



Medical technology

Trends towards miniaturisation and digitisation will continue, says ZVEI



Hans-Peter Bursig,
Managing Director of ZVEI

As in past years, this year's MEDICA is one of the most important stages for the medical technology industry. International manufacturers will do a song and dance to dazzle the international clientele. As Managing Director of the German Electrical and Electronic Manufacturers' Association (Deutscher Zentralverband Elektrotechnik- und Elektronikindustrie e.V. - ZVEI), **Hans-Peter Bursig**, is well aware of this trade fair's role for the export-oriented med-tech companies, particularly those in Germany. In an interview with *Meike Lerner*, of European Hospital, he highlighted the position and perspectives of German medical technology firms and the fair's significance for the domestic med-tech industry.

'Medical technology is certainly one of the most important groups of exhibitors at MEDICA, be it in terms of space - four halls are dedicated exclusively to this segment - or of visitors. In visitors' surveys, for years medical technology has been named among the top-ranking points of interest,' Hans-Peter Bursig pointed out. 'Last year's trends will no doubt continue for years to come: miniaturisation and digitisation. The products are becoming increasingly compact and the importance of software and the electronic components to control these products is growing. It also

means that the products become more modular and this can be combined into complex systems that are tailored to the customer's needs and specifications.'

European Hospital: How well are German medical technology companies positioned internationally?

H-P B: The German medical technology industry is very well positioned, internationally as well as in Europe. Depending on your point of view, German manufacturers rank number one to three. In Europe, we are no

continued on page 2

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continued from page 1

doubt the leading country. Internationally, we are behind the US, nevertheless German companies do well on the US market. However, Germany is no longer the international lead-market for medical technology. We have to bring innovative products to the domestic market much faster. If we fail to do so, we will run the risk of losing our competitive edge.

For German companies, MEDICA has developed into a platform from which they face up to international competition – only on the German market. Today, this is the internationally leading fair where customers compare German companies with

their international competitors. For the German medical technology industry, which heavily relies on export, it is an enormous advantage to have the major fair right on the doorstep.

What do you expect from this year's MEDICA?

H-P B: The prime task of such fairs is to network, to maintain contacts as well as initiate new business. Over the last few years, MEDICA has done well in this respect. German customers have displayed increased interest in innovative products and their potential to improve efficiency and quality. Thus, this trade fair is also an indicator of the investment climate in Germany.

Which products and technologies offer the most potential for German med-tech firms?

H-P B: In general, German medical technology is strong in the capital goods sector, where quality and service during the entire life cycle play a crucial role. Today, modern healthcare and the cost-efficient operation of hospitals and doctors' offices are inconceivable without these products. The capital goods sector is complemented by IT solutions and problem-specific packages for defined clinical issues. German medical technology is also well positioned in the market for efficiency- and quality-enhancing solutions.

CONGRESSES & EVENTS Wednesday 14 November 2007

MEDICA CONGRESS

14:30-17:30

CCD Pavilion, 1st floor, room 17

MRSA – an interdisciplinary

problem

- MRSA in in-patient nursing of geriatrics, by Violets Lorecka, Kassel

- Hygiene measurements and epidemiology during occurrence of MRSA, by Dr. Markus Schimmelpfennig, Kassel

- Pharmaco-therapy for MRSA: possibilities and limitations, by Dr. Hans-Walter Schmitt, Kassel

MEDICA MEDIA WORKSHOP

14:00-16:00

Hall 16, booth A 05, workshop room

TeleHomecare – Do nursing robots offer new possibilities? Chairman: Dr Pablo Mentzins, BITKOM, Berlin

MEDICA PLUS

12:00-13:00

Hall 1, 1st floor, room 111

EPC/Rfid and barcode in action – for your transparent healthcare supply chain. Organiser: GS1 Germany GmbH

MEDICA VISION

11:00-13:00

Hall 3, booth H 92

Diagnostics and therapy perspectives: new imaging developments

- Conceptual changes in oncology triggered by molecular imaging, Prof. Dr. Ottmar Schober, Uniklinik Münster

- From molecule to routine cardiac diagnostics, Prof. Dr. Wolfgang Bauer, Uniklinik Würzburg

- Sonohistologie – a histological procedure for ultrasound characterisation of tissue, Prof. Dr. Helmut Ermer, Ruhr-Universität-Bochum

- US-guided navigated intervention, Prof. Dr. Martin Overhoff, FH Gelsenkirchen

- 3-D ultrasound imaging in navigated orthopaedic surgery, Prof. Dr. Georg Schmitz, Ruhr-Universität Bochum

- Radiology in the third millennium, Prof. Dr. Hans-Peter Meinzer, Deutsches Krebsforschungszentrum Heidelberg

13:00 – 14:00

Hall 3, booth H 92

Diagnostics and therapy perspectives: new developments in cardiology

- Monitoring chronic heart insufficiency: development of a pulmonary implant, Prof. Dr. Thomas Schmitz-Rode, RWTH Aachen

- Vital sensor networks for close monitoring of patients with an acute cardiac risk constellation, Christian Hofmann, Fraunhofer IIS, Erlangen

- From cell biology to health services research in cardiology, Prof. Georg Ertl, Universitätsklinikum Würzburg

- Aortic stenosis: new possibilities of percutaneous aortic valve replacement, PD Dr. Stefan Sack, Universitätsklinikum Essen

COMPAMED

13:25 – 16:30

Hall 8a, booth G 40

COMPAMED Forum 'High-tech for Medical Devices'

- Applied Nanotechnology: from experimental approaches to real products, Dr. med Rainer Hanselmann, sarastro GmbH

- Nano2Life: a landmark in EU nanobiotechnology, Dr. Klaus-M. Weltring, Gesellschaft für Bioanalytik-Muenster e.V., Münster

- Transponder-based microsystems for medical applications, Dr. Uwe Schnakenberg, RWTH Aachen

- Creating value through intellectual assets, Dr. Robert Harrison, Sonnenber Fortmann Patent- & Rechtsanwälte, München

- European micro/nano atlas for medical devices, Dr. Uwe Kleinkes, IVAM Research, Dortmund

- Application of plastic in medical technology – an overview: Torsten Urban, Kunststoff-Institut Lüdenscheld, Lüdenscheld

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Switzerland - An Artificial Organ Centre for Biomedical Engineering Research has been set up at the University of Bern, drawing together its established areas of expertise in medical technology.

Housed in the university's Medical Faculty, the ARTORG Centre is active in interdisciplinary teaching and research and development, focusing especially on artificial organs. Research groups from units within the Medical Faculty and other faculties at the University of Bern and other university institutions and universities of applied sciences will work together in the new centre.

Medical technology has become an established high-profile discipline in the University of Bern's Strategy 2012. The importance and excellent international reputation of Bernese medical technology is based on the traditionally high standards of Bern's teaching hospitals, its contribution to the National Centre of Competence in Research Co-Me, the Technology for Humans research focus programme at the Bern University of Applied Sciences (BFH) and the commercially successful medical technology companies in the Espace region of central Switzerland.

Close co-operation between clinicians, technologists, and industry

According to **Martin Täuber**, Dean of the Medical Faculty, this new platform will co-ordinate existing projects and clinical approaches that involve

New medical technology centre to target artificial organs

artificial organs and medical technology, yield improved technological support and cross-fertilization of projects. The scientific programme of the ARTORG Centre will be established and implemented by 11 newly created assistant professorships. The research groups will focus on the following artificial organs and specialist areas:

- Blood vessels
- Bladder
- Ear
- Eye
- Heart
- Kidney
- Liver
- Lung
- Pancreas
- Spine
- Implantation technology of artificial organs



Prof. Martin Täuber

Medical technology research and development at the ARTORG Centre will involve close co-operation between clinicians, technologists, the medical technology industry and other Swiss technology institutions. In particular, the centre will work closely with the Technology and IT Faculty of Bern University of Applied Sciences. The ARTORG Centre's involvement in the

specialist Master of Science in Biomedical Engineering degree programme and PhD programme of the Graduate School for Cellular and Biomedical Sciences will generate additional synergies between research and teaching. The Director of the Institute for Surgical Technologies and Biomechanics at the Medical Faculty is responsible for the operational management of the centre. A scientific committee appointed by the university management is responsible for the strategic leadership of the ARTORG Centre and also for the quality of its science.

Details: <http://www.unibe.ch>



WiFi **NEW** Messenger for hospital use

The WiFi Messenger system from CLB International

CLB International BV (Netherlands) has designed the WiFi Messenger (CLB-WMG) specifically for use in the healthcare sector. The firm reports that this well-designed, robust device works on any existing wireless (LAN) infrastructure enabling full duplex communication via speech or video. The device may also be used for data transfer.

The WiFi Messenger features a dual display, freely programmable buttons, multiple alarm types, location detection, a telephone book and speech recognition. CLB also offers other IP solutions for healthcare – including a nurse call system, which is able to report alarms from different medical devices and has been certified in accordance with the European Guidelines for Medical Devices (CE 0344).

We focus on offering real solutions in ultrasound. Whether it is application versatility across the broadest range of patient types, superior imaging quality for more confident and accurate diagnosis, or advanced technologies and ergonomic system design that improves your clinical workflow, you can always expect the best clinical support.

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medical

A presentation for the 31st tri-national DEGUM, ÖGUM, and SGUM conference in Leipzig, Germany, by **Axel Feldkamp MD** (below), Chairman of the DEGUM paediatrics division, and Director of the paediatrics department at Duisburg Hospital

The advantages of ultrasound for paediatric diagnosis



image quality they deliver obviates the need to use any other imaging technology. Various types of heart catheterisation can now be realised using ultrasound in lieu of radiography. Elaborate high-radiation imaging procedures for the urinary tract are increasingly replaced by the use of ultrasound contrast media. Complex imaging of skull pathology in paediatric patients can now be realised using ultrasound rather than radiography.

that is unmatched by any other method. In some cases, only ultrasound can detect congenital heart defects, brain morphology defects, cranial bleeding, and haemodynamic complications. Although MRI provides outstanding image quality in infants, the examinations are lengthy and an infant must be either anaesthetised or heavily sedated.

Ultrasound is taught in paediatric training programs owing to the extreme usefulness of the technique. Consequently, ultrasound is widely available and can be used for screening purposes. For example, the current practice of doing a hip screening for all newborns has reduced to a minimum the number of hip defects requiring surgery.

Thus ultrasound can be regarded as the paediatric imaging technique of choice for the following reasons:

- the child is not exposed to radiation
- ultrasound devices can be deployed just about anywhere
- ultrasound image quality constantly improves, thanks to the use of high-resolution transducers.

Ultrasound is the most important imaging technique in paediatrics – more so than in any other branch of medicine. This is attributable to a number of factors. X-ray exposure is a more significant risk factor for paediatric patients than for adults by virtue of the cumulative nature of X-ray dosages, thus making paediatric patients more likely to receive a higher dose of radiation. Moreover, some types of immature tissue are more susceptible to radiation. Thus it is essential to avoid the use of X-rays in children and young adults.

Ultrasound scanners have now evolved to the point where the

Another advantage of ultrasound examinations lies in their ready availability. In neonatology in particular, examinations of neonates in incubators are indispensable, since moving the child from one place to another, wrapped in a textile, would constitute an extreme risk. In addition, thanks to the progressive miniaturisation of ultrasound scanners, paediatric ultrasound examinations can be realised pretty much anywhere and at any time.

High resolution ultrasound scanner heads (ideal for neonatology by virtue of their relatively shallow penetration depth) often produce image quality

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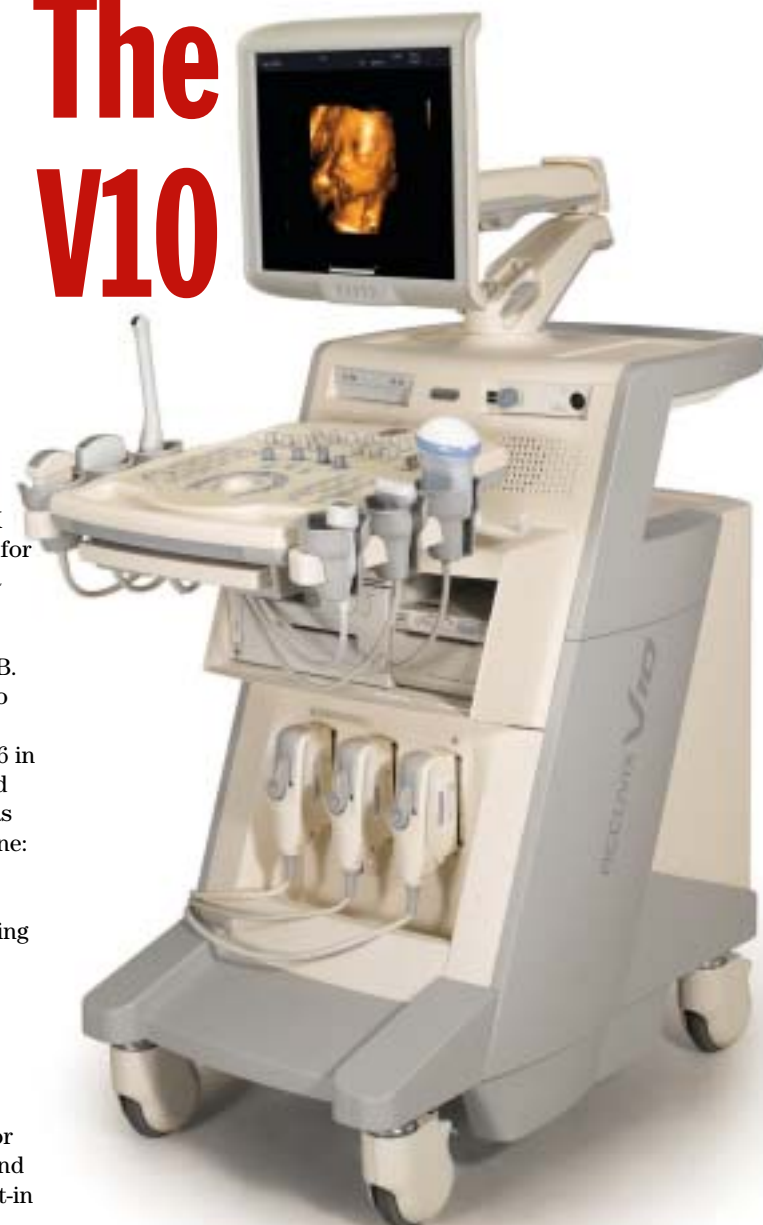
**High-end system applies
premium technology from
Medison's proven brand**

The advanced ultrasound system ACCUVIX XQ has been widely recognised worldwide for its advanced technology and stability, but a new ultrasound system is about to steal its thunder,' its manufacturer reports.

Produced by MEDISON Co Ltd (CEO: J. B. Choi) Accuvix XQ was ranked, according to the Klein Report, in second place in the number of units sold in 2005 as well as 2006 in the US\$200 million American obstetrics and gynaecology ultrasound market. The XQ has now been superseded by the latest in the line: the Accuvix V10.

'The brand new Accuvix V10 integrates various proven technologies from the existing Accuvix line,' said Mr Oh, project leader of V10 in the Medison R&D department. 'However, this unit upgrades accuracy and efficiency with new technologies, while optimising user convenience with its ergonomic design.'

The V10's high definition 17" LCD monitor provides optimised resolution of 2-D, 3-D and 4-D image quality. The V10 has various built-in



A highly portable mini-ultrasound device



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diagnostic tool in the first hour in cardiac emergency care, but the company adds that it is also suitable for surgery, in obstetrics/gynaecology or in veterinary medicine. 'As an additional diagnostic device, Acuson P10 supplements initial examinations in emergency medicine comparable to a visual stethoscope. When needed,

nursing staff or paramedics can perform the initial important examination in the emergency ward. Acuson P10 is used primarily to triage patients. This ensures that each patient receives the treatment necessary according to the seriousness of the illness or injuries sustained within a shorter time period than before,' Siemens reports.

The device will go on sale this year, with its black & white screen, but an additional version (still pending) will have a color Doppler function. Special lithium ion accumulators enable continuous scanning for about one hour. Images from the Acuson P10 can be stored in the Hospital Information System (HIS).

In emergencies, the first few minutes are vital, and having an ultrasound device for initial diagnosis could prove lifesaving. Speaking of a new portable ultrasound device from Siemens Medical Solutions Klaus Hambüchen, head of the Ultrasound group of Siemens Medical Solutions, said: 'This multifunctional system helps medical personnel to make the right decision within that time frame.' Although the portable device to which he refers — the *Acuson P10* — was designed specially for acute care, e.g. in the ICU, an ambulance or medic flights, it is also suitable as a



functions enabling speed and accuracy. Users can save images and re-view them with ease, enabling more efficient management of patients and effective diagnoses, Medison adds. 'Accuvix V10 offers quality of performance and ease of use to clinicians in a range of fields, including, but not limited to, obstetrics, gynaecology, radiology, cardiology and urology.'

Medison, based in Seoul, Korea, was founded in 1985 and pioneered the first commercial real-time 3-D ultrasound scanner. Today the firm manufactures specialised diagnostic ultrasound systems ranging from portable to digital 3-D and 4-D, and has sales offices in more than 100 countries. Contact: MEDISON Co Ltd, Binie Kim/Marketing Dept. Telephone: 02-2194-1092 E-mail: Bini99@medison.com Corporate and product information: www.medison.com.

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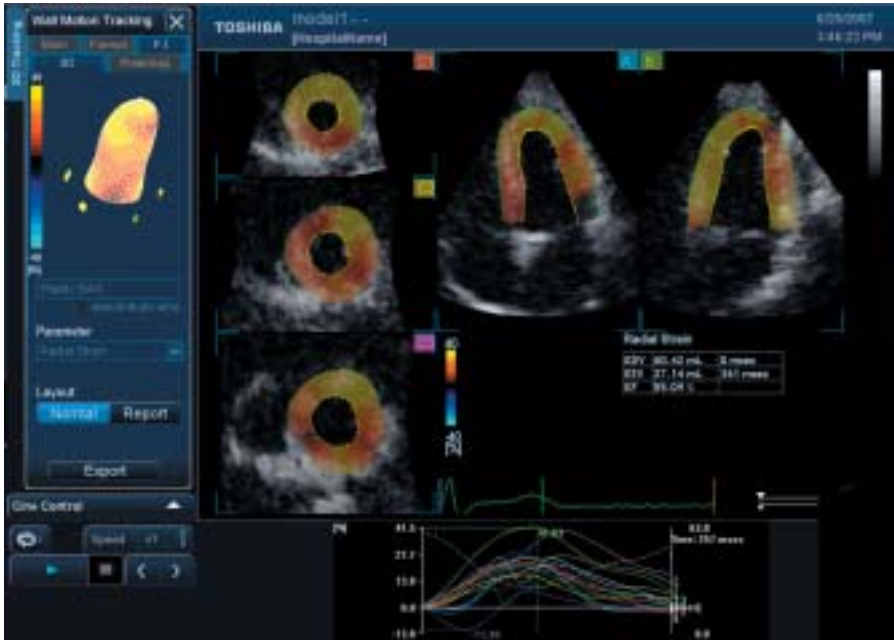
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World's 1st Cardiac motion evaluation in minutes

Toshiba's new *Artida* Ultrasound system is the world's first ultrasound system that can track and display myocardial wall motion three-dimensionally. 'I can obtain several parameters in just a few minutes — longitudinal strain, radial strain, circumferential strain, rotation, shear, twist and torsion of every cardiac segment,' confirmed **Leopoldo Pérez de Isla MD PhD FESC**, of the Cardiovascular Imaging Unit in the Cardiovascular Institute at the *Clínico San Carlos Hospital, Madrid*.

The system has a wall motion tracking feature that allows the user to obtain angle-independent, quantitative and regional information about myocardial contraction.

3-D Speckle

This new diagnostic tool was designed to improve case assessments. Dr Pérez explained its value: 'The heart has three dimensions, so heart motion does also happen in three dimensions. So far we can assess wall motion quantitatively only two-dimensionally, not taking the complex twist and shear motion of the heart muscle into account. The new 3-D-speckle technology (developed by Toshiba) allows us to follow speckle in three spatial directions. What's more, the acquisition and analysis of the data sets is easy and fast, using the 3-D data set. The new technology provides a fast and global approach to the analysis of these parameters and avoids its under-use due to the time consuming 2-D derived speckle technology.' Therefore, arbitrary views of the heart



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The Sarano digital US

NEW

The *Sarano* digital, black and white ultrasound system, made by **Shimadzu**, is on show at MEDICA. The company reports: 'This all-round system omblines the latest in hardware, software and probe technology, generating high-performance imaging quality as well as improving the digital handling of clinical data. The *Sarano* is suitable for hospital use and private practice – for stationary as well as ambulant applications. A large number of medical fields, such as radiology, internal medicine, urology, gynaecology and obstetrics will benefit from this economical and efficient instrument.'

High-res images

The core technology for the improved transmission quality and accurate display of the ultrasound image data is the newly developed digital beam former with DBT technology. 'It processes and transmits data ten times faster without any noise. In this way, even the most delicate tissue structures can be shown through high-resolution ultrasound images.'

In addition the system includes micro-imaging array technology for a maximum frequency of 1.5 MHz. The five-tier fine-tuning of the probe frequency and consequently the diagnosis-specific settings both contribute to the improved images, the maker points out. 'Tissue Harmonic Imaging (THI) increases the spot and contrast resolution in the B-mode under difficult diagnostic conditions. Fast image iteration frequencies, focusing on the pixel level as well as high image dynamics, further increase authentication and diagnostic confidence.'

The system also offers a wide range of lightweight, high-resolution electronic probes, and is said to be ideal for ambulant and stationary applications





Dr Leopoldo Pérez

that are unavailable in 2-D imaging can be obtained for surgical planning.

Additional features

Artida's new SmartCore engine employs with the processing power of more than 80 processor cores interconnected by a fast digital system interface, and that means the Artida can obtain clear echocardiographs and a high diagnostic accuracy, Toshiba pointed out. 'A MultiCast beamformer uses advanced digital signal processing to control the shape of the ultrasound beam more precisely and flexibly than in comparable systems. SmartFocus is the first 4-D technology applied to conventional 2-D imaging transducers that offers a finer and more uniform ultrasonic beam in all three dimensions, resulting in an improved image quality from the very near to the very far field.'

The new Tissue Enhancement Mode, which suppresses white noise effectively, enhances image uniformity and endocardial border delineation could be strengthened, the company added, particularly in difficult-to-scan patients.

system

'The panoramic angle of up to 198° at endocavity diagnosis enables excellent orientation. User-specific optimization of image resolution is possible via the frequency spectrum of 2 – 15 MHz and the 5-tier frequency mode.

Digital platform

Due to the fully digital and 'open' system architecture and high performance the equipment is prepared for future developments. It can be integrated in a LAN as well as a DICOM high-performance network. Clinical images are transferred to a PC as JPG or bitmap data, and also can be stored on a USB stick for transfer to a PC outside of the network or to give to a patient.

The newly designed keypad makes neighbouring keys easily accessible via the central trackball, Shimadzu reports. 'The most frequently used functionalities are arranged within easy reach. Diagnosis specific presettings enable fast and targeted operation of the system. Freely programmable function keys support individual physician requirements and optimize workflow.'

Further details: www.shimadzu.de

HYGIENE SPORES SIMPLY WIPED OUT

Gama Healthcare has developed an advanced innovative wipe — *Clinell Sporidical* — which, the company reports, is the world's first peracetic acid generating wipe specifically designed to deal with spores. The wipe was developed by a team of medical doctors and contains patent pending technology designed around the stability of the peracetic acid, the company adds.

'Clinell Sporidical offers an easier and much safer option than the chemicals currently recommended to deal with spores such as Chlorine and Glutaraldehyde based compounds. The wipe is activated with the simple addition of water, which produces peracetic acid instantaneously to levels which are proven to kill all

known germs. Peracetic acid works extremely well in dirty conditions (unlike Chlorine) and can be used directly on fresh blood spills, which will activate the wipe immediately without the need for water. The fumes produced are non-toxic, which allows for use in close proximity to patients. The breakdown products are environmentally friendly and contain no alcohol or organic solvents.

'Clinell Sporidical is the most powerful wipe to ever be created and its development constitutes a major advancement in wipe technology and infection control. In addition, it is set to become the gold standard for dealing with spore outbreaks in hospitals and healthcare institutions across the world.'

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TRAUMA CARE

Using high energy ultrasound to control internal bleeding

In the ongoing quest for technologies that result in as little damage as possible when used in surgery, therapeutic ultrasound stands out because it can offer what no other technology does: non-invasive, bloodless ablative surgery. Whether it is an emergency operation to staunch deep internal bleeding, or an elective procedure to remove a tumour, ultrasound has been shown to provide an effective method that can deliver ablative energy to deep-seated

tissues, while requiring no incision in the skin or surgical exposure of the tissues of interest.

This technology, dubbed High Intensity Focused Ultrasound (HIFU), relies on the ability to focus ultrasound waves on a region about as small as a grain of rice, positioned at any desired depth in soft tissues. The main difference between HIFU and diagnostic ultrasound imaging is in the levels of applied acoustic intensity,

Paediatric interventional ultrasound ('Safety first')

By **Professor György Harmat MD** (right), Director General of the Budapest Municipal Council Pal Heim Children's Hospital, Hungary

With the rapid development of new instrumentation it is now possible to carry out interventional procedures on ever younger children and even neonates.

Ultrasound guided therapeutic interventional procedures may also be carried out in certain clinical circumstances where the alternative would be operative intervention e.g. the drainage of intra-abdominal abscesses or accumulated peritoneal fluid. In many cases this will result in a definitive cure.

The most frequent inter-

vention is the parenchymal biopsy.

In childhood the pain sensitivity is always individual. Sudden artificial movements are possible. We perform biopsies in the operating theatre, with US guidance attachment.

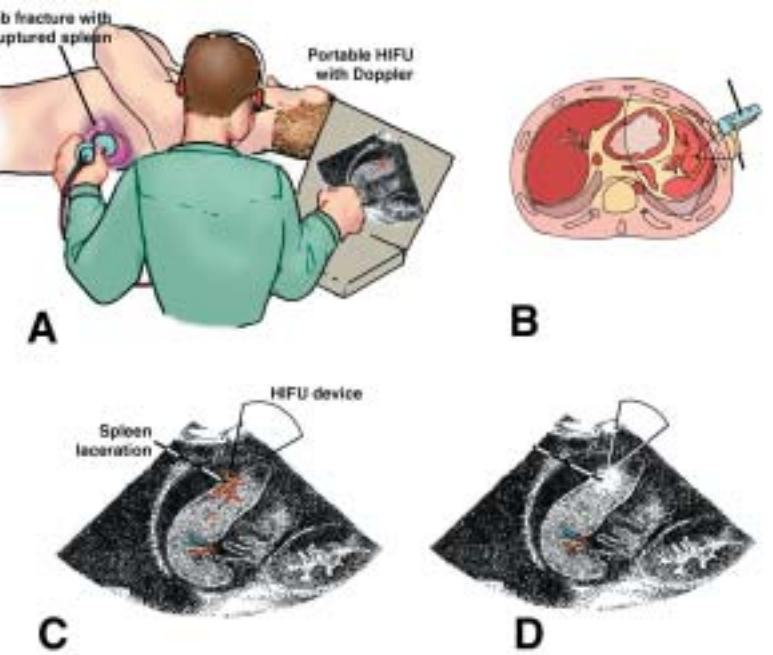
During our 17-year experience, we have undertaken 366 procedures on 125 children.

Biopsy samples should be taken from children between two breaths with suspended ventilation. The anaesthetist is able to manually ventilate the child allowing the procedure to



be performed in the 20 to 45 second pause between ventilations. Using this technique we have not observed any damage to the solid abdominal organs.

During sampling with a special True-cut needle of 18G, the accurate place and dimension of the invasion can be chosen. Control examinations have been



performed after 1, 12 and 24 hours of the first intervention. Other interventional procedures, such as drainage, peritoneal lavage, pleuritis puncture, abscess or pseudocyst drainage or antibiotic treatments are also performed under general anaesthesia.

In our series, the clinical indi-

cations for interventional procedures have been for biopsy intra-hepatic cholestasis with portal fibrosis, hepatic tumours such as hepato-blastoma, some at a very early age, chronic persistent hepatitis, Niemann-Pick storage disease, giant cell hepatitis, nephrosis, nephritis, ovarian tumours, neuroblastoma and different other tumours, as well as varying intra-abdominal abscesses requiring drainage, peritonitis, pancreatic pseudocyst.

Taking 'safety first' as our most important consideration, we have found a very low frequency of minor complications in our cases. We have detected some capsular, subcapsular or perirenal haemorrhages, however these disappeared within 24 hours and could not be observed at follow up. Once, after biopsy, a temporal blood clot was detected within the gall bladder. We have had no major complications.

Conclusions

In children, general anaesthesia should usually be used to avoid involuntary movements.

An early diagnosis of serious illnesses is possible by this very successful combination of ultrasound and biopsy. It does not cause any complications, and due to general anaesthesia during the procedure, children have not suffered. By applying instrumental breathing, damage of the parenchymal tissues can be avoided.

It should be emphasised again that ultrasound guided interventional procedures in children should always be performed with great care. The use of general anaesthesia minimises complications and this is a significant difference in practice between adults and children.

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By **Shahram Vaezy**, Associate Professor of Bio-engineering at the University of Washington, Seattle, and **Vesna Zderic**, Research Associate at the Centre for Industrial and Medical Ultrasound, Applied Physics Laboratory, George Washington University, Seattle

while both use similar frequencies in the range of 1-10 MHz. In ultrasound imaging, low intensity waves of about 0.1 W/cm² are used to reflect from tissue structures to be resolved in the image, and in HIFU, high intensity waves of about 1000 W/cm² are used to cause instant coagulative necrosis and tissue disruption.

The application of HIFU to the haemorrhage control problem (often called acoustic haemostasis) stems from the need to have an effective method to stop bleeding in 'the golden hour' after severe traumatic injury, involving profuse bleeding. Many trauma patients suffering injuries with high bleeding rates expire during transportation to hospital, or on the operating table, due to haemorrhagic shock (particularly true for battlefield victims).

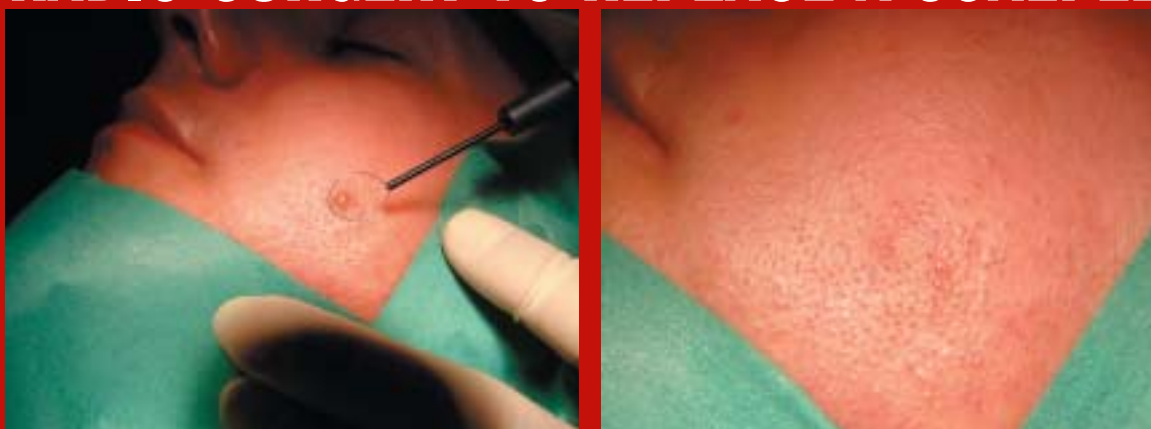
In general, cessation of haemorrhage using extrinsic, interventional methods is possible with delivery of energy to bleeding tissues, i.e. cauterisation. We have shown in preclinical studies in large animals that bleeding from injuries of liver, spleen, kidneys, and major blood vessels (femoral and carotid arteries, jugular vein, aorta, etc) can be stopped using HIFU within a minute or so. The mechanisms of acoustic haemostasis include thermal and potentially mechanical effects. Temperatures above 70 degrees Celsius can be produced in the targeted tissue within seconds. Further, it appears that boiling of interstitial fluids and blood, as well as acoustic cavitation (i.e. formation of microbubbles at the focus due to mechanical HIFU effects) are also involved in acoustic haemostasis. The biological effects are believed to include coagulative necrosis due to high temperatures, and mechanical disruption of tissue structures potentially leading to release of tissue factors enhancing the coagulation, coagulum and thrombus formation at a wound site, tissue fusion via collagen and elastin remodelling, and fibrin plug formation.

HIFU integrated with ultrasound imaging offers a unique potential for developing a small portable device that can be brought to the site of an accident. Such a device can be used to detect and localise the bleeding site using ultrasound imaging and to stop the bleeding using HIFU, all in real-time, using a seamless image-guided therapy system. Currently, the ultrasound imaging systems can be as small as a laptop and the HIFU devices can fit in a small suitcase.

Further development of these devices would provide automation of the bleeding detection and treatment methods to facilitate its usage by paramedics and other first responders. A haemorrhage control device for use outside hospital settings shortly after injury occurs, and capable of site-specific treatment, could provide a life- and limb-saving tool in trauma management.

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A further asset: tissue samples can be histologically examined. Surgeons can examine this device at MEDICA — Hall 5, P21. Details: www.meyer-haake.com

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Today, ultrasound is present in most specialised medical fields, and even used in small practices. However, in terms of quality, when using ultrasonic equipment in the low price segment, users often had to compromise in terms of quality. This has been not only to do with resolution, but also the granulation typical in an ultrasound image.

This year at MEDICA, GE Healthcare is introducing its new 'economy class' ultrasound device that, GE reports, integrates high-performance with high-end technology. 'The LOGIQ A5 Primare permits only monochrome B-images - but these are of a very high quality, because the hard- and software are taken from the considerably more expensive medium-class system LOGIQ P5. The two-dimensional B-mode provides an optimised view of the anatomical conditions as well as, if necessary, of pathological changes in organs and tissues. The possibility of Doppler ultrasound to record the blood flow speed in vessels has foregone in the member of the LOGIQ family.'

Thanks to its refined multiple focusing, the system delivers a local resolution that corresponds with that of the high-end class and can also be optionally equipped, in the 'Premium' version, with GE's unique speckle reduction, the company adds. 'In this connection, the graininess typical of the ultrasonic image is recognised as an artificial phenomenon and eliminated. The result is an amazingly realistic representation of the tissue and its fine structures, which comes close to that of the MRT. New image processing techniques such as Phase Inversion Harmonics or CrossXBeam provide a clear definition of boundary surfaces, reduce artefacts as well as the background noise, in order to distinguish more clearly between cystic and echo poor lesions more clearly.'

In addition to routine applications in general and internal medicine, the LOGIQ A5 Primare is suitable for more specialised investigations e.g. in orthopaedics, rheumatology or paediatrics, GE points out.



The ProSound α7

With over 200,000 ultrasound systems delivered worldwide, ALOKA, which has been a leading innovator in ultrasound for half a century, continues to enhance the ProSound family of high performance products. At MEDICA this year, the company is introducing its latest development: the ProSound α7. To deliver high definition images on a LCD monitor, ease of use and a compact form design, the ProSound α7 combines innovative technologies with renowned reliability and high industry standards of the ProSound platforms.



Visit Aloka at Medica
Hall 9 Booth A74

The new system was developed to meet the needs of modern imaging departments for daily patient care where examination time and workflow must be continuously optimised. To deliver higher patient throughput, the ProSound α7 offers a user friendly design for multiple users. It consists of user-customisable panel switches, a virtual keyboard to make entries via the touch panel, the integration of a gain knob and freeze switch, which can easily freeze images, and fast access to all frequently-used keys, arranged around a trackball. The reporting functions for individual applications



Aloka's powerful yet compact and friendly ultrasound system for daily patient care

reduce the time required for a series of examinations. A comprehensive data management system with high-level DICOM network compatibility provides efficient imaging and data administration.

With important breakthrough flow display technology, the system offers Directional eFLOW, D-eFLOW, a new innovative blood flow capture and display mode offering increased accuracy in blood flow detection of low velocity flow as well as acute acceleration non-invasively.

Aloka has also developed a technique that not only helps early detection of atherosclerosis but also helps to identify patients who are prone to the indication even before the usual clinical symptoms appear. Echo tracking, eTRACKING, is a proven technique that picks RF echo signals from blood vessels, tracks the motion of the vessel walls, and measures changes in blood

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Microbubbles and ultrasound to treat ischemic stroke

A new research collaboration to study the potential of microbubbles and ultrasound to treat ischemic strokes has been established between ImaRx Therapeutics, a biopharmaceutical company in Tucson, Arizona, and the Philips' Medical Systems division in Andover, Massachusetts.

Philips ultrasound technology is to be used within the ImaRx's SonoLysis programme* to develop new treatment for acute ischemic stroke. Under the agreement, Philips will provide ultrasound devices and technical assistance to ImaRx during its laboratory and preclinical studies using the ImaRx's proprietary MRX-801 microbubble technology to determine the optimal ultrasound parameters to be used.

The vast majority of strokes, according to the American Stroke Association, about 87% of strokes are ischemic, i.e. caused by blood clots that block normal blood flow in brain vessels. Additionally, Datamonitor reports that less than 6% of the ischemic stroke patients receive the thrombolytic drug tPA, the only drug currently approved by the FDA to treat acute ischemic stroke.

'This research collaboration represents a significant step forward for ImaRx's SonoLysis programme,' added Bradford A Zakes, President and CEO of ImaRx Therapeutics. 'By working closely with Philips Medical Systems, we are incorporating the leading ultrasound technology and expertise into the early stages of product development, which strengthens our position as we move further through our clinical trials.'

Anne LeGrand, senior vice president and general manager of Ultrasound, for Philips Medical Systems, confirmed that Philips recognises the promise of microbubble therapies.

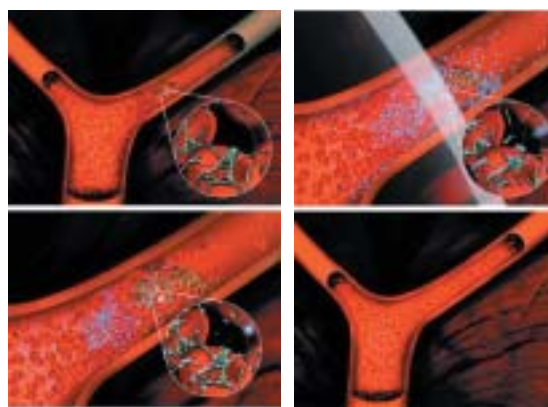
The companies' agreement includes a mutual exclusivity clause during the term of the collaboration. Following completion of the research programme, Philips and ImaRx will have an exclusive negotiation period to discuss future development and commercialisation.

The ImaRx' SonoLysis research programme

The company focuses on developing and commercialising therapies for stroke and other vascular disorders.

(Current commercialisation efforts are focused on its product, Abbokinase as a treatment for acute massive pulmonary embolism).

The aim of this research programme is to develop product candidates that involve the use of the firm's proprietary MRX-801 microbubbles with ultrasound to break up blood clots and restore



blood flow to oxygen deprived tissues. The sub-micron size of MRX-801 microbubbles may allow them to penetrate a blood clot, so that when ultrasound is applied their expansion and contraction, or cavitation, can break the clot into very small particles, ImaRx reports. 'ImaRx is conducting an ongoing Phase I/II multinational clinical trial evaluating its SonoLysis+tPA therapy to treat patients with acute ischemic stroke.'



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Areas of use:

The ProSound α 7 offers ultrasound imaging applications in radiology, internal medicine, obstetrics & gynaecology, cardiovascular and other specialist ultrasound-guided procedures.

Full details: www.aloka-europe.com

Study finds cartilage implant promising

Poland – At September’s International Cartilage Repair Society Annual Meeting (ICRS), in Warsaw, participants heard that a neocartilage implant called NeoCart, made by US firm Histogenics, is safe as well as promising.

NeoCart is an autogenous neocartilage implant grown by seeding a patient’s own cartilage cells on a collagen matrix. A patented, high-pressure tissue engineering

processor is said to produce more natural neocartilage than other techniques.

Dennis Crawford MD PhD, Assistant Professor of orthopaedics and surgical director for Sports Medicine & Cartilage Reconstruction at Oregon Health & Science University (OHSU), was reporting on an FDA Phase I safety trial that involved seven patients treated with NeoCart at OHSU, with a 2-year follow-up. All

patients showed good cartilage fill and integration with surrounding cartilage. Knee joint function was improved in six of the seven patients. Advanced MRI techniques showed that the NeoCart treatment had resulted in the formation of true hyaline cartilage in four of the seven patients, Dr Crawford pointed out. ‘This novel therapy may replace microfracture to become the next primary treatment for cartilage injury to the knee. Patients are getting pain relief for at least two years, the technology can be applied via a simple out-patient procedure and it appears by our best radiographic methods to mature and stabilise over time,’ he added.

Device helps heal the meniscus

Faced with meniscus injuries surgeons usually decide to remove the torn meniscal cartilage, which typically leaves the deficient knee vulnerable to future arthritis, because the padding that provides shock absorption and joint stability has been removed, causing bone to rub on bone.

A new knee-surgery device to help repair ‘irreparable’ meniscus tears has been approved by the FDA for use in humans. The BioDuct Meniscal Fixation Device was developed by Herb Schwartz, president and CEO of Schwartz Biomedical, LLC, and James Cook, MU professor of veterinary medicine and surgery and William C. Allen, Endowed Scholar for Orthopaedic Research in University of Missouri-Columbians’ College of Veterinary Medicine, which they believe can save the

meniscus as well as long-term knee function.

The device transports blood and cells from the vascularised knee area to the avascular area of the meniscus, to enable healing.

The research team performed the BioDuct surgery on 25 canines – complete or partial repair of the meniscus was observed in all cases that received the BioDuct Meniscal Fixation Device.

Herb Shwartz pointed out that this new device could have a considerable impact on orthopaedics because with fewer meniscal tear patients developing arthritis there could be fewer total joint replacements, or a delay in the need for one.

The study results have been published in the *American Journal of Sports Medicine*.

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Point-of-care ultrasound from SonoSite

Hall 9 Booth E31

At Medica, this year, SonoSite is presenting innovations – *M-Turbo* and the *S-series* – which present numerous technical improvements and deliver a breakthrough image quality, the company reports. ‘With the S-Series, SonoSite launches a radically new concept in ultrasound unlike anything else in the market. Highlight is the S-Nerve visualisation tool, the first ultrasound device custom-designed to support the specific needs of anaesthesiologists who perform regional anaesthesia,’ the manufacturer explains. ‘The new SonoSite products can perform a variety of examinations and deliver high quality diagnosis even under difficult conditions. Thanks to a large capacity for image and data transfer, the mobile ultrasound systems provide many possibilities for lower cost, multi-media hospital communication. Therefore, it’s not just patients who benefit; hospitals are also experiencing benefits due to decreases in costs.’

PD-Q: A screening tool to identify neuropathic components in pain patients

PAIN



Dr Rainer Freynhagen

Every fifth European is suffering chronic pain, according to the recent ‘Pain in Europe Survey’.

However, there are pains and other kinds of pain, as particularly seen in patients with neuropathic pain.

At the German Congress for Orthopaedics and Trauma Surgery new diagnostic and treatment methods were described that might promote better pain therapy.

Usually doctors classify pain according to an accepted system that is based on the type and extent of the prevailing dysfunctions. ‘However, it is not the dysfunctions but the underlying pathophysiological mechanisms the pain is based on which are decisive,’ said neurologist and psychologist Professor Thomas R Tötle MD, who is Head of the Pain Surgery at the Neurological Clinic in Munich’s Technical University. Pain, he said, can be traced to

nociceptive and neuropathic mechanisms. ‘Neuropathic pain development, caused by lesions or dysfunctions of peripheral nerves or central nerve tracts, takes a severe course: Based on inflammatory processes, the patients develop physiological changes that lead to hyper-sensitised, peripheral, spinal and supraspinal signal processing. Patients with neuropathic pain require specialist and intensive treatment.’

At the DRK Pain Centre in Mainz, neuropathic pain is currently being documented from comprehensive physical examinations, laboratory tests, electrodiagnostics, imaging, biopsies and quantitative sensory testing (QST). Professor Hans-Raimund Casser MD, the Centre’s medical director, said: ‘We have to intervene in these inflammatory processes as early as possible to prevent nociceptor sprouting and chronification of the pain. But even achieving a precise diagnosis is difficult and complex, because we don’t

need to detect the symptoms but the nerve damage.’

‘Up to now we have not had any method to diagnose neuropathic pain at an early stage on a large scale,’ added pain therapist Rainer Freynhagen MD. With a research associate and team at the Anaesthesiology Clinic at Düsseldorf University Hospital, 47,000 patients have been examined in a project called painDETECT. ‘We discovered that patients with neuropathic pain complain about long and severe periods of pain with relevant loss in functional efficiency. Moreover, characteristically they tend to suffer from particularly pronounced comorbidities, such as sleep disorders, panic attacks and anxiety or depression.’

Based on the collected data the researchers developed a painDETECT questionnaire (PD-Q) – a list of questions that can be completed by patients and their doctors within a few minutes. ‘The painDETECT questionnaire in no way replaces regular



Prof. John E. Wagner

Children with recessive dystrophic epidermolysis bullosa (RDEB) lack a protein that binds the skin to the body, resulting in fragile skin that sloughs off with little movement or friction. In the most severe cases, the skin also sloughs off inside the body, affecting the mouth, oesophagus and gastrointestinal tract. EB is genetic and severe forms are fatal. Those who live to be young adults develop squamous cell carcinoma.

Now the first bone marrow and cord blood transplant to treat RDEB has been carried out by physicians at the University of Minnesota Children's Hospital, Fairview, with the collaboration of researchers at Columbia University, University of Minnesota, on an 18-month-old boy suffering the most severe form of RDEB.

With the help of an EB mouse model the researchers corrected the disease in mice using bone marrow. They tested various types of adult stem cells to determine which would promote the development of type VII collagen — a protein that patients with RDEB lack. One type of immature cells from bone marrow proved the best at producing binding fibrils that hold skin and body together.

This is the first approach to EB from a systemic perspective, using transplant as a method to rid the body of the defective blood system and replace it with a healthy blood system that produces type VII collagen.

The child received both umbilical cord blood and bone marrow from a perfectly matched sibling. If the results mimic the animal model, doctors anticipate the healthy blood system will aid in the skin's ability to produce type VII collagen necessary to anchor the skin and lining cells of the gastrointestinal tract to the body. Doctors anticipate in early 2008 — approximately 100 days after

Infant receives first systemic therapy to treat RDEB

transplant — they will be able to judge whether this treatment helped.

The paediatric BMT programme at the University of Minnesota Children's Hospital, Fairview, is internationally recognised for pioneering umbilical cord blood and bone marrow transplantation, including the world's first successful BMT in 1968. In 2000, a team led by John E. Wagner MD, professor of Paediatrics and director of the Division of Haematology, Oncology, and Blood and Marrow

Transplantation and director of clinical research of the Stem Cell Institute, University of Minnesota, performed the first umbilical cord blood transplant from a sibling donor 'created' after embryo selection. The programme leads the nation in the use of umbilical cord blood in the treatment of adults and children and in the development of innovative treatments of various rare genetic diseases such as adrenoleukodystrophy (ALD) and Fanconi anaemia.

Of this recent transplant, Profes-

sor Wagner said: 'Our goal is to determine the usefulness of stem cells, whether from the umbilical cord blood or adult tissues like bone marrow, in the treatment of human disease. Hundreds of thousands of children and adults are waiting for new breakthroughs in stem cell research, and time is never enough. In two years, the team was able to move this project forward remarkably fast — from testing in animal models to treating patients. Time will tell whether this risky treatment will

work as effectively in humans. But, RDEB is a horribly debilitating, life-threatening disease with no existing curative therapy.'

Maria Hordinsky MD, head of the Department of Dermatology at the University of Minnesota and a member of the care team, added: 'This represents a real change in thinking within the dermatological community. The possibility of this approach compels us to explore more broadly the way some skin diseases are typically treated.'

Source: Molly Portz, University of Minnesota

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diagnostic procedures, but it is an important aid because the calculated score has a high significance as to the prevalence of neuropathic pain components,' explained Dr Freynhagen, who this year was awarded the 1st promotional prize for pain research.

The questionnaire, which is now available in fourteen languages, paves the way for early, individually adapted medication. Good treatment results are currently being achieved with Pregabalin (LYRICA, Pfizer). Licensed since September 2006 for the treatment of central neuropathic pain, Pregabalin modulates a calcium influx into the nerve cell and leads to a reduced release of excitatory transmitters. It not only weakens the course of the pain and its intensity but also eases mental and somatic symptoms, such as sleep disorders and anxiety. 'I admit that we do not yet know all of the pathomechanisms. But we are getting very close with our methods and have achieved significant therapeutic success,' Prof. Tölle concluded.

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MEDICAL TOURISM Ophthalmology

UK-based company StatMedica specialises in medical tourism in Poland and has been appointed to represent several leading Polish eye surgeons who operate in high-tech clinics in major cities across that country, reports Alison Hope, the firm's Managing Partner in London. Clinics represented by the firm offer a wide range of elective procedures, including refractive surgery, cataract removal and corneal transplants. The StatMedica team assists with communications between patient and clinic and arranges an in-depth consultation with the ophthalmologist prior to a patient's departure from the UK to Poland, Alison Hope adds. Warsaw-based managing partner, Lukasz Lies, leads the Polish team, which provides a range of services, from airport transfers to 24-hour care by a qualified professional.

* Source, StatMedica Research

The increased need of medical care among ageing populations is causing cost explosions across Europe. Some countries tackle this challenge with Managed Care processes: Controlled interventions in the healthcare system aimed at getting doctors, patients and insurers to follow a more balanced, forward-looking path. Using different control models, the Netherlands and Switzerland have shown that it is possible to achieve significant cost savings without any loss of the quality of care.

Competition, bonuses and competent patients secure the future

'Fewer and fewer workers must care for increasing numbers of patients. Our system is on the brink of collapse – something has to hap-

pen,' said Professor Jo Caris of the TIAS Business School in Tilburg, the Netherlands, during the BMC Congress 'Managed Care in Europe'. In January 2006, the Netherlands introduced a new medical insurance law in January 2006 that moved the system away from the principle of comprehensive solidarity and closer to a system based on competition, self-regulation and choice: Every adult Dutch citizen takes out a basic insurance services package, regulated by the state, with a private medical insurer, which is independent of income and currently set at 1,050 Euros a year. In addition, contributions of 6.5%, which are dependent on income, have to be made, most of which are covered by employers and form the basis of the risk structure compensation scheme. 'Changing the financing system in itself does not prevent the uncontrollable consumption of medical services though. We had to emphasise to patients that medical care costs money and give them incentives to

save money,' Prof. Caris explained. Therefore, the Netherlands additionally implemented a reimbursement system whereby patients who only had basic medical care from their GPs were reimbursed contributions of up to 255 Euros. Patients can also make additional savings if they join group contracts or agree to take on part of any treatment costs, if and when they arise: 'These simple measures have proved to be very effective. People now get more involved in saving money and develop more realistic expectations' the professor pointed out. 'Too much control and regimentation, on the other hand, is bad for the healthcare system.' According to this expert, action is also needed from the doctors: Efficient treatment is based on three

Control of medical treatment and quality assurance is down to the GP

Prof. Caris cites as a positive example the treatment of children with attention deficit hyperactivity disorder (ADHD). Here the combination of medication, supportive family therapy and the strengthening of their own competence for those affected, by, for example, making their daily routines more structured, is having the maximum effect. 'Better quality at lower costs: To achieve this goal, patients and healthcare professionals should be ready for the market,' Prof. Caris concluded.

The introduction by law of Managed Care in Switzerland occurred as far back as 1996. Other than in The Netherlands, the system is not

Top down or bottom up? Managed Care in the Netherlands and Switzerland

regulated top-down, but bottom-up, with the legislator almost completely passing on the responsibility for efficient and cost-effective medical care for the population to general practitioners (GPs). This system is based on so-called medical networks – around 56% of doctors have so far decided on interdisciplinary co-operation within an integrative network. 'Within the medical network, the GP as the gatekeeper is the central point of contact for patients. In case of illness, people are always initially seen by their GPs. The GP controls medical services and, if required, refers patients to specialists within his network. Through the co-ordinated control by one person therapy turns out efficient and cost-effective and duplicate examinations can be avoided,' said Dr Peter Berchtold, of Forum Managed Care, Switzerland. 'Compared with traditional care, the cost saving lies at between 10% and 35%,' he continued. 'Doctors who have become part of these networks show a lot of their own initiative. They are not only interested in cutting costs but also in quality assurance. There have been particular improvements in information transfer. A computer network that documents all therapeutic measures in electronic form and is accessible for everyone involved in treatment, was also set up alongside the medical networks over the last few years. Patient safety has increased significantly.'

In January 2006, the Netherlands introduced a new medical insurance law in January 2006 that moved the system away from the principle of comprehensive solidarity and closer to a system based on competition, self-regulation and choice: Every adult Dutch citizen takes out a basic insurance services package, regulated by the state, with a private medical insurer, which is independent of income and currently set at 1,050 Euros a year. In addition, contributions of 6.5%, which are dependent on income, have to be made, most of which are covered by employers and form the basis of the risk structure compensation scheme. 'Changing the financing system in itself does not prevent the uncontrollable consumption of medical services though. We had to emphasise to patients that medical care costs money and give them incentives to



Peter Berchtold MD Professor Jo Caris

things: Specific medical therapy, referral to supportive social institutions and enhancing patients' health competence. 'We tend to start large-scale campaigns that point out to people that their lifestyles are damaging and which actively encourage them to stop smoking. But, when people are actually ill, we only involve them in their own treatment in a more passive manner. The patient is therefore put under tutelage. He feels left alone, is scared and lacks the competence to help himself when he is ill. We have to give patients more and better information about their illnesses and increase their ability to act. Competent patients can make significant contributions towards avoiding unnecessary costs.'

More quality and more safety – the new system also appeals to patients, particularly as it is worthwhile financially. About 30% of all those with medical insurance decided on treatment within a particularly medical network and therefore received bonuses of up to 20%. Regular contributions can also be lowered if patients agree to take on a higher share of costs, if and when they arise. 'The system of differentiated, additional contributions is very popular in Switzerland, he said. 'Many patients also use the telephone advice services that have recently been introduced. These provide competent information before costs even arise.'

So far the managed care measures implemented have been mainly restricted to out-patient care and less so to inpatient services. Hospitals, rehabilitation clinics and out-patient care services should follow suit, Dr Berchtold believes. 'Co-operation and networks are becoming increasingly important as health is always an interdisciplinary matter. Those who don't co-operate will not survive within the healthcare market of the future'

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MRI and magnetic fields

EU Directive postponed for amendment

The European Commission (EC) has postponed the EU Directive that would have affected the use of MRI until 30 April 2012, to allow time for a substantive amendment to be adopted. The Alliance for MRI said it welcomes the Commission's statement that '... the future amendment will aim to ensure that limits will not have an adverse effect on the practice of MRI' and the recommendation to Member States to put the transposition of the current Directive on hold.

'MRI is a powerful, non-invasive and safe diagnostic and research tool,' said Professor Gabriel Krestin, Professor of Radiology at Erasmus MC, University Medical Centre Rotterdam, in the Netherlands, and a leading member of the Alliance for MRI. 'However, its application often relies crucially on the presence of a healthcare worker or researcher. If the EC legislation were implemented, it would almost certainly impact on patient welfare and be a major setback for scientific research, denying patients innovative treatments in the future.'

In June 2007, the Alliance for MRI held a lunch at the European Parliament with Commissioner Spidla to discuss research undertaken by Professor Stuart Crozier of Brisbane University, Australia* that vindicated the Alliance's concerns.

In addition to its serious impact on healthcare, the Alliance believes the Directive would threaten Europe's position as world leader in MRI research, as recognised in the Nobel Prize awarded to Sir Peter Mansfield. MRI is a leading example of where the EU stands in cutting edge research.

'We look forward to working with the European Commission prior to the proposal to amend the directive,' Professor Krestin said. 'It is essential that the European Commission assesses closely the full impact the directive will have, taking into consideration the social, economic and environmental impact of the legislation. Any new legislation must be evidence-

based and founded on sound science. There has been no proven harmful effect of MRI to either patients or workers over the past 25 years, during which time over 500 million examinations have been undertaken.' The Alliance for MRI believes that it is essential to evaluate the real risk to patients which would be brought about by impeding the full use of MRI,

against the notional and unproven risk to workers.

The safety of MRI workers is already regulated by the EU Medical Devices Directive (amend. Direct 93/42/EEC) and the established MR safety standard IEC/EN 60601-2-33 (as amended to include users/workers). The IEC standard establishes limit values for time-varying electromagnetic fields which have been set, so that any danger to patients and workers is excluded.

* Study Commissioned by the UK Health and Safety Executive
<http://www.hse.gov.uk/research/rrpdf/rr570.pdf>

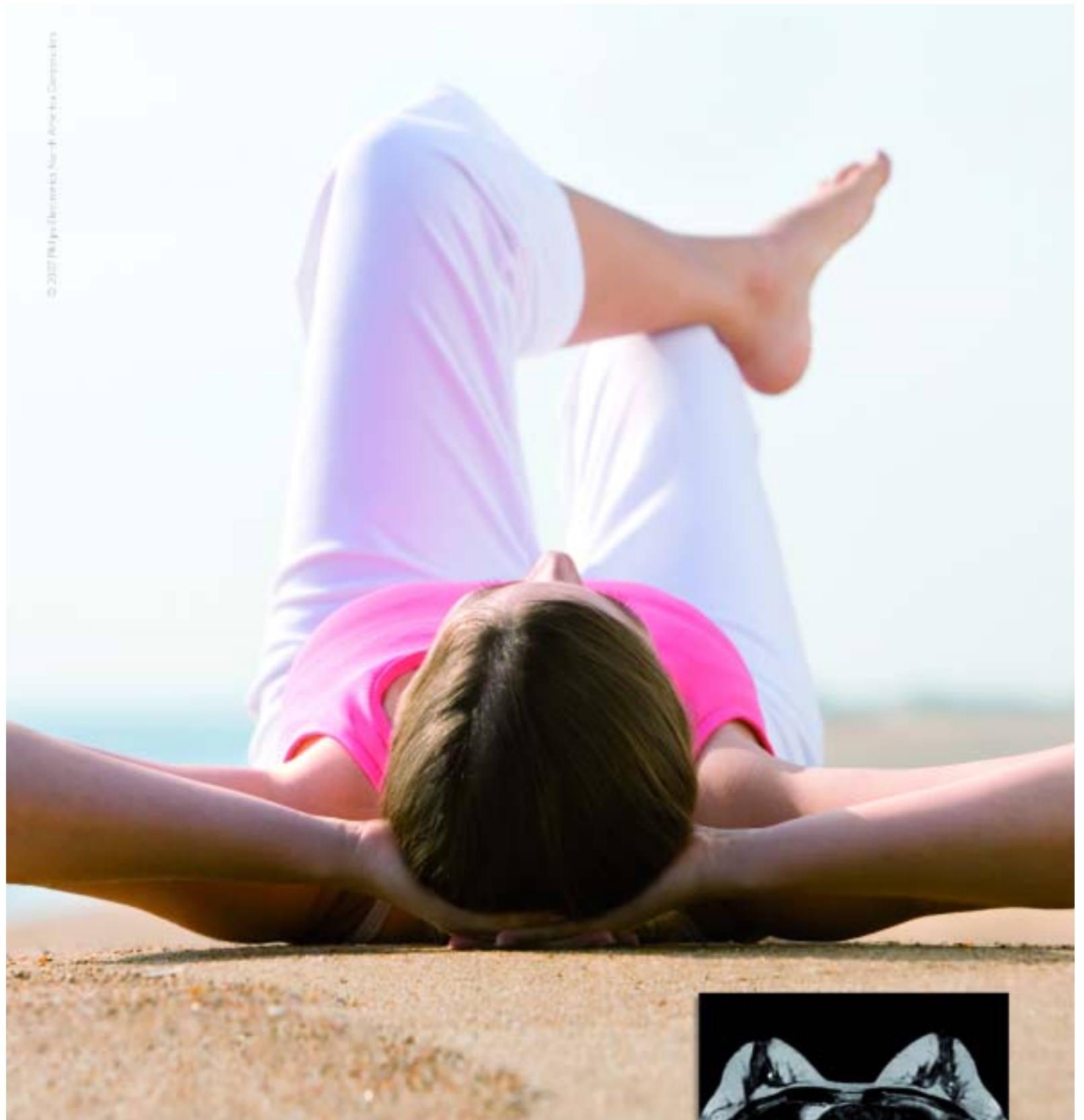


POC diabetes management

The DCA Vantage Analyser from Siemens Medical Solutions Diagnostics is a user-friendly, point-of-care (POC) patient management platform for diabetes. It provides glycosylated haemoglobin (HbA1c), microalbumin/creatinine and albumin-to-creatinine tests. Physicians can enter a patient ID, via the touch screen or barcode, view on-board printed reports and graphs of HbA1c trends.

The system is network-ready. Test results can be shared within the office, clinic, among coordinated POC or can be easily uploaded to an external healthcare information technology (HIT) system.

Besides glycaemic control the microalbumin/creatinine measuring capability of DCA Vantage helps physicians by early detection of kidney disease, a common complication of diabetes. The onboard glomerular filtration rate (GFR) calculator assists in kidney disease staging.



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Magnetic Resonance Imaging (MRI) scans produce detailed pictures of the inner structure and function of patients' bodies using magnetic fields and radio waves. Its use has become an essential tool in diagnosing and treating illnesses such as cancer, cardiac diseases and neurological problems, and in medical research for the same disorders.

The EU Physical Agents Directive 2004/40/EC (EMF), however, would prevent medical staff from assisting or caring for patients during MRI imaging, due to concern over the effects of the magnetic fields generated.

The Alliance for MRI, which represents a coalition of European Parliamentarians, patient groups, leading European scientists and the medical community, has campaigned to bring attention to the potential loss to patients.

'The increase in cancer survival seen over the past decades is, to a large extent, due to more precise diagnostic tools - MRI included,' said Professor Dag Rune Olsen, Chairman of ESTRO Physics Committee. 'Impeding the medical use of MRI would have severe impact on treatment out-come of cancer patients in Europe. The European Commission must learn from their experience with this Directive and consult widely before implementing Directives that impact negatively on research and patient care.'



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Britain's biggest trade fair for medical product design and manufacturing will be held next February in the NEC Birmingham

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3C 2008 - the Contamination Control and Cleanroom Products exhibition, focuses on products for the protection and prevention of particle infection to personnel, products, or the environment. Sections include design and construction products and services, garments and consumables, equipment and products and general services.

Details: www.devicelink.com/expo/mdt2007/

High-tech solutions for medical technology

Micro and medical technology are growing together and driving one another on to new developments. According to a survey by IVAM, the Professional Association for Microtechnology (Dortmund), medical technology is the principal target sector for European microtechnology companies, with a clear lead on the telecommunication and electronic industries. Over 43% of the companies questioned replied that they regard medical applications as the primary focus of their marketing opportunities. It is therefore no wonder the international fair COMPAMED, for international suppliers in medical manufacturing, continues to boom alongside MEDICA. Again, in 2007, this event has seen impressive growth.



'Three months before the start of the COMPAMED 2007 tradeshow, the number of exhibitor applications received was over 40% higher than in 2006, and there was an increase of 48% in terms of the surface area reserved,' said **Wilhelm Niedergöcker**, General Manager of Messe Düsseldorf. There are over 455 exhibitors from 30 countries and a surface area covering over 8,400m in Halls 8a and 8b.

Among the exhibitors is NanoFocus AG (Oberhausen), which is showing its non-destructive, automatable 3-D measuring systems, designed to enable surface inspection of implants or stents, among other things. **Heinz-Peter Hippler**, the company's Sales Manager said: 'With regard to our measuring technology, which ranges from the microscale to the nanoscale, we are expecting a surge in demand from the field of biomedical engineering. Accordingly, we are expecting great things from this event.'

In the Innovation Report 2007, an annual publication by the Association for Electrical, Electronic & Information Technologies (VDE, Frankfurt a.M.), medical technology remains the third most important driver of innovation. Europeans lead this field, well in advance of the USA, according to this event's organisers. 'With over 70% of the technical experts, Germany and Europe can claim to have the highest innovative capacity in medical technology; by comparison, the USA has 24%. They are followed at some distance by Japan and China. Also noteworthy is the forecast for 2015, according to which not only will the

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COMPAMED 2007

order of rank stay the same, even the percentage shares are to remain largely unmodified.'

The study of 'Optical technologies – Commercial Importance in Germany', commissioned by the BMBF, reports that the global market for medical technology and life sciences has a volume of €18.6 billion. This amount is supposed to increase to €38.8 billion by 2015, which represents a growth rate of 7.6%. Germany's share of this amounts to almost 16%. It is worth mentioning the high percentage of graduates (13%) among the 17,400 employees of the medical engineering industry, which exports 70% of its products abroad. The trends toward intelligent and

'Humidity sensors integrated in plasters could make it easy to monitor the healing process of burn injuries, for instance.'

Laser-modified surface properties

The on-going miniaturisation in many branches of the medical engineering sector also demands new manufacturing techniques. At this year's event, the Hannover Laser Centre (LZH) is offering a

whole batch of micro-technical manufacturing processes for medical product engineering. Along with conventional precision methods, such as laser removal, cutting and joining, other product modifications and solutions are being presented that specifically target medical applications. For example, laser processes can be used to make selective modifications to surface properties



– especially of polymer materials. In this way, through the use of micro-stereolithography, materials can be provided with particular liquid properties.

'Micro-fluid systems are coming increasingly to the fore in medical technology. Systems like these require new types of expertise, above all in manufacturing technology,' said Dr **Roland Stangl**, Director of Micro Technologies at PARI Pharma GmbH. PARItec GmbH, which is presenting current developments in this field. The firm's micro-technologies, using the example of PARI eFlow the innovative medical *continued on page 18*

Messe Dusseldorf, the massive trade fair centre, filled annually by MEDICA and COMPAMED



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MEDICA 2007 – Hall 10, Booth C42



multifunctional high-tech products and toward continual internationalisation are also a characteristic of COMPAMED.

Top potential for optical inspection systems

Similar to NanoFocus AG, the Optical Solutions division of Siemens is also working in the area of quality inspection, for which it offers ultra-fast optical inspection systems. These can detect, for example, fractures in stents and thereby prevent micro-wounds in arteries, which can occur when parts of damaged stents straighten up in the artery. **Markus Lotz** from Siemens Optical Solutions sees a bright future for measuring and image processing technology. 'The development potential of optical inspection systems can be increased fivefold, because we have not yet availed of all the opportunities presented by image processing.'

The measurement of surface textures — down to the nanoscale — would be inconceivable without modern sensors. This topic therefore stands equally high on the priority lists of the exhibitors and the visitors to COMPAMED. The components, based on CMOS technologies (Complementary Metal-Oxide Semiconductor), for example, and therefore belonging to the micro-technology sector, are also used to measure the flow rate of gases and liquids in anaesthesia systems and infusion technology, among other things. However, **Ulf Kanne**, Product Manager at Sensirion AG in Stäfa in Switzerland, can envisage numerous other application areas – especially for disposable sensor solutions:



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volume range, compatibility with a particular material or greater conveyor accuracy,' explained Product Manager **Severin Dahms**. Bartels is presenting some specimens of the implementation of such requirements at the trade fair. The prototypes of a high-pressure, a high-volume and a regulated micro-pump will illustrate the numerous possibilities. Complicated components like these can be applied, for example, in laboratory technology in bio-chips ('lab-on-chip' applications).

Many MEDICA exhibitors migrate to COMPAMED

Many of MEDICA's 'traditional' exhibitors are exhibiting at COMPAMED this year for the first time. Along with companies such as Alike Buerkert, Binder, Degussa, Helbling and others, these include Bernd Richter GmbH (Wipperfurth) and Nicolay GmbH (Nagold), which both offer cable systems and accessories for medical technology.

Mechatronic AG (Darmstadt), which manufactures programmable electronic medical devices, as well as the corresponding components, modules and software, have switched to COMPAMED for the first time. 'MEDICA has played a decisive role in the success of our company up to now,' explained **Thomas Ullmann**, Chief Executive

Officer of Mechatronic AG. 'Not least due to the valuable contacts that we establish every year at the trade fair, our turnover has increased almost fivefold in the last ten years. At the same time, almost 90% of the MEDICA visitors were outside our core target audience. As a result of switching to COMPAMED, we are anticipating a significantly sharper focus on our specialised audience from the decision making bodies for new developments in medical technology.'

Quite apart from the ever increasing number of exhibitors that are presenting innovations and products from the entire field of medical technology, the 'High-tech

for Medical Devices' forum provides a different information focus.

Organised by IVAM, it shows the latest trends, particularly regarding micro and nanotechnology for use in medicine. New materials and substances, a traditional mainstay at COMPAMED, is again the centre of attention.

Of the 137,503 professionals who attended last year's overall event, i.e. MEDICA and COMPAMED, about 13,000 experts were interested in the technically specialist range of products offered at COMPAMED.

Report by Klaus Jopp, freelance technical writer for science and technology, Hamburg.

continued from page 17

nebuliser, are being demonstrated. The production of PARI eFlow incorporated medicine-compatible and autoclavable adhesive bonds with various materials such as steel, piezo-ceramics and plastics and involved high-speed laser drilling in steel, for holes with a diameter of two micrometers or more. The company also provides this technique as a service.

Two important elements in fluid systems of whatever size are pumps and valves. Bartels Mikrotechnik GmbH is presenting the 'mp6', its latest micro pump generation, for the first time, at the

IVAM Joint Pavilion. Equipped with a double actuator (actuator = final controlling element in a control loop), the component doubles the back pressure range to 500 mbar, while a modified signal form ensures low-noise operation. A valve with positive opening pressure, for regulating flow when the pump is not in operation, is currently being developed to go with the pump. 'The basic principle of the piezo membrane pump has been kept simple so that it can be adapted to various requirements - the customer decides whether he needs, for example, a larger

IVAM is an international association of companies and institutes that specialise in microtechnology, nanotechnology and advanced materials. This 13-year-old association aims to open up new markets and set standards with its 242 members from 17 countries.

According to its latest survey, medical technology is top of the ranking list of the European MEMS industry's most important target markets.

26 of the association's members are exhibiting at this year's COMPAMED.

Sensor technology

Sensirion is demonstrating the use of gas and liquid flow sensors in spe-

THE IVAM

cific medical applications (e.g. anaesthesia, ICU, homecare ventilation, CPAP, medical diagnostics, analytics and drug delivery). For example, it is illustrating the use of its gas flow sensors in medical ventilation applications, and is discussing future sensor-based products that become possible thanks to its CMOSens technology e.g. implantable and disposable solutions.

Aceos GmbH is exhibiting three novelties: two new O2 sensors: ACE-Xmed2 with an ultra-fast response time (< 50ms), especially applied with respiratory applications for infants, and ACE-Xmed3 with a measuring range up to 60 Vol%O2 for patient monitoring; also, the ACE-DXmed1 - a plug&play sensor module to measure O2 and CO2 in spiroergometric applications simultaneously.

Tiny components

The Servometer Precision Manufacturing Group, LLC, is presenting custom electroforms, which are very precise, thin-walled, light weight precision components, that can be made as miniscule as 0.020i in diameter, with walls as thin as 0.005i, made of nickel, copper, implantable gold, silver, or a combination thereof, depending on application requirements. Servometer electroforms can be used as molds, precision tubing, precision nozzles and other lightweight, structurally rigid components in various applications, including both invasive and non-invasive applications within the medical industry.

Smart Products, Inc. is introducing

its 101 Barbed Check Valve at the IVAM joint pavilion, which fits 1/8i ID tubing and is ideal for medical applications including blood pressure cuffs, kidney dialysis, post-surgery instrumentation, or any application where space is limited. Due to a spring-loaded design, the 101 plastic valve does not require pressure to close and can also be used as a pressure relief valve. A range of precise opening pressures from 2 PSI to 20 PSI are available. Also new is the 103 NPT Check Valve which mounts by screwing into a manifold. The thread size is 1/8i, and a choice of materials and opening pressures is available. Smart Products provides over three million possible check valve combinations with a modular, mix-and-match capability.

Measurement

Lasers for oxygen detection are being exhibited by eagleyard Photonics GmbH. The company has expanded its product portfolio by 760 nm and 763 nm Distributed Feedback (DFB) lasers in butterfly package. eagleyard's new DFB lasers track down oxygen by the characteristic 'fingerprint' of the absorption spectrum. With narrow line width, the lasers can sense even residual amounts of oxygen, the firm reports. A mode-hop free emission guarantees a very precise gas analysis by means of absorption spectroscopy. The lasers are designed for applications in the medical, pharmaceutical and chemical industries.

Bonding technology

As a system supplier, PARItec GmbH is presenting micro technologies exemplified by the novel drug nebuliser PARI eFlow. This includes bonding technology with different materials such as steel, piezo ceramics, and plastics (e.g. polyimide) for medical use, as well as autoclavable or high-speed laser drilling for holes ex 2 µm diameter. 'Micro fluidic systems are more and more common in medical technology. Such systems require new competences particularly in manufacturing technology,' said Dr Roland Stangl, Director Microtechnologies of PARI Pharma GmbH.



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- **In the Thursday issue we present progress in hospital IT systems**
- **Friday's focus is on news surgical procedures and equipment**

The *European Hospital* team is at the fair (hall 7, booth E15), all looking forward to meeting you, to hand out free issues if you missed any, and to answer your queries regarding editorials or advertising. Our reporters are also circulating around *MEDICA* to catch the most interesting highlights of the fair and report about these. Their on-the-spot reports will appear, for the first time, on our homepage www.european-hospital.com in a special *MEDICA* section. So, even if you must miss the fair, you can access daily news to keep up-to-date.

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increased in importance, *European Hospital* is launching a new, online newsletter, so you can receive selected medical news directly in your own e-address! (For subscription details, please visit our website!)

Along with our main medical and healthcare publications and related activities, *European Hospital* is again organising the *Hospital Manager Symposium 2008*, in tandem with the *European Congress of Radiology (ECR)*. In 2007, the Symposium attracted over 300 radiologists to hear talks and lectures given by our selected international experts in Finance, IT and Management.

Also, at this year's ECR, we launched our latest publication: The *RADBOOK*, the first guide for radiology equipment in the English language. EH will continue the successful publication of this valuable

source of information for those who must make decisions on purchasing new systems for their hospitals and clinics.

We have also expanded our pan-European readership to Russia, by publishing, within our prestigious journal *European Hospital*, several special issues, as well as additional pages in the Russian language – a great success. In addition, we will publish, for the first time, a special issue for the most important Russian medical fair – *Zdravo* (Zdravookhraneniye 2007).

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