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EUROPEAN HOSPITAL

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

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Streaming data, speeding reports – then up to a cloud?

Forensic medicine

'The perfect murder is one that isn't actually discovered'

Austrian specialist Dr Walter Rabl: If the science is not used the impact on crime detection will be negative

In 1983, after completing his studies at Innsbruck University, **Professor Walter Rabl MD** worked as a research fellow and then junior doctor at the Institute of Forensic Medicine. In 1989 his training was complete and he qualified as a specialist in Forensic Medicine. He was then appointed as a district medical officer at the Cantonal Hospital in St. Gallen, Switzerland for a year (1991/92) and afterwards became a sworn in, legally certified expert. He wrote his habilitation in 1998. Since 2004 he has been President of the Austrian Society of Forensic Medicine (ÖGGM). He is also Deputy Director of the Institute of Forensic Medicine at Innsbruck Medical University. His work centres on lecturing, morphology, toxicology and the provision of expert consulting services.

Report: Michael Krassnitzer

Is there such a thing as the perfect murder? 'It always depends on how much effort is put into solving a case,' says Professor Walter Rabl, President of the Austrian Society of Forensic Medicine (ÖGGM), 'In any case, the perfect murder is the one that isn't actually discovered."

Committing the perfect murder may have become easier in recent years across Europe. 'There's an international trend that's resulted in fewer autopsies being carried out,' he explains. 'If forensic medicine is not being used, this has a negative impact on crime detection.'

Decades ago, almost all patients who died in hospital in Austria underwent postmortem examinations. Today, only every third hospital patient is examined after death. This mostly happens if prior surgery was carried out or if there is a vested medical interest in individual cases. People who have died beyond a hospital are only autopsied if the cause of death is not clear, which happens in around 15-20% of cases. Scientific studies show that a postmortem – even if carried out under optimum conditions – will result in a wrong diagnosis in about a third of the cases. Possible murder victims are not the only ones to end up on the autopsy table; victims of road traffic accidents also end up there – to help reconstruct how an accident occurred – which also includes those who died in the mountains (not a rarity in Austria's Alpine areas). 'The fewer autopsies are being carried out, the fewer unnatural deaths are going to be discovered,' the professor points out. The continuous decline in the number of postmortem examinations also results in a loss of knowledge. Well-founded statistics on causes of death, he adds, require autopsies in at least 30-35% cases.

There are several reasons behind the decline in postmortem examinations. Increasing cost pressures, felt internationally, are manifested in a specific funding problem in Austria. Universities only feel responsible for teaching and research, not for the work of forensic medics on behalf of courts and the prosecution. The judicial authorities in turn do not see why they should pay University forensics departments anything other than for individual reports that would help to fund teaching and research. 'We are caught in the middle,' the professor laments. Result: at the Institute of Forensic Medicine in Innsbruck Medical University, where the Tyrolean forensic expert is deputy director, two thirds of the Institute's staff have to be paid through third party funding.

Furthermore, Austrian forensic medicine is experiencing a major recruitment problem. The lack of career perspectives is putting many young medics off this 'most interesting of all medical disciplines' (Prof. Rabl). There are only a few positions at the four Forensic Institutes countrywide, and working in private practice is not an option for forensic scientists. There is also the fact that salaries are comparatively low because there are no night or weekend shifts in this discipline to help supplement earnings. In Innsbruck, a position recently had to be advertised twice before attracting any applicants at all.

A further setback for forensic medicine training in Austria is that, because the ministries of the Interior, Justice and Economics and the City of Vienna cannot agree on funding, there is currently not a single apprenticeship for forensic medicine in the capital. The Medical Council is warning that the long and successful tradition of forensic medicine in Vienna is under threat of dying out. The local Institute of Forensic Medicine is among the oldest institutes of forensic medicine worldwide, with the first chair established here in 1805.

A further trend affecting forensic medicine is the increasing use of radiological procedures to assess causes of death. Instead of being put on an autopsy table, bodies are placed in a CT or MRI scanner. Some people are already questioning whether this may be the end of dissections. Prof. Rabl is of a different opinion: 'Radiological procedures are providing us with additional information, but they could never replace a dissection. An autopsy is the diagnostic procedure with the highest efficiency.'

Europe's pressing need for transcultural competence

It's more than a language problem; migrant patients have different needs

Report: Anja Behringer

Patients with a migration background can create underestimated difficulties in healthcare systems in Western countries. The issue is not merely a lack of language skills – interpreters can help – but the entire cultural, religious, social and therefore also psychological background of these patients. Ostensibly, language barriers affect medical care and treatment, beginning at a general practitioner's (GP) surgery. Many inter-cultural studies have revealed a multi-layered, complex connection between migration and health. Results from pain therapy, for instance, show that patients with a migration background are at risk of receiving insufficient treatment.

The language barrier also leads to non-observance of follow-up examinations and appointments, a larger number of diagnostic examinations being carried out, lower therapy compliance as well as lower patient satisfaction. Language problems result in significant healthcare costs, due to longer hospital stays, for example.

Trans- or intercultural competence in a hospital is therefore a health-political mandate that healthcare institutions should satisfy, so that migrant patients also receive the best

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

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EH 6/12

Coping with pain – in German, Turkish and Russian

Open communication between doctor and patient is one of the prerequisites of successful and individual pain treatment, and pain therapy can only succeed if the patient is well informed.
When Mundipharma, a medium-size pharmaceutical company based in Limburg, repeatedly received enquiries from patients and doctors asking whether its German language booklet on chronic pain was available in other languages, the firm was prompted to publish it in Turkish and Russian.
Birgit Steinhauer, Head of Communications at Mundipharma, explained: 'Our booklet contributes to the patient's education and information because it answers commonly asked questions, such as: What can pain therapy achieve and what exactly is involved? What analgesics are there? What are the significance and advantages of opioids? Doctors as well as patients value the booklet in equal measure.'

Europe's pressing needs

Continued from page 1

possible care. However, this is about more than language problems.

At the 11th European Healthcare Congress in Munich, the German-Turkish Health Forum focused on the fact that mainly cultures dominated by religion need a different approach to illness. In hospital, this begins with food requirements, the observance of prayer times and a different way of relaying negative diagnostic results.

Women are also subject to different treatment criteria than men. The need, therefore, is not so much for an interpreter service, but for inter-cultural training for healthcare workers. To that end, an increasing number of workshops and seminars are on offer. However, at the congress, Dr Fuat S Oduncu MA EMB MBA, Head of Haematology and Oncology at the Medical Clinic and Policlinic IV, Munich University Hospital, emphasised that migrant patients always receive treatment based on Western European knowledge – and that a change of perspective is needed.

Knowledge helps healing

The medical staff needs inter-cultural competence to help understanding of migrants patients' worlds. The number of multinational teams in healthcare is increasing. Knowledge of religious aspects and aspects of everyday life, along with awareness of one's own cultural views is essential.

More and more hospitals provide foreign language hotlines and multilingual information brochures about the hospital as well as brochures published by pharmacological companies and medical device manufacturers. Employees from different countries and lay interpreters act as points of contact.

In seminars for inter-cultural competence, staff can learn more about the religious background and cultural customs of Muslims. They are, for instance, taught that the face of a deceased Muslim needs to be positioned to face towards Mecca – i.e. Southeast – immediately upon death. Specific rituals during birth are also explained. Germany is not the only country increasingly trying to accommodate the needs of Muslims in this way. In the USA, for example, the River-View Hospital in Detroit has succeeded in accreditation for 'Islamic Health and Human Services' by the Islamic Healthcare Service.

However, the debate continues over whether there should be Islamic hospitals in Western Europe in the future. The affected target group appears to have very different views.

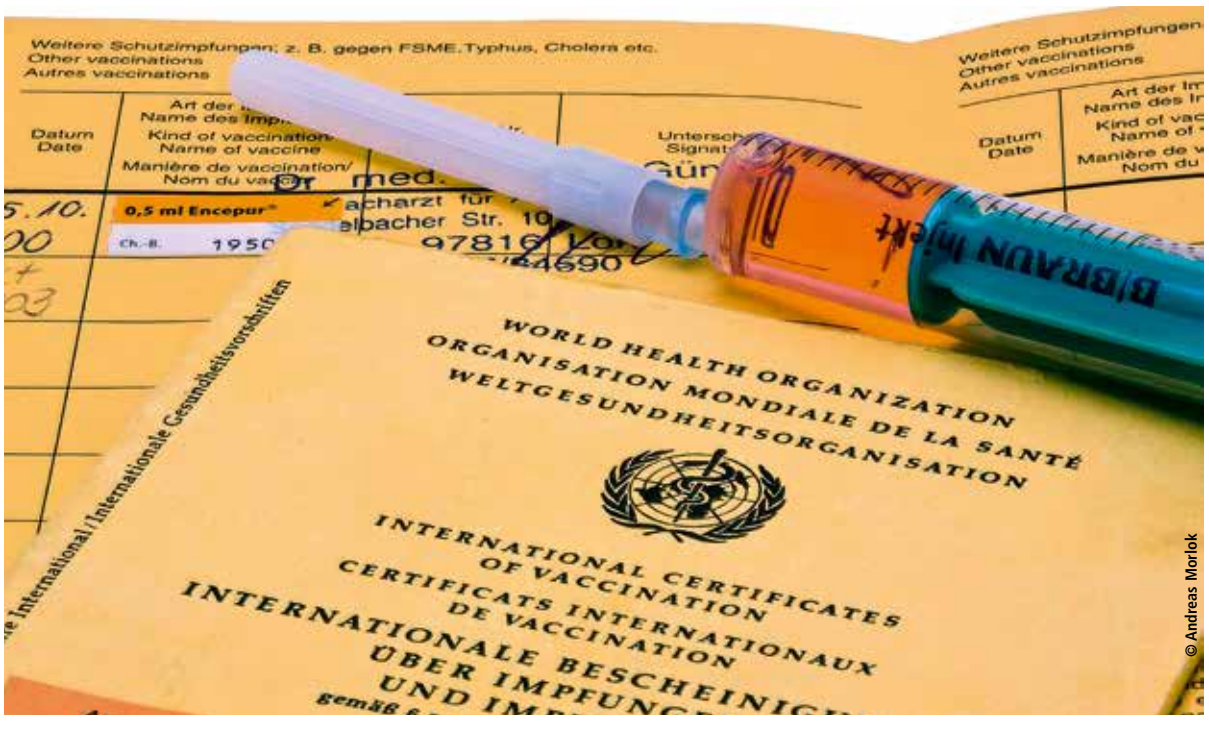
Studies have shown that increased stress amongst migrants manifests itself as psychosomatic illnesses. Conversely, studies have shown that patients who feel understood and can communicate have a significantly higher chance of being cured – and surely this is what it should be about for all involved.

Vaccination in Europe

Measles and whooping cough cases are on the rise

Report: Moira Mizzi

When country doctor Edward Jenner inoculated 8-year-old James Phipps with pus from a cowpox lesion on a milkmaid's hand, little did he know that he had started a long lasting revolution in preventive medicine. More than 300 years later, vaccination is still the hallmark of disease eradication and control, especially in the developed world, where one can safely say that we owe most of our present quality and longevity of life to vaccines' unique protective effect.



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Despite their glaring success, the existence of vaccines has been anything but a bed of roses. The battle with viruses has been particularly vicious and new strains, particularly mutations from animal pathogens, are continuously emerging. The safety of vaccines has been another tough issue – the link between the MMR vaccine (or more closely its preservative thiomersal) and autism has been among global safety issues that almost completely tarnished the allure of vaccines and surrounded them with scepticism sometimes bordering on outright hostility. The recent increasing government regulation on their production and research does not render vaccines a profitable market asset and only one or two major pharmaceutical companies produce them for public use. Thus, having so few suppliers has sometimes resulted in insufficient vaccine supplies, not to mention an increasing lack of public trust, especially following a string of scandals and lost lawsuits.

Public perception - a serious issue

Although each EU Member State has its own vaccination schedule, a large number of children are still going unvaccinated for one reason or another. During a recent media seminar organised by the Directorate-General for Health and Consumers on 'Why is it important to be vaccinated?' paediatrician Susanna Esposito addressed the perception of vaccination and obstacles against its efficient use. From her experience and studies at the University of Milan, she explained, the factors that affect vaccination include lack of information on vaccination impact and on the safety and efficacy of vaccines and that vaccines are not considered important either by attending healthcare professionals or parents. Factors that can promote vaccination include a good trusting relationship between doctor and patients, having previous positive experiences with vaccines, being more aware and educated on the importance of vaccination even when there are no pressing health hazards and knowledge on the safety of vaccines.

A classic example on the effect of public perception on vaccination is the measles issue. MMR vaccination decreased worldwide for various reasons but especially following the allegation that this vaccine or, more precisely, its adjuvant thiomersal, increased the likelihood of autism in young infants. Unfortunately, even though the allegation was disproved, the perception still held and the number of measles cases quadrupled since 2008 with several countries experiencing large outbreaks in 2010 and 2011.

The re-emergence of measles spurred the European Centre for Disease Prevention and Control (ECDC) to conduct a consultation process with experts, following which it issued a guide for healthcare professionals to enhance childhood vaccination uptake and tackle resistance to vaccination and lack of access to vulnerable groups. Ten interventions that could contribute to increase vaccination in the EU were elucidated, including investing more in educating physicians and nurses to more efficient and empathic communication with patients, efficient alert systems to remind people about vaccination, making vaccination more accessible, motivating local authorities and NGO's to address under-served groups, using mass media to promote vaccination and monitoring the web to understand concerns about vaccination and provide answers through trusted web sources, among others. The European Commission has also joined the ECDC to tackle this challenging situation. Following agreement on the need to strengthen childhood immunisation at EU level, in the 2011 Council Conclusions on childhood immunisation, the EC, ECDC and the European Medicines Agency (EMA) devised a number of measures to support EU countries. Some of these include advising them on best-practice measures during outbreaks of vaccine-preventable disease, funding projects on immunisation through the Health Programme, improving data for monitoring vaccination coverage (via the Venice network, an overview of vaccine recommendations, funding and coverage, across), encouraging European associations of healthcare professionals to help advocate childhood immunisation to parents and providing objective and evidence-based information to healthcare professionals (e.g. European public assessment reports) and the public (e.g. ECDC TV). The Commission is also assisting with the introduction of vaccines against cancer and promoting seasonal flu vaccination for risk groups aiming to vaccinate 75% against seasonal flu each year by winter 2014/2015.

Centrally, it seems that the structure both to promote and tackle the resistance to vaccination (PromoVax project) and to monitor vaccine uptake in the European Community (Venice project) is in place. There also appears to be a tangible effort to learn from mistakes made during the last pandemic and find ways to create a more efficient system both for disease surveillance and tandem action if the need arises (FastVac, FluModCont, FluResp, FluSecure). Presently, the greatest hurdle appears to be how much the EU States are willing to take this available wealth and support on board and move on to new ways of working. The data and infrastructure are there – we only need to use them.


Edward Jenner

Manchester United footballers gain CT, MRI and ultrasound systems

As Toshiba Medical Systems enters a partnership with English Premier League side Manchester United to provide state-of-the-art medical equipment at the club's training ground, team doctor Steve McNally outlines the benefits

Photographs (4) by Paul Cooper

Toshiba's executive team at the Old Trafford ground, including football stars Giggs, Kagawa and Nani.

Manchester United club doctor, Steve McNally (above) believes the biggest long-term benefit from the new equipment will be through the early detection of pathological signs to prevent injury.

Announcing that Toshiba is now the Official Medical Systems Partner of Manchester United: Chikao Kamijim, CEO of Toshiba Medical Systems Europe, with Sir Alex Ferguson.

The ground-breaking partnership between Toshiba Medical Systems and Manchester United is set to add a whole new dimension to the treatment the club's medical staff can offer to players. In becoming the club's Official Medical Systems Partner, Toshiba will provide the football club with a CT scanner capable of single rotation volumetric imaging, an MRI scanner, and five ultrasound systems including the industry-leading premium Aplio 500.

Club doctor Steve McNally said the installation at the club's Trafford Training Centre in Carrington would provide medical staff with improved diagnostic and screening tools that offer greater degrees of accuracy.

This will allow them not only to monitor healing in injuries and fine-tune rehabilitation processes but also to identify potential injuries and respond to them before they become serious. In addition, it will offer the players more privacy and increased confidentiality when they are injured or ill and avoid the need for them to attend private facilities off-site.

Dr McNally said: 'We've always been fortunate to enjoy good access to imaging facilities in the locality, but having such equipment on site will be much more convenient and less disruptive in terms of affecting training and rehabilitation programs. The convenience also means that we will have a better opportunity to use imaging as part of our daily routine. It means more privacy, increased confidentiality, and a much better experience for the players as patients.'

He said another benefit of having the equipment available to the club's medical team at Carrington is that medical staff will be able to discover more about just what the different medical imaging modalities can do for them. 'We'll find out which systems are most appropriate at certain times: what is normal, what is abnormal, and what is happening in the evolution of an injury. We can monitor healing in various injuries much more closely.'

The club already operates a comprehensive players screening programme, which includes undertaking detailed medical histories and clinical examinations in conjunction with functional tests, physical tests and some medical imaging.

'But we could start to utilise these imaging tools to look in much more detail at the anatomy of players; before they start pre-season training, what it is like after a certain phase of pre-season training, and what happens as they are exposed to the training loads and the game loads throughout the season,' Dr McNally explained.

'So, we can build a more detailed profile of what happens to the joints, the muscles, the ligaments, the tendons, the heart, the lungs and what effects the training programme is having on those tissues and organs.'

Such medical scanning equipment offers the opportunity to build complete medical profiles of players and enhances monitoring of them as they develop and age; from the youngest players at the club who are only eight years old to those in their late 30s such as Ryan Giggs, Paul Scholes and more recently goalkeeper Edwin van der Sar, who was 40 when he stopped playing.

From this, there will also be benefits for Toshiba, which will gain greater insights into sports medicine.

The partnership is the first of its kind in the UK with a football club and Dr McNally believes the Toshiba equipment provided to the club's medical team would help with the accuracy and speed of diagnosis of an injury leading to greater confidence in the treatment plan by both the patient and the treating clinician.

'In combination with our expertise and experience it allows us to inform our coaches and our team manager with a timely and likely prognosis so they can plan for the team and we can plan strategies around the whole injury scenario - not just deal with the individual patient,' he said, adding: 'I think we could also utilise the systems to fine-tune our rehabilitation processes because we can monitor the progress and the evolution of tissue healing alongside the observed functional improvements.'

'That will give us greater confidence in making a certain progression in a rehabilitation program and also what types of exercise and loading we put on a player during that rehabilitation.'

Levels of radiation exposure have always been a consideration with CT scanners but Toshiba CTs are renowned for having very low radiation exposure, allowing its potential use as a screening modality.

Dr McNally said: 'The fact that the Aquilion systems are well-known for having significantly reduced radiation doses opens up a wider opportunity to use CT as a monitoring tool.'

With MRI, the distinct advantage of the 3-Tesla is speed of imaging and higher resolution, particularly in joint injury.

'The increased detail and the facility to map the cartilage in joints over time will hopefully assist us in terms of the welfare of our players, but also it will allow us to assess the effects of our training programs on their joints,' Dr McNally added. However, he believes the biggest long term benefit from the Toshiba partnership will be in the field of injury prevention by detecting early pathological signs that would trigger a managed response long before they become acute or career-threatening injuries for players.

Manchester United Captain Ryan Giggs is equally excited about the partnership. 'It's fantastic to have such state-of-the-art equipment at the training ground. It means that having scans or medicals will be much more convenient as everything is there and to hand.'

Giggs, who is 39 and still a regular first team player, joined the club as a schoolboy when the medical team was smaller and access to advanced medical equipment and physiotherapy was limited. With the additions at the Carrington training ground, he added: 'It's no surprise that United are working with Toshiba Medical Systems and will have the latest equipment, such as MRI and other scanners, on site.'

Toshiba's new CT system

Accommodating large patients, providing the thinnest slices, and all with low dose exposure.

The Aquilion ONE ViSION edition provides 'a gantry rotation of 0.275 seconds, 100 kW generator and 320 detector rows (640 unique slices) covering 16 cm in a single rotation, with the industry's thinnest slices, 500 microns (0.5 mm),' the company reports, adding that the system can accommodate more patients with its 78 cm bore and fast rotation, including bariatric and patients with high heart rates. Additionally, the newly launched CT system from Toshiba America Medical Systems, Inc. includes the firm's third-generation iterative dose reconstruction software, AIDR 3D, which incorporates significant system enhancements by reducing radiation dose compared with conventional scanning, the firm points out.

Satrajit Misra, senior director of the CT Business Unit at Toshiba, explains, that the system 'is capable of imaging the entire brain and heart in a single rotation with 500-micron accuracy, and can capture both anatomical and functional data'. In Europe, the new system has been installed at Radboud University Nijmegen Medical Centre in the Netherlands, and another will be installed at Rigshospitalet in Denmark. Based in Tustin, Calif., Toshiba America Medical Systems (TAMS) focuses on the sales and servicing of radiology and cardiovascular systems, including CT, MR, ultrasound, X-ray and cardiovascular equipment, and coordinates clinical diagnostic imaging research for all modalities in the USA.

Details: TAMS website at www.medical.toshiba.com.

Personalised

Individually customised drug therapies have been used for the last two years, particularly for cancer patients

Report: Michael Krassnitzer

'A quarter of all medicines licensed by the European Medicines Agency EMA already contain certain genomic information to personalise their use,' according to Professor Andrea Laslop, Head of the Institute of Science and Information at the Austrian Federal Office for Safety in Healthcare (Medicines and Medical Devices Agency).

Today, personalised medicine is a central topic during large scientific congresses and conventions that focus on future healthcare, as well as in the world of politics and among medical insurers.

The critics strike out

This November a symposium held in Vienna, Austria, by the umbrella organisation of the statutory medical insurers – the Main Association of Austrian Social Security Institutions – explored the potential and limitations of personalised medicine.

Due to the high costs involved and, bearing in mind that unlike other countries Austria has no upper limits for the costs of medical treatment, one might suspect that the organisers were mainly interested in highlighting the limitations of personalised medicine.

Currently, treatments classed under the heading 'personalised medicine' are still extremely expensive. Example: the substance Crizotinib, not yet licensed in the EU but already used in the USA to treat non small-cell lung cancer. The treatment has a positive effect in 3–7% of patients and costs US$116,000 per patient per year. The test to ascertain whether it makes sense to carry out the treatment for an individual patient costs between US$250 and US$1,500. 'These sums cause those responsible for funding treatment a lot of worries,' Dr Anna Bucsics, Head of Department at the Main Association, acknowledged. Following reports by several Austrian and international experts about the huge potential of personalised medicine the hour of the critics had struck.

Dr Bucsics criticised what she believes to be a lack of scientific evidence for personalised medicine. The principle behind it allegedly leads to an 'orphanisation' of diseases, for example meaning that a widespread disease such as cancer is being split into a vast number of rare diseases. 'Studies can then only be carried out with small patient collectives, lead-

People prefer to seek medical help in public rather than private hospitals

Emergency healthcare in Spain

According to Spain's Health Ministry (Health Barometer 2010), among the people surveyed 30.1% had visited an emergency service at a public or private healthcare centre in the last 12 months – slightly lower than in the preceding year (31.5%)

Report: Dr Eduardo de la Sota

The average frequency of use of public healthcare services was 1.82 times and for private hospital emergency services 0.20 times – both practically identical to results in previous years. The average use of emergency services at public centres were, for women 2.01 times and men 1.58 whilst, on average, women used private centres 0.23 times and men 0.16 times.

As in previous years, in 2010 most of those surveyed (46.3%) who had some sort of health problem needing immediate care, preferred the public hospital emergency service as the single and sole option, without first having requested care at a primary care emergency service. That percentage is 2.3 points higher than the year before (44%), though lower than in all the preceding years.

More than five in every 10 people go to hospital emergency services, whether because it is the only immediate option or as a complement to the care they received previously at a public or private primary care service. In this edition of the Barometer, the percentage (54.5%) using the option of going to hospital is similar to that of 2009 (53.2%). The second most widely used alternative is the public primary care emergency service, where 39.5% of those needing emergency care sought it. The series showed that people are beginning to make greater use of primary care emergency services.

Of all those who went to a public hospital's emergency service to solve a health problem needing immediate care, eight in ten (78.8%) did so as a personal decision. This variable, which may be forming a trend towards an increase, is the highest percentage found in any edition of the Barometer.

Moreover, once again it would make it clear that there is a preponderance held by public hospital emergency services of solving urgent problems, and the people's trust in these clinical units. Only 20.4% of those who went to a hospital emergency room did so due to instruction by a family doctor or because they were sent from a primary care emergency service.

Almost eight in 10 people who went to a public hospital emergency service mainly did so as the result of a personal, not a clinical, decision. There were two reasons given by those who went directly to the hospital emergency service – the hospital would be better equipped and be better able to solve problems (37.7%) or because the time when the problem occurred was outside their family doctor's opening times (36.5% of all cases). Other reasons why they used the hospital emergency services were given in far lower percentages than the two reasons indicated above.

Satisfaction

Eight in 10 survey respondents given treatment at a primary care emergency service or that of a hospital (77.8%), stated it was very good or good. Men (78.1%) stated that the care in emergency services was very good or good at a rate practically equal to women (77.6%). As for the speed with which they received care in the emergency room, the percentage of people who believe it was given very quickly or fairly quickly (63.8%) is similar to the percentage in recent years. Care was provided not very quickly or not quickly at all in the opinion of 34.8%, a result very similar to that of prior years.

Emergency services used by immigrants

Interestingly, Buron et al (2008) from the Hospital del Mar, Barcelona, studied hospital emergency services use among the immigrant population in that city, comparing emergency department utilisation rates between Spanish-born and foreign-born residents in a public hospital.

The overall lower utilisation rates obtained for foreign-born residents is consistent with previous studies and probably due to the 'healthy immigrant effect'. Thus, the population increase due to immigration does not translate directly into a corresponding increase in the number of emergency contacts. The lack of differences in minor and gynaecological emergency care supports the hypothesis that immigrants overcome certain barriers by using the emergency department to access to health services. The issue of healthcare barriers should therefore be addressed, especially among immigrants.

A study on the prevalence of emergency processes and Pathologies (PACHECO ET AL. 2011).

Carried out by contacting 26 Medical Emergency Services (MES) and using a survey, this study received final data from 22 MES. Population covered: 42,538,730 Spaniards. Total number of calls: 7,656,768, with 711,228 interventions. Number of operational forces: intensive care units (mobile-ICUs): 329, rapid intervention vehicles (RIV) 20, health ambulances 39 and medical helicopters 39 (five of these 24-hour: Canary and Balearic Islands and Castille-La Mancha) and three aeroplane Interventions: mobile ICUs: 94.3%, medical helicopters: 1.4% and health ambulances: 4.3%. Number of A&E doctors/day: 388, nursing personnel 427. Pathologies dealt with, grouped according to ICE-9-MC: V-psychiatry group: 3.7%, VI-neurological group: 2.7%, VII-cardiovascular group: 9.3%, VIII-respiratory group: 3.2%, XVII-lesions poisonings group: 23.1%, IX-digestive group: 1.3%, X-XI-genital-urinary and gynaecology-obstetrics groups: 1.4%, XVI-group of other ill-defined pathologies: 40.1%. Specifically studied groups (from the MESs that provided them) were: thoracic pain - dyspnoea: 3.7%, ictus/acute cerebrovascular accident: 0.9%, alteration in consciousness: 7.7%, syncope-blackout: 2.5%, self-inflicted lesions: 2,654 (0.4%). Total of pathological and syndrome groups: 59.9% and total of other ill-defined pathologies: 40.1%. Of the pathologies considered to be of greater relevance in A&E: acute coronary syndrome: 3.1%, arrhythmias: 3.2%, cardiac arrest: 1.7%, respiratory stoppage: 0.16%, total traumatisms: 34.9%, traumatisms: 1.16%, cranio-encephalic traumatism: 1.77%, intoxications: 5.1%, aggressions: 6.9%, burns: 0.26%.


Hospital at Cadiz

University Hospital in Sevilla

l medicine

ing to deterioration in the quality of evidence,' explains the medical insurers' representative. Orphanisation would also cause high costs because only a comparatively small number of patients could be treated with one drug the pharmaceutical industry would be likely to raise their prices considerably.

Highly suggestive terms

'Biomarker-based new drugs are not necessarily a guarantor of clinical effectiveness,' said Dr Claudia Wild, head of the Ludwig Boltzmann Institute for Health Technology Assessment. Some medicines don't actually have the promised higher effectiveness and lower toxicity.

For this reason, the researcher even accuses the EMA of 'no longer being trustworthy'. For instance, the patient groups used for drug trials have nothing in common with real patients, she points out. The very term personalised medicine – along with the often synonymously used terms precision medicine and individualised medicine – are 'highly suggestive' terms thought up by marketing experts. 'You will be measured by your words,' warns Dr Wild. Health Technology Assessment is one instrument used worldwide for the systematic assessment of medical services from a patient benefit perspective.


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Dr Claudia Wild, head of the Ludwig Boltzmann Institute for Health Technology Assessment in Vienna since 2006, studied Communication Sciences and Psychology at the University of Vienna and Political Science at Ohio University (USA). Following her doctorate in 1985 she became a scientist in the Department of Communication and Political Sciences at Erlangen-Nuremberg University and freelancer on media-effective and media-political topics.

From 1986 to 2006 she was a researcher at the Institute of Technology Assessment at the Austrian Academy of Sciences, where she built up and managed the Division of Health Technology Assessment. In 2009 she wrote her habilitation at Graz Medical University, focusing on social medicine (subject: 'Resource allocation in healthcare').

The Hospital Twitter

Computer scientist Dr Dieter Kramps, an expert in and provider of safe IT, cloud and mobile solutions with a focus on healthcare, discusses social media with Michael Reiter

If only your hospital knew what it knows about your patients – nowadays, all patient and administration-related facts are mainly available online, yet still distributed across information sources (e.g. HIS, RIS/PACS, lab or nursing systems, email). Nonetheless, complete, current patient data is not only needed online in a consultancy room, ward or during ward rounds. On tablet computers and smart phones, a 360° view of a patient is now also increasingly helpful – especially when it is structured, compact and quickly available.

What social media, such as Facebook and Twitter, offers is now finding its way into hospitals. Physicians and nurses 'follow' the people and objects they work with – patients, beds, operating theatres and medical resources. At a touch they can obtain the very latest information about lab and X-ray results, changes in vital signs or the availability of required resources – and all this without phone calls, enquiries or e-mails – directly from the hospital's IT system.

Previous approaches

Hitherto, patient data has already been available online. HIS solutions increasingly turn into central information hubs not only integrating secondary systems (e.g. RIS/PACS and DMS) as data sources and data sinks, but also mobile devices. However, woe betide if you need to change your HIS – this hub is immediately lost and can only be replaced with difficulty.

Another option is an integration server. You can access relevant data from the clinical production systems and make it available, sometimes also with a master patient index, for active recall … provided the production systems have open and affordable interfaces for integration. Based on the respective application, standards such as IHE, HL7 and DICOM help to facilitate integration.

The micro-invasive way

The use of the mechanisms we know from social media results in a more efficient 'micro-invasive' way. 'Streamers' scour production systems for current data entries, condense that data and assign it to number ranges, security levels and access rights and also observe compliance regulations in the hospital. The result is posted into a secure information system, which is available location-dependent as well as on a mobile basis. Staff can now follow this information according to their respective roles and rights. If details are required, one click at the PC, or mobile phone, establishes direct phone contact with the information originator. A link via a push button and a suitable connector ensures data availability. Existing DMS or archiving systems are useful in lowering the variety of interfaces required for a HIS. Classic integration servers, streamers provided by the manufacturers and related apps are further solution components.

The expense is manageable: A central server makes condensed data available uniformly, on a fixed and mobile basis. A safe 'app' ensures device-appropriate display and processing. A respective, customised streamer connects the server and the production system.


Dr Dieter Kramps

Now a physician, nurse or administrator decides which information they need, when and for how long, and what and whom they want to keep on their radar. Internal e-mails are minimised, hours of viewing and processing correspondence dwindle to minutes. The previous information flood changes into a compact, active, condensed data stream from the clinical systems directly to the user. In addition, a precise, compliance-conforming, secure information system for change-over management and online-information is then also available for external nurses, rehabilitation clinics and GP surgeries.

http://cobago.net

Medical research in Fr

Since its creation three years ago, the French National Alliance for Health and Life Sciences (Aviesan) has proved its full worth in scientific coordination

André Syrota (left), President of Aviesan, with Chris Viehbach, Director-General of Sanofi-Aventis.

Annick Chapoy reports from Paris

Life and health sciences are faced with considerable scientific challenges: modern biology calls on mathematics, physics, chemistry, social and human sciences to determine the place of each mechanism that is identified within a network of interactions that is growing more complicated. The environmental impact has been proven; it must be integrated into the study of physical and pathological mechanisms. High-speed data processing and analysis must be used for the benefit of life sciences.

The economic impact of research into life sciences in industrialised countries must be considered, as must inequalities in health and access to healthcare, that are likely to be accentuated by medical innovations.

Faced with growing international competition in the life sciences sector, French research had to step up a pace. With this aim, the French National Alliance for Health and Life Sciences (Aviesan) was created in 2009.

Aviesan includes nine essential academic founding members: CEA (Commissariat à l'Énergie Atomique), CNRS (Centre National de la Recherche Scientific), INRA (Institut National de la Recherché Agronomique), INSERM (Institut National de la Santé et de la Recherche Médicale), Institut Pasteur, IRD (Institut Regional de Développement), Inria (Inventeurs du Monde Numerique), CPU (Conférence des Présidents d'Université) and CHRU (Centres Hospitaliers Régionaux et Universitaires) comprised of chairmen of regional and university hospital centres.

Aviesan is structured around 10 multi-agency thematic institutes (known as ITMOs), operational bodies for research coordination, with the particular role of forming links between French research groups covering major research themes – molecular and structural bases of living organisms, cell biology, development and evolution, cancer, circulation, metabolism, nutrition, genetics, genomics and bio-informatics, immunology, haematology, pulmonology, microbiology and infectious diseases, neurosciences, cognitive sciences, neurology, psychiatry, as well as public health and healthcare technologies. Its objective is to make access to French academic research easier, and not just research from supervisory ministries (in particular the Ministry of Research and the Ministry of Health), but also research from industrial and international partners.

Three years after its creation, following three main lines of action, Aviesan has enhanced the reactivity and visibility of French research in the fields of life and health sciences, particularly by improving coordination between the French, European and international research institutions.

Since 1979, nuclear medicine specialist and Aviesan's President **André Syrota MD** has been a university professor and senior clinician at the University of Paris Sud. He has headed the CEA Frédéric Joliot Hospital Department in Orsay since 1984 and teaches biophysics and nuclear medicine at the Paris Sud Medical Faculty. Additionally, since 1993 he has directed Life Sciences at the CEA.
In 2007 Prof. Syrota was nominated Director General of INSERM and its President-Director General in 2009.
His research on the development of non-invasive functional imaging techniques in humans is based on positron emission tomography (PET) and Nuclear Magnetic Resonance (NMR). His research has given rise to numerous publications.

Some Aviesan achievements

- During the 2009 H1N1 influenza outbreak, Aviesan immediately galvanised its research teams, mainly using three ITMOs. The microbiology and infectious diseases ITMO, as coordinator with a sound knowledge of the research teams, liaised with the public health and healthcare technologies ITMOs and thus, within 48 hours, managed to gather the different researchers, clinicians and industrials concerned, along with representatives of the Research and Health Ministries. Priority research targets were defined during the first meeting and actions undertaken.

- Following the Fukushima nuclear power plant accident in 2011, Aviesan produced a report for the ministry of higher education and research, coordinated by the healthcare technologies ITMO, in which Aviesan made a list of proposals. A call for nuclear safety proposals has since been launched based on that accident.

- Given the decisive part it has played in assisting the biology and health research infrastructures, Aviesan has played a key role in France's participation in the pan-European research infrastructures defined in the ESFRI's (European Strategy Forum on Research Infrastructures) road map.

- To meet the challenge of neuro-degenerative diseases, a challenge well beyond the scope and resources of one country alone, the Aviesan alliance initiated a common European strategy to fight Alzheimer's as well as other neuro-degenerative disorders.

Medical research in the United K

The formation of the National Institute for Health Research has made the field vastly stronger and the country is now placed second only to the USA

Mark Nicholls reports

The UK has a long record of medical research and a reputation that has grown considerably in this arena in recent years. Funding via the government, private organisations, industry and leading charities has led to a number of innovative breakthroughs benefiting patient treatment and care.

That process has been enhanced more recently with the creation of the National Institute for Health Research (NIHR) by the Department of Health, which has overseen NHS-based research, while the Medical Research Council (MRC) – established in 1913 – has continued to co-ordinate pre-clinical research. It works through its Council, scientific boards, and committees, in close partnership with Health Departments, other Research Councils and industry to identify and respond to the country's current and future health needs. Individual projects have also benefited from EU funding.

However, since its establishment in 2006, the NIHR has increased the volume of applied health research, driven faster translation of basic science discoveries into tangible benefits for patients and supported the people who conduct and contribute to applied health research. It manages its activities through four main work strands: The NIHR Faculty, NIHR Research, NIHR Infrastructure and NIHR Systems.

Government funding

Professor Tom Walley, Director of the NIHR Evaluation, Studies and Trials Coordinating Centre, explained that, in the UK, government funding for medical research either goes to the NIHR via the Department of Health for National Health Service (NHS) research based in a clinical setting or the MRC in an annual grant via the Department for Business, Innovation and Skills (BIS) for pre-clinical research and basic science. 'There is,' he explained, 'a degree of overlap between the two, for example when basic science moves into the NHS sphere for trials and there is a joint programme that covers this area.'

In addition there is funding from the pharmaceutical industry and through charities such as Cancer Research UK and the British Heart Foundation, which is often supported by the NIHR Infrastructure.

The NIHR is interested in applied research that will bring benefits to patients – for example the pulse oximetry study, led by Dr Andrew Ewer of the University of Birmingham, with findings published earlier this year.

The study measured blood oxygen levels of more than 20,000 apparently healthy new-born babies across six UK maternity units and discovered a quick and painless test that can detect more incidences of life-threatening cardiac defects in new-born babies.

In addition, the CRASH-2 trial, led by Professor Ian Roberts from the London School of Hygiene and Tropical Medicine, found that early administration of tranexamic acid (TXA) in major trauma patients substantially reduced the risk of death.

Professor Walley said the current standing of UK medical research is second only to that of the USA, and added: 'In terms of where we were 10 years ago and where we are now, medical research in the UK is vastly stronger since the creation of the NIHR. It gives better utilisation of funds that were already being put into medical research and the government has recognised that medical research can save money and improve care.

'There are difficulties and challenges though; we have to change the culture in the NHS, which is not always research friendly, but our strength is in very strong basic science in the universities, good links with the pharmaceutical industries and the NHS providing a strong testing ground for research.'

Charities

The independent stream of research funding from charities in the United Kingdom remains vitally important and complements the objectives of the Research Councils and Government departments.

The Association of Medical Research Charities (AMRC) is a member organisation of the leading UK charities that fund medical and health research and its 100-plus members, including the Wellcome Trust, provide funds in various ways, ranging from small pump-priming grants to substantial funds intended for programmes of research. Cancer Research UK, for example, gives a significant proportion of its scientific funding to its core research institutes in the UK, but it also works in partnership with other organisations in the fight again the disease, while the BHF awards new research grants every month to the top cardiovascular scientists and spends about £88 million a year on research.

Research projects in the UK have benefited from EU funding through the EU Research Framework Programmes, particularly where there is collaboration with European partners. The UK Research Office (UKRO) promotes this and has a key role in promoting effective UK participation in European Commission funded research programmes.

Medical research in the UK is regulated by the Health Research Authority (HRA), which was set up in December 2011 to protect and promote the interests of patients and the public in health research.

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This strategy is a perfect example of the common goal of the 25 European countries involved. The first actions are scheduled for 2012.

- Each of the 10 ITMOs drew up a critical review of its research and also analysed its weak and strong points in order to suggest priority actions. Through its ITMO entities, Aviesan has demonstrated its ability to group the right experts in record times, regardless of the institution to which they belong, to prepare a coordinated response to the needs of the authorities, needs often dictated by current events (such as reports and recommendations on technetium supply, bio-informatics and hadron therapy).

- Since 2009, Aviesan has organised nearly a hundred scientific meetings, all aimed at looking towards the future. These meetings have attracted not only researchers from all kinds of institutions, but also learned societies, organisations involved in the 'hard' sciences and social and economic bodies. The next few months will see the first symposium of the public health institute entitled 'Determining factors in health, and social inequalities'; a symposium on 'Rare diseases and model organisms' organised by the genetics, genomics and bio-informatics institute and the cell biology, development and evolution institute; the fourth annual meeting of the institute of healthcare technologies; the summer school at the institute of neurosciences, cognitive sciences, neurology and psychiatry, and the international research symposiums organised with the help of ARIIS (alliance for research and Innovation in health industries).

- Since 2009, Aviesan has helped to bring Inserm's Avenir programmes closer together with the CNRS' ATIP (incentive thematic action programme). The joint programme, renamed ATIP/Avenir and run by Inserm and CNRS, helps young researchers to set up and lead a team within a French research entity. It involved 80 researchers from all fields of science, who were given ideal conditions in which to work on their ambitious research projects.

Bringing together innovations from labs and industry

In February 2010, Aviesan and the leading pharmaceutical company Sanofi-Aventis signed the very first research partnership agreement. This provided financial backing to help the young researchers who had won the ATIP AVENIR prize from CNRS/Inserm, plus a promise to invest up to €50 million over five years in public/private research partnerships. Sanofi-Aventis thus enhanced its commitment to French research through this partnership with Aviesan.

In order to smoothe along relationships with the industrialists, make things simpler and encourage innovation, Aviesan decided to set up a 'single point of contact' system for the industrialists. In practice, the founder members of Aviesan signed a 'single representative charter' in April 2011, which means that one person is appointed as a single contact to carry out negotiations with industrialists involved in multiple research facilities.

In 2011, an epidemiology portal was also created to make it easier to share public health data between the different research bodies and thus create an environment that would be conducive to the development of original scientific joint ventures. In concrete terms, any industrialist can rapidly access on-going research work (cross-sectional studies, cohort studies, interventional clinical trials, etc.) and contact the academic teams in order to develop research partners.

Aviesan's initial achievements have been conclusive, however much is still to be done to raise French research in life and health sciences to the highest level. Aviesan's ambitions are to continue and reinforce its actions along the same lines as those already explored and in which it has already proved its efficiency. Three years after its creation, Aviesan wants to keep its informal character, because this allows it to act collectively, freely and intelligently in all aspects of research into life and health sciences.

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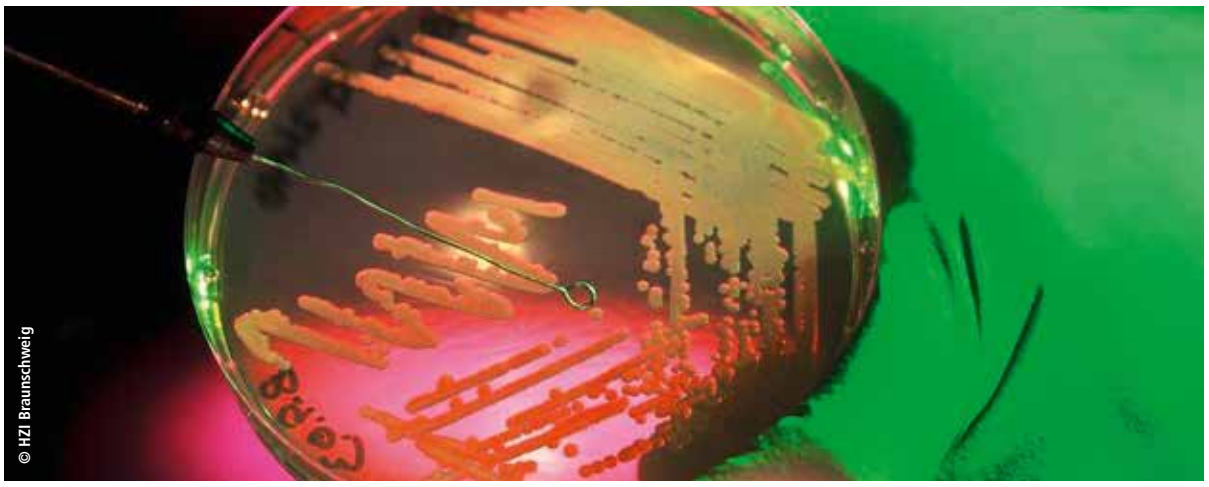
Tom Walley, Professor of Clinical Pharmacology at Liverpool University and a Consultant Physician at the Royal Liverpool University Hospital, is also director of the NIHR Evaluation, Studies and Trials Coordinating Centre as well as the HTA (Health Technology Assessment) Programme – part of the NIHR – producing independent research information about the effectiveness, costs and broader impact of healthcare treatments. Formerly he headed a research group at Liverpool University focusing on drug prescribing, pharmaceutical policy, clinical and cost effectiveness In 2008, he was awarded the Order of the Britisch Empire (CBE) by the Queen for his services to medicine.



Strengthening collaborations in systems biology

French and German experts hear of a possible new computer-based system to identify new biomarkers for colon cancer. And perhaps there is a new way to design vaccinations based on new understanding that memory cells are generated early in the immune response to infection, Bettina Döbereiner reports.

About 90 participants gathered in the French Embassy in Berlin this November to hear 16 lectures in just one day. In a French-German joint workshop entitled 'Perspectives of systems biology - from modelling to therapy of complex diseases', the talks covered general funding strategies, with presentations of selected institutions and departments specialising in systems biology and introductions of core areas of systems biology research in both countries.

The workshop was initiated by the Scientific Department of the French Embassy and BioTOP Berlin-Brandenburg, which is a central contact and coordination office for all issues concerning biotechnology in the region, and is funded by the Federal States of Berlin and Brandenburg. Welcoming participants, BioTOP's CEO, Dr Kai Uwe Bindseil, explained that the workshop is part of a series of annual conferences organised with the French Embassy since 2007, to cover current scientific issues such as regenerative medicine, obesity or functional food. This time scientific partners were the École Normale Supérieure (ENS) in Paris, and the Max Delbrück Centre for Molecular Medicine (MDC) in Berlin-Buch, Germany.

There are plenty of definitions of systems biology in the literature and even at the workshop definitions varied. However, it is beyond dispute that, as a relatively new field of research in life sciences, systems biology can be seen as a shift of perspective from studying single and specific components of the organism to the focus on relations and interactions between the single components in terms of the whole system in time. Thereby scientists inter alia hope to understand the functioning of complex diseases better and develop enhanced diagnostic tools and more effective therapies. In this approach, mathematical analysis and computational modelling play a key role to comprehend the complex biological interrelations.

Therefore, multidiscipline is a pre-condition for this new research branch, as was seen in the gathering, which included biologists, chemists, physicists, mathematicians, computer scientists as well as physicians and other healthcare professionals.

That systems biology advances to become a key-issue in life sciences also may be seen in the funding strategies of France and Germany. In her lecture, Karin Efferts PhD from the German Ministry of Education and Research (BMBF) introduced e:Med – Measures for establishing systems biology – the new funding concept for systems biology in Germany, launched in 2012. The programme predicts €200 million in funding over the next eight years. Recently, systems biology projects in France have also been funded on a large scale. As Jean-Michel Heard PhD from the French National Research Agency (ANR) reported, in 2011 and 2012, as a part of its so-called future programme, France began funding systems biology for the next ten years, which will amount to around €300 million dedicated to infrastructure, equipment and projects related to systems biology.

All lectures held at the workshops primarily addressed the analysis of complex diseases such as neurodegenerative, cardiovascular or inflammatory, as well as cancer on a very basic, pre-clinical level. One interesting typical systems biology example of the cooperation between biology and the computational sciences is a project headed by Professor Thomas Höfer from German Cancer Research Centre and the BioQuant Centre for Quantitative Analysis of Molecular and Cellular Biosystems, at Heidelberg University. He presented his recent results regarding the fate decisions of lymphocytes during infectious diseases. By means of computer modelling he and his team recently developed a model for the pathway of the differentiation of naive antigen-specific T cells into long-living memory cells. In the first phase of project, Professor Dirk Busch and his team at Munich Technical University observed the fate of individual naive T cells in infected mice.

Prof. Höfer and colleagues then generated a set of different potential pedigrees of naive T-cells through mathematical analysis. Later on, these models of pedigrees were compared to the observations made in adoptive transfer models. The results were clear – only one of these models was suitable to explain the data. It indicates that the precursors of memory cells are generated early during the immune response to infection, rather than – as had been previously thought – at its very end. If further validated, this new finding for example will have implications vaccination design.

The ppp-project OncoTrack – a more practical oriented research –was presented by two industry representatives, David Henderson PhD, Principal Scientist at Bayer Healthcare and project coordinator, and Bodo Lange PhD, CEO of Alacris Theranostics.

OncoTrack is one of the largest ppp (public/private partnership) projects in systems biology. With funding of around €27 million from the European Innovative Medicines Initiative (IMI) and partners from the pharmaceutical industry, the project involves 21 partners in Europe and is scheduled for completion in five years. The ambitious aim of OncoTrack is to develop a computer-based system to identify new biomarkers for colon cancer. Called ModCell, the computer model was developed by Prof. Hans Lehrach's department at the Max Planck Institute of Molecular Genetics, Berlin, and exclusively licensed to the spin-off company Alacris in 2010.

The system integrates data from sources such as genome, transcriptome, drug action, protein function and their mutant variants obtained from the literature and from public databases. With this unique systems biology approach the project partners analyse the obtained genomic and patient data on colon cancer.

On cell and mouse xenografts the ModCell system is validated to predict optimised drug actions for patients based on genome and transcriptome information from the individual patient's tumour. This approach also aims to identify complex biomarkers that will improve diagnostics and therapy.

1. David Henderson, 2. Jean-Michael Heard, 3. Prof. Thomas Höfer
Pictures: C.H.Wegen

4. Bodo Lange, 5. Karin Effertz, 6. Dr Kai Uwe Bindseil

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New, promising methods, tools and tests for prevention and treatments

Jacquie Michels

A recent webinar, hosted by the American Association of Clinical Chemistry, featured doctors Duane Newton of the University of Michigan and Susan Novak-Weekly of Kaiser Permanente. The presentation, entitled Molecular Testing for Methicillin-Resistant Staphylococcus Aureus (MRSA) and C. Difficile *(C. diff):'Using New Tools to Identify and Reduce Healthcare-Associated Infections'* (HAIs), outlined the problem of rising rates of these two virulent and possibly fatal infections, possible new testing methods, and suggestions for controlling outbreaks where risk is greatest.

'C. diff and MRSA are healthcare-associated infections,' Dr Newton pointed out. 'They are among the top ten causes of death in any such setting – and all are preventable.' According to Newton, there are up to two million infections caused in the healthcare setting, and as many as 1.7 million related deaths. These include urinary tract, bloodstream, surgical site and pulmonary infections.

Dr Newton is not surprised by these risks. 'Healthcare institutions use surgical procedures, injections, and in-dwelling devices, such as catheters, and there are countless sources of contamination,' he said. 'Infection can be passed between provider and patient. And over-use of antibiotics has made this problem infinitely more complicated.'

The USA's Department of Health and Human Services has devised some initiatives to eliminate healthcare-based infections. 'A steering committee was formed at the federal level, and an action plan was published in 2010 that contains clinical, administrative, and governmental directives and strategies to manage this problem,' Dr Newton said. 'Some of their findings seem self-evident, but calling in federal involvement and organising

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these issues under one agency is a major step toward improving infection rates and bringing new weapons to bear on the problem.'

At the clinical level, the committee advised a reduction in the use of medical devices that could transmit infection, as well as increased hand washing and barrier precautions, and antimicrobial stewardship, or personal awareness and caution during testing and care. The government mandated financial initiatives for improvement of infection rates, increased reporting, and better system-based protocols and approaches.

According to Dr Newton, those actions, in addition to increased awareness and improved testing methods, have led to a 30% reduction in C. diff and a 25% reduction in MRSA infections in responding hospitals and clinics.

C. diff is the most common cause of hospital-acquired diarrhoea, Dr Novak-Weekly pointed out. 'Cases of C. diff tripled between 2000 and 2005,' she said, 'leading to as many as 15,000 deaths per year. Risks of death increase in older patients, those with prior antibiotic use, and those who experience extended hospital stays.' 165,000 cases were reported between 2007 and 2009, leading to costs of around $1.3 billion and 7,000 annual deaths.

Additional reports were issued by the Society for Healthcare Epidemiology of America (SHEA), and Infectious Disease Society of America (IDSA) to suggest clinical approaches for C. diff. These reports suggest that applicable case definitions and restrictions could be used to conduct surveillance for infection onset. 'Hospitals need to implement antimicrobial stewardship programmes for many other infections as well, in order to prevent drug resistance,' Dr Newton added.

Testing methodology

In response to these reports and government mandates, a flurry of new testing options has been introduced. 'The testing methodology should fit with the hospital's work flow, employee base, and need for speed,' she said, going on to describe new options, such as molecular assays, toxigenic culture, C. diff Complete (GDH molecule and Toxin A/B), and the new LAMP technology, as well as the Cepheid Gene Xpert, among many others. Information is available online explaining the differences and benefits for each type of testing.

'There is no one right answer among these options that will fit every lab or hospital,' Dr Novak-Weekly said. 'Each must evaluate all the variables to make its selection. In 2007, we at Kaiser chose a molecular model test (made by Cepheid), which helps us track C. diff rates both in the hospital and the community. We then report our data to the National Healthcare Safety Network and the California State Department of Health. Because we have several hospitals, our findings give these overseeing agencies an overview of the situation in this State.'

Staphylococcus Aureus (SA) presents as a skin flora or infection of the urinary tract. It is worse when the infection is resistant to methicillin, which is encoded by the MecA gene. 'So new testing options target MecA as a diagnostic marker,' Dr Newton explained. Studies find as many as 300,000 hospitalised patients have MRSA, and that MRSA is 2.5 times more lethal than other infections. Up to 30% of the regular population carries SA, but hospitalisation significantly increases the risk of infection, especially in older people, or those who have been in a care facility,' he added. 'In hospital settings, high-risk admissions include those who admit through the ER, inter-hospital transfers, and ICU, surgical, or burn unit patients.'

A key question for administrators and practitioners is how wide a net should be cast by institutions when trying to identify MRSA or C. diff patients. There is no consensus between the CDC or SHEA on exact guidelines to follow, but some issues are clear:

- Enhance routine activities of identifying, reporting, and following precautions during contact with infected patients.
- If infection rates are rising dramatically, active surveillance is critical. Use contact precautions, such as hand hygiene, barriers such as masks, gloves and clothing covers, and do a better job of using the tools at hand to prevent further spread. Report the outbreak immediately to your local agency.

To detect MRSA, Dr Novak-Weekly explained, most new options include chromogenic media or commercial real-time assays. Some platforms use a nasal swab; a new offering from Roche uses heat and glass beads to release the pathogen from the swab. This MagNA-Lyser is FDA-approved and completes the assay in two hours.

'There is no clear choice, as I noted before, in selecting testing equipment for C. diff, and the same is true with MRSA,' Dr Newton added. 'Using culture-based testing, you get lower costs, no up-training for staff, a high throughput of tests, but a slow turn-around time. With polymerase chain reaction (PCR) the cost is as much as five times higher, and special training is required for staff. A culture sample is required, but it works much more quickly.'

'These are serious infections, and can have broad and even fatal impact in a hospital,' Dr Novak-Weekly added. 'Expect more testing options, and guidelines on who and when to test. In the meantime, we recommend you share data with your local agencies and institutions in your area to help you make the right choices with these complex questions.'

A call for greater hygiene expertise

Nosocomial infections

Interview: Bettina Döbereiner

As in so many European countries, nosocomial infections have hit the headlines in Germany over and over again in recent years – as when three premature babies died in a Bremen neonatal clinic in 2011. Tragically, they were among the many: between 10,000 and 15,000 patients die of a hospital-acquired infections every year. In Germany the annual figure is 500,000 – and yet an estimated 1,500 to 4,500 of those deaths could be prevented by enhanced hospital hygiene measures, according to hygiene expert Professor Petra Gastmeier, Head of the Institute for Hygiene and Environmental Medicine at the Charité, University Medicine, Berlin and director of the German National Reference Centre for the Surveillance of Nosocomial Infections.

'We anticipate that around a third of hospital acquired infections could be prevented,' Prof. Gastmeier explained. 'The exogenous infections are particularly avoidable. However, endogenous infections are often inevitable.

'Fortunately, the majority of nosocomial infections in Germany, around 42 percent, are harmless and easily treatable infections of the urinary tract. However, infections of the lower airways (around 21 percent), wound infections (about 16 percent) and sepsis (around eight percent) can be fatal, especially if the pathogens inducing the infection are multi-resistant. Around 10 percent of all hospital germs are multi-resistant and therefore difficult to treat.

Which pathogens are they?

First, the Methicillin-resistant Staphylococcus aureus – MRSA – the incidence of MRSA is still stable. A national evaluation showed, that the rate of MRSA did not increase in between 2001 and 2009 and, compared to the other European countries, our rates are even a little lower than the European average. However, we are very concerned about the distinct increase of gram-negative bacteria, such as the extended-spectrum beta-lactamase-producing agents (ESBL).

Why is the incidence of ESBL-producing bacteria so alarming?

ESBL is an enzyme, breaking the molecular structure of most antibiotics, de-activating the molecule's antibacterial properties and thus invalidating its therapeutic effect. By now germs have been identified that are even resistant to carbapenem antibiotics, the current reserve group for the treatment of ESBL-producing bacteria. We do not have any drug to combat these bacteria and there are no antibiotics in the pipeline. Therefore further hygiene steps are highly important to avoid the transmission of these germs. One of the most important means is the correct conduct of hand hygiene at the right time in the right place. The average hand hygiene compliance among German hospital staff is about 50 to 60 percent, in other words, every second hand-rub is left out.

Why? Partly, because there's a lack of knowledge, for example, to know when hand hygiene is essential or how to hand-rub effectively. Some hospitals, or wards, still don't attach sufficient significance to hand hygiene or hygiene is not even institutionalised. In some cases hand-rubs aren't even available where necessary. However, the main reason is the heavy workload, often linked with understaffing. Recently we published a study proving that the nurse to ventilated patient ratio has a significant impact on the nosocomial infection rate.

Professor Petra Gastmeier

In 2008 the 'Aktion saubere Hände' (Clean Your Hands Campaign) was set up. The campaign offers a large scale of resources, information, educational material etc. and also monitors the compliance of hand hygiene and the consumption of alcohol hand-rub. How would you evaluate, as the director of one of the organising institutions, the effect of the campaign up to now?

Among the 152 hospitals voluntarily participating, we could evaluate an increase of hand-rub consumption of altogether 36 percent in three years, compared to the starting situation in 2007. That is a striking success and, because of this compelling result the Federal Ministry of Health promoted the campaign for a further three years. Up to 2013, we will broaden the focus of the campaign on care facilities and out-patient care.

What could be done to enhance hospital hygiene further?

We definitely should invest more in education! In the last decade, plenty of Chairs in hygiene have been reduced in Germany – leaving only six in 2011. I therefore appreciate the implementation of crash training courses in hygiene for internists, intensive care specialists, surgeons etc., because of the requirements of the revised German Infection Protection Act of 2011, to rapidly correct the shortage of hygienists in Germany's hospitals.

A high acquisition cost but low running costs

Mass spectrometry

'Mass spectrometry has developed into a successful routine procedure,' according to Dr Christoph Seger (Univ. Doz.), technical head of the Mass Spectrometry and Chromatography division at the Central Institute of Medical and Chemical Laboratory Diagnostics, Innsbruck University Hospital, Austria

Report: Michael Krassnitzer

However, in the run-up to the 4th Annual General Meeting of the Austrian Society of Laboratory Medicine and Clinical Chemistry, he admitted '… mass spectrometry is currently still being treated as a very exclusive procedure'. In Austria, for instance, it is only available in university hospitals and some larger laboratories. 'But,' he added, 'as international trials have shown, the use of mass spectrometry in laboratories is very much on the increase.'

Tandem mass spectrometry combined with liquid chromatography (LC-MS) allows a much more precise measuring of drug levels compared to other, conventional procedures. This makes individualised dosing – which is frequently necessary – much easier, leading to an optimisation of the effect and a reduction in undesired side effects. LC-MS chemically analyses body fluids by transporting ionised particles, sorting them and quantitatively recording them. The procedure offers several advantages: It requires only small amounts of sample material and facilitates measuring, with high precision and reliability, those small molecules for which previously there had been no suitable analysis procedures. Unlike conventional procedures, the new method also enables measuring several substances simultaneously. LS-MS is particularly efficient whenever the matter involves measuring small molecules introduced into the body. For a long time this was the only routine method for forensic and toxicological problems, where substances had to be clearly identified to detect unknown drugs and toxins. In the last few years a further focus of application has been added, i.e. measuring levels of medication present in the body. Here, the first area of application was to measure the levels of immune suppressants patients should take following transplant surgery, for the rest of their lives, to maintain organ function. Meanwhile, mass spectrometry also has a central role in neonate screening. It facilitates the diagnosis of a whole range of metabolic disorders from just a few drops of blood in a very short period of time, which is the basic prerequisite for the introduction of respective treatments and diets.

'The acquisition cost of mass spectrometers at several hundred thousand euros is high,' Dr Seger says, but adds, 'running costs are comparably low because each analysis costs only a few euros.' By contrast, whilst immunological tests only entail low acquisition costs they result in much higher reagent costs.

Dr Walter-Michael Halbmayer (Univ.-Doz.), Specialist in Laboratory Diagnostics and Human Genetics at the Hospital Vienna-Hietzing, described a virulent problem in laboratory diagnostics: new oral anticoagulants (NOAC) distort a number of important laboratory coagulation tests and can therefore simulate pathological changes of the coagulation system – especially if the blood sample was taken shortly after their administration. 'Therefore we urgently recommend that the examining laboratory should be notified whenever such medication has been taken prior to the analysis of the respective blood samples,' Dr Halbmayer advises. In addition to the anticoagulant name, the laboratory should be notified when the medication was last taken and at what time the blood sample was taken. 'This is the only way to detect laboratory measurement results that might have been impacted by anticoagulants and to avoid misdiagnosis, or the wrong treatment.'

There is no provision for routine laboratory monitoring of the new anticoagulants. However, in some situations, such as prior to surgical interventions, confirmation of the presence of the new anticoagulants through laboratory testing may well be desired. For these situations laboratories have special testing systems already licensed at their disposal – but only with limitations, as Halbmayer emphasises: 'As yet there is too little experience with these tests to allow us to routinely use them in daily clinical life, such as for the assessment of the risk of bleeding.'

Having studied chemistry, biochemistry and biology, in 2001 **Dr Christoph Seger** (Univ.-Doz.) gained his PhD at the University of Vienna. Research stays followed at the Max Planck Institute for Biochemistry and in the USA. Back in Austria, he became a University Assistant at Graz University and, in 2002, a research assistant at the Institute of Pharmacy, Innsbruck University. Then, in 2005 he was a freelance scientist before, in the same year, taking the role of technical head of the Mass Spectrometry and Chromatography Division at the Central Institute of Medical and Chemical Laboratory Diagnostics, Innsbruck University Hospital. In 2008 he wrote his habilitation on 'Pharmacognosy'.

© Shimadsu

Controllin

There is no other way: We need a compreh to their responsibility to combat this seriou

Report: Moira Mizzi

The most basic instinct of every living organism is survival. What selects one organism or species over another, in fact, is its capacity to withstand any kind of adverse condition that comes its way – what scientist Herbert Spencer called 'the survival of the fittest'.

When antibiotics were invented in the early 20th century the world breathed a collective sigh of relief, thinking that the fight against infectious disease had finally been won. However, the relentless misuse and abuse of antibiotics, both in human and veterinary medicine, led to the emergence of resistant bacterial strains which, compounded with the paucity of new antibiotic molecules in the pipeline, is contributing to the desperate state-of-affairs we have today. Bacteria acquire resistance to anti-microbial agents either by mutation during replication or by encoding a mechanism of resistance from other bacteria. Microbes can easily acquire resistance to many antibiotics resulting in multi-drug resistance; in extreme cases, this can extend to all anti-microbials available on the market.

Every year in the European Union, about 400,000 citizens acquire an infection with a resistant bacterial strain and of these 25,000 die as a result. Multi-drug resistant strains

Paediatrics

In-line filters significantly lower severe complications as well as SIRS cases.

Report: Bettina Döbereiner

The use of in-line filters for infusion therapy significantly lowers the rate of severe complications in children aged between 0-18 years being treated in intensive care units, according to a new study from the Paediatrics Clinic at Hannover Medical School (MHH). The study also confirmed that the number of cases of systemic inflammatory response syndrome, SIRS, dropped substantially through the use of this procedure.

Discussion about the use of in-line filters in ICUs is not new. For a while, filters were mainly recommended and used to keep micro-organisms at bay. However, an indisputable benefit, particularly in terms of the number of sepsis cases, was never conclusively proved in any studies, explained Dr Michael Sasse, Senior Consultant paediatrician in the ICU at the Hannover Medical School Paediatrics Clinic, who was among the initiators of the study. 'In-line filtration reduces severe complications and length of stay on the paediatric intensive care unit'.

However, since verification that fine dust caused by diesel engines can cause infectious reactions if inhaled, resulting in the introduction of preventive fine dust filters, concern has increased over 'fine dust' in infusions. Moreover, in recent years, the number of drugs administered daily on ICUs and their administration by infusion has increased substantially. According to Dr Sasse, this results from increasing economic pressure on ICUs. 'The average patient on our intensive care ward receives around 50 drug administrations per day, be it via syringe pump, short infusion or bolus,' he points out. A solution always includes particles – an estimated 100,000 per litre of infusion. They are unavoidable, a part of the nature of any solution. However, some of these minute particles are in fact avoidable. They only develop during the drug manufacturing process, be it through abrasion on three-way valves, or during preparation of a drug's administration – such as the opening of a glass vial – or as a result of intolerance reactions involving several different drugs with respective precipitation reactions. The study carried out from 2005 – 2008 and published by Dr Sasse and his team in mid-2012 was the first in a clinical setting to examine whether filtration of particles has an impact on the patients' state of health. 807 children participated, with 401 patients in the filtration group and 406 in the control group. The filters used were customary filters supplied by German firms Pall Cooperation and B. Braun Corporation. 'You have to imagine it like this: An intensive care patient usually has five to six tubes through which infusions are administered. We placed filters in front of all of these access points to the body,' Dr Sasse explains.

Dr Michael Sasse completed his doctoral thesis on ventricular arrhythmia in 1999, qualified as a paediatrician and was appointed as acting senior practitioner in the Department of Paediatric Cardiology and Paediatric Intensive Care at Hannover Medical School (MHH), where he became Senior Consultant in the Department of Paediatric Intensive Care in 2000.
Since 2003 he has also headed the Paediatric Intensive Care Network (PIN), since 2004, has worked as a trainer and course director for the European Resuscitation Council for European Paediatric Life Support (EPLS), European Paediatric Immediate Life Support (EPILS) and the Generic Instructor Course (GIC).

Different types of filter were used, such as the slightly coarser syringe filters (1.2 micrometres), as well as positively charged filters with a pore size of 0.2 mm. The advantage of the latter is that they also retain all the negatively charged particles, independent of their size.

Results were clear: The use of filters led to a significant reduction in the rate of complications across all age groups from 40.9% in the control group to 30.9% in the filtration group. The incidence of SIRS was also lowered from 30.3% in the control group to 22.4% in the filtration group. 'Furthermore, we found that certain organs benefit from the use of filters,' Dr Sasse explains. A particular benefit was seen in the case of the lungs. 'This is quite easy to image because the lung can be considered as the first filter for all infusions that flow through the body,' he points out, but the kidneys and haematopoietic system also benefited from filtration, as seen from the organ dysfunction scores published in the study. Since the study evaluation, the ICU at the Hannover Medical School Paediatrics Department has used filters consistently and Dr Sasse is convinced that the results of the study are transferable to adults. 'The group of 12 to 18-year-old patients benefited from the use of the filters in the same way that the newborns did,' he says.

Dr Sasse can also prove that using filters make financial sense: the length of ICU stay can be decreased by an average of 21.75 hours per patient – representing a 23% drop. Almost an entire day can thus be saved - a substantial economic advantage, which is not affected by the additional costs resulting from the use of filters and the additional amount of work.

Based on his calculations, the additional costs for 807 patients ran to around €50,000, but the release of 21.75hrs of stay in the ICU creates an additional 815 'spare' days, meaning that an additional 209 patients a year can be admitted. In turn, this leads to an increase in revenue at the ICU of around €1,670,000 a year. For the Paediatrics Unit at the MHH it means that no patients have to be turned away due to a lack of capacity, as the numbers for the clinic roughly correspond.

Appropriate staff training is indispensable for the successful introduction of a filtration system, Dr Sasse adds. 'Without staff compliance the best filters won't work and the investments will not pay off.' He also recommends the use of planning software programmes, such as KIK. 4.0, so that drugs can be tested for their compatibility with one another before they are even administered to avoid precipitation or the formation of particles.

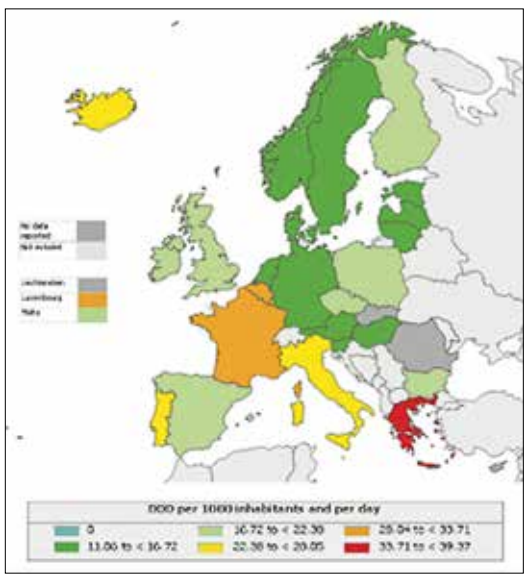
ng antimicrobial resistance

ensive approach, with everyone living up us health threat in their respective areas.

infect 5-12% of hospitalised patients, especially the most vulnerable ones, such as organ transplant patients, those on haemodialysis and patients with various cancers or other chronic diseases.

In the past four years, in more than a third of EU/EEA countries, there has been a significant increase in the trend towards combined resistance to both Klebsiella pneumoniae and E. Coli; on a more positive note methicillin-resistant Staphylococcus aureus (MRSA) has shown a decrease or stabilisation in most European countries. ECDC data from the European Surveillance of Antimicrobial Consumption Network (ESAC-Net) also showed that consumption of carbapenems increased significantly between 2007 and 2010. Iceland, Latvia and the United Kingdom have increased its antibiotic consumption by more than 5% between 2009 and 2010, while consumption fell in three other countries – Austria, Lithuania and Poland – during the same period. The vast majority of human consumption of antibiotics, in fact, occurs in the community with penicillins the most common antibiotics used.

The resistance of some microbes, notably Klebsiella and E. Coli, to a multitude of commonly used antibiotics requires the use of last line antibiotics, such as carbapenems; this places a burden on healthcare systems resulting in increasing healthcare costs, extra length of hospital stay, treatment failures and sometimes death.



Consumption of antibiotics for systemic use in the community in EU/EEA countries, 2010*

Reproduced from the ECDC publication Summary of the latest data on antibiotic consumption in the European Union – 11/2012

*** Data expressed in Defined Daily Doses (DDD) per 1,000 inhabitants and per day**

The European Commission launched a 12-key action plan in November 2011 focusing on many sectors, including human and veterinary medicine. The aim is to instil and reinforce good practice over a period of five years, while introducing rigorous measures to prevent further spread of resistance. In the meantime 26 member states have implemented actions to prevent and control healthcare associated infections (HAI). The Commission has also devoted €1 billion into AMR-related research including drug projects to use existing antimicrobials in a more efficient way and to develop new molecules on the market. The Commission is also working on increased surveillance both in food safety and the transmission of resistance between animals and humans. Executive agencies like ECDC, EMA and EFSA are supporting this initiative.

Antimicrobial resistance is a responsibility of each and every one of us, be it a patient, healthcare professional or policy maker. Director General of DG Sanco, Paola Testori Coggi was very clear in her statement when she said: 'In order to successfully address antimicrobial resistance, we need to tackle the problem in a comprehensive approach, in which all relevant parties and stakeholders live up to their responsibility to combat this serious health threat in their respective areas.' There is no other way.

The First German/French symposium on cardiovascular research

Bilateral initiation

Renowned French and German cardiovascular researchers gathered in October at the French Embassy in Berlin for a one-day symposium entitled 'The Frontiers of Cardiovascular Research: From Basic Concepts to Novel Approaches in Therapy and Prevention'

A full house for a day in the French Embassy lecture hall.

The event was organised by the embassy's Science Department along with the Max Delbrück Centre for Molecular Medicine (MDC), Berlin, and the French National Alliance for Life Sciences and Health (Aviesan), Paris.

'In France, cardiovascular research is closely associated with a broad range of topics, for example nutrition and metabolism. We are very much interested in this kind of systemic approach,' said Professor Walter Rosenthal, Director of the MDC and Member of the Board of Directors of the German Centre for Cardiovascular Research (DZHK). 'In addition, in Germany we could profit from the clinical orientation, meaning the typically translational medical research in France, where nearly every research unit is part of a university hospital.'

On the other hand, the French were attracted by the bundled expertise within German research associations, according to Professor Christian Boitard, director of the institute for Circulation, Metabolism and Nutrition within Aviesan, which coordinates French research agencies in life sciences, like for example INSERM, CNRS, INRA, CEA.

Those German associations include the Helmholtz Association, with its 18 scientific-technical and biological-medical research centres throughout the country, and the six nationally funded German Centres for Health Research, such as the German Centre for Cardiovascular Disease (DZHK).The MDC, collaborating partner of the symposium, is both member of the Helmholtz Association and the DZHK, with tight links to the Charité University Hospital and the German Heart Institute in Berlin.

The all-in-all well-attended symposium - especially by young scientists - was organised in three sections, focusing on basic and translational research and new concepts for therapy and prevention. The speakers of the first section, all engaged in studying still unexplored cardiac functions at a molecular level, included Professor Michael Gotthardt, head of the research group Neuromuscular and Cardiovascular Cell Biology at the MDC. Based on rat studies, with colleagues from the USA and the MDC, he discovered that the giant protein titin needs the co-factor RBM20 to properly regulate filling the cardiac ventricles with blood.

Patients with a gene-mutation of the protein RBM20 do not produce the proper titin protein that enables cardiac filling and they die at an early age. To utilise these findings clinically, Professor Gotthardt has developed a technique to characterise the functional consequences of individual RBM20 mutations. 'We can help patients learn if their RBM20 mutation will likely result in the severe form of cardiomyopathy, so that their physician can devise an appropriate therapy,' the professor explained, adding: 'We're currently using this information to develop novel therapy strategies for patients suffering severe forms of this disease.'

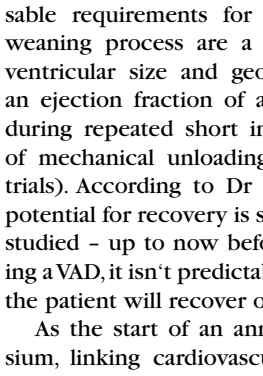
In the second session, covering translational research, unexpected findings were presented inter alia by Xavier Jouven, epidemiologist and electro-physiologist at the PARC research centre in the European Georges Pompidou Hospital (HEGP) in Paris. He spoke of the epidemiology of sudden cardiac death (SCD) in France and the SCD mortality risk factors. Evaluating the heart rate as a prime risk factor, he and his team discovered that people '…with the highest risk of SCD are those who do not increase their heart rate sufficiently during exercise, but who increase their heart rate the most during mental stress.' Prof. Jouven estimates this is due to an insufficient balance between the adrenergic system and parasympathetic nervous system, two subdivisions of autonomic nervous system. This will be studied further in the Cartagene Study, whereas the genetic profile of 2000 people who died of SCD out-of-hospital will be analysed.

In the third session, treating with already available therapies, a lecture given by private docent Michael Dandel MD, physician at the German Heart Institute Berlin (DHZB), stood out. He highlighted the possibility of myocardial recovery while receiving assistance from a Ventricular Assist Device (VAD). In patients with chronic cardiomyopathy (idiopathic dilated cardiomyopathy and chronic myocarditis) with mechanical unloading, up to almost 20% recovered and in some of them even the VAD could be removed. However, indispensable requirements for a potential weaning process are a normal left ventricular size and geometry plus an ejection fraction of at least 45% during repeated short interruptions of mechanical unloading (off-pump trials). According to Dr Dandel, the potential for recovery is still too little studied – up to now before implanting a VAD, it isn't predictable whether the patient will recover or not.

As the start of an annual symposium, linking cardiovascular disease experts under the umbrella of Aviesan, representing the French research institutes, and the Helmholtz-Centre MDC as well as the consortium of DZHK on the German side, appears to be a promising development – not just for France and Germany, but also for Europe, Prof. Boitard believes. 'For me,' he said, 'this seems the best way to go forward in future scientific cooperation, to first build a strong bilateral interaction and then drop to the next level - to the multilateral European level.'

The next meeting of cardiovascular research specialists will take place in Paris in 2013.

Director of the national Circulation, Metabolism and Nutrition Institute within Aviesan, the French research alliance in life sciences, since 2008, **Professor Christian Boitard**, studied medicine at Caen Faculty of Medicine. Following his medical and research career in immunology and diabetes, in 1989 he became Professor of clinical immunology at the Paris-Descartes University. In 2002 he became Director of the research Unit 561 of Inserm, the National Institute of Health and Medical Research, focusing on autoimmunity of Type 1 diabetes at Cochin hospital. Since 2006 he has headed the diabetology and clinical immunology department at Hôtel Dieu-Cochin hospital.



Following his medical studies at Justus-Liebig-University Giessen, Germany, and the Royal Free Hospital, School of Medicine in London, UK, **Professor Walter Rosenthal** became Assistant Professor (Habilitation) for pharmacology and toxicology at the Free University Berlin. He was then Visiting Professor and Heisenberg Fellow at Baylor College of Medicine, Houston, Texas, USA for two years. Between 1996-2009 he directed the Leibniz-Institut für Molekulare Pharmakologie (FMP) and then took the role of Scientific Director of the Max Delbrück Centre for Molecular Medicine (MDC) Berlin-Buch.
He is also a professor at the Charité Universitätsmedizin Berlin, one of the largest university hospitals in Germany.

Olympus: Launching a ter

Endosc

Olympus has led the field in advancing end users thought no further optimisation was innovation in the marketplace – and the fi arrived. *Daniela Zimmermann* of European Senior Product Manager for Gastroenterolo Division about the company's past and pre

EVIS EXERA III comes with brighter Narrow Band Imaging and Dual Focus for improved lesion detection and characterisation.

'Our company sports a long history of success stories in the development of flexible endoscopy. We began in 1950 with a gastrocamera,' he recapped. 'We added fibre endoscopy and video endoscopy. In 2000, we introduced the EVIS EXERA system with a technology upgrade in 2006. Every one of these products was a major technological milestone. When we launched EVIS EXERA II with Narrow Band Imaging (NBI) and HDTV, everyone, including ourselves, thought that no significant further development was possible in endoscopic imaging following that revolutionary step.'

Nonetheless, Olympus achieved further major modifications - what were the drivers?

'We are continuously looking to improve the technologies we offer. Impulses come from our team and from our customers. At Olympus, there's a lot of communication involved between the creative R&D departments – the highly competent engineers in the R&D departments and production facilities in Japan – who analyse whether ideas can prove to be viable and feasible – the service and support teams who will need to ensure function and quality over a product's lifetime, and the marketing team who, interacting with R&D staff in numerous markets, interview customers about their needs and product suggestions. In addition to product innovation there are R&D teams in Japan who work on basic technologies, such as electronic and microcomponents and endoscopic optics.

'From the interaction among those teams, and with customers, concepts with feature sets emerge that are analysed regarding clinical benefits and commercial viability. Our opto-digital,

rific product, yet forever seeking to change for the better

opy systems

loscopic technology. Just when experts and possible, Olympus placed another major rm has done it again. EVIS EXERA III has Hospital, asked *Rüdiger Tamm*, Olympus gy in the firm's European Medical Systems sent gastroenterology R&D.

microscopy and consumer products expertise is a great plus.

'When we take an innovation to market, the R&D phase is typically already starting in the life cycle of its predecessor. A prototype with selected features is produced, which is evaluated within our network of collaborating physicians.'

In this respect, what are the major changes in EVIS EXERA III?

'The key challenge for our R&D team in further optimising the EVIS EXERA II technology was to come up with modifications which, again, show marked clinical and economic benefits. It turned out that optimising NBI would involve benefits: enhanced luminosity and colour contrast could help broaden the scope of applications. We were successful in making these improvements real, taking NBI to a new dimension. In its pursuit of the perfect endoscopy system, Olympus has introduced EVIS EXERA III as the next milestone towards improved clinical outcomes.

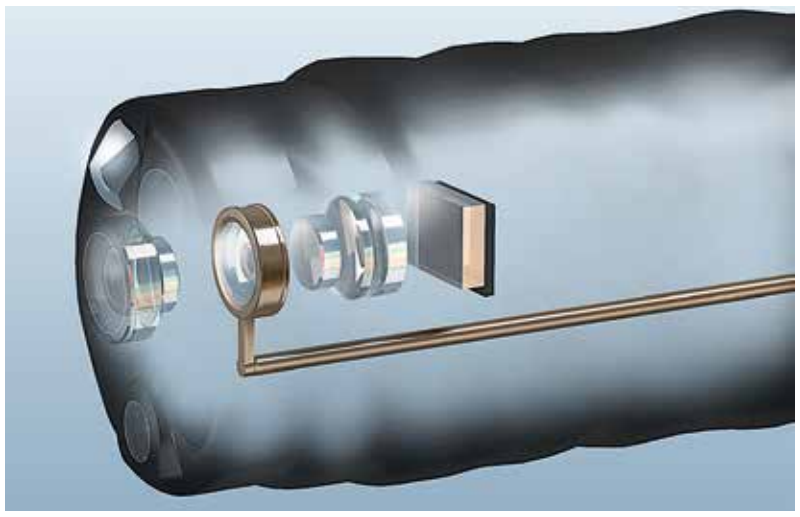
'Dual focus is another case in point: diagnostic analysis of mucosa and in-situ characterisation has long been practiced in Japan, whereas in the West, the approach was neglected, particularly because of the large effort that goes with the technique. With EVIS EXERA III, this method is now readily available to any physician at the push of a button. Our users love this ... and so do we!'

What's in the endoscopy R&D pipeline now?

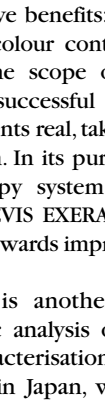
'Everybody is now excited about EVIS EXERA III – but we are certain there is still room for further optimisation; and miniaturisation and digitalisation will drive major advances regarding interventional applications of endoscopy.'

What else does Olympus offer physicians as a whole?

'Physicians expect us to spread our know-how to support the quality of their work. We respond by carrying out a huge number of training activities in Europe – and, of course, worldwide. In Hamburg, for example, we operate two training centres; the one at the Olympus Surgical Technologies Europe production facility focuses on rigid endoscopy, whereas flexible endoscopy is key at the ENDO CLUB Academy, founded in 2011. We operate that academy in collaboration with the UKE (University Hospital Eppendorf) and the Asklepios Altona and Barmbek on the campus of the UKE; it will train about 500 physicians in 2012. Besides the Endo Club Nord and numerous other major events, Olympus supports over 700 smaller endoscopy conferences across Europe. 'In addition to quality and innovative technology from Olympus, users highly appreciate the value of our educational activities in their field.'



Dual Focus Technology supports a 'near mode' by moving the optical lens in the tip of the endoscope.



With an IT background, in 1991 **Rüdiger Tamm** set out on a career at Olympus Germany as a consultant for documentation software in endoscopy. Starting with EVIS 140 he launched all follow-up video endoscopy series in the German market and also contrived the concept of Olympus Video System Integration (VSI) for endoscopy.

Since 2006 the consultant has worked on preparing the European roll-out of EVIS EXERA III as a Senior Product Manager for Gastroenterology, in the Medical Systems Division of Olympus Europa Holding GmbH.

University Hospitals Leuven (UZ Leuven), Belgium

Improved visual guidance for minimally-invasive surgery

Versatile connectivity and ease-of-use provide a range of benefits to clinicians and surgeons

To modernise the surgical display equipment at Belgium's foremost university hospitals, NDS Surgical Imaging (NDSsi) has installed Radiance HD surgical displays in the operating theatres and the gastroenterology department. Easy to implement and offering reliable and consistent colour quality, the multi-modality imaging systems addresses the needs of UZ Leuven's surgeons, clinicians, imaging technologists and technicians.

One of Europe's foremost university hospitals, UZ Leuven, provides top-level medical care and related healthcare services to in- and outpatients from its four sites in the Leuven area, near Brussels. This hospital with 1,995 beds, 47 operating rooms, 49 nursing departments and seven intensive care units serves more than 64,000 inpatients and 111,000 outpatients each year, in more than 635,000 consultations. The workflow is managed by 8,815 employees and clinicians.

Modernizing image guidance and support

'Because of our size and volumes, it is crucial to consider display systems not as individual devices but as an infrastructure,' says Prof. Erwin Bellon, IT Manager. 'We have a growing number of operating theaters, over 50 diagnostic workstations in our diagnostic imaging department, and literally thousands of screens for medical practitioners and clinicians to look at patient images.'

The decision to modernize the existing operating rooms with roof-mounted operating lamps provided the impetus to upgrade the medical display equipment as well. 'We looked for a partner which would allow us to meet the needs of our most demanding internal customers. We soon realized that NDSsi was by far the most experienced partner for us in surgical image guidance and support,' says Kris Schoonjans, Project Manager, Medical Instrumentation.

Unanimous decision in favor of NDSsi

Kris Schoonjans elaborated that an extensive and user-driven review of the most relevant vendors was undertaken. 'We organized a double-display setup of each of the vendors in the same room, displayed the same images and asked our clinicians and surgeons to assess the image quality. On all counts, NDSsi came out on top of the user preferences.'

Prof. Dr. Raf Bisschops, Deputy Head of the hospital's gastroenterology department, was convinced during the trials by the color perception, contrast, and sharpness on the Radiance displays. He was also impressed with the connectivity of

For the University hospital Leuven with more than 635,000 consultations and 8,815 clinicians and employees, workflow and excellent equipment is crucial. Kris Schoonjans, Project Manager Medical Instrumentation (above left), Prof. Erwin Bellon, IT Manager and Prof. Raf Bisschops (small picture), Deputy Head of the Gastroenterology Department, look at NDSsi as a partner who helps them to stay abreast of technological developments.

the display solutions. 'We rely on them in our eight examination rooms. The versatile connector panel is key for us: we use three different image generating platforms and the Radiance screens connect to all of them. In particular I appreciate the NDSsi PIP and Swap feature, which allows me to see two sources on a single screen, right in front of me, during confocal endomicroscopy. This speeds up the intervention.'

It is important that imaging technology keeps pace with changing modality technology, Prof. Bisschops continues. As the image-capturing quality of the endoscopic processors improves, display quality needs to improve too. But at the same time, compatibility with all types of image signals must be ensured. 'It is obvious that the introduction of HD images requires HD displays, but we must still be able to switch between new and historic formats, as well as between composite mode or digital mode, depending on the source', he says.

Enhanced color accuracy and consistency

The new displays feature the groundbreaking Color Correction Technology, enhancing color accuracy and consistency in surgical video, and the industry's first stabilized LED backlight, assuring consistent brightness over the life of the display.

Kris Schoonjans has high expectations for this new generation of displays. 'Because we began replacing the screens in sync with the renovation of the operating rooms, a project that takes quite some time, some of our screens are already four years old and may suffer from reduced backlight. This typically is not noticeable in practice unless we replace one screen of a set of two, in which case even small differences in color output become disturbing. Thus, we believe that the new Radiance G2 HD displays will further improve performance.'

Keyhole surgery requires visualization systems that are HD compliant

Thoracic surgery has become primarily a keyhole technology-driven discipline since the introduction of digital camera technologies in the operating theater. UZ Leuven decided to equip all of its operating rooms by default with two Radiance HD displays. This allows surgeons to work in any room with their preferred video tower and enjoy the same display configuration and image quality.

Thoracic surgeon Dr. Herbert Decaluwé recently joined the UZ Leuven thoracic surgery team. For him, the availability of High-Definition visualization systems is a major advantage. 'High-Definition makes all the difference. With keyhole interventions, you miss tactile feedback from direct contact with the patient; so visual feedback on-screen becomes even more crucial. HD cameras and displays allow us to enlarge images so that you can actually see more than with open surgery. It's great to have this technology at hand.'

Enhanced technical comfort for technicians

From a technical perspective, NDSsi's Radiance HD surgical displays offer a level of user comfort that is unparalleled, says Kris Schoonjans. He particularly appreciates the quality default settings of the displays. 'Unlike other vendors, with NDSsi we do not need to adapt or calibrate the color settings when installing the displays. That saves us a lot of time and guarantees perfect display quality from the start.'

The ability to connect to many diverse sources, enabling simultaneous viewing of real-time video, fluoroscopic, ultrasound, or vital sign imaging is also important. The in-out connectors allow to connect a source from one screen directly in cascade to additional displays, without the need for a splitter. 'It's a very useful feature when using cameras that have only a single output', says Kris Schoonjans.

Connectivity of displays is key, both now and in the future

Along with Prof. Bellon, Kris Schoonjans emphasizes the continuity that NDSsi and its local distributor have provided throughout the execution of the contract. 'We have seen displays move from the CRT model to flat screen, and from 19" screens with a 4:3 ratio to a 16:9 format. In spite of these important developments, we still have the choice between all sizes of screens from 19" to 55". And all this time, the display user interface has remained unchanged.'

Both view NDSsi as a valuable partner, who will keep abreast of developments and future trends in medical imaging, particularly in the surgical fields. 'We chose an infrastructure solution from a responsive partner that could also help us anticipate future trends. Connectivity of the displays is proving to be even more important than we could have imagined five years ago and we are convinced that with NDSsi we will stay abreast of technological developments.'

Visualisation at its best

Last November, the medical visualisation expert Barco showcased numerous highlights at their booth at Medica

Besides state-of-the-art medical displays, Barco presented automated calibration of mobile device displays for reporting of images, sophisticated bedside terminal systems, and integrated operating theatre (OT) video management.

Bedside terminals

Back in February 2012, Barco had acquired JAOtech, a company renowned for its high-tech bedside smart terminals. 'Since then, we have further elaborated our portfolio,' explained Aldous Lippard at Barco's Medica booth. 'These terminals include entertainment features such as TV, radio, video on demand, gaming etc. which make the patient's stay more comfortable,' continued Global Marketing Manager for Point of Care at Barco. 'And, for hospital staff, they offer ready access to information systems including HIS and PACS.'

Over the years, JAOtech had developed from a hardware manufacturer to a total solution provider. Barco, experts in medical displays, added the company's medical displays at the bedside to their portfolio. 'At Medica, we launched the latest generation of terminals: they are thinner, lighter, and support optimised touch-screen technology. Patients can enjoy the same experience at the hospital that they are used to at home.'

The devices come with improved performance to ensure that clinical and entertainment applications run smoothly. The arm has a tilt feature, allowing patients to face up looking at the screen; the screen can be set to an appropriate angle for the clinician to enter data via touch technology. The terminals are fanless and easy to disinfect.

IP-based video distribution for the operating theatre

A year after its introduction, numerous hospitals are working successfully with Nexxis. 'Acceptance is high,' summarised Johan Stockman. 'Hospitals trust that this IP-centric approach to integration and flexibility is the way to the future.' Barco has set up its qualified OT integration channels for the system; at Medica, Karl Storz announced their new OR1TM Fusion Integrated OT system and this will

Highlights from Barco at Medica: Nexxis, IP-based video distribution for the OT Johan Stockman, VP Strategic Marketing Surgical Imaging (left) and new bedside terminals with Aldous Lippard, Global Marketing Manager Point of Care.

use Nexxis as their backbone; 'Our partner appreciates the value and future-orientation of our technology,' continued Barco's Vice President, Strategic Marketing Surgical Imaging.

Flexibility is the key benefit of this system: when a hospital plans to set up a new procedure or connect another modality, Nexxis allows to do this safely and conveniently. 'This helps reduce the complexity of OT integration significantly,' said Johan Stockman. Once images become available, they can be shared readily inside as well as outside the IR for collaboration purposes, e.g. with students. The capability of taking images outside the OT, and to record them, was a highlight from Barco at Medica. Customers who have decided in favour of Nexxis include St Antonius in Nieuwegein/The Netherlands.

MR

AWARD WINNING HAND HYGIENE MONITORING

At MEDICA 2012, OPHARDT hygiene presents its Award winning hand hygiene monitoring system "OPHARDT Hygiene Monitoring System®" (OHMS). The complete hardware and software solution helps hospitals to measure, analyze and sustainably improve hand hygiene compliance.

The complete monitoring system from one source has been already recognised with the prestigious Frost & Sullivan "Best Practices Award" for new product innovations. In the course of an international study carried out by the renowned market research institute, various system solutions to measure hand hygiene practices in medical facilities were compared. The OPHARDT Hygiene Monitoring System® placed significantly higher than products offered by competitors. The new product solution has been received very positively in practice: Several hospitals in Germany as well as a university hospital in Switzerland already use the system successfully.

OHMS offers unique features:

- Extensive options to evaluate the actual hand hygiene behaviour
- Fully automated data transfer ("WiFi")
- Continuous monitoring of dispenser functionality
- Alarm function with automatic warning when bottle needs to be changed
- "Green Technology": The energy required for data transfer is generated in the dispenser by the user. No batteries or additional power supply is required
- Precise measurement of the amount of dispensed liquid

www.ophardt.com
info@ophardt.com

PANASONIC HAS PRESENTED THE NEW 3MOS FULL-HD MICRO CAMERA GP-US932X

The new GP-US932X micro camera is suitable for many applications including medical (hospitals, microscopy), industrial (quality control, inspection), live science (research facilities, laboratories) and broadcast (for example in nature documentaries). Panasonic has extended its flexible range of micro cameras (also called remote head) with the GP-US932X, which can be purchased in full or as individual components in OEM state to suit custom needs.

Thanks to the newest CMOS technology the GP-US932X delivers HD quality with one of the smallest remote 3-chip camera head. The already at the head fully digitized signal, the possibility to use different cable lengths, the ability to use many different video formats (HD/SD/digital/ analogue), the outstanding performance of 1000 TV Lines resolution and amazing light sensitivity of 2000lx at F11 turns the camera to an impressive visual solution. Other functions like image rotation and mirroring options, three pre-sets including the colour temperatures, the freeze picture, 2.5x electronic zoom, 12-axis colour matrix and frequency-depending detail enhancement makes this camera to a even more versatile product. With the new Binning Mode the sensitivity can be increased to 2000lx at F12 with almost no reduction in resolution.

www.panasonic.eu

NEW MULTI-TOUCH SURGICAL INFORMATION HUB

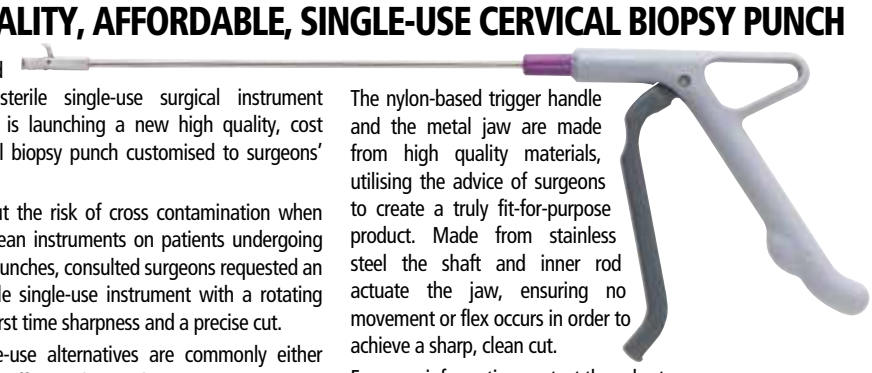
Buzz™ Digital O.R. represents a major step forward in data integration for the surgical suite. A centralized O.R. information hub, Buzz bundles robust hardware and sophisticated software together in a sleek, modern design. IP-centric, software-centric, workflow-centric, and patient-centric, Buzz controls the flow, from pure DICOM viewing to comprehensive digital O.R. functionality, including video management and documentation – at the touch of a finger, or two. With a large 42" full-HD display and ultra-slim multi-touch interface, Buzz allows users to connect with a multitude of video signals and route content to multiple displays. Buzz Digital O.R. effectively manages advanced surgical workflow – facilitating planning, navigation and intraoperative imaging connectivity. The newly designed control concept helps enable intuitive management of data sources and displays. Fast and easy access to medical data is provided through the integrated interactive DICOM viewer. Procedures can be conveniently documented with screenshots or dual channel recording.

Buzz Digital O.R. embodies the Brainlab vision to continuously work toward the integration of medical devices and IT in healthcare facilities. With the integration of Buzz in the surgical suite, data management within the O.R. can become more intelligent, scalable, and flexible. The goal of the Buzz Digital O.R. is to help improve workflows, reduce costs and positively impact patient care.

www.brainlabbuzz.com

™ trademark of Brainlab AG in Europe, the US and Japan

HIGH QUALITY, AFFORDABLE, SINGLE-USE CERVICAL BIOPSY PUNCH



DTR Medical Ltd – a leading sterile single-use surgical instrument manufacturer – is launching a new high quality, cost effective cervical biopsy punch customised to surgeons' specifications.

Concerned about the risk of cross contamination when using hard-to-clean instruments on patients undergoing cervical biopsy punches, consulted surgeons requested an affordable, sterile single-use instrument with a rotating jaw, providing first time sharpness and a precise cut.

Currently, single-use alternatives are commonly either plastic and cost effective but without a precise cutting jaw, or metal but unable to consistently meet the quality requirements. These alternatives often "mash" the tissue, creating poor biopsies and risking continued wound trauma that leads to longer patient recovery time.

With approximately 260,000 annual cervical biopsies conducted in the UK and the increased HPV testing demands, DTR Medical's new product has the opportunity to enhance current procedures and aid the prevention of cross-contamination.

The nylon-based trigger handle and the metal jaw are made from high quality materials, utilising the advice of surgeons to create a truly fit-for-purpose product. Made from stainless steel the shaft and inner rod actuate the jaw, ensuring no movement or flex occurs in order to achieve a sharp, clean cut.

For more information contact the sales team on +44 (0) 1792 797 910, or email info@dtrmedical.com, www.dtrmedical.com.

Visit DTR Medical at Arab Health, Dubai between 28-31 January to view the new cervical biopsy punch and talk with the business development managers on 7F10 in the UK stand.

EKF PRESENTS NEW POC SOLUTIONS

EKF Diagnostics' success at MEDICA 2012 has been highlighted by a list of impressive statistics. Generating the greatest interest was the European launch of two new POC products: the Quo-Lab glycated haemoglobin (HbA1c) analyser for the affordable management of diabetes; and the STAT-Site™ M ßHB strip-based analyser, for highly accurate near patient testing of ketosis. Over 200 product demos and 66 customer meetings were given to delegates to demonstrate the qualities of EKF Diagnostics' newest POC solutions. The semi-automated, CE marked Quo-Lab analyser monitors HbA1c and provides a highly accurate, affordable and easy-to-use technology for GP surgeries, diabetes clinics and laboratories. The STAT-Site™ M ßHB has been developed for the measurement of ß-Hydroxybutyrate (ßHB), the main ketone produced during ketosis, and provides a quantitative and accurate assessment of patients displaying symptoms of ketosis. This makes ketosis testing easier and more affordable in POC settings. A range of clinical chemistry reagents were also presented by EKF, including the ß-Hydroxybutyrate (ßHB) LiquiColor® Reagent System developed by EKF subsidiary, Stanbio Laboratory.

For more information please visit **www.ekfdiagnostics.com.**

PATIENT BEDS ENABLES OPTIMIZED PROCESSES

Linking patient beds to the electronic communication infrastructure in hospitals helps generate numerous benefits, explained Harald Walz at MEDICA. The CEO of the consulting company openConsulting manages current projects in renowned hospitals such as Alexianer Krefeld. This German care provider has installed beds which come with a Bluetooth interface which enables, e.g., repositioning via a touchscreen display. Walz: "This has helped the hospital to eliminate risks regarding patient safety, workflows, and data privacy as part of the risk management for IEC 80001-1." In a subsequent phase, additional features will cover risks which can be defined for each patient: out-of-bed sensors communicate patients leaving their beds, lights can go on automatically when patients prepare to get out of bed, connected rinsing catheters help to optimize nursing e.g. for prostate patients, and a liquids sensor sends a message to nursing.

To link a bed also offers benefits regarding its maintenance: data from the bed's gear can generate warnings, triggering maintenance activities and even automatically ordering of individual spare parts.

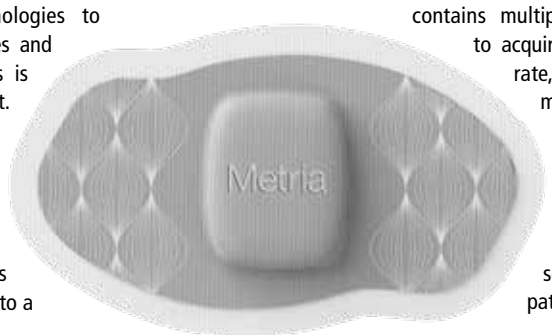
Michael Wilke, CEO, Alexianer Krefeld is convinced that this approach helps him meet challenges: „With budgets shrinking and staff in short supply, technologies such as these help us to reduce workloads and ensure qualitative, safe care for our patients."

www.openconsulting.de

SENSING THE FUTURE – VANCIVE'S NEW DEVICE FOR PATIENT MONITORING

Avery Dennison has produced disposable healthcare products for about 30 years, with core products built around adhesive technologies, which the firm extended into numerous sectors, including medical technology – for wound care, surgery, ostomy, electro-medical and some diagnostic applications. The firm progressed, with its engineers developing new technologies, independently as well as with partners. Those innovations are now repositioned under a new branding – Vancive Medical Technologies, an Avery Dennison business.

Leveraging new technologies to enable inspired advances and intelligent results – this is what Vancive is all about. The parent company had supplied products to manufacturers until recently, when the new division began to offer its own finished products and solutions. This leads to a complete transformation of how the company interacts in the market: it now speaks to customers directly.



Metria, Vancive's new wearable sensor technology, is a fine example. This high-tech platform provides comfortable, secure physiological monitoring for a variety of consumer and clinical applications. The platform is based on the firm's advanced adhesives, materials, and manufacturing, and includes technologies from Proteus Digital Health and Bodymedia. The Bluetooth-enabled device is worn on the body and contains multiple sensing technologies to acquire temperature and heart rate, and accelerometers to measure force or impact, and skin-galvanic response. This vital data is communicated, in an intelligible format, via mobile phone to medical service centres. Based on patient profiles, the health status, including cardiac arrhythmias, sleep quality, respiration, etc. can be monitored and decisions on any necessary medical actions may be taken.

Health, wellness and fitness are the initial, consumer-oriented markets. Good concept: why not let managers wear sensors for a week for longer-term monitoring before they go to see their physician for a check-up?

A clinical setting is now being built because, hospital representatives realise there is a huge benefit in monitoring patients in their home or office over a longer period, at reduced cost compared with being in hospital. The European market is of major importance to Chicago-based Vancive, which along with other US locations is present in Belgium and China. Negotiations for distribution partners in other countries are being finalised.

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Unfors RaySafe: 'Like a canary in a coal mine'

With a mission to help people avoid unnecessary radiation, and the continuing launch of related products, the Swedish company points out that it is now the world's only provider of comprehensive solutions to measure, monitor and manage X-ray radiation dose

Report: Brenda Marsh

Founded 1994 by Tomas Unfors in Billdal, Sweden, Unfors Instruments began produced measurement equipment for quality assurance of X-ray machines. However, although still a leader in that market, in March 2012, the firm was renamed Unfors RaySafe. 'We made this change because our new brand will better represent our company moving forward,' explained its CEO Magnus Kristoferson.

In just under two decades of its existence, the Unfors RaySafe now has 150 employees.'To enable a rapid international expansion and better serve our market, we are represented by subsidiaries in seven countries, including United States, United Kingdom, Germany, Singapore, India, Japan and China. In addition we are present in 60 further countries represented by local distributors,' the firm's CEO adds. 'Among the customers are major X-ray manufacturers as well as some of the most well-known university hospitals worldwide.' Revenues of around €20 million were reported in the fiscal year 2011/2012.

'Like the canary in the coal mine helped miners avoid dangerous gases,' Magnus Kristoferson points out, 'the RaySafe solutions, now and in the future, will enable users to help themselves and others avoid unnecessary radiation. Our philosophy of combining the simple and intuitive with the most advanced and innovative technology has made us a world-leading supplier of radiation measurement solutions in the medical field. Radiation, however, is not confined to the professional sphere. For the past 20 years, the average person's exposure has increased dramatically - a trend that is likely to continue. Therefore, we are constantly exploring new ideas and expanding our portfolio of products and services to help those we serve avoid unnecessary radiation.'

What's new from the firm, now with a symbolic canary in its logo? 'Early this year we introduced a new segment to our portfolio, personal dosimetry,' Magnus Kristoferson said. 'With the real-time solution medical staff is able to see, control and influence the amount of dose they are exposed to during interventional procedures. And now, during the RSNA in Chicago, we have launched a software solution to better manage patient dose, improve process quality before, during and after X-ray procedures and to reduce a number of unnecessary exams.The key words here are justification, optimisation and control. With this introduction we can now provide a comprehensive solution to improve safety in the X-ray room – from quality assurance of X-ray equipment, to real-time dose monitoring for medical staff and dose management for the patient.'

The firm launched its real-time dose monitoring system RaySafe i2 at ECR 2012. The basic package has one real-time display and four dosimeters (additions are available). During imaging, the staff receives instant information on their current X-ray exposure giving them prerequisites to adjust their behaviour to minimise unnecessary exposure.

Studies presented at ECR and RSNA indicate a dose reduction among personnel up to 40% when using Unfors RaySafe's real-time dosimetry technology.Workplace efficiency and safety can be improved, and work processes streamlined, by facilitating the time-stamped, dose data collected by RaySafe i2.

'RaySafe i2 is proven to reduce staff dose, and makes it easy to work correctly and achieve a well-functioning radiation safety culture in hospitals,' Magnus Kristoferson concludes.

The new cloud-based software RaySafe S1 is prepared for integration in a multi-modality environment within diagnostic radiology, with equipment from different X-ray manufacturers that support the DICOM standard.

Whilst it enables medical staff to manage and lower patient dose it still retains image quality, thus reducing unnecessary examinations.

Magnus Kristoferson studied business administration at Umeå University, and successfully led several companies before becoming CEO of Unfors RaySafe in 2011.

Additional assets: The software supplies justification support with evidence-based referral guidelines; optimises features that help find the right balance between image quality and dose – as well as minimise often hidden retakes and rejections; helps retain workflow control; provides online with notifications, alerts, checklists and protocol guides, and on demand can supply relevant statistics and key performance indicators.

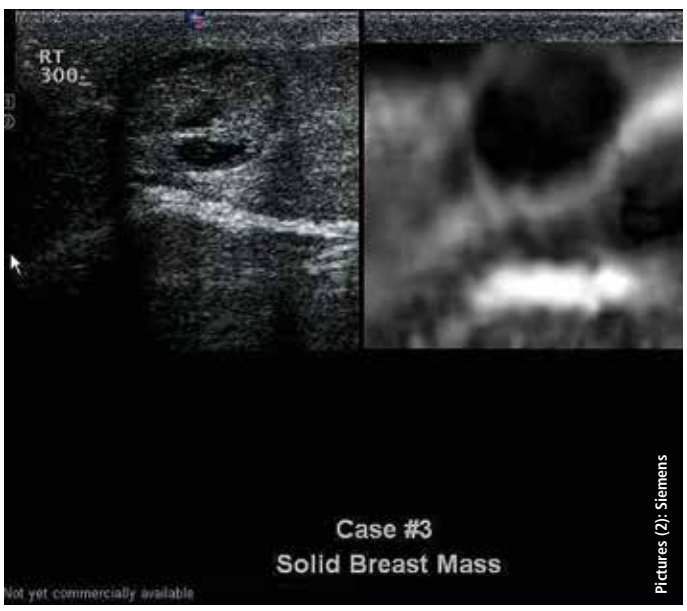
Radiology data is also collected and shared with others in the diagnostic process – referring physicians, radiologists, operators, medical physicists, Radiation Safety Officers (RSO) and medical engineers. Additionally, the system can provide managers with insight into the radiology department's usage, to support efforts to increase productivity.

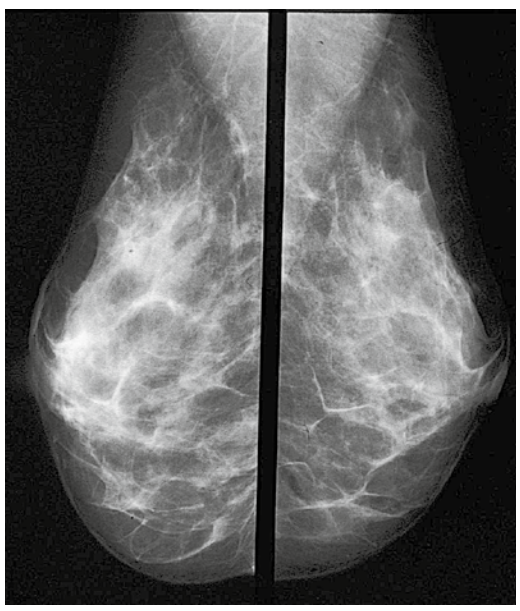
X-ray and ultrasound combo on a mammo platform

A first in medical imaging is still unknown for Kit Vaughan, who is ready to simultaneously scan with X-rays and ultrasound for breast screening. Stay tuned for the results at RSNA 2013, says EH Correspondent *John Brosky*.

It all works fine on paper – and the first clinical trial shows half the system, the X-ray mammography unit, is performing perfectly well. Now, over the next six months, CapeRay of Cape Town, South Africa, will try for the first time to layer an ultrasound scan on top of a simultaneous X-ray acquisition of compressed breasts. The goal is to generate a tightly registered fusion image for the early detection of breast cancer.

The PantoScanner X-ray mammography platform incorporates automated breast ultrasound, which the company believes will greatly improve both sensitivity and specificity for screening of women with dense breast tissue, where 50 percent of cancers are routinely missed.





Breast ultrasound (left) and X-ray image of the breast (right)

Pictures (2): Siemens

The radiographic component, the PantoScanner Soteria, is a slot scanner where the X-ray tube remains stationary as it emits a fan beam, the collimator, a narrow band detector.

According to CapeRay CEO Christopher 'Kit' Vaughan, the PantoScanner platform requires a more powerful X-ray tube, '… but a woman is exposed to much less radiation using slot scanning and we get a higher quality image due to a higher signal to noise ratio that cuts down on the scatter, potentially by 50 percent.' Just how good the image quality is was not known until October 2012, when CapeRay was authorised to conduct its first clinical trial on 30 women.

A radiology board is currently assessing those images against a predicate device manufactured by GE Healthcare (Waukesha, Wisconsin).

Now comes the simultaneous ultrasound acquisition, the unknown factor. Bound to the detector moving on the PantoScanner, the ultrasound transducer that was added to create the PantoScanner Aceso model must move at 50 millimetres per second, which should be sufficient to acquire the signal.

'We have the prototype, but we have not yet acquired images,' Kit Vaughan explained. 'The effect of the scanning speed on image quality remains unknown, though we have an innovative way to solve the coupling and matching problem.'

On paper, he added, the radiation should not have a detrimental effect on either the ultrasound transducer or image quality. The PantoScanner Aceso model is an automated breast ultrasound (ABUS) in the same family as the FDA-approved U-Systems Sono V that was acquired in November 2012 by GE Healthcare.

What distinguishes the CapeRay ABUS method, said the CEO, is that

CapeRay CEO Kit Vaughan

where the Sono V requires a woman to lie down for a horizontal image acquisition, Panto uses the traditional standing position with compressed breasts. 'The issue is co-registration of the X-ray and ultrasound images,' he pointed out. 'When a radiologist needs to align two different images in his head, one vertical and compressed with one lying flat, it becomes difficult. Theoretically,' he added, 'our system acquires the breast images in the same orientation with the same degree of compression.'

With a goal of launching the combination PantoScanner Aceso model at RSNA 2013, Kit Vaughan says the CapeRay development team is 'scrambling to get the system ready'.

A clinical trial at the University of Cape Town, already funded by the South Africa Cancer Society, is planned for July 2013.

'We hope to make a meaningful difference for women in discovering cancers earlier,' Kit Vaughan explained, 'and for radiologists to make the job so they get the right diagnosis early enough.'

Catching up with people and new concepts in Chicago, USA

Plug and Play electronic medical records – No more CD or DVDs!

Report: John Brosky

The USA faces an enormous task as it begins to create the electronic medical records (EMRs) required by Obama-care. Agfa Healthcare reports that it can now help with an Integrated Compliance Information System (ICIS) – the first fully-integrated IT package that hospitals can plug in to existing information systems. It is easier to talk about an electronic medical record (EMR) than to create one. In the USA, the Affordable Care Act, also known as Obama-care, requires US healthcare providers to run a secure EMR to help physicians to make clinical decisions electronically.

The good news is that the US government is providing hospitals with billions of dollars to help fund this monumental effort. The bad news is that pain is being felt in the executive suite where C-level administrators such as chief information officers, chief operating officers and chief executive officers need to untangle layers of information systems built over many years to find a path to a single, universal EMR. This will not be easy, warns Charles Morris of Agfa Healthcare, resembling a doctor preparing to tell a patient why surgery will not really hurt. It is, he says, simple enough to send one image for one patient from one scanner to one medical record. Unfortunately there are more than 30 departments at a hospital that produce images. Despite many years of heroic work, medical devices still do not speak the same language. Here comes the painful part. Each of the 30 departments has dozens of devices speaking different forms of code, which makes 360 different translators. Each translator needs to have two-way communication with the EMR, so now we have 720 data exchanges.

Companies that make EMRs for hospitals charge a fee for each one of these exchanges. If only charged $1,000 for creating the exchange, a hospital would face a bill of $720,000 to connect its devices to the EMR. However, EMRs companies charge a great deal more than $1,000 for each exchange, which is why you will probably hear screams coming from the executive suite.

Charles Morris explains that Agfa can make these exchanges work for just $1 each, or $720, using the example. By plugging all hospital devices into the Agfa Imaging Clinical Information System (ICIS), suddenly the pain disappears. The EMR companies do not need to charge translation fees because there is only one connection with the ICIS that holds the key and can open clinical images from anywhere directly inside a patient's EMR. 'The EMR is broken and we are fixing the EMR,' he declares.

The real value of the ICIS is for the doctor who can sit at one computer and see all records for a patient. Currently, he explains, a doctor opens a patient record and sees a list of documents for appointments, lab reports and references to images. To actually see the images the doctors needs to go to a different machine, usually in a different part of the building, open up the images, then go back to the computer with the EMR in order make a clinical decision about a patient treatment and schedule the appointment. Agfa's ICIS embeds an image viewer called Xero inside the EMR that can display any of the images linked to the patient, from ophthalmology to oncology to endoscopy, including the incredible number of videos that physicians are now attaching to patient files.

Walking around the RSNA 2012 exhibit gives the impression that there are hundreds of companies claiming to do exactly the same thing as Agfa ICIS. This is a mistaken impression, he points out, one that will quickly lead to pain again in the executive suite.

'There are many companies that can do different parts of this work, and they do their little part very well,' he said. ICIS represents the first time all these information services have been assembled in a package, a product that can be bought, shipped and plugged into existing hospital and clinical information systems. 'The key message is that ICIS puts all the data a clinician needs in the same place and in a clinical context that allows them to make decisions.'

Carestream's MyVue

MyVue Patient Portal empowers patients to securely access, manage and share their medical images and radiology reports with specialists and healthcare providers.

'Customers told us they are digital everywhere in the hospital but are still printing radiology images to CDs and DVDs because patients need to move the images to referring physicians, to specialty centres,' said Cristine Kao, who leads the marketing effort for Carestream's MyVue Patient Portal. 'When we looked at the cost of this image transfer we found it went beyond the hardware to the human costs of all this manual workflow,' she added. Embedding the MyVue Patient Portal within an existing hospital information system or PACS, regardless of the vendor, empowers patients to own and control their own data. 'When patients walk away with a CD, they don't know what to do with it. With the portal, they suddenly understand, right away, intuitively that they can send the images to their physician.'

The MyVue Patient Portal has a 'zero footprint' because it does not require any software to be downloaded. The portal is accessible with any web browser on any device because, 'you cannot predict what device a patient will want to use to access their data,' Cristine Kao pointed out. The portal features security encryption and built-in features to comply with the USA's Health Insurance Portability and Accountability Act (HIPAA), including logins and tracking of accessed data. Hospitals and stand-alone radiology services purchase the portal as a service to patients. More significantly, they are required to do so according to Stage 2 Meaningful Use requirements of the Affordable Care Act.

Otherwise known as Obama-care, the law states that US healthcare providers and professionals must provide a secure patient portal that allows patients to electronically view, download and transmit their medical records. Houston Medical Imaging in Texas is one of the first healthcare providers to implement MyVue as an extension of its PACS system. More than 60% of patients, or 3,000 people, registered for the portal and over half of those patients have accessed their images online, according to Randall Stenoien MD, the hospital's CEO.

These results are significant, Cristine Kao acknowledges. 'Other companies may say they can do this and talk about it as a platform, but none have come back with results as to how the portal is used and whether anyone was happy about the result,' she said. 'What is unique with Carestream MyVue is the design of the user experience. How this application works is what makes it different.'

MyVue is currently available as an option for Carestream Vue PACS and Carestream Vue for Vendor Neutral Archive, which uses third party PACS systems. The system is now available as a Carestream Vue for cloud-based services.


Cristine Kao, Global Marketing Manager for Healthcare IT at Carestream

Charles Morris, Senior Technical Marketing Manager at IMPAX Data Centre, Agfa HealthCare Corporation

During an average day, reports are usually with the requesting physicians within one and a half hours, at the most.

Radiology information systems

Erlangen's CSC RIS streams data through workplaces, speeds up reports and patient care, so, what's next – greater mobility and transmission to a Cloud?

A decade ago, when the Radiological Institute at Erlangen University Hospital relocated to the Centre for Internal Medicine, a radiology information system (RIS) was also installed. Very soon, the project implemented by CSC became more than 'just' radiological digitisation.

When Professor Alexander Cavallaro shows visitors his department's IT systems, the Radiology Institute's senior physician and head of the Imaging Science happily points to an almost vacant row of chairs. 'This is the waiting area for six pieces of equipment. If IT does its job, our waiting rooms are empty,' he explains.

Ten years ago this was a very different story. 'Up to then, the radiological workflow ran conventionally – without any IT support,' he explained. This changed practically overnight, after the CSC RIS was implemented and a Picture Archiving and Communication Systems (PACS) was introduced.

Hospital-wide RIS: a strategic decision

For radiologist Prof. Cavallaro and project leader Dr Thomas Kauer, the RIS introduction signalled the start of a hospital-wide image data infrastructure. 'We were fortunate that radiology, the board and Medical Informatics all pulled together,' Dr Kauer recalls. 'We made the strategic decision not to install an isolated radiology solution, but to lay the foundations for a hospital-wide solution.'

At the hospital six specialist departments at eight locations currently work with CSC RIS.

The Radiological Institute at Erlangen consists of six departments that serve internal medicine, surgery, ENT, the Children's Hospital, Women's Hospital and Neuroradiology, with some additional interdisciplinary services such as Cardiovascular CT and cardiovascular MR. There are 250 RIS workplaces, 2,100 Web workplaces and the system produces around 250,000 reports annually.

The RIS was integrated in the existing technical and organisational infrastructure, as well as the workflow. It was connected to the hospital systems for patient data administration, performance data entry, medical service accounting and report communication. 'The entirety of the range of services offered impressed us, from specialist as well as financial points of view,' says Dr Kauer.

More than just diagnostic radiology

Meanwhile, the CSC RIS is used not only for diagnostic radiology, but also four locations in internal medicine, surgery, gynaecology, and paediatrics. 'This comprehensive approach means I no longer like to talk about RIS, but rather an image information system,' Prof. Cavallaro said.

Around 250,000 reports are created every year – i.e. between 600 and 700 daily. Including all the departments, 80 physicians and 120 medical technical assistants use the software.

During a typical workflow, a doctor on the ward uses the web solution to commission an examination. 'Scheduling is very flexible. It also takes into account conflicts in schedules, which is important for patients undergoing more than one examination,' the professor emphasised.

The web solution is integrated deep in the hospital workplace system. 'Anyone registered on a hospital workplace hardly notices that he is calling an external application. It's as though it is all one thing,' Dr Kauer points out.

Integrated voice recognition accelerates workflow

Digital dictation and voice recognition functions are also integrated. As Prof. Cavallaro explains, 'Previously, assistants viewed the images together with the senior physician before dictating. Thanks to integrated voice recognition they now dictate immediately.'

Thus reports are usually with the requesting physicians within one and a half hours. The high degree of acceptance in non-radiology departments is thanks to the fact that specific requirements have been taken into consideration: for example, various voice recognition systems can be used, depending on the user's preferences.

Visions: Cloud, tablets and an operator model

Nonetheless, the RIS installation is not regarded as a complete project by the Erlangen staff. They believe that other departments may also be convinced by the integrated approach.

Dr Kauer also predicts further developments: 'We are interested in mobile solutions and have already trialled tablet PCs for mobile access to radiology data.' The move to Cloud technology or use of the RIS as an operating model could also be interesting in the future.

Building contrast-

Adding micro-bubbles to the blood lights up the body for ultrasound scanners. Non-invasive, non-toxic and low-cost, these examinations present a disruptive, readily accessible technology for diagnosing disease.

Report: John Brosky

Whilst contrast enhanced ultrasound (CEUS) remains an off-label use beyond cardiac applications in the USA, European physicians are rapidly compiling a powerful clinical case for applying the technique for tumour detection and tissue characterisation almost everywhere else in the body.

In August this year, CEUS was recommended by the United Kingdom's National Institute for Health and Clinical Excellence (NICE) for the detection of focal liver lesions, characterising cirrhosis and investigating potential liver metastases. NICE is Europe's only methodical health technology assessment authority and is both widely followed and highly influential, with its sharp eye for opinions on cost-effectiveness.

A year ago at this time the European Federation of Societies in Ultrasound Medicine and Biology (EFSUMB) issued guidelines on Liver CEUS, as well as recommendations on non-hepatic applications. While several companies are advancing CEUS agents towards the market, notably Sonozoid from GE Healthcare (Waukesha, Wisconsin), the dominant agent in clinical practice in Europe is SonoVue from Bracco Diagnostics (Milan, Italy), which has been available in Europe from 2001.

CEUS approval in the USA remains fixed within the Food & Drug Administration (FDA) approval for cardiac imaging in patients with suspected or established cardiovascular disease, to improve visualisation of cardiac chambers and endocardial borders. In Europe, SonoVue is approved for liver, breast and vascular applications.

An aqueous suspension of microbubbles in the blood enhances the ultrasound signal, illuminating a tar-

MIR 2012 REPORT

The Golden Age of radiological imaging is shifting into the past

It lasted forty years – but now it's over – that Golden Age of radiology and medical imaging is surrendering under technology stagnation and imaging issues such as the growing rejection of unnecessary public use. The field is now subject to radical change, declared *Professor Stephen R Baker MD M.Phil,* from the UMDNJ New Jersey Medical School in Newark, New Jersey USA, speaking at this year's Management in Radiology (MIR) Conference in Milan, Italy.

Report: Michael Reiter

Radiology's Golden Age lasted from 1970 to 2010. Its key ingredients included the discovery of new energy sources to create medical images – ultrasound, MRI and nuclear medicine. The emergence of cross-sectional imaging with CT scanning was another important aspect. In the '90s, major breakthroughs marked the technological progress in both CT and MRI. Further key contributions came from PACS and tele-radiology, which served to revolutionise communication.

Radiology: 'radiant' no more

Numerous reasons have led to the demise of radiology's radiance, the expert explained. On the one hand, no new imaging sources are in the pipeline that would lend themselves to comparison with the groundbreaking discoveries in the 1990s. On the other hand, there is a widespread perception that a vast number of procedures are being carried out that are not necessary; dose and patient harm are under scrutiny by regulators. Budget restrictions in most health systems are showing a serious impact on high-cost diagnostic imaging procedures. 'Our field has entered a period of reconsideration,' Prof. Baker summarised.

The role of radiologists is also undergoing a transformation. To an increasing extent they are being made obsolete by peers in other disciplines, technologists and also by the technology. An illustration of this trend is virtual colonoscopy, which is performed by technologists. Computer-aided decision-making is evolving in breast and chest cancer detection; and software can automatically determine the status of liver tumours. In this context, 'Radiologists need to redefine their role if they wish to continue doing their jobs – or having a job – in the future', according to Prof. Baker.

'The unintended consequences of a technology often cause more profound changes than what that technology was intended to achieve,' according to Professor Baker, speaking about management in radiology at the MIR 2012 conference.

MIR 2012 took place in a prestigious palazzo in Milan. An MIR session will focus on innovation management and telemedicine at next year's ECR, and MIR 2013 is scheduled to take place in Nice.

Interaction and involvement could help them to survive

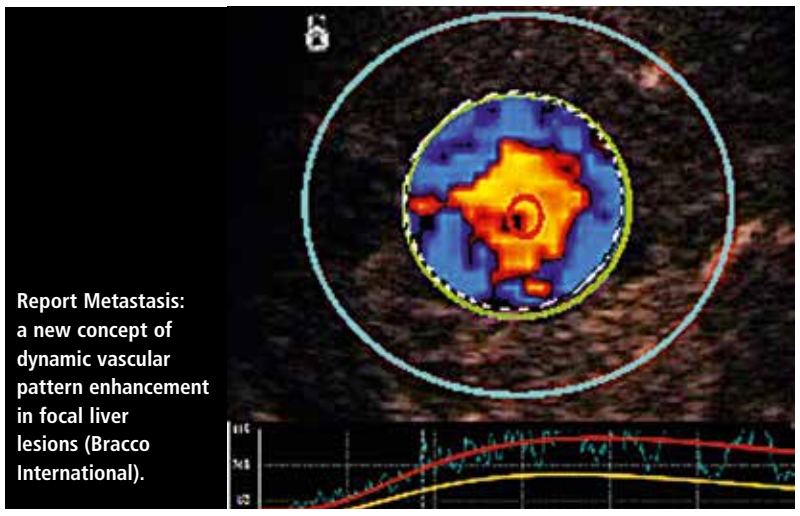
Radiologists have tended to be active, to some extent, in silos. Tele-radiology takes them even further away from their referrers, their peers in other disciplines and from clinical interaction. In order not to become anonymous and obsolete they need to reassert their position in the physical clinical context. That is, they should discuss readings with physicians in

g a clinical case for -enhanced ultrasound

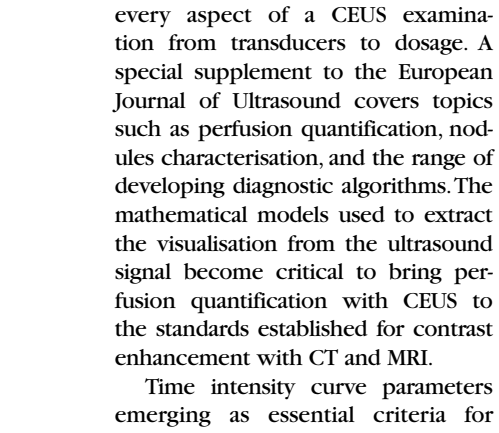
get area. The distinguishing quality of this device is the use of sulphur-hexafluoride micro-bubbles, which Bracco claims further amplifies the signal quality yielding diagnostic information comparable to more expensive imaging techniques, such as nuclear medicine, contrast-enhanced computed tomography (CT) or magnetic resonance imaging (MRI).

In March 2011, the company reported to the FDA that the database of pooled data on SonoVue for 70 completed clinical studies includes 5,275 patients, with only three of them reporting adverse events where the contrast agent could not be ruled out as the cause. In the 18 months since that report, the database of clinical studies has grown rapidly. European clinicians have a long advance on American colleagues for exploring every aspect of a CEUS examination from transducers to dosage. A special supplement to the European Journal of Ultrasound covers topics such as perfusion quantification, nodules characterisation, and the range of developing diagnostic algorithms. The mathematical models used to extract the visualisation from the ultrasound signal become critical to bring perfusion quantification with CEUS to the standards established for contrast enhancement with CT and MRI.

Time intensity curve parameters emerging as essential criteria for CEUS diagnosis include especially the wash-in/wash-out analysis with bolus injection. Recent European CEUS guidelines provide researchers with detailed discussion of these models, including pitfalls and artefacts that can be encountered. Off-label usage by researchers in Europe is overtly encouraged. In the August 2012 supplement of the European Journal of Ultrasound, editors wrote that CEUS presents a promising tool for studies in the musculoskeletal system, gastrointestinal tract and in the chest. As an example they cite explorations for endocavitary. 'Although the precise concentration of US contrast has not been defined yet, adding some drops of SonoVue to a physiologic saline solution is all that is needed to outline fluid collections, to diagnose normal and abnormal connections between body cavities, to visualise bile duct obstructions and internal fistulae, and much more,' they wrote. Three years ago Bracco and TomTec introduced SonoLiver, a PC-based software for radiologists to review off-line dynamic images of blood perfusion in the liver. The number of clinical studies for liver focal lesions immediately increased as the software became available across multiple manufacturers' platforms.



Report Metastasis: a new concept of dynamic vascular pattern enhancement in focal liver lesions (Bracco International).



Organised annually by the European Society of Radiology (ESR) and particularly addressing radiology department managers and head radiologists, MIR 2012 focused not on medical advances in this discipline, but on the 'big picture' – key trends and issues such as business management and workflow, benchmarking and quality management, and regulatory frameworks.

the other departments and reassume their role in the coordination of care. 'To become a virtuoso, you need to be there and interact' Prof. Baker said, characterising one of the approaches that could help to stop radiologists from becoming a dying species.

Proton and ion therapy developments

The curious (and sad) tale of abandoned plans and dismantled hopes

A prototype for proton and ion therapy has been used clinically in Heidelberg since 2009. Constructed jointly by Siemens and GSI (Helmholtz Centre for Heavy Ion Research) in Darmstadt. Siemens committed to two further units in Marburg and Kiel, with a third under development in Shanghai. However, soon after a successful trial the manufacturer terminated both the Marburg and Kiel contracts, announcing it were backing out of particle therapy. Among its reasons: Siemens' 3rd Quarter of 2011 results showed liabilities of some €381 million. Although almost ready for use, Siemens began to dismantle the high-performance Kiel facility. However, the Shanghai equipment is to be handed over in 2013. To meet that deadline, Siemens is developing the machine's technology still further, using its still-owned Marburg machine as a test unit. What will happen to it after 2013? *Daniela Zimmermann*, Managing Director of European Hospital, asked **Professor Jürgen Dunst**, President of the German Society of Radio Oncology (DEGRO) and Director of the Clinic for Radiotherapy at Schleswig-Holstein University Hospital (UK-SH) in Kiel

Among its other assets, proton therapy (PT) is important because healthy tissue surrounding a tumour receives less radiation from protons and carbon dioxide ions than from conventional radiotherapy, Professor Dunst explained. 'All international specialist medical associations assume that this results in a relevant advantage for around 10% of all radiotherapy patients. In the medium-term, particle therapy will therefore play an important role, and the respective equipment is being manufactured all over the world.

'The technology co-manufactured by Siemens is in use in Heidelberg, it also works in Marburg and it will work in Shanghai – and it would have worked in Kiel. Marburg's PT unit is already CE-certified.'

Why did Siemens depart from particle therapy?

'It's not actually an exit, because Siemens is still developing this technology until its routine clinical use. The Shanghai project is scheduled for completion according to plan. Siemens only terminated the contracts in Marburg and Kiel because they could not deliver the agreed service parameters in these locations.

'Reimbursements made by German medical insurers for particle therapy by international comparison are very, very low, i.e. only €20,000 for a complete series of treatments lasting several weeks. In other European countries reimbursement is between €40-50,000, and $70-100,000 in the USA. In Germany, therefore, the equipment must be utilised to the point where twice as many patients must be treated per year to finance such projects – unless, as in Heidelberg's case, the equipment is being financed through research funds. Although Siemens initially agreed to this double capacity, they couldn't comply with it – and so far no other manufacturer has been able to achieve this. The Rinecker Proton Therapy Centre in Munich and the Proton Therapy unit in Essen have the same problem.

Since 2005, Westphalian-born **Dr Jürgen Dunst** has been Professor of Radiotherapy at the University of Lübeck and Director of the Radiotherapy Clinic in the Lübeck campus at Schleswig-Holstein University Hospital. The 54-year-old current president of the German Society of Radio-Oncology (DEGRO) has long campaigned for a greater understanding among patients, colleagues and health politicians alike that radiotherapy is an important part of cancer treatment.
His research commitments centre on simultaneous radio-chemotherapy, organ-preserving procedures for breast, bladder, laryngeal and throat cancers and tumour therapy for children.

'Nonetheless, despite the limited number of patients and Germany's comparatively low reimbursement level, the proceeds would have been sufficient to finance the running costs. Even with the Heidelberg unit the proceeds are to cover the running costs along with the investment costs. It's only the refinancing of a purchase price of over €100 million that can't be covered.

'From a medical point of view, dismantling the particle therapy unit in Kiel is completely incomprehensible and would not have been necessary. Siemens even rejected a purchase offer, opting instead to dismantle the unit at the firm's own cost. I cannot imagine a commercially sensible strategy here because the same development costs arise in Shanghai and there's no saving. As a doctor I'm disappointed that patients are subsequently missing out on a chance of treatment because this kind of equipment cannot be replaced overnight. As a scientist I don't agree that medical technology developed in Germany and at the forefront worldwide is made available in China for further clinical research whilst the technology is handled in Germany.

The Kiel particle therapy project was considered the largest PPP project in German healthcare. Whose fault is it that this project could not be realised?

'Firstly, we should not talk about a "fault", but about responsibility towards patients and the research location, Germany. Secondly, with such a complex project the responsibility can't only be attributed to one party, but also to many others, although currently it is obviously a problem for Siemens.'

After Kiel's unit is dismantled, will there be a shortage in radiotherapy provision?

'Possibly. What is clear is that all proton therapy units manufactured in Germany put together will be able to treat a smaller, total number of patients than we assumed only a few years ago. What is also certain is that these high-technology projects have long realisation phases with at least 5-10 years between planning and utilisation. It's therefore important to utilise existing equipment. Dismantling of a facility almost ready for use is not a solution but a poor show.

Could the Marburg unit be saved?

'I sincerely hope so. Unlike the Proton Therapy unit in Kiel, it's already CE-certified. All those involved should seriously consider all options available to facilitate clinical use. Dismantling the Marburg facility would also be costly, which can't be in the shareholders' interest. The worldwide unique dismantling of the Kiel equipment should be just a one-off "memorial'.

The German Consortium for Translational Cancer Research (DKTK)

A powerful new entry to the oncology scene

A dynamic new consortium was launched in October during the recent *Innovation in Oncology* event organised by the German Cancer Research Centre (DKFZ) with Heidelberg University Hospital. The aim of the new *German Consortium for Translational Cancer Research* (DKTK), in which the DKFZ is the core centre, is to augment nationwide cancer research by transferring to the consortium the collaboration between cancer researchers and physicians established at the National Centre for Tumour Diseases (NCT), explained Professor Otmar D Wiestler, the chief coordinator of DKTK and Chairman of the Management Board of DKFZ.

Commenting on the new consortium, Germany's Federal Minister of Education and Research Professor Annette Schavan pointed out that, by having the best researchers from 20 institutions cooperating on an interdisciplinary basis, the consortium opens up possibilities to develop new ideas and achieve real innovations in cancer treatments.

160 committed scientists

Nobel Prize winner Professor Harald zur Hausen, who outlined the long route from discovering that papilloma viruses cause cancer to having a vaccination against cervical cancer, emphasised the obligation of cancer researchers to continuously consider whether their results may be a starting point for new approaches in cancer prevention, diagnosis and treatment. More than 160 scientists and physicians with their working groups at DKTK's eight locations will be committed to this 'translational' idea.

In a panel discussion, DKTK scientists and oncologists also presented aspects of individual programmes, which include high precision radiation therapy. Technical innovations such as the unique gantry of the Heidelberg Ion-Beam Therapy Centre (HIT) contribute to this aim. Using the example of paediatric cancer, DKTK researchers explained the chances for improved cancer therapies emanating from sequencing individual tumour genomes. Efforts to develop targeted anti-cancer drugs will require a much higher number of clinical trials in the future, but each of these will include a smaller number of patients. The DKTK Clinical Communication platform will ensure that patients have the chance to participate in clinical trials best suited for them anywhere in Germany.

The partnership of the German Cancer Research Centre with seven university hospitals has evolved from a joint initiative by the German Ministry of Education and Research (BMBF), German Cancer Aid (Deutsche Krebshilfe) and the German Cancer Research Centre (Deutsches Krebsforschungszentrum, DKFZ). The consortium will help to translate current research results even more swiftly into patient care. A translational centre will be established at each of the partnering sites, as a joint project of DKFZ and the respective university hospital.

Experts heard of the new consortium during the Innovation in Oncology event held in Heidelberg this autumn organised by the DKFZ.

The Federal Ministry of Education and Research and participating states will provide funds of around €12 million for the consortium this year. The annual budget will be successively raised to reach about €28 million by 2014. Additionally, German Cancer Aid (Deutsche Krebshilfe) will, upon request and after evaluation, provide funding for defined research projects.

The general scientific concept of the German Consortium for Translational Cancer Research provides for seven translational research programmes: Signalling Pathways of Carcinogenesis, Molecular Diagnosis of Cancer, Tumour Immunology, Stem Cells and Cancer, Imaging and Radiation Therapy and Therapy Resistance, and Cancer Prevention and Early Detection. Several sites will participate in each programme.

Research platforms will also be available for all partnering sites. A clinical communication platform will ensure uniform diagnosis standards for all patients so that they may then be offered innovative treatment protocols in clinical trials. Various service units will facilitate outsourcing of routine laboratory work and conducting it according to uniform standards. Preclinical models will facilitate common access to animals that have been genetically modified to develop specific cancers. Substance development will focus on collaboration with the pharmaceutical industry.

Finally, the School of Oncology will provide education and training for life scientists and medical researchers in translational cancer research at the highest level.

Lights, music, action…

The patient is soothed and ready for proton therapy

A special system to promote patient relaxation during proton treatments enables them to select comforting light, sound and images for the treatment room before their therapy begins, thus transforming a cold, impersonal environment into a tailor-made and more pleasant environment.

In their first active collaboration, the Belgian firm IBA Group, which produces advanced cancer diagnosis and therapy technologies, and Royal Philips Electronics will install a state-of-the-art, patient-centred proton therapy treatment room in the Willis-Knighton Cancer Centre in Shreveport, Louisiana, USA. It will be the first IBA installation to incorporate the Philips Ambient Experience, designed and engineered by Philips Healthcare.

IBA's CEO Olivier Legrain said that the Philips-IBA cooperative agreement demonstrates a successful collaboration in offering highly advanced, patient-centred care, a statement backed up by Dr Lane Rosen, at the Willis-Knighton Cancer Centre, who observed: 'Ambient Experience enhances our ability to provide superior cancer care. The soothing and empowering atmosphere will make our patients more comfortable, which will allow our staff to work more efficiently.'

This will be the first centre to utilise ProteusONE, IBA's single-room compact gantry solution for those needing a more cost-effective, smaller footprint option, the Belgian firm reports. The $40 million project is expected to begin proton treatments for cancer patients in early 2014.

*ProteusONE is the brand name of a new configuration of the Proteus 235, including some new developments subject to review by Competent Authorities (FDA, European Notified Bodies, et al.) before marketing.

'We are increasingly defining treatments according to the molecular characteristics of individual tumours'

Advancing personalised medicine

BRAF is a protein that plays an important part in the transmission of growth signals. In a mutated state it can lead to uncontrolled cell growth. Around every second malignant melanoma – the deadliest and most aggressive form of skin cancer – has a certain mutation of the BRAF gene.

Report: Michael Krassnitzer

As has now been shown, affected patients respond particularly well to the substance Vemurafenib. Their average life-span is around 40% higher than with conventional chemotherapy, according to a current study presented at the Congress of the European Society for Medical Oncology (ESMO).

Recently licensed in the EU, this substance is a fitting example for a treatment concept that has undergone rapid developments in recent years – personalised medicine. 'The next ten to fifteen years will see us make real strides toward genuinely personalised treatment for cancer patients,' said ESMO president Dr Martine Piccart, during the society's 2012 meeting held recently in Vienna.

The right drug in the right dosage at the right time is, to coin a snappy slogan, the objective of individualised medicine. 'Personalised medicine is about matching patients to the treatments that work best for them. In oncology, personalised medicine is becoming a clinical reality, with targeted treatments already in use,' explained Professor Antanasio Pandiella, Translational Oncopharmacology Unit Director and Vice-director at Salamanca Cancer Research Centre in Spain. 'The concept of one chemotherapy drug fits all is now history. We are increasingly defining treatments according to the molecular characteristics of individual tumours.'

Cancer develops through genetic mutations in the body's cells. The genome of some types of tumour contains up to 100,000 changes of the genetic material. Not all of them are relevant to cancer development, with the number of 'cancer-genes' currently estimated at around 300 – 400. During genetic tests carried out in the context of cancerous diseases, only very few genetic mutations are classed as biomarkers. If Dr Pier Giuseppe Pelicci, Co-Scientific Director of the European Institute of Oncology (IEO) in Milan, Italy, had his way, whole genome testing will soon be part of clinical routine: 'This could identify new prognostic markers and new therapeutic targets.'

'Increasingly extensive sequence analyses of cancer genomes have led to the discovery of new mutated cancer genes and have explored the extant patterns of somatic mutation,' explained Prof. Michael Stratton, Director of the Wellcome Trust Sanger Institute in Cambridge (UK) and joint head of the Cancer Genome Project, which aims to elucidate the genetic causes of human cancers. In the context of the Cancer Genome Projects some catalogues of the mutations in the genome of individual breast cancers have already been compiled. 'The combinations of mutated cancer genes and the mutational processes that are operative in the subclasses of breast cancer are becoming apparent,' said Prof. Stratton, summarising the research results. During ESMO, other oncologists reported on the cartography of the genetic landscape for pancreatic cancer and melanoma.

Nonetheless, personalised medicine must also overcome some obstacles: 'We are very concerned about the huge bureaucracy involved in running clinical trials,' explained ESMO President Piccart. 'We hope that the new clinical trials directive, due to come into force in 2016, will facilitate research.' Another new directive in development also has a potentially important impact on clinical trials: the new Data Protection Regulation, currently in draft form. 'In cancer research, we need to be able to share data,' she added.

Dr Paolo G Casali, head of the Adult Sarcoma Medical Oncology Unit, Istituto Nazionale Tumori, Milan, Italy, refers to a methodological problem: The more individualised the treatment, the more difficult the clinical examinations. 'We need hundreds of patients for a clinical study. If the target groups become increasingly smaller we won't be able to achieve these numbers,' he warns. Concerning data protection and the clinical trials directive he cautioned, 'There will be no personalised oncology at all if we don't change the rules.

Martine Piccart MD PhD is associate professor of oncology at the Université Libre de Bruxelles as well as head of the medical department at the Jules Bordet Institute in Brussels, Belgium. She founded the Breast International Group (BIG) of which she is Chair. From 2006 to 2009, Dr Piccart was President of the *European Organisation for Research and Treatment of Cancer (EORTC)*, and has been President of the European Society for Medical Oncology (ESMO) since 2009. Her main research areas and interests are breast cancer and new drug development, both as a researcher and as a clinical expert for registration.

Professor Michael Stratton MD PhD is Director of the Wellcome Trust Sanger Institute in Cambridge, England, where he jointly heads the Cancer Genome Project. He is also Professor of Cancer Genetics at the Institute of Cancer Research. The professor qualified in medicine at Oxford University and Guys Hospital and obtained a PhD in the molecular biology of cancer at the Institute of Cancer Research. His research interests have been in cancer genetics. He led the group that mapped and identified the high-risk breast cancer susceptibility gene BRCA2. More recently he has found moderate-risk breast cancer susceptibility genes, such as CHEK2, ATM, BRIP and PALB2, as well as genes for skin, testis, colorectal, thyroid, and childhood cancers.

Sepsis diagnosis and treatment

Blood culture and the PCT test are still the most suitable

Report: Bettina Döbereiner

'We need an ECG for Sepsis,' urged Professor Konrad Reinhart during this year's Anaesthesiology and Intensive Care Medicine (HAI) Congress in Berlin. Obviously his hope is not for an ECG machine, but for a faster means of diagnosis than the standard blood culture that can only provide a sepsis diagnosis in 48 to 72 hours. As yet there is no ideal marker for sepsis, even though the earliest possible diagnosis and treatment is decisive in the patient's survival. Even though the improvement and acceleration of the diagnostic procedure has been researched worldwide for decades, there has been no trailblazing development in this field.

During his congress lecture, Prof. Reinhart, who directs the Clinic for Anaesthesiology and Intensive Care Medicine at Jena University Hospital, explained that he recommends the frequently used and so far most investigated diagnostic marker, the procalcitonin test (PCT), as an add-on to the blood culture.

Although the diagnostic effectiveness of this marker is better than that of other infection markers, such as the C-reactive protein, studies have not yet sufficiently proven that using the PCT marker can lower the mortality rate from sepsis. However, it is known that the survival rate can be improved through earlier and better diagnosis, and this speaks for the PCT Test, he emphasised.

Procalcitonin is the precursor of a thyroid hormone produced naturally in the body, which is normally hardly or not at all detectable in the blood plasma. However, during infection it rises significantly, particularly if bacteria are present. Therefore, PCT is often used as a marker if sepsis is suspected in order to differentiate between infectious (sepsis) and non-infectious causes (such as SIRS) of a systemic inflammation. The big advantage of this marker in particular is speed, with the result available in only 1-2 hours from laboratories that work around the clock.

The PCT Test as a diagnosis marker does have its limitations and therefore cannot replace the blood culture. The PCT level is for instance also raised after major surgery without the presence of sepsis. In the case of fungal infections and fungal sepsis the PCT test also has certain weaknesses. A severe fungal infection, which points towards a sepsis, can be present without the PCT being markedly raised. However, the marker can also be used for treatment control. If the marker doesn't fall during antibiosis – procalcitonin has a half-life of 24 hours – one can assume that the antibiotics are not effective, be it due to resistant pathogens or a centre of inflammation that cannot be treated with antibiotics, such as a catheter infected with pathogens or an abscess, a bowel leak or an infected heart valve. However, Prof. Reinhart said that the treatment control of sepsis with PCT has so far been insufficiently documented in qualitative studies.

At least ten large-scale, randomised studies, however, have proved that PCT monitoring clearly helps to decrease antibiotics use, Prof. Reinhart said. Although the examinations centred mainly around respiratory infections and pneumonia respectively, there are now also some studies from other areas of intensive care medicine that proved this. To be on the safe side, a study (SISPCT) is currently being run, on behalf of the Sepsis Competence Network, to capture whether PCT can also be used for antibiosis monitoring in severe cases of sepsis, he outlined. Although antibiosis monitoring does not have effects on individual patients it saves costs, reduces the use of antibiotics generally and therefore also helps to fight the development of resistances due to the uncontrolled administration of antibiotics.

Blood culture independent tests on a PCR basis, which can detect bacterial DNA in vitro within 6-8 hours, are available. They have been tested in several studies and are already partly used in clinical applications. 'We have great hopes and have already carried out studies together with SIRS-Lab and Roche, which suggest that this method allows us to find out at an earlier stage which pathogens might be involved. This is promising, but the effectiveness, particularly cost-effectiveness, has not yet been sufficiently proved,' Prof. Reinhart said. However, these tests can neither deliver comprehensive answers to questions about resistance nor even multi- resistance – they can only give hints, which is why the PCR test should only be regarded as an add-on to a blood culture.

The PCR test will also not be able to replace the PCT marker, he pointed out. 'So far we know that we can find pathogens twice as often, or sometimes even three times as often, with the PCT test than with a blood culture, for which the hit rate is 20-30%.' By combining the two methods a detection rate of 40% up to a maximum of 60% can therefore be achieved. This means that '…with both methods there will always be cases where we don't know if there is a pathogen and if we should treat based on the clinical symptoms and the PCT'.

Renowned sepsis expert, researcher and member of numerous sepsis groups, **Professor Konrad Reinhart** studied medicine in Munich and the Free University (FU) in Berlin before working in several FU clinics and becoming a registrar at the Anaesthesiology and Intensive Care Clinic at the FU's Benjamin Franklin Hospital. There he completed his doctorate and postdoctoral lecture qualification. A professorship followed and he became Assistant Director of the hospital. In 1993 he joined Jena University Hospital, where he heads the Anaesthesiology and Intensive Therapy Clinic.

His research is on the development of new diagnostic procedures and treatment approaches for sepsis. Apart from managing numerous research projects he has had a long involvement with the foundation of advisory boards and organisations that work against the sepsis mortality rate. He was the first President of the German Sepsis Society (founded 2001), Chair of the International Sepsis Forum and, since its foundation (2010), has Chaired the Global Sepsis Alliance, which launched World Sepsis Day.

Perioperative anaesthesia for patients with heart failure

Still a challenge

Report: Bettina Döbereiner

Can an anaesthetist treat a patient with heart failure (HF) without any specialist knowledge of cardiology? That was the question posed by Dr Florian Weis, from the Clinic of Anaesthesiology at the University Hospital of the Ludwig Maximilian University Munich, when lecturing on perioperative management of this patient group. Speaking in Berlin, at the Capital City Conference of the Congress of Anaesthesiology and Intensive Care Medicine HAI 2012, his answer was 'Yes.' However, the treatment of patients with heart failure continues to pose a big challenge and there is much to consider, he pointed out.

Undoubtedly, the number of HF patients who need surgery and therefore anaesthetics will increase significantly due to demographic changes as well as recent advances in anaesthesiology and surgical procedures. The latter was confirmed by Eike Martin, Professor for Anaesthesiology and Intensive Care Medicine at the University Hospital in Heidelberg and one of the session Chairs: 'Despite existing risk factors, we are more confident these days about operating on older patients, meaning patients in their 80s and 90s.'

However, postoperative, 30-day mortality in HF patients who have undergone minor or major surgical interventions other than heart surgery continues to be significantly higher than in non-HF patients, Dr Weis said, quoting 2011 study results, which, to many people's surprise, also proved that mortality in the case of HF is actually clearly higher than amongst patients with coronary disease. Therefore, Dr Weis concluded, heart failure should be given more consideration than it currently receives.

'You will see that, in Germany, a third of all HF patients who come to you have not been receiving ideal (doses of) medication,' he said. Especially when these patients do not take any ACE blockers or an angiotensin receptor blocker the mortality rate rises considerably. Dr Weis reinforced this statement with data from a survey carried out by Deutsches Ärzteblatt, the official journal of the German Medical Association, which showed that only 24% of general practitioners (GPs) and specialists were actually aware of and able to quote current heart failure guidelines. It also illustrated the persistent lack of knowledge of current treatment standards regarding the administration of aspirin for patients with heart failure. 'People still don't realise, and that also includes doctors in surgeries outside the hospital, that aspirin should not be stopped but that it should continue to be administered,' Prof. Martin added, when it became clear that some of the congress audience were obviously not aware of this.

The obvious theme of the event was the need for a more generous diagnostic utilisation of echocardiograms and the diagnostic markers BNP or ProBNP as additional instruments of pre-medication diagnostics, at least for patients with cardiovascular problems. During his lecture at the event, cardiologist Prof. Markus Ferrari, from Jena University Hospital, recommended a combination of different methods in cases of uncertainty: 'A patient will most likely state that they are able to climb five flights of stairs even if they have enlarged ventricles. Without the patient visibly suffering heart failure, in some of these cases an echocardiogram will actually establish an ejection fraction (EF) of only 30%, when the normal level is > 60%, and the cut-off for a higher risk anaesthesia is at <40%,' he said. Together with a stress-echocardiogram, a determination of BNP or ProBNP – taken during the pre-operative assessment – could further aid the diagnosis. The levels of these hormones are raised in the case of relevant heart failure, although along with the patient's age, obesity, liver failure and other co-morbidities can lead to a shift in definition of the normal range.

There was also news around the discussion of the administration of anaesthetics: Etomidate is out, Dr Weis urged: 'It can, at any rate, no longer be recommended as a first-line anaesthetic.' Etomidate administration has been controversial for some time – one of its quoted advantages being its clear haemodynamic stability and a disadvantage being the cortisol-synthesis problem. However, according to recent findings, Dr Weis said, the arguments for Etomidate administration, which largely originate from studies between 1974 and 1984, can no longer be sustained. A comparative study from 2010 could not detect any haemodynamic differences in the different classes of substance. Further studies, he said, prove that a single administration for re-intubation in itself already increases the requirement for steroids administration, and that a single dose to prepare for the administration can increase the risk of adrenal insufficiency. Although the effects on mortality are not conclusive, the authors of all the latest studies conclude that its administration should, if at all possible, be avoided.

The pulmonary artery catheter (PAC) appears to be more popular again. In recent years it was only rarely used as an instrument for perioperative management and monitoring due to complications, as yet no documented evidence of its use, and for financial reasons. Dr Weis however, referred to the 2011 Mega-Study carried out by Hamilton, which describes the use of this catheter as beneficial for patients. Dr Weis ascribes the aforementioned complications to problems with handling: 'In my view, the user problem is based on the frequently low incidence of use. If you only use the PAC once a year the PAC is and will continue to remain a device that needs to be viewed very critically; however, if in more frequent use, I think this will be possible with a very low rate of complications, for general surgery as well.'

However, the substantially more expensive PACs that offer permanent online monitoring are, with some exceptions, e.g. lung transplants, are not necessary, he said. 'The level needs to be established, but whether or not it's available every minute is not relevant. There is also no evidence that the much more expensive measurement catheters with online tools have any advantages.'

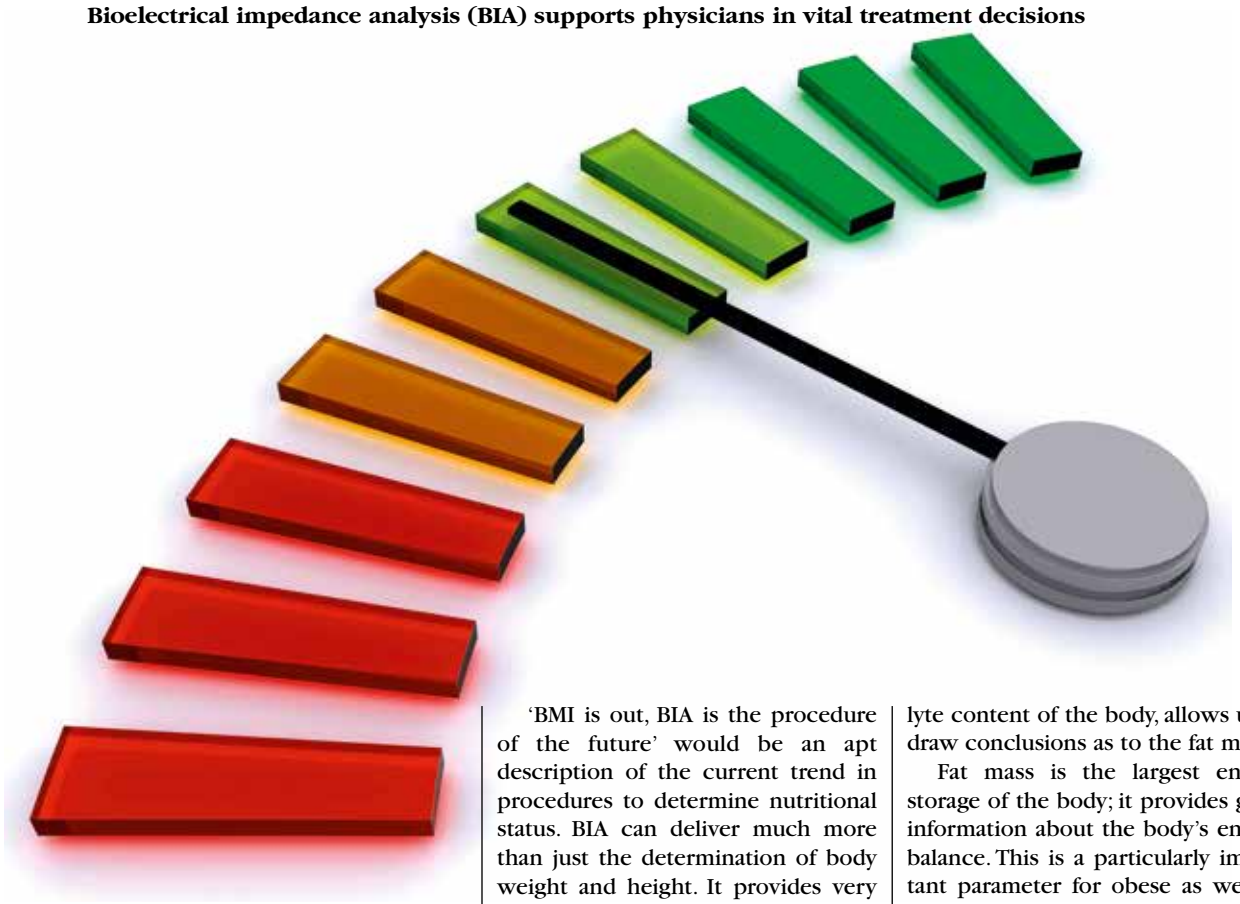
Senior anaesthesiology consultant **Dr Florian Weis** studied medicine at the Ludwig Maximilian University, Munich and trained as a specialist in its anaesthesia clinic in the university's Grosshadern Campus. From 2006 – 2009 he worked as a consultant on its intensive care ward.

Eike Martin, Professor of Anaesthesiology and Intensive Care Medicine, and Managing Director of the Anaesthesiology Clinic at Heidelberg University Hospital, studied medicine at Mainz University, completing his specialist training and habilitation at the Institute of Anaesthesiology and Re-animation at the Ludwig Maximilian University Munich. From 1977 he was a consultant at Grosshadern University Hospital, Ludwig Maximilian University, Munich. Between 1987-1990 he was Senior Consultant at Nuremberg Hospital, then becoming Professor and Medical Director of the Heidelberg Anaesthesiology Clinic. In 1991 he joined the hospital's Board as Deputy Medical Director and was Executive Medical Director of the University Hospital between 1993-2007.

Internal medicine specialist **Professor Markus Ferrari** studied medicine, as well as education and sports sciences, in Göttingen. Early on, his aims fell on the human heart; he wrote his MD thesis on mobile cardio-pulmonary support systems and his habilitation on the 'Development of a transvascular aortic valve replacement with a self-expanding stent'. In 1997 he left Göttingen University Hospital for the Internal Medicine Clinic at the Friedrich Schiller University Jena where he has served as Senior Consultant and Co-Director. In 2006 he co-founded JenaValve Technology GmbH and is its Medical advisor and a Member of the Scientific Advisory Board.

Simpler risk scoring

Bioelectrical impedance analysis (BIA) supports physicians in vital treatment decisions



Over the last ten years, bioelectrical impedance analysis (BIA), a procedure that originated in the USA, has also become established in Europe as an evidence-based method to assess body composition and a patient's respective state of health. 'New technological developments make it possible to precisely and simply determine clinical parameters, and networking with different databases facilitates accurate risk prognoses for diseases,' explains Professor Manfred J Müller, who heads the Department of Human Nutrition at the Institute of Human Nutrition and Food Science as well as the German Federal Ministry of Education and Research Reference Centre for Body Composition at the Christian-Albrechts University in Kiel.

'BMI is out, BIA is the procedure of the future' would be an apt description of the current trend in procedures to determine nutritional status. BIA can deliver much more than just the determination of body weight and height. It provides very precise information on fluids, functionality and energy balance of the human body. 'BIA measures body fluids and can, if run in several frequencies, even differentiate between water that is still in the cells and water outside the cells,' Prof. Müller explains. Assuming that fat-free mass (= FFM, which includes muscles and internal organs) has a water content of around 73%, this mass can be calculated with the help of BIA. The fat mass is then calculated from the difference between body weight and FFM. 'BIA therefore does not actually measure fat mass, as frequently and erroneously described, but is primarily a measuring procedure to determine body resistances which, depending on the water and electrolyte content of the body, allows us to draw conclusions as to the fat mass.'

Fat mass is the largest energy storage of the body; it provides good information about the body's energy balance. This is a particularly important parameter for obese as well as underweight patients. The objective of the treatment of obese patients is the mobilisation of surplus energy storage: 'With the help of BIA, a doctor can calculate precisely how many calories a patient has to mobilise of the surplus fat mass in the context of a diet. The follow-up then shows clearly whether or not a patient has consistently stuck to the diet,' he explains. Deviations compared to gold standard procedures can amount to around one to one and a half kilos, which, in his view, is insignificant because it is more important to reconstruct the change of a parameter over a certain period of time. The same applies to the observation of fluid increase and decrease in dialysis patients, for instance. 'The actual important question, which can be answered with the help of BIA, is how much water the patient stores between dialysis appointments and how much is removed through dialysis. This is also important for patients with heart failure and vice versa, for patients suffering dehydration (such as geriatric patients).'

Unique method captures a number of data

BIA can precisely capture a number of raw data including, for example, the phase angle and BIA vector graph; these are values that cannot be determined by any other method. The phase angle depends on the quality of the cell membranes, which indirectly in turn allows conclusions as to the quality of the fat-free body cell mass. The phase angle is a prognostic parameter, which, in the severely ill, prognostically discriminates between shorter and longer life expectancy. 'In patients with wasting diseases, such as tuberculosis or cirrhosis of the liver, the phase angle helps to determine the extent or respectively the stage of the disease in addition to other values.' This parameter is very helpful and supportive for the doctor's approach regarding a patient's further treatment. The big advantages of this method are the high precision and low impact on the patient, because it can basically be repeated every day.

For functionality, BIA also delivers very helpful information for patient rehabilitation. Through determination of the FFM and functional body mass (which corresponds with the sum of the oxygen-consuming cells) respectively, the doctor for instance can recognise whether muscle regeneration after a fracture is sufficient or whether the patient needs further physiotherapy. However, BIA not only measures but, through linking to other risk parameters and networking with various databases, can also provide comparisons.

The software supplied with the Body Composition Analyser (mBCA) by seca calculates the risk of developing certain diseases. 'For obese patients it is also possible to enter data on inactivity and blood levels and the doctor will then receive information as to the extent of the patient's cardiovascular risk. The physician can even choose between different, validated scores, such as the Framingham and the WHO Score,' he explains, adding that it is fascinating how a patient's risk can be calculated at the touch of a button – and with outstanding precision, as the variance of measurements for repeated measurements is less than one percent. 'Bio-monitoring with BIA does not need to shun comparison with other medical procedures, and not with regards to the validity of its results either,' Prof. Müller concludes.

After studying medicine and psychology **Professor Manfred J Mülller MD** began his academic career at the Institute of Biochemistry at Hamburg University. Once qualified as a specialist for Internal Medicine, Gastroenterology and Hepatology he became a consultant in the Endocrinology and Gastroenterology Department at Hannover Medical School, as guest lecturer at the University of Geneva and head of the Department of 'Dietetic Foods' at the German Federal Health Office in Berlin. Prof. Müller habilitated in Internal Medicine and Food Sciences. He currently heads the Institute of Human Nutrition and Food Science at the Christian-Albrechts University, in Kiel, and is spokesperson of the BMBF (Federal Ministry of Education and Research) Competency Network on Obesity

Malnutrition and undernourishment

Adverse consequences are clinical as well as economic

No one wants to be admitted to a hospital because the food is good. Yet, following discharge, one of the first things the patient is asked is, 'How was the food?' as if the medical treatment is of secondary interest.

Report: Anja Behringer

It is also notable that many, particularly older patients are already malnourished when admitted – and a surprisingly large number are also undernourished when discharged – i.e. showing a weight loss. The issue then is not about personal taste and dietary preferences but the active composition of nutrition provided to support healing and cure.

Undernourishment and malnutrition in hospitals are common and increasing problems for 28-30% of all patients in European hospitals, as explained by Professor Christian Löser, Consultant at the Medical Clinic of the Red Cross Hospital in Kassel and joint editor of the specialist publication *Current Nutritional Medicine*. Speaking at the European Health Congress in Munich, he added: 'Nutrition used to be part of basic care, but these days it is a highly efficient, integral component of medical prevention and treatment and offers substantial scope for cost reductions in the hospital.'

Professor Christian Löser

A shift in nutrition evaluation

On ward admission, each patient must have their nutritional status recorded based on simple, established parameters, and those suffering undernourishment or malnutrition must be treated with targeted nutrition based on the established step treatment scheme. Undernourishment/malnutrition are independent risk and cost factors that impact on all relevant clinical parameters, such as mortality, morbidity, length of hospital stay and quality of life. The immediate, annual costs in Germany alone run to around €9 billion and in Europe to around €120 billion a year. Interventional studies and meta-analysis convincingly confirm the therapeutic benefit and cost efficiency of supportive liquid oral supplements and tube feeding. Setting up a nutrition team consisting of doctors specialising in nutrition, nurse specialists, dietary assistants and/or a home economist (ecotrophologist in Germany) is vital to the implementation.

There are still no standardised, worldwide definitions for the terms undernourishment and malnutrition, and there is also no standardised recording and quantification. The current guidelines of the German Society of Nutritional Medicine (DGEM) define undernourishment as a reduction in energy storage (primary target: reduced fat mass) and malnutrition as either disease-associated weight loss, protein deficiency (reduced muscle mass) or a deficit in

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Adverse consequences

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specific essential nutrients. The early recording of the onset of undernourishment and/or malnutrition as well as consistent basic, nutritional medical care not only has a large impact on a patient's individual mortality, morbidity, therapy tolerance, rate of complications and therefore prognosis and quality of life but also, as proven in prospective clinical studies and meta-analysis, leads to a significant decrease in the length of hospital stay and a substantial cut in individual resulting costs.

During the hospital stay, further problems regarding a patient's nutritional status can arise. Clinical studies have shown that, depending on the medical specialty and the patient collective examined, between 30-80% of in-patients lose weight during a hospital stay. The occurrence of undernourishment/malnutrition correlates heavily with social factors (e.g. family and care status, education), the age of the patient or medical factors (malignant primary disease, polypharmacy).

After an individual evaluation and treatment of underlying causes, the next step in the scheme introduced by Prof. Löser includes an individual nutritional anamnesis with modification of the respective diet using a well-tolerated, energetically high-quality individually adapted diet. Moreover, there are numerous established, general measures, such as the use of special flavour enhancers, or food enrichment with cost-effective supplements that are odourless and neutral in taste but rich in energy, such as maltodextrin or specific protein concentrates.

Mealtimes are highlights in a patient's day

Nurses must ensure that patients eat in a pleasant, companionable environment, that special dietary training is provided for a patient's relatives or carers at home, and that promotion of physical activity between meals or the prescription of frequent, small meals high in energy (finger-foods, other snacks, energy drinks) is spread throughout the day. The catalogue of menu choices varies according to the individual hospital, but an increasing number of their caterers are trying to adapt dietary concepts to the guidelines of the German Society of Nutrition and to provide balanced and well-tolerated food.

'Procuratio' offers up to 150 different diets – Mediterranean, dietary concepts for maternity units, and indication-induced menus for rheumatism and cardiovascular patients. A liquid nutrition concept is also offered because the therapeutic benefit of liquid and supplemental nutrition has been confirmed in numerous clinical studies. Prof. Löser explained that the daily administration of a 250kcal liquid supplement substantially reduces all complications for patients. 'The therapeutic efficiency of nutrition is higher than that of any medication,' he pointed out. The professor therefore also demands, for economic reasons, that 'nutritional medicine, in view of its enormous relevance, must finally become an obligatory part of the training for medical students and specialists.

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