a good, specialised trade structure, other countries don't have enough specialist distributors, so we have to penetrate the market with our own distributor - all in all we employ about 600 people. We are the only Europeans who ever managed to penetrate the US market, where we are number two among the established companies. We did it by adapting to the particular American requirements and not even trying to export our European philosophies to the US. That also goes for Asia, where we are now also active. You just have to adapt to local conditions. Us Swiss are quite used to this, because we have always depended on exports. No one can simply live with only a national market, in a >

Intensivists

They're here - but not enough

Not so long ago, in addition to carrying their normal workload the surgeon, anaesthetist, lung specialist and internist worked in the intensive care unit (ICU). Now, however, the 'intensivist' has arrived - 'A real specialist' writes **Michiel Bloemendaal**, EH Netherlands correspondent

Walking around an Intensive Care Unit (ICU) in a normal Dutch general hospital reveals its daily routine. Patients usually lie asleep amidst a mass of technical equipment, and the latest technical gadgets monitor them, constantly showing their heart and lung functions, while their medical data is being printed on a flow of paper. Each patient is allocated one nurse with a PC.

Vital functions - Although patients in an ICU suffer all kinds of diseases, they have one characteristic in common: their vital functions are working inadequately. Indeed, their blood circulation, breathing and brains work so badly, that they need to be stimulated by machinery in order to survive.

Intensive care in one specific ward began in university hospitals, where initially they were called *Intensive Treatment Units*, a name that better suits their activities because it specifies not only care but treatment.

About 25 years ago a specialist could work on his/her own ward as well as in the ICU. However, it slowly dawned that intensive care is a specialty in itself, involving facets of lung, heart and internal diseases. Thus, for doctors and nurses, ICU specialisation gained its own status, with its own training and well-defined goals.

Today's ICU has a 'knowledge base', and IC-specialists take over when the 'field' specialist ends his/her treatment. This 'evidence-based' medical science developed as doctors learned by their mistakes; for example, artificial respiration used to be applied slowly, with a big draught volume, but this resulted in stretched and damaged lungs. Now artificial respiration is applied more quickly, using smaller volumes. Due to that learning process, doctors can now treat patients who would have died just a few decades ago.

Originally much of the ICU procedures were based on advice from the USA, but the Dutch intensivist is now miles ahead of his US colleagues, because American intensivists are becoming more conservative (legal claims restrain them).

However, it is not all halleluja in Dutch hospitals. Most of these recognise they need a full-time intensivist, because it is better for patients as well as cheaper for hospitals, but, there are too few intensivists.

NICE - The intensivists' knowledge can be increased in several ways, including via the National Intensive Care Evaluation (NICE) programme. This contains anonymous data of all ICU patients, so all units can compare that data and treatment results. By doing so, possible problems may become evident. Also, questions can be asked, such as: 'Why, in hospital A, does a patient have to stay in an ICU for two weeks, whereas in hospital B a patient can go to the general ward after only a week?' Unfortunately only 40 of the Netherlands' 120 hospitals with an ICU take part. In addition, the programme demands structured data registration, which not all doctors have time to do.

The ICU is the place, 'par excellence', where new medical technologies appear. Often employees are involved in those developments, and their technical developments eventually may be adopted throughout the entire hospital. For example, intravenous feeding and the pulsoximeter, generated in an ICU, found their way to other wards.

One should not forget, that among all these technical devices there are living creatures, and all those devices are only aids. If doctors really want to know their patients' condition, they should lift the blanket and take a look - generally, this should tell them what data could be expected on the computer monitor.

Hans Hoogervorst, Dutch Minister of Health, has announced, that the quality of intensive care units in Dutch hospitals must improve. ICUs must adhere to new quality rules. If they do not, the Inspection on Healthcare will take severe action, because patients' interests are at stake. This follows a report presented to the Minister by the Inspection on Healthcare. This estimated that almost 50% of Dutch hospitals misjudge the quality of their intensive care. As a result very ill patients do not receive the care they need so badly. The measures announced by the minister will be effective from 1 February 2006. These new measures make clear, to doctors and nurses, what care a patient needs. If a hospital cannot supply the necessary care, the patient must be transported to another hospital, which immediately presents the next problem: transport of IC-patients is poorly organised in some regions of the Netherlands. Often there is a lack of adequate equipment and well-trained nursing staff.

country of just 7.5 million inhabitants. We must export. This has worked to our advantage; it has given us an international outlook in an increasingly global market. It also shows in our internal organisation: our decision-making processes are extremely short. Being the most senior member of the company, I am always easy to get hold by everyone. We make decisions swiftly. Moreover, our company is 100% independent - the shares are owned by our family.'

Today Schiller AG has three areas of expertise: Cardiopulmonary diagnostics, patient monitoring and external defibrillation. 'Our strength lies in the ability to combine all these applications with IT solutions and hospital information systems,' Alfred Schiller explained. 'In the future, hospitals will become similar to what we have been used to in offices for the last 20 years. Currently, medicine has fallen behind a little. We have only ever looked at diagnostic and operating methods, neglecting the organisational side and the whole area of data management.'

Isn't one of the problems the fact that information technology has been produced for the different areas and medical fields, but not for the entire organisation?

'This will come!' he responded, 'and it's a big opportunity for our company as we will not merely offer equipment but entire system solutions. We have a few things happening in this area. We have been working with an IT company and the internal IT department at the University Clinic, Basel - one of Europe's leading cardiology clinics - and have set up a wireless network that connects all medical technology areas in the hospital. All processes in cardiology are electronically registered and electronic patient files, including CT, MRI and ultrasound images, are accessible at all times. When doctors meet they can quickly discuss every single case by calling up Power Point electronically, without having to look for EEGs or ultrasound scans. In addition, all patients are given a CD upon discharge, which contains details of all their examinations. The local GPs are also wired up to this centre. This all makes the work far more efficient. For example, an anaesthetist can go to a terminal and access all relevant information electronically, prior to an operation, without having to gather bits of information from different places. The doctors in Basel are very happy with the system - and this network will grow. These days, when a GP refers a patient to hospital he can send the patient's file to the hospital electronically. Then he can log on and keep up to date with what is happening to his patient while in hospital, and when the patient is discharged he receives all the information, without anything being sent by post.

'The three areas of our involvement that I mentioned are covered by IT solutions that are now required for the daily use of this equipment and these diagnostic processes. The IT solution has to be integrated with the equipment. We also produce hardware. The interfaces are defined and now also standardised. All equipment manufacturers must be able to do this. We are a member of the IHE (Integrating Healthcare Enterprises) and we are at the stage where we can transfer our data onto existing systems via conversion programmes.'

Providing IT solutions is a very support-intensive business. How can there be profit in this?

'By combining that with the sale of hardware.'

But this means the equipment will be more expensive - surely no one accepts that?

'It's accepted as long as the equipment can be integrated. If you buy cheap equipment manufactured in the Far East, for instance, of course this isn't possible. This is the art of selling. You have to make the doctor realise that, although he might save €1,000 by buying a cheaper product elsewhere, he will have no support and advice. We supply complete, ready solutions - and support. Of course this costs money! It is mostly done via service contracts. One of our most important, strategic objectives is to integrate in this world of IT and to be compatible. As we are active globally we have to be able to adapt to the most varied solutions. However, we are actually more advanced than they are in the USA. In the average US general practitioner's surgery, most things are still done manually. Germany, France, Switzerland and particularly Italy are far more advanced. In Italy, we work closely with a company called *Esaote*. Eleven years ago we convinced them to have their EEG equipment manufactured by us. Now, with *Esaote*, we are by far number one in the Italian market. Their IT solutions are brilliant and our systems are integrated with those solutions.'

Today, he added, the firm's presence in France is 'extremely strong', which he attributes to Schiller having a production plant there. In addition, the firm will soon open its new sales offices building in Paris.

Schiller also works partly with *Esaote* in England, where the health service is in a dynamic state of change. In addition, the firm uses two distributors there.

'We analyse each country individually, then adapt to what we have found, so our strategies are different in different European countries,' Alfred Schiller confirmed, reflecting, 'The healthcare sector in general is a crazy market and you must be very flexible to survive.'

SPANISH ICU ADOPTS IT

The Intensive Care Unit (ICU) in the Medicine and Dermatology Institute, Hospital Clínico de Barcelona, has implemented the IT system *Infinity ChartAssist*. In addition to freeing staff from manual data collection, Dr José María Nicolás, specialist in Internal Medicine and Intensive Care Medicine and Head of the hospital's ICU, expects that this information solution will enable precise monitoring of the medical care process. The ICU also uses Infinity Delta patient monitors, which are fully integrated with ChartAssist, as well as *Evita XL* ventilators from *Draeger Medical*.

Before purchasing the equipment, Dr Nicolás and the ICU team first evaluated electronic data management systems made by various major manufacturers, in relation to their existing SAP Healthcare hospital information system (HIS). Their choice - Draeger's Infinity ChartAssist - was made because it is designed specifically for critical care. 'It was easy to customise the parameters at the user level, and there was no duplication with our existing HIS,' Dr Nicolás pointed out, adding that the new system facilitates the collection of ICU data and consolidates all the different paper-based forms on one platform. 'Thanks to that, we have simultaneous access to the entire HIS, including radiology examinations and lab results.'

Dr José Marìa Nicolás (centre) with the hospital's ICU team. Dr Nicolás is also Associate Professor at the Medical School, University of Barcelona

When trained, the staff migrated to the new system in 24 hours. To aid planning, Dr Nicolás said, personnel attitudes to new routines were evaluated. Although a group of people showed slower adaptation characteristics '... the motivation of other department members spurred a very fast and problem-free implementation,' he said. 'The system is currently well accepted. Our nurses particularly like the automatic collection of monitoring information and different types of vital support systems data, because it allows more time for patient care. We hope that by reducing the time dedicated to collecting data manually - 20-30%, according to the literature - we'll increase the level of patient care.'

Auditing - Based on his experiences, Dr Nicolás said that automating data collection facilitates the auditing of medical care processes. 'We expect that data collection and subsequent information preparation will support decision-making in our daily work. In fact, automatic data collection does not make sense if it does not help us design ways to gauge different areas, such as resource tracking, evaluation of results, and patient medical care processes.'

Remote access - The web-based ChartAssist gives authorised users access to patient data from any PC connected to the hospital's Intranet. The system can be configured locally or on the web, and many clinicians can access patient data simultaneously for consultations.

Dr Nicol·s believes that the need for intensive care will increase in coming years, explaining: 'High-tech hospitals will specialise in treating serious diseases, while less serious problems will be treated in out-patient clinics. So, intensive medical care will be of major importance.'

If ChartAssist demonstrates that it benefits patient care, it is likely that it will be extended to the hospital's other ICUs, Draeger reports.

- The 100-year-old, 782-bed Hospital Clínico de Barcelona, is a leader in medical assistance and educational training. It also has acquired international recognition for its scientific publications.
- The Medicine and Dermatology Institute's ICU, which provides care for patients with infectious diseases, has 8 beds, 4 doctors, and 20 nurses. They tend 350 patients annually (average stay: 7 days).

Measuring hospital performance

By **Professor Alan Maynard**

Measuring hospital performance is a complex and essential activity. **Nikolas Matthes** *(European Hospital. Vol 14, issue 6/05, page 7)* raises some interesting issues, but his analysis is incomplete. The first two central questions to be answered before proceeding to manage performance are *Why?* and *How?*

There are many reasons for measuring performance. The ultimate gaol is to ensure that the hospital delivers good quality care, and the most important aspect of 'quality care' is whether medical interventions improve patient outcomes, in terms of the length and quality of their lives.

The way in which most healthcare systems approach this issue is to measure and manage processes of care and activity. Process quality performance focuses on whether doctors and nurses are polite to patients and whether hospital food is edible, car parking is adequate and how the institution fares in terms of patient and staff satisfaction surveys.

Activity performance measures often tend to focus on waiting time. Thus the Welsh have to wait for elective procedures longer than the English, Norwegians who wait can access Danish hospitals, Danes who have to wait for elective care can access German hospitals and the French and Germans wait short periods because of their high capacity levels and their payment systems.

Activity performance measurement and management may also include aspects of care such as the timely provision of thrombolytic interventions after myocardial infarction, as well as waiting times for outpatients and diagnostic procedures.

Such measures highlight the universal problem of variation in healthcare: whatever is analysed in medicine, doctors do different things to similar patients. Thus in the US Medicare system there is enduring evidence of variation in expenditure and activity with patients in this universal Federally financed healthcare system costing more in the East of the USA than West, due to differences in volume of care delivered and with no observable benefit in terms of satisfaction or outcome for the patient. *(REFERENCES: Maynard, A, Enduring problems in health care delivery, in A. Maynard, 'The public-Private Mix for Health: plus ca change, plus c'est la meme chose', Radcliff Publishers, Oxford and Seattle, 2005. V. Fuchs, Perspective: More variation in the use of care; more flat-of-the-curve medicine, Health Affairs, electronic supplement, 7/10/2004 (www.healthaffiars.org)*

This focus on activity performance and variation begs answers to question such as: *If you reduce waiting do you always improve patient health or do you get, and when do you get diminishing returns?* Similarly, in any analysis of variation: *Will, for instance, reducing the variation in the activity levels of orthopaedic surgeons by incentivising the shifting of the mean of the distribution, lead to increased activity but poorer patient outcomes?*

Performance management that ignores patient outcomes is potentially dangerous. Often politicians, anxious to reduce waiting times and squeeze more activity out of doctor stocks, ignore this conclusion. Increasingly there is recognition that there is a need to measure outcomes, but all too often this involves a narrow medical approach that focuses on failure.

The narrow orthodoxy of outcome performance management is epitomised by President Reagan's decision, nearly a quarter a century ago, to publish the mortality rates of all hospitals treating Medicare patients. The hospitals were outraged and insisted that many of the data were inaccurate. To which the administration responded by emphasising that it was the data they, the hospitals, had given the Federal authorities and were they lying! The work of the Reagan administration in publicising the mortality outcomes of hospitals is yet to be emulated in many European countries.

Mortality data is useful in performance management, but it is a measure of failure rather than success in medicine. Similarly measures such as complication rates and re-admission rates are measures of failure.

All such measures have to be carefully collected and analysed because of variations in case mix and other compounding factors. Furthermore, their use will inevitably affect behaviours. For instance, in Pennsylvania and New York, postoperative mortality rates after cardiac surgery are published by individual surgeon. The goal of this data production was to inform patient choice. However, the evidence from this and similar American studies shows that the publication of such data has little affect on patient behaviour: they continue to seek medical advice to interpret available information and make their choice of doctor.

However, in Pennsylvania and New York, the publication of post operative cardiac mortality by individual practitioner had an immediate effect on providers. Poorly performing providers changed their patient selection practices, treating less complex patients with fewer co-morbidities and, in so doing shifting the mean of the distribution (thereby apparently 'improving' outcomes) by excluding the more risky patients from surgical procedures. These high-risk patients were then treated medically at higher cost and with poorer outcomes. This example shows clearly the significant and sometimes perverse effects of publishing performance data.

It is now time to complement measures of failure, such as mortality, with measures of *success* in medical interventions i.e. patient reported outcome measures (PROM). The measurement of changes in mental and physical well-being uses generic instruments (i.e. measures that can be used across clinical specialties) such as short form 36 (www.sf36.org) and EQ5D (www.euroqol.org). These instruments have been translated into dozens of languages and used in thousands of clinical trails. However, they are not used in routine clinical care, particularly as performance measures.

An exception to this is the British private insurer, the British United Provident Association (BUPA). They offer SF36 to their elective patients at entry to the hospital and 3-6 months after the completion of the procedure. This enables them to ensure consumer protection against poor clinical practice and it also enables them to monitor and manage the relative performance of the practitioners they employ in terms of restoring the mental and physical functioning of their patients. This pioneering work is now being emulated by experimental work in the UK-NHS.

Performance management is complex and has to use both activity and outcome data, especially PROM. These data can be used for the appraisal of practitioner performance and for their revalidation as well as for ensuring value of money in public and private healthcare systems. It is curious how little use there is of PROM measures and how all measures of activity and outcome are often not linked to incentive systems by which clinical practice can be changed.

Alan Maynard is Professor of Health Economics, in the Department of Health Sciences at the University of York, England. He is also Chair of York NHS Hospitals Trust, an acute hospital with over 700 beds, which provides elective and emergency care for a population of 350,000. The professor has been involved in NHS management for over 20 years. He also has worked as a consultant for the World Bank, the World Health Organisation and other international agencies in over twenty countries, including China, South Africa, Brazil, Malawi and Thailand. He has published extensively in journals, has written and edited over a dozen books and is Founding Editor of the journal Health Economics.

Performance measurement to improve quality

By **Karen H Timmons**, President and Chief Executive Officer of Joint Commission International, and **Maureen Connors Potter** RN BS MS, Executive Director International Accreditation at Joint Commission International

Joint Commission International (JCI) accredited hospitals have long expressed an interest in performance measurement to support quality improvement efforts and to provide a valid base for local, national, and international comparisons. In response to this request, JCI has introduced the Hospital Quality Indicator project. The implementation of a limited number of standardised indicators began in January 2006.

This initiative focuses on data collection for seven standardised performance indicators (measures) currently in use in the United States (Table 1). The purpose of this project is to fully understand the operational issues uniquely associated with international implementation. During 2006, measures will be assessed for interpretability, applicability/usefulness to the

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Table 1

INDICATORS

AMI-: Aspirin at Arrival

Acute Myocardial infarction (AMI) patients without aspirin contraindications who receive aspirin within 24 hours before or after hospital arrival.

AMI-: Aspirin Prescribed at Discharge

Acute Myocardial infarction (AMI) patients without aspirin contraindications who are prescribed aspirin at discharge.

AMI-:Angiotensin Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) for Left Ventricular Systolic Dysfunction (LVSD)

Acute Myocardial infarction (AMI) patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.

AMI-: Beta Blocker Prescribed at Discharge

Acute myocardial infarction patients (AMI) without beta blocker contraindications who are prescribed a beta blocker at discharge

AMI-: Beta Blocker at Arrival

Acute myocardial infarction patients (AMI) without beta blocker contra-indications who are prescribed a beta blocker within 24 hours after hospital arrival.

HF-: Left Ventricular Function (LVF) Assessment

Heart failure patients with documentation in the hospital record that left ventricular function (LVF) was assessed before arrival, during hospitalisation, or is planned for after discharge.

HF-: Angiotensin Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) for Left Ventricular Systolic Dysfunction (LVSD)

Heart failure (HF) patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.

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international community, feasibility of data collection, data collection effort, and overall resource use.

In addition to indicator evaluation, assessment of the potential limitations related to electronic data transmission, preferences for data feedback mechanisms, expectations regarding support services, and data use by JCI in accreditation activities will also be addressed. Evaluation findings will be used to assist in planning for a voluntary automated standardised indicator set.

The benefits of participation in the project are three-fold:

- Accredited organisations have the opportunity to participate in and shape the future of JCI accreditation requirements;
- It provides an early opportunity for international benchmarking; and
- It supports hospital compliance with JCI standards.

Accredited hospital organisations, which volunteer to participate, collect indicator (measure) data using tools provided by JCI. These tools include the data dictionary, data elements, and Indicator Information Forms (IIFs) for the seven indicators (measures) that are included during the first year of the JCI Hospital Quality Indicator project.

Joint Commission International (JCI) has also developed International Patient Safety Goals, which were adapted from the Joint Commission's National Patient Safety Goals (Table 2). Since January 2006, JCI has surveyed international hospitals for compliance with the goals as a way to evaluate the relevance and feasibility of the goals for international hospitals and whether there are any unique adaptation requirements for individual countries. The survey findings currently do not affect the hospitals' accreditation decisions. The results of surveys conducted in the first months of 2006 will be used to decide whether to proceed with full implementation of the International Patient Safety Goals as accreditation requirements for 2007.

For further information, organisations can contact Maureen Potter, executive director, International Accreditation, JCI, at mpotter@jcrinc.com

Table 2: 2006 International Patient Safety Goals

Goal: Identify Patients Correctly

Protocol 1: Use at least two (2) ways to identify a patient when giving medicines, blood, or blood products; taking blood samples and other specimens for clinical testing; or providing any other treatments or procedures. The patient's room number cannot be used to identify the patient.

Goal: Improve Effective Communication

Protocol 2: Implement a process/procedure for taking verbal or telephone orders, or for the reporting of critical test results, that requires a verification "read-back" of the complete order or test result by the person receiving the information.
Note: Not all countries permit verbal or telephone orders.

Goal: Improve the Safety of High-Alert Medications

Protocol 3: Remove concentrated electrolytes (including, but not limited to, potassium chloride, potassium phosphate, sodium chloride >0.9%) from patient care units.

Goal: Eliminate wrong-site, wrong-patient, wrong-procedure surgery

Protocol 4: Use a checklist, including a "time-out" just before starting a surgical procedure, to ensure the correct patient, procedure, and body part.
Note: Hospitals in many countries have downloaded the Universal Protocol and are using it. Because the Universal Protocol is a set of three complementary, evidence-based practices that together will prevent wrong-site surgery, please note that protocols 4 through 6 of these International Patient Safety Goals are the same as the requirements for the Universal Protocol.

Protocol 5: Develop a process or checklist to verify that all documents and equipment needed for surgery are on hand and correct and functioning properly before surgery begins.

Protocol 6: Mark the precise site where the surgery will be performed. Use a clearly understood mark and involve the patient in doing this.

Goal: Reduce the risk of health care-acquired infections.

Protocol 7: Comply with current published and generally accepted hand hygiene guidelines.
Note: This should recognise that not all countries have an agency that is equivalent to the Centres for Disease Control and Prevention (CDC) or may not recognise guidelines of the U.S. CDC.

Goal: Reduce the risk of patient harm resulting from falls.

Protocol 8: Assess and periodically reassess each patient's risk for falling, including the potential risk associated with the patient's medication regimen, and take action to decrease or eliminate any identified risks.

In August last year, Hurricane Katrina smashed into the USA's Gulf Coast. Within 36 hours a swathe of Louisiana had become a disaster zone. Just two weeks after the event John Matessino, President of the Louisiana Hospital Association, Baton Rouge, described the transformation of its healthcare services and heroic efforts of healthcare workers, many of whom also suffered personal losses

John Matessino

With the arrival of Hurricane Katrina in southeast Louisiana, the mission of the Louisiana Hospital Association took a 180-degree turn from its normal advocacy role to running an emergency operations centre.

More than two weeks later, I am still astounded by the whole experience — the evacuation of hospitals; the untiring efforts of healthcare workers; the networks created for communications and supplies; the support from all the hospitals in the state; the help and assistance from hospitals, associations and organisations throughout the country; and the loss of life both in our state and in Mississippi.

The association staff performed a vital role in operations at the state's Office of Emergency Preparedness Command Centre, working ceaselessly to assist with hospital evacuations, find available hospital beds around the state, assess damage to hospitals and coordinate patient transfers and resources. The offices of the LHA were transformed into a situation room.

During the evacuation of the hospitals and the days that followed, the walls of our office were plastered with pages from flip charts with names of hospitals that needed to be evacuated, medical and related suppliers from all over the nation, and lists of supplies each hospital needed. Each time we were informed that a hospital was evacuated of patients, staff and family, there would be a moment of relief only to return once again to a heightened level of intensity.

The LHA staff, like many everywhere around the state, were doing things and providing services we never dreamed of performing. There were hysterical calls from hospital employees taking care of infants, to calls for help from hospitals needing supplies to either sustain them until they could be evacuated, or to weather the storm.

The calls for fuel, generators, security, medical supplies, food and water, clean linens and other supplies just kept coming. The staff here pulled every rabbit out of the hat to secure and deliver the needed supplies and services. With much help from our friends, I am happy to report we were successful on many of the requests to help all hospitals, whether they were members of our association or not.

Several days after the storm, I was part of a Public Health Service healthcare assessment team that flew by helicopter around New Orleans and some of the areas affected by the storm north of Lake Pontchartrain. To witness such a devastating blow to our state left indelible impressions.

However, more than the effects of the storm, I was impressed by the spirit of the healthcare professionals and others working in the areas we visited. They were exhausted but were coping and taking care of patients.

One example was in Chalmette, La., an area just southeast of New Orleans, where the storm surge nearly immersed all of St. Bernard Parish. The local hospital in

CATASTROPHIC CARE:

By **I R Nemeth, K J Rinnert, R E Swienton and P E Pepe**

In traditional civilian multiple casualty incidents (e.g., bombings, explosions, rail mishaps and aircraft crashes), most patients are killed outright or survive with less serious injuries that are not immediately life-threatening. While many of these problems can eventually lead to permanent disability and death, classically, only a small percentage of patients have immediate life-threatening critical illness or injury.

In light of these observations, one would surmise, intuitively, that disasters should be manageable, particularly in most urban settings where the highest risks for such traditional disasters reside. Compared with only a half century ago, most western nations now enjoy a relative plethora of modern, highly-equipped hospitals that offer specialised emergency departments (EDs), trauma centres and intensive care units.

Despite this optimistic view, on a day-to-day basis, most hospitals lack bed capacity and are severely understaffed, especially in their EDs and ICUs. Hospitals are facing increasing volumes of more acutely ill and injured patients and these daily challenges contribute to delays in patient care and they often limit the efficacy, efficiency, and continuity of emergency care operations. It is clear therefore that with such day-to-day over-crowding, delays and inefficiencies will be exacerbated further by the sudden influx of large patient volumes that may occur as the result of natural, unintentional or intentionally-created disasters. In addition, for a multitude of reasons, compared with 50 years ago, the threat of catastrophic disasters continues to escalate dramatically, along with the numbers of persons who will be affected, both directly and indirectly.

Worse yet, recent experiences and evolving threats demonstrate that our modern, sophisticated medical care facilities may be totally inadequate for managing disasters in the future. Underscoring this point was the recent sudden displacement of tens of thousands of persons with chronic serious illnesses and special medical needs in the wake of Hurricanes Katrina and Rita that struck the southern tier of the United States (US). Likewise, the recent experiences with SARS and the threat of worldwide pandemic also make it clear that our currently overwhelmed resources may very well be crippled under such circumstances. This concern will be especially true if medical care workers become ill, as they were with SARS.

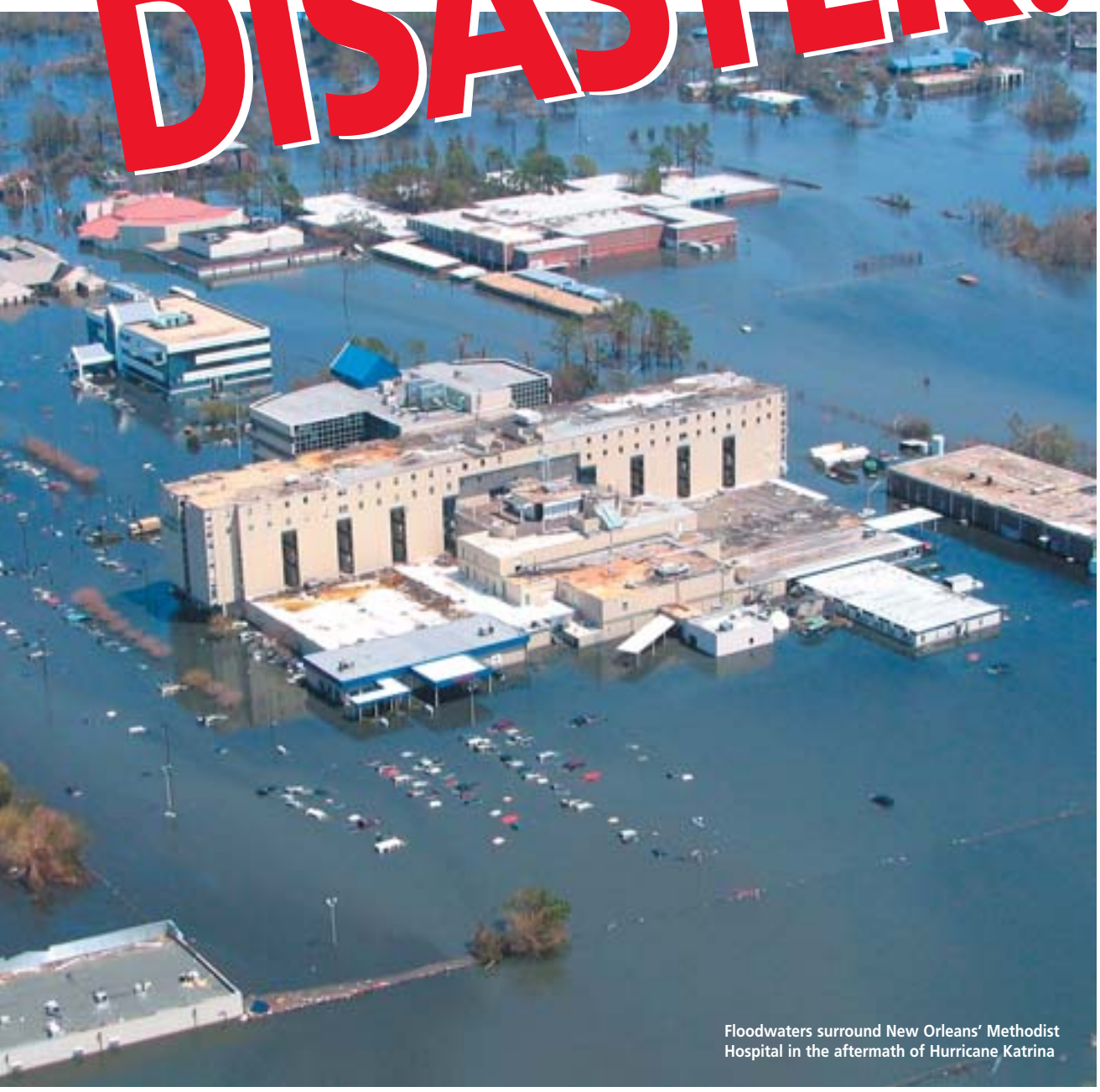
Although it has been speculated that the past smallpox case fatality rate of 30% might be mitigated by modern medical care, it does not take into account the numbers of patients requiring critical care to produce that life-saving. Despite modern care facilities, a dramatic genetic shift in influenza strains accompanied by brisk worldwide dissemination in the modern age of rapid, mass world travel, would be insidious. Entire populations could be affected in a matter of months, or even weeks. Even if only 1% of a population required critical care, our healthcare facilities and providers would be overwhelmed (e.g. 10,000 critical care beds for a population of 1 million). The insidious consequences of nuclear explosions are, in many respects far more unimaginable.

The need to further evolve responses to major disasters

Traditionally, in most venues, planning for increases in patient volumes have included several strategies such as: 1) cancelling elective procedures and treatments; 2) expedited, early discharge of hospitalised patients who have more stable medical conditions, and 3) reconfiguration of patient holding areas to become temporary patient care wards. Unfortunately, the recent imperatives to increase use of out-patient treatment centres, minimally invasive surgical techniques, and early hospital discharge have only served to drastically reduce the use of hospital in-patient wards and therefore their availability for surge capacity.

Immediately following the August 2005 landfall of Hurricane Katrina, and without the benefit of

DISASTER!



Floodwaters surround New Orleans' Methodist Hospital in the aftermath of Hurricane Katrina

John A Matessino / Louisiana Hospital Association

Chalmette had water into the second floor of a two-story building where I witnessed a boat tied to a second story windowsill left after the evacuation.

The only piece of ground in the entire parish that did not flood was the administration building of the ExxonMobil refinery. At the refinery, a makeshift clinic had been established by a few physicians and two registered nurses from the hospital. They had lost everything in the storm but were relentless in their commitment to care for people in need.

In the aftermath of the storm, our office was in communication with many of the hospitals that needed to be evacuated due to the floods. What these healthcare workers and hospital staff did for their patients, the families and each other is amazing. Evacuations took almost four days because of the difficulties encountered in security, communications and problems of evacuating a flooded area.

Temperatures at that time exceeded 95 degrees outside during the peak of the day and more than 100 inside.

One can only imagine the experiences these people faced in caring for their patients. In the end, nearly 2,200 patients and 9,000 staff and guests were evacuated.

The LHA has also been helping hospitals and family members locate patients who were transferred to hospitals all over the nation and established a service on our Web site. Many people have been calling in tears either relieved to know their loved one is safe or that at least someone is trying to help.

One evening, I stayed until 1 a.m. taking call after call from many desperate family members. The American Hospital Association and other state and metropolitan hospital associations have also assisted in this effort. Hundreds of families have been reunited with patients that were evacuated, and the number is climbing every day. This effort will continue as long as necessary.

While I think we have waded through the initial chaos from the storm, there are mountains to scale on the road to recovery. Thousands of healthcare workers affected will need our continued support. Many have lost everything.

I cannot say enough about the efforts of the entire team at the LHA that was supported by several members of both the Metropolitan Hospital Council of New Orleans and ShareCor, our shared-service company, which have had several employees that have been displaced from their homes and evacuated as well. Finally, I want to thank the hospitals and other healthcare organisations, suppliers and others that have given so unselfishly to the recovery effort.

EH Editor's note: A charity - named *The Care Fund* - has been established by Louisiana's healthcare workers to help colleagues affected by Katrina to rebuild their lives. For our European readers who want to contribute to this fund, please go to: http://www.thecarefund.net/thecarefund/index.html

* John Matessino's article was first published in Modern healthcare (http://www.modernhealthcare.com/page.cms?pageId=1300&potId=WE)

When hospitals are *overwhelmed*

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previous planning, alternate-site medical surge facilities (convention centres and sports arenas) had to be implemented, within a matter of hours, to provide timely care for thousands and thousands of Gulf Coast evacuees in settings far from the destroyed sites. On average, these centres, spread across the southern US, Texas and other more distant sites, managed to care for twice as many patients each day as they would have at their already-overwhelmed emergency departments and ICUs. Few of these patients had their existing medications, medical records or even the telephone availability of their own healthcare providers. Furthermore, since this surge population was comprised of elderly displaced citizens, underserved segments of society, and individuals with special needs, it created unanticipated, novel stresses on the impacted healthcare community. In turn, healthcare practitioners, administrators, legislators, and regulators will now have to formally consider new models for disaster medical care.

Accepting a sufficiency of care model

The fundamental change needed in healthcare delivery during episodes of excessive demand in an environment of limited resources is the implementation of a 'sufficiency of care model'. This is distinctly different from the usual tenants of the 'standard of care' model that is based solely on the premise of a minimal acceptable level of quality healthcare delivery. For example, the use of simple cots and bag-valve devices instead of approved hospital beds and ventilators, or limitations in climate control and altered provider-to-patient ratios, are but a few of the many elements that may require modification during periods of excessive patient care demand in a resource-constrained environment. In these cases, licensing, regulatory, or accreditation standards, however reluctantly, must be modified.

For example, many plans for pandemics propose the concept of home-based care, utilising either indirect medical care via electronic means or direct medical care via roaming, community-based medical teams. Healthcare facilities and normally-compulsive healthcare providers will likely be reluctant to implement the necessary strategies as outlined. However, during conditions of extreme surge demand, the clinical paradigm of doing the greatest good for the greatest number of potential survivors must drive decision-making.

Examples of entry, expand and exit strategies

In addition to sufficiency of care, there are many potential strategies for handling significant surge capacity demands. These strategies may be categorised into three general groups: entry, expand and exit. 'Entry' strategies refer to reducing or limiting entry of surge patients to hospitals through strategies such as cancelling elective admissions or out-patient procedures and establishing surge capacity facilities outside of the traditional hospital base. The inclusion of specialty facilities such as long-term acute care, nursing home and other rehabilitative facilities is potentially useful. Effective risk communication is also an important 'entry' factor. The ability to deliver succinct, timely public information messages through the media may significantly reduce unnecessary or untimely arrival of large numbers of the 'worried well' in the general population. Even preventive recommendations for cough etiquette, compulsive hand cleansing and self-quarantine can be very useful. Detection and medical decontamination capabilities are also a vital 'entry' strategy in terms of limiting facility closure due to contamination.

Strategies that increase internal facility capacities and capabilities are considered to be part of the 'expand' group. This would include the creation of alternate treatment areas by increasing the in-patient bed capabilities through the use of hallways, auditoriums, or out-patient beds. Other 'expand' strategies include pre-designated assignments for various patient types to various destination hospitals, as well as accessory, off-site caches of immediately accessible supplies, scalable personnel rosters, and many of the traditional 'disaster plan' initiatives discussed previously. In the long term, hospitals may need to re-consider architectural designs and significant infrastructure changes.

Early, rapid patient discharge is an example of the strategies to be implemented in the 'exit' group. Transferring post-operative patients to facilities that lack operative resources but possess post-operative care capabilities is another. Limiting care services to essential services only is also an 'exit' strategy. Other strategies include: delayed orthopaedic fracture management, delayed primary closure of wounds, and modified intensive care admission criteria. Caution is warranted in the strategy of limiting care when inevitable services are delayed. During prolonged periods of surge demand, patient arrival volumes will be cyclic. The next wave of arrivals is likely to be compounded, or exponentially increased, as patients previously delayed will continue to seek access to healthcare.

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SECURITY Biometric authentication

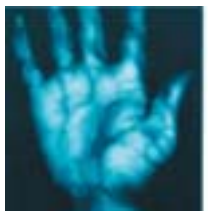
By **Thomas Bengs**, Product Manager for Vein, Fujitsu Europe Limited Group

Biometry, or the technical recognition of physical characteristics, is playing an increasingly important role in clinics and hospitals. Its primary applications involve entry restriction for wards and laboratories, as well as verification of identity to clear access to patient data. The purpose of biometric authentication is verification: in other words, the clear determination of identity, with confirmation or rejection of the identity claim of a given person. The system compares personal data with unique, permanent physiological characteristics such as fingerprints, facial features, iris or vein patterns. Germany's Bad Reichenhall City Clinic was the first hospital in the world to introduce biometric iris scanners to protect maternity ward baby rooms from unauthorised entry. Now the Bodden Clinics in Ribnitz-Damgarten have also introduced biometric authentication through fingerprint controls at the entrance of its maternity room facility.

The advantages of biometric authentication are obvious. Classic password or PIN-based authentication systems cannot distinguish whether the person entering the correct data or keys is actually the authorised owner. In addition, unlike passwords, chip cards or keys, biometric characteristics cannot be forgotten or lost.

Potential Dangers

Although an array of biometric authentication systems are currently available, including fingerprint, iris or face recognition. All vary in the security they offer. Some are even contested by security experts. For example, face dimensions change over the course of time and may often be unreadable by scanner systems after a few months. Vulnerabilities have also been discovered in iris scanners, for example, which can be outwitted by the use of contact lenses, and fingerprint sensors by adhesive tape or latex dummies. Researchers at Clarkson University in the US recently used artificial fingers made of modelling clay or silicon to fox 90% of fingerprint systems they tested.



Vein scanning as a security system

A newer method of biometric security control uses near-infrared rays to scan the unique pattern of veins in the palm. The reduced haemoglobin flowing through the veins of the human palm absorbs the rays, reducing the reflection rate and displaying the veins as a black pattern. This pattern is then compared with a pre-registered database and verified with highest accuracy. Since every hand has its own unique vein patterns that are permanent throughout life, it is nearly impossible to fake identity through manipulation.

Last year, the Tokyo University Clinic selected the Palm Vein sensor, due to its high level of security and user-friendliness. At the clinic the biometric system secures the entrance to the Department of Planning, Information and Management, instead of the fingerprint-based system used in the past. The clinic sought a more secure control method after Japan's Personal Information Protection Act came into full effect, and finally decided on the Palm Vein authentication system from Fujitsu.

Hospitals face the challenge of maximising their level of security, while also keeping a watchful eye on the costs involved. Investment in biometric security systems represents a useful option in which the hospital is equipped with state-of-the-art technology, patient service is improved and cost efficiency is maintained at the same time.

Med-e-Tel

5-7 April 2006
Venue: Luxembourg

The Med-e-Tel eHealth conference and trade show, attended annually by healthcare professionals, industry representatives, insurance providers and policy makers from almost 50 countries, will also include representatives from the European Commission, World Health Organisation, International Telecommunication Union, and the International Society for Telemedicine & eHealth. 'It brings all parties together to learn from each other and share experiences,' explained Frank Lievens, Med-e-Tel's International Coordinator. 'This year's event will again cover a wide variety of health ICT topics, ranging from broadband networks and mobile solutions, to standardisation and interoperability. ICT of course only remains a tool, but an important one that makes healthcare delivery more efficient and effective. These ICT tools can help to solve the predicted nursing shortage, tackle the challenge of a growing ageing population and the associated rise of chronic conditions, and overcome the current lack of specialist doctors in developing countries.'

Homecare is set to increase, so inevitably will e-health delivery (under supervision of healthcare professionals). The Med-e-Tel 2006 program includes several sessions to cover these developments. For example, the Luxembourg CRP-Santé (Institute for Research in Healthcare, Public Health & Biotechnology) will conduct a regional symposium, examining how IT services at a patient's disposal (e.g. automated appointment booking, online consultation of electronic patient records, and e-prescribing) will lead to new solutions and strategies for all those involved in healthcare.

Among the many highlights will be a symposium on ***Global Healthcare Challenges and Opportunities: The Role of Advanced Technology***, organised by the Telemedicine and Advanced Technology Research Centre (TATRC), which is part of the United States Army Research and Materiel Command (USAMRMC). This event will focus on the implementation of broadband networks, mobile solutions, operational standards, environmental sensors and telemedicine technologies.

The Doc@Hand project consortium will present ***Knowledge Sharing and Decision Support for Healthcare Professionals***, focusing on IT tools that help reduce the time and associated costs of collecting information and knowledge.

The Luxembourg CRP-Santé (Public Institute for Research in Healthcare, Public Health and Biotechnology) will present a regional symposium (in French) titled ***IT at the Service of the Client-Patient: New Solutions and New Strategies for Hospitals, Mutualities and the Industry***, with a focus on Automated Appointment Booking, Online Consultation of Electronic Patient Records, e-Learning, Telemonitoring, e-Prescribing, CRM in Mutualities, Image Transfer, Electronic Signature, Wireless and Mobile Solutions.

The International Society for Telemedicine & eHealth (ISfTeH) will give an overview - *International Telemedicine & eHealth Initiatives and Developments*.

A session ***E-Health in Developing Countries: The Future of Healthcare*** will include contributions from the World Health Organisation (WHO) and International Telecommunication Union (ITU) representatives, showing ICT's contributions to healthcare delivery in the developing world.

Satellites as a Basic eHealth Tool will review the practical and growing use of satellite communication in eHealth, with related posters of various South American projects, supported by the United Nations Office for Outer Space Affairs (UNOOSA).

The Siberia, Information Technologies and Europe (SITE) project workshop will present the potential of Russia (particularly the Sibirsky region) for IST, and SITE's support for collaboration between Europe and Siberia in IST projects.

The ***Standard and interoperable satellite solution to deploy HEALTH care services over Wide AREa*** (Healthware) is an Integrated Project co-financed by the European Commission and co-ordinated by Alcatel Alenia Space. The Healthware workshop will describe the value of a satellite platform in four promising telemedicine applications: services at home, second opinion, medical training, teleconsultation - initially involving cardiology, oncology and chronic respiratory diseases.

Frank Lievens

The Finnish-based provider of information and communication software for disease management Medixine, will present A ***Multichannel Communication Platform for Healthcare***, which has been used in about 50 installations in Finland, Norway, United Kingdom, France and the USA. Case studies in medication management, treatment and medication follow-up, multiplayer e-booking, asthma self management solution, RFID communication, and a Parkinson's Disease support network will be discussed.

Dr Bernard Vrijens, of Pharmionic Systems, Switzerland, will describe how ***Electronic Monitoring of Dosing Histories Allows Real Time Detection of Poor Adherers and Offers the Bases for a Successful Intervention***. The company specialises in remote electronic monitoring of patients' compliance with prescribed drug dosing, so that individual patients' actual exposure to the prescribed drug is known and its clinical consequences analysed. Pharmionic has a database of such dosing histories and clinical consequences of over 16,000 patients in a dozen major fields.

Canadians increase remote monitoring

Aerotel Medical Systems (www.aerotel.com) produces a complete disease management package, including trans-telephonic portable devices designed for a variety of remote diagnostic, and monitoring applications; a hardware and software platform; plus phone and web-based software.

Since Health Canada recently announced its reimbursement plan for telehealth loop recorders, Aerotel has reported a surge of interest in its Heart 2005A trans-telephonic ECG loop event recorder, the Heart 2006 dual lead Tran telephonic ECG loop event recorder and its HeartLine Receiving Station (HRS) software. Aerotel products will be exhibited at *Med-e-Tel*. This is a small taster of the very broad range of presentations at Med-e-Tel.

Full details: www.medetel.lu

SMS MESSAGING IN PAGING SYSTEMS

The DP6000 suits any hospital; modules can be added, as needed, to the basic system. DECT receivers and GSM mobiles also can tie in to the system, with SMS messages alerting off-site staff of emergencies

Digital pagers, first introduced by Bosch in 1978, are now essential to hospital communications. However, hospital paging systems generally cannot reach members of staff when they are off duty, or even if they are on call but out of range, as can be the case for doctors working across a number of sites, and en route from one to the next.

Now, however, Bosch has launched a new system, the DP6000, which automatically diverts paging calls to mobile phones, so that an SMS message can be sent to alert key personnel during emergencies.

A hospital paging system consists of a central control desk and transmitter that can be equipped with up to 10,000 pagers. Pagers placed on a storage rack indicate that the owner is off duty or absent.

At the control desk the operator can call any receiver by picking a name from a list, or entering the page call code directly. Pocket sized and lightweight, pagers provide various combinations of bleep, vibration, speech, and numeric or alphanumeric display. They can receive real-time spoken messages, and users can scroll back through previously received information. There is also a 'do-not disturb' mode. Text messages can accompany the paging calls along with essential numeric information such as addresses, room numbers and phone numbers.

Paging systems offer considerable other versatility. For example, the Bosch paging system can be connected to external alarm systems for fire detection, or it can link into building control systems (for machine monitors, AC control or security), remote contacts (door switches, proximity devices) and Nurse Call. And now the firm's the DP6000 enables SMS messages to be sent to staff who have stored their pagers in the rack. A hundred GSM mobiles can be programmed. The SMS messages can be pre-defined so users just point to the relevant message and click to send, or they can be customised. They can be displayed on any mobile phone or any pager with an alphanumeric display. The system is very versatile, and PCs connected to the hospital's TCP/IP network can also use DP Client software to send messages to pagers.

Thus, when an emergency occurs in a ward, or multiple casualties arrive in an Accident & Emergency department, the various hospital personnel needed (surgeons, nurses, porters, etc.) - whether off duty or on call, can be sent paging and SMS messages to inform them which area or operating theatre to attend, without worrying that they are out of range.

Ilias Iakovidis

The European Commission
DG Information Society and Media

By **Ilias Iakovidis**, Deputy Head, ICT for Health Unit, DG Information Society and Media

What is eHealth and why is it important? Today, in just seconds, eHealth - the tools and services of information and communication technologies in healthcare - provides health professionals access to vital data for patient care and to the latest literature and knowledge. While such systems ultimately aim at reducing administration time and increasing time spent on patient care and continuous education, many deployed systems leave much to be desired. We use the term eHealth to encompass classical medical and health informatics as well as telemedicine, telecare and telehealth. The main idea behind telemedicine systems is to provide access to best quality care for people isolated from care facilities, due to their location or other reasons.

Has eHealth delivered real value? Yes, eHealth can deliver real and proven benefits when accompanied with the right organisational changes and skills. It can improve access to quality of care and even save costs through productivity gains and quality improvements. Several examples of real life solutions are available in *E-Health - Current situation and examples of implemented and beneficial E-Health applications* (Iakovidis I, Wilson P, Healy JC (Eds.). IOS Press, Vol.100, 2004) and on http://www.ehealth-impact.org/.

What is the role of the European Commission, DG Information Society and Media? The European Commission (EC) was one of the first funding agencies in the world to support this multidisciplinary field. In total, since 1988, about 650 million Euros in EU contributions have been granted to approximately 450 R&D projects in eHealth programmes alone. Many of these research results have now been tested and put actively into practice. (Details: www.cordis.lu/ist/health/index.html). As a result, Europe has a lead in the deployment of Regional Health Networks, Electronic Health Records, Healthcards and services such as e-referral and e-prescription. The market has grown multifold since 1990. However, the deployment of eHealth solutions varies greatly among European countries.

EU eHealth Action plan

In April 2004 the EC adopted the Communication COM (2004) 356 final *eHealth - making healthcare better for European citizens: An Action Plan for a European eHealth Area*. This describes the main objectives of eHealth, the challenges in wider deployment and proposes specific actions for Member States with the support of the EC. The Action Plan's main areas:

- ***National eHealth Roadmaps and Leadership***: Each EU Member State is to develop a national and/or regional roadmap for the deployment of eHealth systems. These national roadmaps will be discussed in the next eHealth Ministerial conference 2006 in Malaga Spain (www.ehealth-conference2006.org).
- ***Interoperability of eHealth systems***: The connectivity and interoperability of health information systems is a prerequisite for the main added value of eHealth, namely enabling patient centred healthcare, where providers have access to comprehensive and relevant health information stored anywhere in the EU. The need to identify a person unambiguously is an important component of the interoperability of health information systems. The current focus is on necessary technical, semantic and organisational steps in order to provide short and basic summary of an electronic health record on line everywhere in Europe.
- ***Labelling and Accreditations***: To support the development of an eHealth market there is a need to agree on attributes and norms that define good quality systems and services. Exchange of experiences between EU Member States and draft guidelines are expected in 2007. The European Commission supports these activities through Q-REC project (www.eurorec.org).
- ***Legal and Regulatory Issues***: A greater legal certainty with regard to eHealth services (not including cross-border eHealth services) within the context of freedom of movement of people, goods and services is necessary and will be addressed by the Action plan by 2009.

Conclusion

The EC has invested early in this domain and helped the European Union and its stakeholders to become global leaders. The ultimate aim of eHealth is to support the new generation of patient centred health delivery systems. Such future systems connect all the points of care, enable access and sharing of information, and ensure continuity of care from prevention to care and rehabilitation. eHealth has proven benefits but the full potential of eHealth tools and services has not yet been realised due to challenges in wider deployment that are rather organisational, financial and of legal nature.

Since 2004 Europe has its eHealth Action Plan, providing activities to support a coherent implementation of eHealth in Europe over the next five years. To achieve a European wide eHealth area, supporting patient safety and mobility of citizens, is a real and worthwhile challenge.

** Disclaimer: The views developed in this article are those of the author and do not necessarily reflect the position of the EC.*

The 4th eHealth High Level Conference

The European Commission describes eHealth as the application of information and communications technologies (ICTs) across the whole range of functions that affect the health sector, from the doctor to hospital manager, via nurses, data processing specialists, social security administrators and - of course - the patients. Since 2003, the EC has supported eHealth High Level Conferences, and the first of these events took place in that year, in Brussels, Belgium. The second conference was held in Cork, Ireland, in 2004. Last year the third venue was Tromso, Norway.

The 4th eHealth High Level Conference - along with an exhibition and two associated events: the European eHealth Industry Forum and the World Panel on Interoperability - will be held in Malaga, Spain, from 10-12 May 2006. The organisers: The Spanish Government, Andalucian Regional Government, the Austrian Presidency of the European Union and the European Commission.

The conference aims to encourage best practices exchange between European policy makers, experts and others involved in eHealth and to present innovative processes and implementations. This year's focus will be on the role of eHealth in the progress of health policies in European regions, and the need to build seamless information networks across regional and country borders.

As for the earlier events, the conference is reported to be by invitation only. Ministers and other key-players in eHealth are encouraged to attend. See details: www.ehealthconference2006.org

NEAR-PATIENT TESTING (NPT)

By **Manole Cojocaru MD PhD**, scientific consultant at ROMAR Medical-Laboratory Colentina, Bucharest

Near-patient testing (NPT) is any analytical process performed for, or by, a patient outside the traditional clinical laboratory.

NPT benefits: reduction of total costs, improved patient care with better quality of life. NPT speeds up diagnosis, so treatment decisions can be made much more quickly and the patient can be managed more effectively. The operational advantage is also clear: NPT gives faster results and thus reduces length of stay.

Analytical systems, when used properly, provide clinically acceptable measurements. However, it is widely recognised that procedural errors generate inaccurate data that can be clinically misleading. Therefore, quality assurance is crucial. The chronological link between test results, quality control results and instrument status must be retained. The service is to be carried out within recommended national quality assurance schemes.

NPT training: For NPT to realise its potential economic and clinical benefits it must be monitored and supervised by qualified staff from the clinical laboratory and it has to be performed within the framework of a clearly defined policy. An approach that may be varied with local circumstances is to be preferred.

The success of NPT depends on the effectiveness of the training of non-laboratory staff. Training ensures:

- knowledge of pre-analytical factors, including obtaining the correct specimen, the importance of clinical contradiction, sample handling, and stability of sample and reagents
- demonstrable expertise in analytical skills, including operation, calibration and routine maintenance, together with an understanding of any analytical limitations of the instrument; a recognition of instrument malfunction and simple troubleshooting techniques; principles and procedures of internal quality control and external quality assessment; cleaning and decontamination procedures
- knowledge of post-analytical factors, including accurate documentation of patient data; basic knowledge of the importance of abnormal results.

NPT applications: NPT is used in the home, health centres, emergency rooms, out-patient clinics and hospitals. It is particularly valuable with regard to diabetes mellitus and gestational diabetes. The key in diabetes is to maintain normoglycaemia, which needs regular monitoring and access to a mobile and rapid testing device. NPT is used in hospital for clinical crises, e.g. hyperglycaemia, hypoglycaemia, in all of which treatment must be given quickly. Patients suffering from type 1 diabetes should follow the intensive treatment scheme, including very frequent self-testing of blood sugar. There is also now evidence that provision of the HbA1c result at the time of consultation can improve glycaemic control.

A good example of NPT use is in ruling out urinary tract infections. It is common practice for general practitioners to send urine samples to the laboratory and start antibiotics before the diagnosis of an infection is made. However, 80% of samples sent to laboratories are not infected. A stick test for bacterial metabolites in the urine reduces the number of unnecessary samples sent to the laboratory, and avoids unnecessary antibiotic use and hospital referrals.

Helicobacter pylori testing is yet another example of the benefits of NPT. There are good data to show that using NPT to detect H. pylori antibody reduces endoscopy requirement, changes therapy, decisions and reduces clinic visits.

The effectiveness of NPT is also documented for interpretative assessment of anticoagulation status. Monitoring patients for anticoagulation status during coronary bypass and minimising blood loss reduces the amount of blood product used: Close control of anticoagulation also reduces surgery time, time of chest tube drainage and ICU time, all of which save considerable costs.

NPT is also applicable with patients with acute chest pain, since it can determine if the patient has had a heart attack. Half of all coronary care beds contain people who have not had a heart attack - and they cost twice as much as other beds. Therefore, faced with a patient with chest pain, the general practitioner needs to know if this is a myocardial infarction and thus emergency admission is needed. Many ECGs do not give a clear answer regarding myocardial infarction.

Finally, patient expectations are increasing. They expect more from their general practitioner and from their hospital. An accurate diagnosis is a prerequisite for correct treatment. Correct treatment also leads to optimal spending and resource allocation in the healthcare system. Laboratory test results are one of the most important sources of objective medical data and thus vital to most diagnoses.

Positive/abnormal test results help determine or confirm a diagnosis. Negative/normal results help determine that the patient is well or that a certain diagnosis can be ruled out. This will not lead to further treatment, but it does not mean the testing itself was unnecessary!

NPT outlook

Four main drivers will strengthen the role of NPT:

- changes in clinical practice
- clinical need, in particular compliance with therapy
- limitations of the laboratory services
- direct patient demand.

NPT, which will increase dramatically over the next few years, will support optimisation and compliance with therapeutic interventions.

So the time is ripe for NPT. The next steps to be taken? Change the culture, change the practice and improve the outcomes.

Analytica 2006

25-28 April

Red green and white biotechnology

Experts estimate the global value of biologically manufactured chemical products to be 50 billion euros. Apart from the USA, Germany is now considered the world's strongest location for biotechnological development and production. For this reason biotechnology will again be an important sector at the *20th Analytic* and *Analytica Conference*, which covers laboratory technology, analysis, high-tech laboratory automation and data and process management.

Three areas of biotechnology have become defined by colours - *red*, *green* and, in more recent years, *white*. Although red biotechnology (medical and pharmaceutical applications) and green biotechnology (genetic engineering) are the predominant applications in the eyes of the public, 'white' biotechnology is the sector with potential to secure Europe's - and especially Germany's - technological and economic lead in the chemical industry, according to a report from Messe München International (MMI), the organiser of Analytica. 'White products are old and new products for which *classic* syntheses are increasingly replaced by biotechnological processes during production, at least in part. The term white biotechnology refers the use of biological means and techniques to optimise industrial processes. A distinction is made between biotransformation, i.e. enzyme and cell-catalyst processes, and fermentative manufacturing processes. While products manufactured using biotransformation are created in processes with one - or a just few - steps, entire metabolic pathways are used in fermentative processes.'

MMI points out that, in the 1980s Degussa, a Dusseldorf-based supplier of specialty chemicals, began to develop processes for producing amino acids for animal feed - a market now worth billions. Henkel is also working on the front lines with improved enzyme systems that make laundry detergents more efficient and environmentally compatible. Wacker supplies specialty products such as cysteine and cyclodextrins (odour-absorbing agents used in cleaning products and suit fabrics production). At BASF, biochemical processes are used to produce vitamins and precision chemicals.

'Applications are diverse. Researchers know of over 3,000 enzymes, 150 of which are already used in commercial applications,' the MMI report continues. 'White biotechnology is also increasingly important for new techniques and products (mostly more environmentally compatible) in other branches of industry. The share of chemical products produced using biotechnology is only 5%. However, that figure is expected to increase to 10-20% by 2010 and will probably continue to grow afterwards (*2004 McKinsey study on biotechnology's contribution to the chemical industry*). In five years, 60% of all chemical products could involve the use of white biotechnology in some form.'

- Biotechnology advantages:
- Reduced synthesis steps
- lower consumption of raw materials
- increased energy efficiency
- lower emissions
- lower production costs.

MMI provides this example: Until 1990, Vitamin B_2 (riboflavin) was produced using a multiple-step synthesis process; then researchers at BASF established a single-step fermentation process based on soy oil that offered key advantages over the old petrochemical process. Waste was reduced by 95%, CO_2 emissions by 30% and resource consumption by 60 %. As a result, the cost of producing Vitamin B_2 decreased by 40%.

Transgenic potatoes: German companies process some 650,000 tons of starch annually, for use in the paper, textile and adhesive industries. Potato starch is a mixture of amylose and amylopectin, but only one is generally wanted for industrial applications. Separating these is complicated and pollutes the environment, so growers and genetic engineers are looking for potatoes with only one component. By switching off the gene responsible for producing either amylose or amylopectin, genetic engineers at BASF Plant Science have developed two such potatoes. This example - bordering between *green* and *white* - demonstrates that white biotechnology can be used in several branches of industry: its significance both in the chemical industry and in food, cosmetics, textile and paper industries, continues to increase. New tools such as screening methods, metabolic engineering, global analysis methods such as genomics, proteomics and metabolomics, as well as bioinformatics tools are also becoming more readily available.

Red biotechnology continues to dominate the industry, in terms of the number of companies and sales. The pharmaceutical sector is the place to make money, MMI points out. The number of *green* biotech companies (focusing on genetically engineered pest control, improved farming methods, new foodstuffs, renewable raw materials and medications from transgenic plants) is considerably lower.

Klaus Dittrich, Managing Director of Munich International Trade Fairs and head of Analytica, concludes: 'The close link between personalised diagnostics - i.e. identifying the genes that determine why pharmaceuticals have different effects on different individuals - and therapy is opening up new dimensions in the recognition and treatment of illnesses, especially the treatment of diseases that involve tumours. I refer to mini genetic-testing laboratories for emergency medicine, online diagnostics to understand the interaction processes of living cells and the use of biochips for the early recognition of common illnesses. That also applies to the use of biotechnology in industrial manufacturing. White biotechnology may not generate as much public attention as red or green biotechnology, but it has the potential to help the German biotech industry return to the top of the global market.'

Details: www.analytica.de
www.analytica-world.com

Advances in analytical and diagnostic tests

The development of diagnostic products and systems has paralleled the development of new technologies in fields such as biology, electronics and computer science. As a result, modern analytical and diagnostic tests have become ever more effective in determining a patient's clinical state. The firm Grifols specialises in the development of sophisticated instrumentation and methods for clinical analysis, which has led to numerous technological advances to facilitate the work of diagnosticians in three critical categories: Haemostasis, Immunology and Immunohaematology. The company's automated laboratory solutions presented at Medica, last November, included:

Haemostasis - Grifols offers a complete catalogue of products to determine the haemostatic balance of patients, including reagents (clotting, chromogenic and immunologic techniques), avant-garde automated instrumentation and oral anticoagulation expert software.

Immunology - The Triturus System consists of the Triturus analyser and associated reagent panels. The system is the first completely open, fully-automated, multi-test and multi-batch enzyme immunoassay analyser designed to automatically perform all the steps of any microplate EIA test. Grifols reports that the highly-flexible system provides the most efficient approach to automation of the ELISA workload without changing a laboratory's routine workflow.

Immunohaematology - Grifols' Immunohaematology system includes the fully automated WaDiana compact analyser, the semi-automated Diana processor, manual instrumentation and the DG Gel cards, which the company points out is '... the next generation of gel cards at the cutting edge of column agglutination techniques. The development of new technology, the optimised column design, the exclusive presentation, the stability of the reagents and the unique 8-column format are all clear advances, providing the Immunohaematology lab with clear and reliable results in pre-transfusion testing.'

SOUND PHILOSOPHY LEADS TO QUALITY LED LIGHTING

Formerly integrated with the electronics/medical division of Trumpf GmbH + Co KG, the medical technology sector has now been made a separate business segment, led by Managing Director Harald Völker. 'Continuing as head of this sector was important to me,' he explained in our interview. 'I had overseen it since it first became part of Trumpf. Years ago I worked in our subsidiary Hüttinger Elektronik in Freiburg. This also owned a small medical technology firm in Umkirch. We extended the range of Hüttinger's activities in medical technology through Trumpf Medical Systems (formerly Blancomed) in Saalfeld, and Trumpf Kreuzer Medical Systems (formerly Kreuzer), in Puchheim, near Munich.'

With the re-definition of this business division, the previous managing director, Dr Simone Rehm, returned to Trumpf's head office in Ditzingen. 'She did a great job in helping us through a somewhat difficult period and ensuring that the company is now back on track and growing,' Harald Völker said, adding that efficiency has increased significantly.


Harald Völker

In the changeover, very few jobs had to be cut. Staff changes included the appointment of Dr Kordt Griepenkerl, from Trumpf Kreuzer, to the management team, as well as the assignment of an experienced production head, from the Trumpf group, 'to further improve production'. In the last financial year, 2004-5 the firm's productivity was turned into profit. 'We also extended our distribution efforts, particularly abroad, and increased our marketing,' Harald Völker pointed out. 'Today we have a complete and outstanding range of products. This is where the synergies with the Trumpf group came into their own. The group worked with machine tools and lasers initially and had little involvement with ceiling mounts or workstations in hospitals. The synergies lay in production, through procedures and processes. We have developed an entirely different manufacturing set-up - since the end of 2005 we have worked with a production line system rather than a stationary system. For example, stands had been fixed to the ceiling, in one place, and all the materials where brought there. This was too unstructured, complex and also inefficient, because the materials supply process was not transparent. We had storage facilities here, storage facilities there. Today our production line is much like those in the car industry - we don't bring materials to the stand, we take the stand to the materials. We have fixed assembly positions where certain parts are added. The stand moves on a rail along the ceiling, from stop to stop, and is assembled along the way. There are clearly defined production steps, which make the supply of tools, materials and workers far simpler. Logically, this leads to increased effectiveness and efficiency, lowers costs and allows us to produce more items in limited space.'

Who oversees that process?

'We do. The method is taught in Ditzingen. A group there introduces the procedures to our subsidiaries and provides initial coaching. However, responsibility eventually falls on those in charge of production - plant managers or production unit managers. We talk about production units, because these are relatively self-sufficient. Each unit is responsible for itself, and its quality, and must ensure that the materials are well managed.

This kind of process planning is not demanded as much in Europe as it is in the USA - as yet - he pointed out. 'Nonetheless, we have a group of medical technology specialists who have the know-how to serve the customers who want it. That's the essential part; we can integrate our products into all kinds of processes; we look at how the system we deliver to a hospital can be integrated into its workflow from a processing point of view. Then we look "backwards", at what the user really needs and how to link things. *How can the system be combined with transport equipment? How can it be combined with imaging procedures?* That's an area for which we supply very creative and innovative solutions.'

Trumpf's most important market in Europe has long been Germany, but, he pointed out, that has shown a downward trend. Other Western European markets include Italy, France and the United Kingdom. 'It differs from product group to product group,' he explained. 'In Eastern Europe growth rates are high, but of course they have to be able to pay for the products - and appreciate their value. Trumpf products do not sell on price alone. We see ourselves as premium manufacturers; we sell added value. Initially, Trumpf's prerequisites are profit and a good corporate culture, then growth through innovation and quality leadership - something we are particularly keen to achieve in medical technology - and that's why we began our latest, innovative development with LED surgical lights.
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Healthcare service is an 'export' business

New project aims to develop standards for design and marketing

Germany - *Health Care Export*, a new four-year project run by the Institute for Work and Technology (IWT) and the Sozial- und Seniorenwirtschaftszentrum in Gelsenkirchen, supported by the German Federal Ministry for Education and Research, and by advertising and public relations measures from VVA Health Marketing Ltd, aims to develop international standards for international healthcare service design and marketing. 'Initially, healthcare networks must be created and developed on an international level, so patients from abroad can be comprehensively well looked after, from the ambulance service to accommodation, treatment, and aftercare,' explained Stephan von Bandemer, project leader at the IWT. Pointing out that healthcare management is the fastest growing economic sector in Germany - among the key German industrial sectors, with 4.2 million employees and a 240 billion euro turnover, healthcare has considerable export potential.- he stressed the importance of co-operation between clinics and enterprises to create a stronger image abroad.


Stephan von Bandemer, Manager of the *Health Care Export* project

Part of the project will be observation and analysis of international and national patient streams. Networks should be built up on the basis of unique selling propositions, regional proximity, and ethnic cultural relationships, the organisers point out.

VVA Health Marketing Ltd will support participating firms and clinics in the production and application of means of communication, which includes advertising in print media and at trade fairs, and public relations (PR) for the project groups.

A scientific analysis of project results is provided as a guideline for firms who may wish to enter the international market at some point. Participation in the project is open to health care institutions and their suppliers. Among participating clinics and firms are such well-known institutions as the Hamburg University Clinic, the Nuremberg Clinic, and Meyra, the tradition-rich wheelchair manufacturer. No less important is the project's intended function of building support for scientific exchange in the field of medicine, to which the further project goal of making internships in Germany available for young doctors from abroad is also relevant.
Contacts: bandemer@iatge.de and e.schaefer@vva.de

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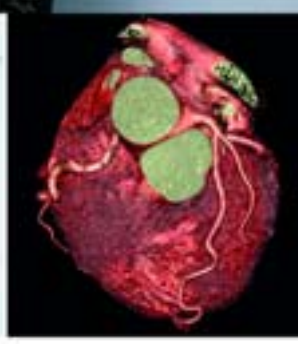

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