**UK & Germany** – An Interna
tional Partnership is to be laun
ded (5 September) to bring
together major donor countries,
as well as key international
agencies such as the World Bank
and the World Health
Organisation, to hasten the
Millennium Development Goals
(MDGs) that aim to reduce
infant and maternal mortality
through co-ordination of ‘success
systems’ and ‘key health
partnerships.’

UK & Germany – The hypertension in the Very Elderly Trial (HYVET), the biggest
of clinical trials to assess the benefits of low-
nering blood pressure in patients aged 80+,
was halted in July, two years before its
scheduled completion in 2008. Professor
B J Bullingham MB, the trial’s Principal
Investigator and Professor Emeritus of the
Care of the Elderly Department at Imperial
College London, said the interim findings
indicated that an antihypertensive, low
dose diuretic (indapamide 1.5 mg sustained
release) and if needed, an additional ACE
inhibitor (perindopril) taken daily, reduced
the number of strokes and mortality at a
statistically significant level. 3,845 patients
in seven countries (Bulgaria, China, Finland, Romania, the
Russian Federation, Tunisia and the UK) par-
ticipated. The trial was designed to deter-
mine whether a 35% difference occurred
between a placebo and active treatment.
Secondary outcome measures included
total mortality, cardiovascular mortality, car-
diac mortality, stroke mortality and skeletal
fracture. All patients in the double-blind,
randomised, placebo-controlled trial began in
2001, are being seen for a final visit.

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2001, are being seen for a final visit.

The new partnership follows talks at 10 Downing Street
between the UK’s new Prime
Minister Gordon Brown and
German Chancellor Angela
 Merkel, who later jointly
announced that addressing
healthcare and aid provision
was now a ‘development emergency’

Speaking at the United Nations
in June, Prime Minister Brown
had urged the most developed
countries to get back on track
with meeting their jointly agreed
Millennium Development Goals
(MDGs), which were established
by the UN back in September
2000. These include specific
commitments, such as eradicating
extreme poverty and achieving
universal primary education –
aims to be met by 2015.

For her part, earlier this year
Chancellor Merkel had called
the G8 summit, when the world’s richest
countries promised to honour
financial commitments and
improve the coordination of aid
with national health plans of
recipient countries.

The Brexit could point out that
the MDGs that focus on healthcare
were the ‘least likely to be met’ by
the agreed target date of 2015, proud
adding that an ‘improved approach’ was needed. This would
entail strengthening of ‘weak
systems’ that suffer a lack of
workers and clinics, and improving
co-ordination of ‘complex’ and
‘fragmented health provision’.

Following their meeting, Prime
Minister Brown said: ‘We re-affirm
our commitment made at the G8
and the EU to provide the
financing needed to meet our
health commitments through
the established institutions and
mechanisms. In this context,
the replenishment of the Global Fund
will be a key step. We will also
explore innovative financing
mechanisms to meet these
commitments.’

They two leaders stated: ‘We
see this (the new partnership) as
a critical step in our call for an
international mobilisation of effort to
achieve the MDGs that will
build year on year until 2015. Our
efforts must bring together the
private sector, NGOs, faith
groups, international agencies and
governments in a new partnership
to reduce poverty, improve health
and provide opportunities for
the poor across the world.’

During a press briefing,
Chancellor Merkel added: ‘We
strongly welcome the British
initiatives, which is aiming at us,
combined with the Millennium
Development Goals, and that is
the health initiative that the British
have proposed. We believe that it
does offer us an opportunity to
help us efficiently work towards
our compliance with those
Millennium Development Goals. I
will be travelling to Africa very
soon and I will do my best to
be in Africa for the support.’

Bulgaria issues first electronic medical cards

A pilot project began in February
by the Ministry of Health and the
National Health Insurance Fund
(NHIF) has resulted in Bulgaria
issuing its first electronic medical
cards. The pilot project is run by
the international eHealth specialist
ICW in partnership with the firms
Cisco and Kontrax.

From September 1,000 inhabitants
of the towns of Slivnitsa and
Aldomirovzi (both about 30km
from Sofia) will receive personal
electronic medical cards (EMCs).
These will predominantly be given
to chronically ill patients by their
general practitioners (GPs) during
regular surgery visits. Patients
participating in this project were
nominated by the GPs.

Each EMC is fitted with a micro-
processor chip that stores the
patient’s personal data, issue and
prescriptions will be issued.

In the first six months after the
official start of the project the infra-
structure was developed along with
specific software. All doctors and
chemists in Slivnitsa and the NHIF
were linked to a reliable, secure
private network. Cisco supplied the
networking equipment, firewalls and
IP telephones.

ICW, the system integrator and sys-
tems integrator for the project have
adapted their software solutions,
which have already been used in
Germany and Austria, to the spe-
cific requirements of the Bulgarian
healthcare system. The ICW software
development kit (SDK) seamlessly
links the medical card system
with the software used in surgeries
and pharmacies. The Kontrax soft-
ware Hippocrates and the pharmacy
systems Pharmacy Expert supplied
by Libra Inc. and Pharma Star, sup-
plied by AS Systeme, can now com-
 municate with one another through
the ICW eHealth infrastructure.

The pilot project for the Bulga-
rian electronic medical card was
initiated by the Bulgarian Ministry
of Health and the NHIF. ICW was
appointed for its implementation in
coe-operation with Cisco and
Kontrax.

InterComponentWare AG (ICW) is
an international eHealth specialist
Provider and serves clients in Austria,
Germany, Switzerland, the USA and Bulgaria.

**Pharma Star**

**ICU**

**ICW**

**Kontrax**

**NHIF**

**ICW**
206 tips to save money

Austria  206 tips for administrative reforms, given by the Austrian Council of Ministers at the end of August, have just been published. Almost half of the envisaged total savings of €4-5 billion is expected to result from a reform of the healthcare sector.

The number of acute beds in Austria has been continuously reduced over the years. However, with 6.1 beds per 1,000 people it is still high compared with the European average: 3.9 beds.

The Court of Audit has also targeted regulations on medical fees and special charges for potential savings.

A new concept for 24-hour care

A fierce debate around the illegal employment of foreign care workers in Austria resulted in a new concept for 24-hour care.

An estimated 40,000 nursing assistants, most from Eastern European countries, were being employed illegally in Austria. Since July 2007, the country has had a new, controversial concept for 24-hour care developed by the Ministry of Social Affairs. This system allocates care services to those who need them, or to their relatives, on a refund basis for the disabled.

This aid can be worth up to €800 per carer for those in regular employment, or up to £225 for contractors (self-employed care). The carer can either be directly employed by the person in need of care or their relative, can be a contractor working for somebody entitled to that care, or may be employed by a charitable organisation.

By July 2008, at the latest, carers will have to demonstrate that they hold qualifications in the theory of care to maintain quality assurance. Applicants must be able to prove that they are entitled to a level of training allowing their dimensions of the seca platform scales allow for assisted weighing. Applicants’ income is taken into consideration and the income limit is €2,500 net a month, excluding payments such as nursing allowances, spouse’s and family allowances, child benefits and housing benefit. This upper income limit increases by €400 for each dependent, and by €600 for each disabled dependent. Assets up to a cash value of €5,000, along with the value of the home if this is the main residence for the disabled person claiming, are excluded from the calculations.

The rule is applicable until 31st December 2007 and there are currently negotiations with the individual Austrian Lander to develop a system that can be implemented after the current system expires.

Determining body weight in the elderly

Elderly people lose their physical reserves and are thus more susceptible to diseases. Very often not only one but several organs are affected. Consequently, prophylactic measures such as control of body weight to determine the heart failure status and help to cut back to costs that body weight can reveal, for example, whether a patient is underweight, and thus it plays a major role in finding off malnutrition. Fluid balance can also be monitored by body weight.

Cardiovascular conditions such as hyper- or hypotension, or cardiac insufficiency, can cause severe disbalance. However, many otherwise healthy elderly people are also insecure when walking or have problems with co-ordinating movements. In such cases standard weighing scales are not suitable. Precise weights need to be taken off the platform. The seca product portfolio includes systems using ultrasound, MRT, computer tomography and optical topography. The company points out that Germany is ranked second after the USA for innovation and potential in medical technology, and that specialist training opportunities are important to secure this position for the future.

The Japanese firm Hitachi Medical Corporation develops advanced medical imaging systems that are distributed by Hitachi Medical Systems Europe Holding AG and national distributors and users. The product range includes systems using ultrasound, MRT, computer tomography and optical topography. The company points out that Germany is ranked second after the USA for innovation and potential in medical technology, and that specialist training opportunities are important to secure this position for the future.

The number of acute beds in Austria has been continuously reduced over the years. However, currently the average, a considerable number of expensive acute beds could be expected to result from a reform of the healthcare sector.
Furore over increased balloon angioplasty units

A decision by Ab Klink, Minister of Public Health, Wellbeing and Sports, to increase the number of balloon angioplasty facilities in hospitals to 30, has prompted the NVVC – the Dutch cardiologists association – to express concern that there will be too many centres and too few patients, and specialists will not be able to maintain the level of skills for this procedure. If the minister maintains his plan to allow hospitals to provide balloon angioplasty without cardiologists’ support, then he will also overlook the advice of the National Health Council, which gives almost the same warning as the NVVC.

The Dutch Association of Heart Patients also commented: ‘The quality of treatment by balloon angioplasty will without doubt worsen in this way. The consequences of these plans could be accidents, especially if something goes wrong in those hospitals without cardiologists’ support, particularly when a patient has to be transported to another hospital, and an ambulance is stopped by traffic jams’.

Notwithstanding, the Minister appears to be determined to continue with his plan. It is expected that, by 2010, some 40,000 Dutch patients will need balloon angioplasty due to narrowing in the coronary artery.

What if you could access both an angiogram and a chest x-ray in less time than it takes to read this sentence?

That’s the beauty of integrated medical information. The images and reports you need are at your fingertips and accessible, whenever and wherever you need them. When seconds matter most, you will be glad that Agfa HealthCare created an integrated Cardiovascular Image and Information Management Solution that organizes the entire cardiology patient record at a single point of access. Agfa HealthCare is at work in 1 of every 2 hospitals worldwide, and because our solution is designed by cardiologists, for cardiologists, you’ll be operating with greater efficiency in nearly no time at all.

To learn more about our proven healthcare IT solutions, please visit www.agfa.com/healthcare or Stand A100, ESC 2007.
Medical technology and pharmaceutical corporations, representatives of the social and health insurers, private and public organisations, numerous NGOs, patient lobby groups, the media, decision makers in clinical and administrative functions, representatives of private and public hospitals and healthcare providers from across the world, today, all meet in Gastein.

Let’s make a summary of international demands manageable! Health policy is still handled nationally. I believe there are only a few important health policy issues that need discussion Europe-wide, which means they are definable and manageable.

‘Obviously, the interests of the stakeholders in healthcare and technology, industry, politics and administration – can differ widely. Also, governments, the healthcare sector, and medical technology industries might have opposing views. But in the EHFG framework, time and again we witness that the different players forge issue-specific cross-sectoral and inter-institutional coalitions. I guess most of the successful lobbying for specific and far-reaching changes in the healthcare system has become extremely difficult. This is true for many issues, for example long-term care for the chronically ill, or patient safety, and issues regarding healthcare as an economic activity and growth factor. Might the range of issues have to be limited to enable their deeper discussion? We plan to offer separate scientific symposia for the different stakeholders, where topics that have been on the EHFG agenda, currently relevant for the individual groups can be discussed in more detail. We are also launching a ‘Gastein Group’ of members for the health committee of the EP and other MEPs, to follow up our initiatives in our Forum at a political level.

Since 2000, annual Gastein Declarations have been presented to the European Parliament. Have they affected health policy? ‘One should look at the Gastein event and the Declaration as a unit. The Declaration is a summation of the European experience and workshops this year, what are the burning issues? ‘The focus will be on ageing and chronic diseases, and healthy environments.’

Where do you expect consensus solutions? ‘The foundation of the Gastein Group in the European Parliament will serve as the basis for developed implementation of our recommendations. The EHFG is a major tourism factor for the Gastein Valley. The statistics show its economic benefits here! The Gastein valley has a century-long tradition as a health destination, so the EHFG found the ideal venue. The Gasteiner
No predicted boom in medical tourism

‘Top medicine’ no doubt attracts foreign patients. If congenital heart diseases require treatment, foreign patients entrust themselves to medical expertise found in Berlin; Hamburg is renowned for total endoprosthesis, and North Rhine Westphalia focuses on treatments for epilepsy and chronic cardiovascular diseases.

This indication-based specialisation might in fact offer a solution to fill the empty ‘deluxe’ beds in German hospitals, and in the end turn the ‘guest patient’ concept in to a success story. The SWZ presented its study and discussed future strategies at the Hauptstadtkongress in Berlin this June.

Details: www.swz-net.de

Introducing the radically different KODAK DIRECTVIEW DR 9500 System

We've broken away from tradition with a design that incorporates both the tube and detector in the ceiling-mounted 3D U-arm. Now, the system moves easily around the patient to capture images on the left and right side of the body without the need for additional patient positioning. That means enhanced workflow for you and greater comfort for your patients—a winning combination.

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Advantages of the new design include:

• Two operator interfaces on the 3D U-arm allow you to change the X-ray generator parameters and settings without leaving your patient
• With auto-positioning the system moves into the pre-programmed position for the next exam
• The buoyy and tube are always aligned giving you confidence

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www.carestreamhealth.com

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EUROPEAN HOSPITAL Vol 17 Issue 4/07 5
**Could a virtual game help pandemic studies?**

USA – Online game worlds might prove useful for the study of spread of human infectious diseases, according to scientists Eric Lofgren and Nina Fefferman, of Rutgers University (Piscataway, NJ, USA) and Tufts University (Boston, MA, USA).

In their paper, which was published in the Lancet Infectious Diseases they describe how a programming error in a popular online role-playing game, World of Warcraft, caused a full-blown epidemic of a virulent, highly contagious disease. Although computer models of infectious diseases are of increasing importance, a limitation of these models is that they cannot predict the behaviour of individuals. The scientists realised that appropriate exploitation of online games might alleviate this constraint, since players’ economic and social behaviour often mimics their real-world behaviour.

The outbreak began when Blizzard Entertainment released an update in September 2005, allowing higher level players to access a new area of the game. Players experienced combat with a powerful creature called Hakkar, who occasionally infected players with ‘Corrupted Blood’. To the powerful players, ‘Corrupted Blood’ was no more of a hindrance than a cold, but a game-wide epidemic started after many characters teleported – a common feature of the game – back to urban areas before being killed or cured of the disease, where they infected more susceptible players.

Blizzard Entertainment’s quarantine strategy failed because of the highly contagious nature of the disease, the inability to seal off a section of the game world effectively, and player resistance to the notion. Fortunately, the game developers had one additional option not available to public health officials: resetting the computers.

This is the first time a virtual virus has infected a virtual human being in a manner even remotely resembling an actual epidemiological event. Currently, epidemiologists face major constraints in studies of diseases dynamics because they are limited to observational and retrospective studies. Computer models allow for experimentation on virtual populations without such limitations, but they rely on mathematical approximations of human behaviour. By contrast, human-agent virtual simulation may bridge the gap between real-world epidemiological studies and large-scale computer studies by including the variability and unexpected outcomes that arise as a result of the behaviour of individuals. Lofgren and Fefferman say: ‘We believe that, if the epidemic is designed and presented so as to seamlessly integrate with the rest of the persistent game world, in such a way as to be part of the user’s expected experience in the game, a reasonable analogue to real-world human reactions to disease might be observed and captured within a computer model... By using these games as an untapped experimental framework, we may be able to gain deeper insight into the incredible complexity of infectious disease epidemiology in social groups.’

Source: The Lancet
Details: Nina Fefferman.
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**Needle-free drug delivery device scoops top award**

The Glide Solid Dose Injector (SDI), the needle-free drug delivery system that injects drugs in solid dosage form into the skin, has contributed to its manufacturer, Glide Pharma, winning the Best Business Award at the 2007 Medical Futures Innovation Awards. The competition had attracted over 500 entries. The Best Business Award is given to the overall winner from among the 25 award winners. Glide Pharma located at Milton Park, Oxfordshire, also won the Best Business Proposition Award in the Anaesthetics & Critical Care category, sponsored by Abbott Laboratories.

Ease of use also makes it ideal for self-administration by diabetics, and the device also eliminates needle-stick injury and disposal problems.

Glide Pharma is developing a range of new drug products for use with the system, the first of these to commence clinical trials shortly. This contains the drug octreotide acetate, a top seller from Novartis that recently came ‘off patien’, It is used to treat neuroendocrine tumours prior to surgery, as well as acromegaly, a chronic condition caused by abnormally high amounts of growth hormone.

Dr Charles Potter, Founder & CEO of Glide Pharma, receives the Best Business Award 2007 from across Joanna Lundy at the Medical Futures Innovation Awards Ceremony.

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**Sympoism: Innovations in medical imaging**

The Forum Medizintechnik-Pharma – an association that provides a recognised contribution to the development of the co-operative environment in medical technology and pharmaceuticals, met for a symposium in Germany this July. Awarded by experts from number of institutions, which number 560 from 14 countries (in Europe as well as the USA and far East) it was chaired by Professor J. Ruediger Siewert MD, also chairman of the board of Heidelberg University Hospital, focused on medical imaging. This includes X-ray technology, encompassing all conventional technologies and computed tomography (CT), magnetic resonance imaging (MRI) and ultrasound (US).

Innovations in X-ray technology focus on digital post-processing of image data and on automation and standardisation of examination workflows. Currently, PET-CT is experiencing a boom. The stand-alone PET (Positron Emission Tomography) has been fully replaced and the combination of PET and CT in one scan PET-CTs provide images which allow precise interpretation of the functional morphology as well as metabolism (NI).

Andy Goldberg, founder of Medical Futures, said: ‘Nine out of 10 of the largest medical technology companies are US-based, yet the UK produces some of the world’s best ideas. Medical Futures has demonstrated a strong pipeline of innovations set to become the next high growth area and prove that the UK can be a world beater.’

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**RADIOLoGY**

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**EPIDEMIOLOGY**

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**NEWS - INNOVATIONS**

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**Source:** The Lancet
Details: Nina Fefferman.
Phone: +1 781 710-5025
Email: nfefferman@math.princeton.edu
It’s ESC time again!

And the focus is heart failure

Given the exponential increase in the patients presenting with heart failure in recent years, a total of 53 sessions have been dedicated to the topic of heart failure. The sessions include clinical updates and state-of-the-art lectures, but also the newest on diagnosis and therapy will be presented. In their welcoming address, Kim Fox and Jeroen Bax highlight some of the lures of this important and notable event for cardiologists worldwide.

Three Hotlines - Two Clinical Trial Updates

Late-breaking trials and the most recent updates on published trials will be presented. These sessions frequently include large, randomised clinical trials that have major impact on patient management.

Basic Science

The Council for Basic Cardiovascular Science will present sessions in a bench-to-bedside format, focusing on the translational aspect of basic science, but also highly specific basic science research will be presented.

Abstracts and posters

Submitted abstracts: almost 10,000. Reviewers to grade abstracts: Acceptance rate: 37%

Working lunch

Participants can also fill their lunch periods with attendance at nine practical sessions under the banners Meet the Expert; Read with the Expert, and How to.

The Rene Laennec Lecture on Interventional Cardiology

With the Expert, and how to.

The Geoffrey Rose Lecture on Population Science

Presented by Professor P Puska

The Andrew Currett Lecture on Interventional Cardiology by Professor T Luescher.

The Focus sessions

These consist of live transmissions from European locations – Katowice, Berlin, Bad Nauheim, Bern and Vienna – to demonstrate practical skills in imaging and intervention. Clinical Practice sessions will encourage interactive discussions between an expert panel and audience. Two of the session will focus on mild heart failure (HF) and end-stage HF.

Joint sessions

The American Heart Association and the American College of Cardiology, as well as societies representing subspecialties such as hypertension, atherosclerosis and diabetes, etc. will present joint sessions.

12 main sessions

These will be packed with important clinical topics, e.g. the relation between anaemia and heart failure, or the role of BNP in heart failure. The safety of drug-eluting stents will be another hotly discussed subject, as will the increasing role of non-invasive imaging using different modalities, and the development of percutaneous valve therapy.

New ESC guidelines

Five new ESC guidelines are to be released on acute coronary syndromes without ST elevation, valve disease, cardiac pacing, hypertension and prevention of cardiovascular disease. In addition, the new Universal Definition of Myocardial Infarction (endorsed by the AHA, ACC and ESC) will be presented.

The EHSP Lessons from the Euro Heart Survey Programme – an extensive questionnaire involving many hospitals in ESC countries across Europe – will be the focus of four other sessions.

Annual meetings

The five ESC Associations will report on their annual meetings or present their news in 90-minute sessions organised in the Association Corner. The five include sub-specialisations – echocardiography, heart rhythm, prevention, percutaneous coronary intervention, and heart failure.

What role does molecular imaging currently play in cardiology?

‘In molecular imaging we – just like everyone else – are in the very early stages. We do basic research, so to speak. Research into the visualisation and differentiation of stable and vulnerable plaque is very important for us. Vulnerable – that is inflamed – plaque can rupture at any moment and cause thrombosis, which are often fatal. At this point we do not have a method to distinguish vulnerable from stable plaque. This is where molecular medicine comes in: The macrophages (cells that play a crucial role in the inflammation process of the plaque) bind well with magnetic nano particles. In the Nano for Life Working Group, a research co-operation between Siemens and here at the Charité in Berlin, we work with ultra small iron particles that can make vulnerable plaque visible in MRI. Even more: we can determine the status of the inflammation, because the higher the inflammation activity the better the uptake of the iron markers. Based on the number and distribution of the markers in the body, we can then provide a very precise risk analysis for the patient. MRI is the most sensitive procedure to visualise these markers. There are also CT research projects that are important for cardiology – the non-invasive visualisation of the coronary vessels, for example. We are working with a 64-slice CT which is able to visualise the coronary vessels very reliably. ‘In summary we expect immense progress in cardiological imaging in the near future – progress which will enable us to diagnose diseases earlier and more precisely.’

MRI and the diagnosis of arteriosclerosis and plaque imaging

The spatial-anatomic visualisation offered by MRI already provides immense diagnostic possibilities for cardiology. However, as yet, the potential of this imaging modality is far from exploited, according to Professor Bernd Hamm (right), of the Radiology Department at the Charité Hospital, Berlin. Daniela Zimmermann of European Hospital, asked him why Professor Hamm: ‘As far as the visualisation of vessels and vessel periphery is concerned, MRI has made other imaging modalities all but obsolete. Whole-body angiography, which is state-of-the-art MRI technology, for the first time offers the possibility to visualise all vessels non-invasively. Patients who suffer from a stenosis – which in most cases is accompanied by arteriosclerosis – will particularly benefit from this new technology. Arteriosclerosis is a systemic condition, which quite often means you will find stenoses in different regions of the body that have not yet become clinically relevant. In such cases, whole-body angiography can significantly influence therapy management: Imagine a patient who is diagnosed with a stenosis in the pelvic region but the whole-body angi shows a second stenosis, for example in the carotid artery. Obviously, to prevent future intra-operative complications, we will treat the latter first. This non-invasive method has many advantages – both for the physician and patient.’
A next-generation diagnostic tool for cardiovascular disease, using a nanoscale iron particle, is now under development at a unique industry-university named Nano AG. A report from Siemens describes the research and progress at the centre.

For and against

Absorbable metal stents

Can achieve an immediate result similar to the result of other metal stents and be safely degraded after four months. Nevertheless, the restenosis rate remains high and modifications of the stent characteristics, i.e. prolonged degradation and/or drug elution are objects of further development addressing the problems of excessive recall and proliferation. Due to reduced radioopacity of the used magnesium alloy, the AMS-stent cannot be visualized by X-ray and induces no metallic artifacts during assessment with computed tomography and magnetic resonance. This characteristic allows the non-invasive assessment, even of the stented segment, after implantation of an AMS-stent and gives new opportunities in the follow-up examinations after coronary artery interventions.

Contact for references and further details: Dr. Boese: +49-201-7234888 e-mail: dirk.boese@uk-essen.de

Hot Spots:

NANOSCALE CONTRAST AGENT FOR IMAGING CORONARY ARTERIES

But stents are foreign bodies (‘metal jackets’) that transform elastic vessels into rigid tubes, impair vasomotion, and reduce restenosis after angioplasty.

The magnesium stent was developed in Berlin, by Biotronik and the University of Duisburg-Essen, and Cardiology Department at the West German Heart Centre in Essen, Germany.

Coronary stents provide wall wrapping of dissection, prevent elastic recoil, and reduce restenosis after percutaneous transluminal coronary angioplasty. In addition, drug eluting stents loaded with anti-proliferative agents inhibit intimal hyperplasia and reduce restenosis after implantation, the stent characteristics, i.e. prolonged degradation and/or drug elution are objects of further development addressing the problems of excessive recall and proliferation.

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The tiny particles under investigation are less than seven nanometres across, with an iron core that is highly responsive to the intense magnetism of an MR system. Most MR imaging of coronary arteries already employs contrast agents to improve image quality. Coronary arteries are small and due to the movement of the heart during the cardiac cycle, there is very little imaging time, so you need a contrast agent to get a sufficient signal-to-noise ratio. The super paramagnetic iron oxide particles under development have an optimal signal-enhancing effect far above that of existing contrast agents. An ongoing phase II trial is measuring blood flow through coronary arteries. The goal is to compare images made with the nanocast contrast agent to those made with traditional X-ray angiography.

A second application for the highly responsive nanoparticle is to image diseased arteries. It is a change in paradigm for vascular diagnosis. We may have to look not so much at flow-limiting stenosis, or narrowing, but at the composition of the plaques and the change in the vessel walls. Using a specific contrast medium means to get functional information and then to make a prediction of the risk of plaque rupture in the artery.

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The tiny particles under investigation are less than seven nanometres across, with an iron core that is highly responsive to the intense magnetism of an MR system. Most MR imaging of coronary arteries already employs contrast agents to improve image quality. Coronary arteries are small and due to the movement of the heart during the cardiac cycle, there is very little imaging time, so you need a contrast agent to get a sufficient signal-to-noise ratio. The super paramagnetic iron oxide particles under development have an optimal signal-enhancing effect far above that of existing contrast agents. An ongoing phase II trial is measuring blood flow through coronary arteries. The goal is to compare images made with the nanocast contrast agent to those made with traditional X-ray angiography.

A second application for the highly responsive nanoparticle is to image diseased arteries. It is a change in paradigm for vascular diagnosis. We may have to look not so much at flow-limiting stenosis, or narrowing, but at the composition of the plaques and the change in the vessel walls. Using a specific contrast medium means to get functional information and then to make a prediction of the risk of plaque rupture in the artery.

For and against

Absorbable metal stents

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Cardiac resynchronisation therapy

Worldwide clinical trial gets underway

Switzerland – A clinical trial of cardiac resynchronisation therapy (CRT) in patients with advanced heart failure and a narrow QRS complex (<120 ms) has been initiated by Zurich University.

The clinical benefits of CRT, as an adjunct to drug therapies, in patients with NYHA class III/IV heart failure (HF) have been shown repeatedly in randomised trials and clinical practice. The Miracle ICD trials [Young JB, Abraham WT, Smith AL, et al. Combined cardiac resynchronisation and implantable cardioversion defibrillation in advanced chronic heart failure: The MIRACLE ICD trials. JAMA 2003;289:2683-2694], and Companion trials [Brustow MR, Saxon LA, Boehmer J et al. Cardiac-resynchronisation therapy with or without an implantable defibrillator in advanced chronic heart failure. N Engl J Med 2004;350:2140-2150] suggested that CRT, which paces the left as well as right ventricles simultaneously, used in conjunction with an implantable cardioverter defibrillator (ICD) improved the quality of life, functional capacity and exercise test performance in patients with HF with a wide QRS (>120 ms) interval. Indeed current guidelines for the selection of suitable patients for CRT based on the published evidence advise that optimal candidates to benefit from CRT have QRS >120 ms. [Strickberger SA, Conti J, Daoud EG et al. Patient selection for cardiac resynchronisation therapy: from the Council on Clinical Cardiology Subcommittee on Electrocardiography and Arrhythmias and the Quality of Care and Outcomes Research Interdisciplinary Working Group, in collaboration with the Heart Rhythm Society. Circulation 2005;111:2146-2150.]

This means that until now, the majority of HF patients, those with a narrow QRS complex, have been excluded from CRT, although suffering from dyssynchrony. The Echocardiography guided Cardiac Resynchronisation Therapy (EchoCRT) study aims to provide the necessary evidence base to expand therapeutic options for this population.

EchoCRT is the first prospective, randomised clinical trial to evaluate the impact of cardiac resynchronisation therapy in HF patients (NYHA Class III) who show mechanical dyssynchrony as assessed directly by echocardiography. Echocardiogram (ultrasound of the heart) will provide a direct measure of ventricular dyssynchrony, which is not apparent on indirect assessment by ECG because of the narrow QRS. More than 1,000 patients with advanced HF (NYHA Class III) will be randomised into treatment groups with CRT or no CRT. Both groups will receive an ICD to protect against sudden cardiac death, but in only half of the patients will the CRT capacity be switched on.

The co-principal investigators in Zurich are Dr Frank Ruschitzka and Dr Johannes Holzmester.

In an interview with Dr Ruschitzka, we asked why Zurich have become the international centre for this study and what the rationale is behind the EchoCRT trial.

This is a very large clinical trial of a medical device and will involve 120 different centres worldwide, but it’s led by Zurich because of our wealth of experience in clinical cardiology trials. The trial is sponsored by Biotronik, which manufactures the implanted devices but, Dr Ruschitzka pointed out, ‘EchoCRT is an independent, investigator led trial overseen by an international executive committee.’

‘Many cardiologists feel, as I do, that we are not treating many HF patients who would benefit from CRT simply because there are no scientifically evidence-based guidelines telling us to. I have used CRT successfully in patients with narrow QRS, and so have many others. The medical literature supporting this belief is increasing with observational studies and anecdotal cases of success in several thousands of these patients.’

‘The ESC recently conducted a poll asking its members if they thought patients with a narrow QSR would benefit from CRT. The time is now right for a large scale, international trial to provide the definitive answer. Recruiting will begin in the first quarter of 2008 and will probably last for up to two years. The trial itself will probably run for a further two or three years after recruiting is complete depending on when we reach the numbers required statistically of primary end-point. It would be stopped immediately if it became obvious that the benefits of CRT therapy were statistically superior. The results are due in 2011.

‘I’m very confident that CRT is the way to go with HF patients with narrow QRS. These are very sick patients with a high morbidity and mortality. I am convinced that it is unwise to withhold CRT from this population and that EchoCRT will provide the necessary evidence to support this treatment change.’

We see a way to reduce retake examinations by up to 75%

Proven Outcomes

Helping cardiologists make 24 hours work like 48.
Progenitor cell transfer to repair the damaged heart has emerged as an area of active and promising recent development in cardiovascular medicine. Since the first reports that adult bone marrow-derived stem cells were capable of transdifferentiating into a cardiomyocyte phenotype, research in regenerative medicine has advanced in an explosive manner. A variety of progenitor cell types that reside in bone marrow, or circulate in the blood, are capable of restoring function of the injured heart in pre-clinical models, but underlying mechanisms are incompletely understood. Consequently, the traditional view of the heart as a terminally differentiated organ has been challenged by several groups, who have reported the isolation of cardiac stem or progenitor cells - characterised by the absence of traditional cardiomyocyte, endothelial, or smooth muscle markers, and that have a slow turn-over rate, and might constitute an endogenous reservoir for cell-based repair.

However, massive cell loss of cardiomyocytes and these progenitors alike, such as after acute myocardial infarction, precludes sufficient repair capacity of these endogenous progenitors in the infarcted territory. Therefore, cell-based repair requires inventive strategies to mobilise or deliver significant numbers of progenitor cells to sites of injury and secure their survival, or to stimulate neighbouring cardiac precursor cells to multiply, integrate, and couple with spared myocardium and enhance myocardial function.

While these strategies are very appealing, a major question is whether we have the knowledge and tools to implement them at this stage in clinical practice, at an equitable cost-benefit? Initial trials of autologous bone marrow cells focused understandably on safety and feasibility both in patients with acute myocardial infarction (AMI) and chronic ischemia and reported enhanced recuperation of LV function. However, by virtue of the designs, these studies were not randomised, or lacked a proper control population undergoing the exact same interventions as patients receiving cell transfer. Subsequent double-blind, placebo-controlled randomised trials of autologous bone marrow cell transfer in myocardial infarction patients have shown augmented recovery of global LV function after 999 patients) confirmed an overall benefit above and beyond state-of-the-art therapy. While the absolute increase in global function recuperation may seem modest at first glance, it represents an incremental improvement of almost equal magnitude as the initial therapeutic effects of primary coronary revascularisation. Moreover, we now have convincing data from the largest randomised double blind study that a delayed strategy of cell transfer offers the greatest benefit and that it is almost exclusively observed in patients with a significant reduction in myocardial function at baseline.

These insights will help to facilitate strategies whereby cell-based treatment algorithms are reserved for patients suffering the largest infarcts and where cell transfer can be established according to the highest scientific standards. Indeed, quality assurance of all stem/progenitor cell isolates requires significant haematological expertise, and has been shown to have a major impact on clinical results in early exploratory trials.

At this stage, while safety has been uniformly reassuring, proof of clinical efficacy (improved survival and reduction of heart failure) awaits larger multi-centre outcome trials that are presently being designed. To implement standardised, SOP-based cell isolation, and characterisation protocols, haematological and cell culture expertise from experienced institutions, including central blood bank or Red Cross laboratories or bone marrow transplant centres, will be indispensable.

Finally, enabling such treatment at an affordable cost will require intense collaboration between translational scientists, physicians, healthcare administrators, and private and public health insurance companies.

The therapeutic potential of adult stem cells in CVDs

By Professor Bodo-Eckehard Strauer MD, Head of the Department of Cardiology, Pneumology and Angiology at Dusseldorf University Hospital

Cardiac infarction is characterised by tissue ischaemia with loss of contractile heart muscle. The consequence is cardiac insufficiency and disturbance to cardiac rhythm. About two thirds of all patients have no symptoms before an infarction; about two thirds of all patients do not survive their cardiac infarction. About a third of surviving infarction patients experience increasingly worsening heart function in the first year after the infarction (remodelling).

The aim of therapy is to re-open the infarcted vessel using acute procedures (balloon dilatation and stent implantation), though this is merely the tip of the iceberg, and the destroyed heart muscle usually remains useless. This is where treatment with stem cells comes in as causal therapy, striving to regenerate heart muscle by injecting stem cells into it.

Before cell therapy After cell therapy P

| LV-Ejection fraction, % | 55±10 | 63±11 | <0.01 |
| Stroke volume inex ml/m² | 48±18 | 53±17 | 0.05 |
| EDV, ml | 173±55 | 160±48 | n.s. |
| EDV Index, ml/m² | 87±30 | 85±25 | n.s. |
| ESV, ml | 80±34 | 61±29 | <0.005 |
| ESV Index, ml/m² | 40±17 | 32±15 | <0.005 |

Fig. 1: Method for intracoronary stem cell transplantation: Site of the primary vascular occlusion caused by infarction is dilated with a balloon catheter and bone marrow stem cells are simultaneously and repeatedly injected into the ischaemic area or infarct. This is undertaken in the acute infarction stage (2–8 days after infarction) and in the chronic stage (up to 8 years subsequently). Injection total: 100 to 200 million bone marrow stem cells. Four to six pressure insufflations. Length of PTCA time: approx. 3–4 minutes.

Fig. 2: Test results from 50 patients with acute myocardial infarction – controlled studies. Before cell therapy i.e. on the 8–9th day after infarction, and three months after cell therapy.

Fig. 3: Ejection fraction over a period up to three years after stem cell transplantation. Maintained improvement can be seen in patients who received stem cell treatment (TX).

Fig. 4: Stem cell application procedure in peripheral occlusive disease. Combined intracoronary and intramuscular injection. For better migration, stem cells are injected after repeated compression using a cuff and ergometry loading.
The body itself contains naturally occurring, adult autologous stem cells, e.g. in the bone marrow. They are an ethical resource of cells that is completely safe. The idea was therefore to regenerate heart muscle clinically, by transplanting naturally occurring bone marrow stem cells into the infarcted region. This process was developed in Dusseldorf.

Bone marrow was removed and the cells prepared, then, after re-opening the infarcted vessel by balloon dilatation, they were injected into it under low pressure, using a balloon technique. The vessel was kept open with a catheter (a procedure lasting about 30 minutes), during which time two to three ml of a suspension of stem cells were injected into the infarcted region, a process repeated with four to six insufflations. The intervention was carried out on conscious patients with local anaesthesia, and at most produced mild pain at the site of injection. Follow-up controls for three years and longer after the infarction show that long-lasting improvement in cardiac function has been achieved, with an average increase in cardiac function of 50% and a reduction in the size of the infarct of about 20%. At the same time, blood supply to the cardiac muscle has been considerably improved, as has metabolism, and physical strength has increased. As yet, no side effects have been reported, so the procedure should be considered an ethically safe treatment of muscle loss after infarction, and causal therapy that is really beneficial to the patient.

The Dusseldorf results have since been confirmed worldwide. Work groups in Frankfurt, Hanover and Rostock have been able to show, even in larger studies, that regeneration of infarcted cardiac muscle can be achieved by transplanting autologous bone marrow stem cells. What is important is that this myocardial regeneration, which, depending on study design, is between 4–16%, is of an order of magnitude that is at least as great as the sum of all therapeutic improvements in ventricular function achieved with balloon dilatation or stent implantation for cardiac infarction. Consequently, added improvement in patients’ ventricular function can thus be achieved, on top of surgical intervention and drug treatment.

No complications from the stem cell treatment have been reported so far. There is no malignant degeneration as the cells used occur naturally in the body. No signs of inflammation have been observed, nor have disturbances to cardiac rhythm, angina pectoris or respiratory distress. Complications arising from the procedure itself are much the same as those that might occur in ordinary heart catheterisation procedures, and are insignificant.

It should be mentioned that a similar procedure is also effective in treating peripheral arterial disease. In this case, treatment involves intra-arterial and intramuscular injection of autologous bone marrow stem cells into the limbs affected, the therapy first practised by Barsch et al. Ischaemic preconditioning, such as by compression induced with a cuff, or even ergometry, greatly promotes migration of stem cells into the muscles. After three months there was marked improvement in the length of stride, the ankle/arm indexes, oxygen saturation and even venous occlusion plethysmography parameters. Consequently, autologous stem cell therapy can also be classed as a successful procedure for peripheral arterial occlusive disease, where symptoms are refractory to treatment, and in advanced stages of vascular disease.

Fig. 5: Long-term evolution of the ankle/arm indexes before and after stem cell therapy. Improvement after six months averages up to 30%.
Platinum chromium alloy enhances design

Boston Scientific Corporation has commenced enrolment of a targeted 1,500 patients for the Taxus Peruse clinical trials, planned to take place in 100 international centres. The aim is to evaluate the firm’s third-generation paclitaxel-eluting coronary stent - the Taxus Element Stent. This stent features the proprietary Platinum Chromium Alloy (designed specifically for drug-eluting stents) and is designed to allow thinner struts, increased flexibility, and a lower profile, while improving radial strength, recoil, and radiopacity, Boston Scientific reports.

The second part, the Taxus Perseus Small Vessel study, will compare the Taxus Element Stent with Boston Scientific’s first generation drug-eluting stent (Taxus Express2). 1,264 patients with ‘workhorse’ lesions from 2.75 to 4.0 millimetres in diameter are being selected for this trial, with lesions from 2.25 up to 2.75 millimetres. The primary endpoint of this study will be the composite of death, MI, and TLR at 12 months. Study success is dependent on the principal investigator.

Dr Kereiakes predicted: ‘This new platform, designed for improved deliverability, should allow us to bring the long-term clinical performance of the Taxus Stent to even the most complex and challenging anatomy.’

The first- and second-generation Taxus Stents have demonstrated improved outcomes compared to the Taxus Express Stent, with lower rates of major adverse cardiac events (MACE) in patients with multivessel disease.

T he Lifebridge BI T (bridge-to-transport) is the first, fully portable emergency life support system for patients suffering cardiogenic shock, or those showing signs of imminent cardiogenic shock. The machine ensures circulation and sufficient blood oxygenation can be restored in just minutes, thus preventing multi-organ failure leading to death. Whether in or out of hospital or on an ambulance, a patient can be connected to the Lifebridge to replace external cardiopulmonary reanimation.

First introduced in 2005 (see E H 3/2005), this equipment recently received a CE mark (Conformité Européenne) and the Lifebridge is now ready for action: The 17.5 kg, compact device allows sales across Europe. Its small size (61 x 45 x 37 cm), low weight and power supply via integrated battery make it the ideal for ambulance use. The partly guided, partly automated set-up means that in five minutes it is ready for use by emergency doctors or paramedics – without needing a specialised technician.

To avoid air embolisms, seven security steps guarantee maximum patient protection. Access to the patient is either by percutaneous puncture and insertion of cannulae in vessels in the groin or, after thoracotomy, via insertion of central cannulae into the right atrium and rising aorta. Depending on the access, blood circulation of six litres per minute can be achieved, a volume that ensures adequate gas exchange and sufficient perfusion of all important organs. The German Heart Institute in Berlin tested the Lifebridge during elective routine procedures in bypass surgery. The objective of those trials was to demonstrate the quality of the new, portable system compared with a traditional heart-lung machine. The Lifebridge ran for up to 103 minutes (average: 82 minutes). Under conditions typically found in this kind of heart surgery, with complete cardiac arrest and no ventilation, the device also provided sufficient blood circulation to the organs and adequate gas exchange. Therefore, the Lifebridge can also be used pre-emptively during risky cardiac surgery (e.g. high-risk PCI).

In an earlier experimental study at the University of Cologne, cardiac surgery using the Lifebridge was simulated using pigs. The animals’ blood gases were kept constant during the entire length of the study. The blood circulation remained constant even when the height difference between the machine and heart was changed. Injection of up to 100ml of venous air also did not reduce blood flow, and even the most disadvantageous conditions did not result in an arterial air embolism (source: Melhorn U et al., Ann Thorac Surg 2000; 69:2062–71).

The device’s quality of care has been confirmed by the German Society of Surgery (DGU) in its guidelines for the treatment of cardiogenic shock. The Lifebridge Lifebridge was simulated using pigs. The animals’ blood gases were kept constant during the entire length of the study. The blood circulation remained constant even when the height difference between the machine and heart was changed. Injection of up to 100ml of venous air also did not reduce blood flow, and even the most disadvantageous conditions did not result in an arterial air embolism (source: Melhorn U et al., Ann Thorac Surg 2000; 69:2062–71).

New remote monitoring feature for implantable cardioverter-defibrillators (ICDs)

The company also recently launched a remote monitoring and adjusting feature for ICDs, which have proved effective (98% of cases reported) in patients suffering recurring ventricular arrhythmias. These patients have needed to have device check-up’s two to four times annually, as well as unscheduled visits in critical situations, Medtronic points out, adding that its new CareLink Network system will enable home-monitoring, with internet-transmission of data from implanted cardiac devices. To do this, the patient holds a small antenna over the device and information on how their heart and life are working is transmitted to a secure physician website for a virtual checkup. ‘This technology,’ said Peter Steinmann, Medtronic’s Vice-President for Western Europe, ‘opens up the potential for more efficient chronic disease management and better outcomes.’
caused by the occlusion of coronary vessels following coronary heart disease. To avoid death or lasting damage a patient ideally needs to receive treatment within ‘the golden hour’. However, according to data supplied by MITRA, Germany’s heart attack register, in that country alone, the time lapse between heart attacks and start of treatment is on a continuous increase. Between 60,000 and 65,000 patients do not survive their heart attacks (source: Mark B et al., Dts Aerzteblatt 2006; 103: A 1578). Cardiogenic shock kills around 20,000 people. ‘Up to 50% of those patients could survive if they received fast mechanical, extracorporeal circulation support,’ points out Prof Zerkowski of Basel University, Switzerland.

Ideally, artificial circulatory support should begin during transfer to a specialised hospital, because vital vessels and organs need sufficient blood supply to avoid irreversible damage caused by hypoperfusion. However, mobile emergency systems are not usually used during a transfer, because currently available equipment does not meet requirements for portability and quick, safe use. ‘Filling this gap in the supply is of utmost urgency,’ said Prof Ruediger Lange, director of the Cardiovascular Surgery Department, German Heart Centre, Munich, during a symposium held during a market meeting.

Therefore, a fully-integrated ‘click’n’run’ heart-lung support system is an urgent requirement, said Prof Zerkowski. Lifebridge Medizintechnik AG (founded: 1999) has found a market niche with Lifebridge B2T. With 22 employees, the firm is supported by Bavarian financiers and an investment bank in the United Arab Emirates. It reports that there has already been strong demand from hospitals for this portable heart-lung device, and Manfred Salat, Chairman of the Board, predicts that, as from next year, the Lifebridge should be able to finance further growth internally.

**Trial to raise awareness of gender and CVD**

More women than men die of cardiovascular disease (CVD) every year, yet females receive only 33% of angioplasties, stents and bypass surgeries; 28% of implantable defibrillators, and 36% of open heart surgeries.

Looking at this situation, Abbott, which produces the Xience V Everolimus Eluting Coronary Stent System, is involved in a clinical trial - in Europe, Asia-Pacific, Canada and Latin America – to study the stent’s safety and effectiveness in women patients who have untreated coronary artery lesions. The first patient to enrol in the trial, called Xience V Spirit Women, has been operated on in Argentina, by Liliana Grinfeld MD, at the Italian Hospital in Buenos Aires, Argentina, who reported that the stent system had performed well, and that the patient will be checked for up to five years.

Abbott reports that the trial will focus on ‘...specific aspects of women’s health in relation to coronary artery disease, such as general awareness about the disease, symptoms at time of presentation, referral patterns, and hormonal menopausal status.’

The trial’s principal investigator, Marie-Claude Morice MD, at the Jaques Cartier Institute, in Masoy, France, commented that it is ‘tragic’ that women amount to just 25% of participants in all heart-related research studies, and added that the trial had the potential to enhance access to CVD therapy by increasing their and their physicians’ awareness.
A non-invasive measurement of arterial wall atherosclerosis

By Thaddeus Chodakauskas BS RDMS and Steve Feinstein MD FACC

Non-invasive ultrasound imaging techniques continue to provide a major role in diagnosis and management of patients with cardiovascular disease. The early presence of atherosclerosis predates major clinical events such as myocardial infarction and stroke. Over the last 17 years, the ultrasound-based measurement of carotid artery intima-media thickness (c-IMT) has become a standard for assessing atherosclerosis and is recommended by the American Heart Association for the non-invasive assessment of cardiovascular risk.

Carotid intima-media thickness is defined as the distance between the lumen-intima interface and the media-adventitia interface, which corresponds to the inner and outer echogenic lines seen on the B-mode ultrasound image. (Fig.1). Measurement of c-IMT is traditionally performed with the image of the carotid artery in the longitudinal axis, revealing the common carotid artery, the carotid bifurcation, and the internal and external carotid arteries. Although these measurements have been performed for years, significant variability exists when measuring the near wall due to technical and acoustic difficulties encountered when imaging the c-IMT of the near wall.

Due to those technical limitations, clinical measurement of c-IMT using B-mode ultrasound is often applied to the far (posterior) wall of the common carotid artery. With the development of non-invasive imaging techniques, ultrasound methods can be used to reliably measure intima-media thickness (IMT). This measurement serves as a non-invasive marker of arterial wall atherosclerotic disease. Studies have found that, on average, based on gender and age, the intima-media thickness will increase 0.01-0.03mm per year. (See tables on historical clinical studies of c-IMT).

Tips: c-IMT measurements for the Vivid 7 Dimension/Vivid i

Imaging common carotid artery

- Maximise the depth selection and optimise the gain settings to visualise the posterior intima-media wall of the common carotid artery.
- Attempt to capture the common carotid artery with the jugular vein to improve visualisation of the anterior and posterior carotid walls.

Performing IMT measurements on the Vivid 7 and Vivid i:
- Select Measurement key on the keyboard.
- Select from the measurement menu carotid folder, then CCA IMT, to identify the right or left carotid artery, then CCA IMT Post, for posterior wall.
- Position the IMT cursor above the intimated wall, then press select key to anchor the first cursor. Reposition the second cursor using the trackball then press select key to anchor the second cursor.

Figure 1: Intima-media wall thickness

Intima-media

Media-adventitia

To perform these studies, radiographers/clinicians use high frequency (7, 10 or 12) MHz linear array transducers with the Vivid 7 Dimension and the Vivid i to efficiently acquire multiple c-IMT measurements within seconds. The semi-automated measurement for intima-media wall is simple, easy and takes less than four steps. The physician receives immediate results, which consist of these parameters: maximum, mean, average and number of data points examined. Using the software application, the c-IMT measurement can be exported directly to a worksheet and report page and, subsequently, placed in the patient’s medical record.

In Germany, approximately 1.5 million people suffer from chronic cardiac insufficiency. Very often, the insidious symptoms are recognised too late, leading to complications and hospitalisation. ‘Partnership for the Heart’ is a joint project by science, industry and healthcare system led by the Berlin Charité and aiming to develop a telemetrical early warning system. The system monitors patients 7/24 at home and a mini-computer records all therapy-relevant vital parameters.

Body weight is an important risk indicator. A sudden increase in body weight for example may indicate beginning water retention in the body. Seca designed scales for this project based on the floor scale seca 867. An integrated RS232 interface and a BluedTooth module allow smooth transmission of the values to the Charité’s telemetrical centres or the Robert Bosch Hospital in Stuttgart. Blood pressure and ECG are determined in a similar way.

Specialist physicians monitor the values around the clock and initiate appropriate actions when needed – they inform the patient and the family physician or the emergency medical service. Since the telemetrical early warning system is considered a viable alternative to current options it is being supported by the German Ministry of Economics. The government contributes 5 mio. EUR, the same amount is made available by the industry partners.

Further information: www.partnership-for-the-heart.de

FRED® easyport is a Life-Saver

Cardiac infarction and cardiovascular failure are two of today’s most frequent emergencies. SCHILLER’s FRED® easyport is the only pocket defibrillator in the world. It is so small (133 x 126 x 50 mm) and light (490 incl. battery) that for many doctors it is already standard equipment in their emergency bag. It is also suitable to accompany risk patients and their relatives around the clock.

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An increased TWA (T-wave alternans) is a significant indicator of all-cause and cardiovascular mortality, as well as of sudden cardiac death in patients with mostly normal ejection fraction, according to a recently published study by researchers led by Dr Tuomo Nieminen. Until now, this was only known as an indicator for those patients suffering severe heart diseases predisposing to life-threatening arrhythmias. In an interview with Meike Lerner, of European Hospital, Dr Nieminen explained the advantages of the TWA measurement, study results and the consequences these have for future research.

‘The T-wave represents the electric repolarisation of the heart,’ Dr Nieminen explained. ‘Thus, alternans in the T-wave is a marker of an alternating repolarisation process, which might indicate cellular disturbances during repolarisation. This is important, since pathological repolarisation phase predisposes to ventricular arrhythmias. In general, the TWA measurement could be used for arrhythmic risk stratification, but it is also one of the diagnostic criteria for long QT interval syndrome, another repolarisation abnormality.

TWA can be measured with a regular electrocardiogram; no extra examinations are necessary. The possibility to measure the T-wave alternans is a special feature within normal ECG software.

There are two methods for TWA assessment: time-domain modified moving average (MMA) and spectral methods. Both methods seem to measure the same phenomenon. For our study, we used the GE Health-care software embedded with the MMA method, which can be applied in routine exercise test protocol without stabilising the heart rate to any specific level.

Several studies have proved the effectiveness of measuring TWA for prognoses. What makes this study different?

‘Essentially all previous studies included patients with an ejection fraction of less than 50 per cent, which is called abnormal. But in our population this only refers to 13 percent of the patients.

In 2001, we launched the Finnish Cardiovascular Study (FINCAVAS), in which we enrol all volunteering patients performing a clinical exercise test at Tampere University Hospital. We use the standard protocols of the bicycle ergometer test, with an increasing load every minute. This TWA analysis aimed to test whether TWA predicts mortality in our study population. The results of the study show that the TWA measurement provides prognostic value also in patients with a normal ejection fraction.’

What consequences do these findings have for patients’ treatment?

‘Our results suggest that TWA identifies patients prone to sudden cardiac death at an earlier stage of cardiac disease than supposed before. It is the first but naturally important step to show that a certain marker is associated with mortality. Another equally important step will be to test whether the patients with such a pathological marker will benefit from treatment options, such as anti-arrhythmicogenic pharmacueticals, or an ICD implant. The results of our study did not answer that latter part, which is a big question for the future - studies are being planned and conducted to reach that goal.

‘We need to be in mind that estimating the aggregate risk for sudden cardiac death should be based on several parameters. No single marker will suffice, but TWA seems to be a very good candidate to be involved.’

Dr Tuomo Nieminen, Tampere University Hospital
It has only recently been discovered that very often it is not the size of the plaque in the coronary vessels but its inflammation status that determines the occurrence of a cardiac infarction. This knowledge triggered new research approaches for its early diagnosis and treatment in cardiology – for example the High-Risk Plaque Initiative jointly founded by Philips Medizin Systeme, AstraZeneca, Merck & Co, BG Medicine and Humana, which focuses on the possibilities that molecular medicine now offers. The researchers are looking for suitable biomarkers that allow the early diagnosis and targeted therapy in inflamed, so-called high-risk, plaque.

In molecular medicine, the High-Risk Plaque Initiative is one of the most important projects of Philips Medizin Systeme, as Paul Smit, in charge of strategy and development in the Dutch company, explained: "Today, high-risk plaque is recognised as the major cause of cardiac infarction which kills about 50 percent of the patients. This means, in many cases, death is the first symptom of the disease. Furthermore, those patients who survive the event are chronically ill and require medical care for the rest of their lives. This disease is not only dangerous for the patients but also presents an immense financial burden on the healthcare system – a burden that will increase steadily over the next few years. In short, high-risk plaque is one of the most fatal and one of the most expensive diseases."

In addition, coronary plaque is a highly unpredictable condition because, depending on the degree of inflammation, the plaque suddenly ruptures and causes an embolism, which in turn leads to ATRIAL FIBRILLATION

Cardiologist meet to sum up progress

Czech Republic – During a meeting of cardiologists in Prague earlier this year to exchange experiences with new methods and treatments to control atrial fibrillation, Dr Josef Kautzner, Head of Cardiology Department at IKEM (Institute of Clinical and Experimental Medicine) pointed out that numbers of patients with AF will more than double during the next 20 years. In the Czech Republic alone, there are about 13,000 people diagnosed with AF. These patients have worsened quality of life, twice the mortality due to cardiac failure, and a five times greater risk of cerebral vascular accident (CVA) when compared with the normal population of the same age. AF also causes about a fourth of all CVAs, which means around five thousand people are afflicted by this disease.

The annual treatment of one patient is 40 thousand CZK, i.e. almost 5 billion EUR. Figures for the

Molecular medicine

A weapon to beat high-risk plaque

The high-risk plaque initiative THE BASIC STUDY

This will take place in two mobile units, located in a number of large cities in the USA. The design of the study and the protocol development is being formulated in a close collaboration with BG Medicine, which will be responsible for the biomarker research, and biologists, and with leaders in vulnerable plaque research from leading laboratories in the USA, Denmark and the Netherlands, as well as with partners Merck and AstraZeneca.

The first patients will be scanned in the autumn of 2007, and the complete bio-imaging study will take about one year. While the complete set of imaging data will be ready in more than a year – the study will take about four years.

UK, according to the NICE guidance, indicate that, in July 2006, there were more than 1.4 million UK patients with AF (source: NICE: cost impact report) consuming substantial part of healthcare financial budget.

The main goals of AF treatment are widely recognised: to renew normal cardiac rhythm, and to ensure that AF doesn’t occur again.

Therapeutic modalities are many and varied, apart from anti-arythmic drugs, modern minimvasive methods are recently on the rise – catheter ablation and cardioverters and defibrillators, electric cardioversion and particularly catheter ablation.

In the Czech Republic, the first patient with an implanted cardiostimulator was seen at IKEM back in 1962, and the first digital cardiostimulator was implanted in 2003 at Prague’s Na Homole Hospital. Catheter ablation as an AF treatment has been in use for quite some time.

With new medical technology achievements, three-dimensional imaging has arrived in this scene. New diagnostic approaches allow 3-D views inside of the heart, so cardiologists can combine that imaging technique with a cardiac CT scan to navigate the catheter through the heart with a full stereometric view.

One of the pioneers in the field of even more advanced medical techniques is London’s St. Mary’s Hospital (see robot feature on this page).

Report: Rostislav Kuhlik

The Sensei Robotic Catheter System, a first generation robotic device developed by Hansen Medical at the USA’s Heart Rhythm Society, was awarded the TCT 2006 Scientific Awards in May this year, in use in Europe. St. Mary’s Hospital, in Paddington, central London, became the World’s first centre of excellence for training in and development of the system, under the guidance of consultant cardiologist and electrophysiologist Wyn Davies MD FRCP FHRS.

As of July, over 30 atrial fibrillation patients had been operated on at St Mary’s using this robotic surgical aid controlled by the surgeon at a nearby workstation.

The Sensei system and Artisan catheter aim to enable physicians to easily and accurately place mapping catheters in hard-to-reach anatomical locations within the heart with stability, during the diagnostic phase of complex cardiac arrhythmia treatment, Hansen reports.

The new robotic system allows the operator to perform EP procedures in a more consistent fashion, which I believe will lead to the development of a standard approach for complex diseases,’ Wyn Davies observed.

Currently, the majority of clinicians manually guide catheters through the heart to detect and treat a variety of cardiac arrhythmias. This technique requires physicians to perform a series of complex manipulations at one end of the catheter without assurance that the tip of the catheter will respond as desired when inside a patient’s heart. Achieving stable contact at anatomic sites within the heart, which is essential for successful mapping procedures, can be difficult, Hansen points out. ‘As a result, insufficient contact between the catheter tip and the inside of the heart wall can lead to highly variable and less than optimal procedural results for the patient. Hansen Medical believes its robotic platform overcomes these hurdles and will enable physicians to perform procedures that historically have been too difficult or time consuming to accomplish routinely with existing manual technique.’

The system

The Sensei system is compatible with fluoroscopy, ultrasound, 3-D surface map and patient electrocardiogram data. The two main components that comprise the system are the Artisan control catheter and an ergonomically designed, remotely-placed workstation where the physician sits throughout the procedure. In addition to lessening operator fatigue, the remote workstation creates a virtual shield for physi- cians against harmful radiation, Hansen added.

The open architecture provided by the Sensei system, which allows the use of approved products from third-party manufacturers, requires a labelling addition from the FDA. The addition is intended to remind physicians that the safety and effectiveness of the system for use with cardiac ablation catheters in the treatment of cardiac arrhythmias, including atrial fibrillation, have not been established.

The Sensei system has received CE mark approval in Europe, and the Artisan Control Catheter is currently pending CE mark approval.

For many patients, a catheter ablation is the most effective way of treating AF; however a short- age of clinicians able to perform these complex procedures contributes to thousands living with the condition and its associated risks. In the UK alone, over 50,000 people develop AF annually, yet fewer than 10% undergo catheter ablation.

St Mary’s, which runs one of the UK’s busiest cardiac centres, is a regional referral centre for patients globally that are using the Sensei robot. Wyn Davies said it has been too difficult or time consuming to accomplish routinely with existing manual technique.
a cardiac infarction, or a stroke. This sudden rupture of inflamed plaque in a coronary artery explains why 70–75% of cardiac infarctions occur without prior symptoms.

However, physicians were unable to determine when the plaque has reached a dangerous state. Today, molecular medicine offers the possibility to identify indicators of the inflammation. The first task of the High-Risk Plaque Initiative is to develop a broad patient screening concept, which we hope will show early indicators in patients with infarcts that are not present in the control group. If we know these early indicators, or biomarkers, which predict an inflammation, thanks to modern imaging methods we will be able to locate the high-risk plaque and determine its volume, Paul Smit pointed out. The collected data can be combined with statistical values and thus provide valuable information on the patient’s current and future risk. Currently, Philips and the other members of the High-Risk Plaque Initiative are developing a test that will be applied to more than 6,000 patients in coming years.

Early diagnosis of high-risk plaque is no doubt a major step forward. However, it has to lead to targeted therapies for the affected coronary vessels. Today, physicians are rather powerless when it comes to the treatment of plaque, since there are no validated tests to determine the effectiveness of drugs. However, it appears to be proven that regular monitoring and a healthy lifestyle often improve a patient’s condition.

Molecular medicine offers promising approaches for other diseases as well – cancer, for example. Current methods are being researched that use ultrasound to transport medication through the vessels right to the affected body region. The medication is docked onto micro-bubbles, or a contrast agent, and injected into the body. With the help of ultrasound signals the physician can trace the bubbles’ route to the target region. As soon as the bubbles reach the affected tissue a certain ultrasound frequency causes them to burst and the active agent is released. Because the medication is administered in a very targeted way, a much lower dose than in a systemic therapy is required – which increases the therapeutic success and significantly reduces side effects. The principle has already been tested in pre-clinical trials and is now being developed for clinical use in a joint effort with the pharmaceutical industry. The Philips research team has already gone one step further and is working on finding out whether this innovative method can be used for cardiac diseases.

We are still in the early stage of research into validated biomarkers and it will take about four more years before we will be able to identify high-risk plaque with the help of biomarkers, Paul Smit concluded optimistically, “These developments will open entirely new possibilities from which both the patients and the healthcare system will profit: Early diagnosis can significantly reduce treatment and follow-up costs of many diseases.”

Report: Meike Lerner

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39th World Forum for Medicine
International Trade Fair with Congress

Düsseldorf, Germany
14–17 November 2007

www.medica.de
Anyone who’s somebody in medical manufacturing heads for the MEDICA trade fair held annually in Germany with 4,200 exhibitors from 65 countries at the show, as well as 320 more at Compamed, which runs alongside MEDICA to present manufacturers with everything from new materials, components, pre-products, packaging and services to complex micro systems and state of the art nanotechnology.

Similarly medical professionals and those in hospital procurement flock to this, the biggest event of its kind internationally, to keep abreast of innovations and take a hands-on approach. Last year these visitors numbered 137,000.

Again this year MEDICA will hold a sharp focus on networks and communication. For example, members of ZVEI - the association of the German electrical and electronics industry – will present light signalling solutions. Bluetooth SIG, a co-operation project of high-tech companies that include Nokia, Intel, Microsoft and Toshiba, will highlight application possibilities of Bluetooth technology in healthcare institutions.

Highlighting advances in teleradiology also will continue, as will telecommunication between doctors and patients, particularly the chronically ill.

All this, and more innovations for in-and out-patient care, including electro medicine and medical technology, laboratory technology and diagnostics, pharmaceuticals, physiotherapy, textiles, medical furniture and equipment, will be on show.

Among the forums, e.g. MEDICA MEDIA and MEDICA MEET IT, the Physiotherapy Forum is likely to attract physiotherapists in droves.

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Not to be missed!

MEDICA & Compamed 2007

14 – 17 NOVEMBER 2007

‘Smart Fabrics and Interactive Textiles’ (SFIT)

European Hospital has featured some of these developments in previous issues, and it’s worth noting that, in 2006, this market was already worth $340 million. The general concept is to develop ‘e-textiles’, which can integrate sensors, actuators, communication devices and power generation devices. Designed as shirts or jackets, a wearer could be permanently monitored for medical purposes (e.g. blood pressure, blood/oxygen saturation, sweating, skin temperature, heart rhythm). Because the electronic devices will be worn in direct contact with the body, highly flexible systems must be developed to stretch as well as follow and react to body movements.
Most DICOM-CDs do not meet standards

At the event experts familiar with hospital and general practitioner (GP) working needs looked at software systems from various perspectives – in particular the challenge of data exchange. This not only means online, but also via CD exchange, all of which provides a solution for multi-media patient files based on a PACS.

Recentl...
RFID is contactless – and because for drug tracking and fingerprint, although most still use barcodes, some hospitals in the USA already use electronic pharmaceutical cabinets. This points out that when adopting RFID technology for patient care, staff should be involved in the planning work flow changes, and proper training should be provided in the use of the devices. The effects of the implementation of new technologies have to be carefully analysed and evaluated in pilot projects. A process analysis and a Critical Incident and Reporting System (CIRS) that is accepted by the staff are crucial. Particularly a thorough post-implementation analysis of Critical Incidents is required as this is often the only tool for the early detection of new risks.

The team also recommends a combination of technology (RFID), organisation (fitting the wristband which is marked with the name of the patient and medical attributes) and human control (asking the patient for his/her name) to provide the highest possible safety. ‘If a patient or a family member is unable to respond to the technology failure, there is at least the name tag to provide identification.’ In conclusion: ‘Due to their high degree of automation, RFID visitors and patient cards can be integrated in systems of immanent security (Poka Yoke) and process optimisation systems. This can contribute greatly and cost-efficiently to hospital risk management and patient safety. ‘Although barcodes and RFID are not necessarily mutually exclusive but can complement each other, there is an urgent need for a careful introduction of RFID in medical-clinical processes will depend on the penetration rate of barcodes and the readiness of medical practitioners and health institutions. In addition, possible use may be made by initiating free health consultancy services with leading providers of different specialties,’ explained Hatice Yurtsever, International Manager of Hospitalium. ‘Offering a unique platform to enable video chat integration with hospitals internationally is a 21st century breakthrough in healthcare. It will be achieved by initiating free health consultancy services with leading providers of different specialties,’ explained Hatice Yurtsever, International Manager of Hospitalium. ‘Our objective is to connect everyone in the world with all the hospitals via one online platform, which will give people the opportunity to keep up to date with the world’s latest health technology. In return, individuals and hospitals will also receive the latest updates; patients and doctors can have online video chats and online appointment cards can be made.’

Services will not only include 24-hour online communication between patients and hospitals, but also individual health packages.

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If you wish to promote contact between your healthcare establishment and potential new patients, simply fill in the Hospitalium Registration Form. As you will see, requested information includes the special medical services provided by your hospital, as well as the name(s) of the physician(s) appointed to answer online questions.

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In addition, your various medical services and health packages will be advertised on the international Hospitalium.com portal, accessible worldwide, to attract patients seeking specific treatments.

Pointing to the Hippocratic oath which commits doctors to help all people, Hatice Yurtsever added a message for medical specialists and hospitals: ‘Hospitalium.com also swears that it will put hospitals and patients together regardless of age, race, gender, language, disability, creed or sexual orientation. We are now living in the 21st century, it’s time to reach out and get healthy.’
**Non-invasive monitoring of patients with asthma on field**

By Paolo Montuschi MD, of the Department of Pharmacology, Faculty of Medicine, Catholic University of the Sacred Heart, Rome, Italy

The pathophysiologic role of non-invasive markers for inflammatory airway diseases is growing. These biomarkers should help identify patients who are more susceptible to the disease; reflect the degree of pulmonary inflammation; and assess disease severity; be reproducible in stable clinical conditions; be suitable for repeated use; and be of practical value to follow-up of the patients; be elevated during exacerbations; be useful for monitoring therapy; and be of prognostic value.

Exhaled breath consists of a gaseous phase that contains volatile compounds (e.g., nitric oxide, carbon monoxide, and hydrocarbons) and a liquid phase, termed exhaled breath condensate (EBC) that contains aerosol particles in several non-volatile compounds have been identified. Measurement of exhaled nitric oxide (NO) is a well accepted standardised, validated and widely used method for measuring airflow inflammation in patients with asthma who are not treated with inhaled glucocorticoids. Measurement of exhaled NO is rapid, reproducible, and provides immediate, real-time data. Concentrations of exhaled NO in association with asthma correlate with sputum cell counts and airway hyper-responsiveness before glucocorticoid treatment. A commercially available analyser is commercially available and can be used to assess and monitor airway inflammation in patients with asthma on field.

Interest in the identification of non-invasive markers for inflammatory airway diseases has been growing. These biomarkers should help identify patients who are more susceptible to the disease; reflect the degree of pulmonary inflammation; and assess disease severity; be reproducible in stable clinical conditions; be suitable for repeated use; and be of practical value to follow-up of the patients; be elevated during exacerbations; be useful for monitoring therapy; and be of prognostic value.

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**Setting international standards for TAR**

**Principles of tuberculosis control and DOTS**

TB control is a public health function aimed at reducing the transmission of TB and saving lives. Presently, at global level the TB notification rate is still growing at an average 1% per year, largely due to the constant increase of cases in sub-Saharan Africa and, to a lesser extent, in former Soviet Union with a significant prevalence of multi-drug-resistant TB (MDR-TB) and extensively drug resistant TB (XDR-TB).

XDR-TB is a new severe form of TB presently defined as resistant to at least isoniazid and rifampicin, with the definition of MDR-TB, in addition to any fluoroquinolones, and at least one of the four injectable drugs used in anti-TB treatment: capreomycin, kanamycin, amikacin, and ofloxacin.

In January 2006 the new Global Plan to Stop TB, 2006-2015 was launched. The new Stop TB Strategy, described strategies, technical requirements and existing gaps to reach the Millennium Development Goals (MDGs) in all regions of the world.

The new Stop TB Strategy for Tuberculosis Control and its contribution to control and elimination of TB in Europe

The DOTS strategy composed of five key elements: government commitment and involvement; case finding and treatment; use of standardized, supervised treatment; interruption of transmission; and microscopist, standardized and supervised treatment, uninterrupted drug supply and quality control and, monitoring (DOTS monitoring) has greatly contributed to the improved global TB control over the last 20 years. However, due to a variety of reasons DOTS has not been sufficient to control the TB epidemic in some countries of sub-Saharan Africa and Eastern Europe. This is why the STOP TB Partnership and the World Health Organization, while keeping DOTS as the first and foremost of the five components of the DOTS plus five additional components that must be implemented to reach the 2052 vision, namely: 1) high-quality DOTS expansion and enhancement; 2) address TB/HIV; MDR and TB and other challenges; 3) contribute to health system strengthening; 4) improve care for patients; and 5) empower people with TB and contribute to global effort. The ISTC, private sector and scientific societies

Although the ISTC is evidence-based and widely accepted, it is only a tool, not an end in itself. To achieve adherence to the standards the ISTC is critical that they have sufficient weight to wield influence and be disseminated to the population. It will only be achieved by being broadly endorsed by influential medical and nursing organizations with the involvement of international and that these societies then develop educational activities around the implementation of the close collaboration with the national TB programmes and the strategic level. The ISTC is a basic tool for the proper implementation of public-private mix programs.

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airway inflammation in asthma and COPD

Paula Montauchi MD

Measurements of exhaled nitric oxide

In some centres, measurement of exhaled NO is now available as a routine test for asthma patients. This method is useful in the diagnosis of asthma, can be used to monitor therapy and helps assess compliance. Exhaled NO concentrations in patients with asthma decrease rapidly after anti-inflammatory therapy and are elevated during exacerbations. With the use of reduced NO measurements, maintenance doses of inhaled corticosteroids may be significantly reduced without compromising asthma control.

Data on the concentrations of exhaled NO in patients with COPD are controversial. One important limitation of measurement of exhaled NO in these patients is that exhaled NO is strongly influenced by NO content in cigarette smoke and most of the patients with COPD have a smoking history.

The clinical utility of exhaled NO measurement is currently limited to research applications, and its role in the management of other respiratory diseases, including COPD, needs to be further evaluated.

Analysis of excreta in spumon induction

Tailed asthma interventions based on sputum excreta can reduce the frequency and severity of exacerbations in adults with asthma. For this reason, spu- tomum analysis has been proposed to adjust and monitor asthma therapy for adults with frequent exacerbations and severe asthma. The utility of adjusting therapy for patients with COPD and exhaled NO measurements compared with traditional methods (primarily clinical assessment and inhaled glucocorticoids) is discussed.

Characterization of inflammatory processes in children with asthma needs to be established. Analysis of sputum induction and exhaled NO are generally considered to play a major pathophysiological role in exacerbation of COPD. In the case of patients with COPD, sputum excreta analysis. Analysis of sputum induction measurement is a useful tool for identifying phenotypes of COPD patients. These patients are gener- ally relatively resistant to glucocorticoids. However, improve- ment in lung function and symp- toms concomitant with a reduction in sputum induction are observed in patients with COPD, with baseline sputum excretion, after treatment with inhaled or oral glucocorticoids. The response to glucocor- ticoi ds in this subgroup of COPD is therefore due to a different mechanism than to bronchodilators and the latter is not associated with bronchial respon- siveness. However, sputum induction in patients with COPD has yet to be established.

Exhaled breath condensate

Several biomolecules have been identified in EBC and found to be useful in the diagnosis of asthma and COPD including hydro-gen peroxide, 8-isoprostane, leukotrienes (LTE), prostaglandins (PG), nitric oxide, nitrates, and nitrosamines. In most of the studies, biomolecules in EBC have been measured with commercially available immunoas- say kit, which require validation with reference analyte and tech- niques. The presence of 8-isoprostane, LTEs, PGs, PGE, glutathione, and aldehydes in EBC has been demonstrated by mass spectrometry- analysis. pH values in EBC are reduced in patients with acute asth- ma and stable COPD.

Measurement of NO in EBC is easy, rapid, and provides immedi- ate results. However, some vari- ables including the effect of ambien- cies, CO2 and oral bacteria need to be considered. Most of the studies on EBC are cross-sectional. There are relatively few interventional studies aiming at measuring bio- molecules in EBC and they are all single centre studies. The lack of standardised procedures and vali- dation of analytical techniques is currently the main limitation of EBC analysis. Guidelines for mea- surement are currently available. However, the usefulness is limited by the fact that many of the methodological issues still need to be formally addressed. Moreover, each biomarker in EBC needs to be considered separately as EBC makes it the standardisation of this technique more complex. However, considering the relative lack of non-invasive methods for monitoring airway inflammation and ther- apy, and the relevance of its po- tential applications, additional research on EBC analysis is war- rented.

Conclusions

Measurement of exhaled NO should be used for assessing airway inflammation in patients with asthma and COPD. Assessment of sputum excreta can be used to monitor and adjust therapy in asthmatic patients.

This technique might contribute to the identification of biomarkers with important therapeutic implications for patients with COPD and might be proposed as a routine test for assessing airway inflammation. Identification of selective biomarkers in EBC in the biological fluid may have important diagnostic and therapeutic implications for patients with asthma and COPD. However, due to the current lack of standardisation, whether and when EBC analy- sis will be applicable to the clinical setting is difficult to predict.

As both asthma and COPD are heterogeneous diseases charac- terised by different phenotypes, the combination of different non-inva- sive and semi-invasive techniques, including measurement of NO sputum induction, analysis of EBC, and possibly new techniques that can be used in the emergency setting, may be needed to achieve a better management of patients with asthma and COPD.

Free information about what, in your property, can increase hygiene and minimise risks of infection. Furthermore, this new dispenser generation is the perfect complement of the appropriate dispenser and paper quality for the individual situation and is a guarantee of the highest economic viability. The results have shown that a 50% reduction can be seen, not only in usage, but also in waste and hygiene. Likewise, the refilling time can be reduced by up to 30% up to potentially 75%.

Contacts:

bio@ht.bih.com

More information: www.bih biomasurement.com

Dr. Frank Ledosquet, Metsä Tissue’s Marketing Manager for Central Europe, says ‘InSpectra is part of the new series of Katrin dispensers, making it easy to replace without drilling other holes. The back plate is no sight and therefore protected from water splashes. The dispenser’s body is made of robust ABS plastic and can be quickly cleaned. It can be easily fixed by conventional screws into the wall or a fixed support. The disposers are A further distinctive feature is the choice of lock function. The one user can use the dispenser or lockable to openable dispenser with just a turn. The user-specific diverse range includes different dispensers for paper towels, napkins, paper napkins, toilet paper, soap (in a completely closed system), hand wash foam, air fresheners, (for the first time with 100% non-alcohol-containing), as well as a new type of disinfectant foam in a dispenser for toilet seats. It is important to note that many functions can be operated without direct contact, which maximises the standard of hygiene and minimises risk of infection. Furthermore, this new dispenser generation is the perfect complement of the appropriate dispenser and paper quality for the individual situation and is a guarantee of the highest economic viability.

Stupid people always make the same mistake more often than wise people because they learn from their own mistakes. Wisdom is about observing others and learn from them. Global giant Metsä Tissue has, in the pearl of wisdom their own and analysed the market in full including competitors and users. Further, in the European study research was made not only in hospitals, but full including the decision makers, with regard to the specifications in terms of using suitable dispensers and apparatus and above all from using paper towels which produce poor cleanliness. The corollary to this is that the service provider will be not only in usage, but also in waste and hygiene. Likewise, the refilling time can be reduced by up to 50% up to potentially 75%.

Free information about what, in your property, can increase hygiene and minimise risks of infection. Furthermore, this new dispenser generation is the perfect complement of the appropriate dispenser and paper quality for the individual situation and is a guarantee of the highest economic viability. The results have shown that a 50% reduction can be seen, not only in usage, but also in waste and hygiene. Likewise, the refilling time can be reduced by up to 30% up to potentially 75%.

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Do not hallucinate.
**Wound Management**

**Saving diabetics’ feet**

Heidi Heinhold reports

Disease management programmes (DMP) yield first results

Pressure and callus formation. About 10% of these patients suffer a combination of peripheral arterial disease (PAD) and diabetic neuropathy, 10% have ischemia. In both cases the prognosis is even worse than for neuropathy due to the vascular situation and poor circulation. Vascular diagnostics and reconstruction are imperative – a fact that underlines the necessity for close cooperation between diabetologists and vascular surgeons, if the patient is to have a chance to avoid amputation. Even better: the patient can be convinced to participate in a disease management programme (DMP).

In Germany, such programmes have shown very promising results. In December 2006, the first data analyses to provide an indication as to the effectiveness of DMPs became available. In one German Federal State the condition of 44,995 patients with type II diabetes mellitus were recorded for six months (April to September) in 2006, and the study showed that very few cases of diabetic keto-acidosis had been reported. This means that diabetics in Germany are quite well prepared to avoid this dreadfully life-threatening metabolic disorder. After all, 30.1% of them could get rid of typical diabetes symptoms, such as fatigue, polyuria and polydipsia (excessive thirst). High blood pressure was under control in almost 40% of them. In 92.9% of the patients underwent a foot examination but only 48.6% participated in diabetes training.

These figures show that the education issue requires much more attention. This might well be the most difficult task for the medical team. The patient has to understand that he will benefit from that education and learn to control the disease and its consequences rather to be controlled by it.

Source: Phasengerechtes Versorgen beim Diabetischen Fußsyndrom, Coloplast GmbH, Hamburg

**Wagner classification of diabetic foot lesions**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Foot lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No lesion, foot risk, foot malposition, hyperkeratosis</td>
</tr>
<tr>
<td>2</td>
<td>Superficial ulcer</td>
</tr>
<tr>
<td>3</td>
<td>Deep ulcer extending to muscles and ligaments</td>
</tr>
<tr>
<td>4</td>
<td>Deep ulcer and infection (to muscle, tendon and bone) with osteomyelitis</td>
</tr>
<tr>
<td>5</td>
<td>Extensive gangrene</td>
</tr>
</tbody>
</table>

**Diagnostics and reconstruction are imperative – a fact that underlines the necessity for close cooperation between diabetologists and vascular surgeons, if the patient is to have a chance to avoid amputation.**

**Healing skin wounds**

Researchers define the role of signal molecule c-Met

**c-Met** – the signal molecule that regulates cell growth and cell migration during embryonic development – has been shown to play a key role in healing in the skin, according to a paper published in the *Journal of Cell Biology* (Vol.177, Nr.1, pp. 131 – 162, 2007) by PhD student Jolanta Chmielowiec, working with Professors Walter and Carmen Birchmeier at the Max Delbrück Centre for Molecular Medicine (MDC) in Berlin, Germany.

The research demonstrated that if c-Met is missing in skin cells, no new tissue can form to close a wound. When the skin is injured, it first scabs over, sealing the wound. Starting from the edge of the wound, keratinocytes then migrate across the wound, proliferating very quickly to rapidly form new skin tissue – hyperplastic epithelium – which also fills the wound with new skin cells so that new tissue can replace the skin.

**c-Met regulates this migration process from the edge of the wound. It is a receptor molecule also localized on endothelial cell membranes.**

Professor Carmen Birchmeier and her research team have studied the role c-Met plays in developmental biology for several years. Interacting with c-Met is a growth factor named hepatocyte growth factor/scatter factor (HGF/SF) because it was found to be a growth factor important for hepatocytes (liver cells). The liver regenerates particularly quickly after injury. In cancer research, this factor also plays a key role as scatter factor, which Professor Walter Birchmeier and his colleagues demonstrated repeatedly.

The duo HGF/SF and c-Met is crucial in regulating cell migration. Together, the two are not only released in the liver, but also in the lung, the kidneys, and the heart when these organs are injured. As MDC researchers were able to show, this is also the case with skin wounds:

Cells responding to a skin wound. Those in the upper row have functioning c-Met, which reproduce quickly and move to the wound area; in 48 hours the site contains a large number of these cells. In the lower row many cells do not have c-Met; these respond much more slowly. Only these cells that have c-Met enter the wound region.
The hydro-active wound dressing

**NEW**

The German firm Hartmann reports that Hydrotul, its new hydrocolloid impregnated dressing, combines the benefits of conventional impregnated dressings with those of hydro-active wound dressings. "Whilst the ointment keeps the wound margins soft and supple and prevents macerations, the honeycomb-like structure of the carrier material has large pores for unimpeded exudate drainage in severely exuding wounds."

The firm points out that Hydrotul can be left on the wound for several days to allow a wound to "rest", and adds that an atraumatic dressing change is possible.

Sizes: 5 x 5 cm, 10 x 12 cm and 15 x 20 cm.

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Wound dressing from sticking to the wound. The honeycomb-like structure of the carrier material has large pores for unimpeded exudate drainage in severely exuding wounds.

The products you choose depend on your individual needs – and on those of your patients. seca scales and measuring devices are designed to meet your needs down to the last detail, for example, in cardiology. The digital column scale seca 701 has a capacity of 200 kg with an especially fine graduation of 50 g to a weight of 150 kg. With its cable remote control the floor scale seca 862 is extremely flexible. The seca 861 has practical automatic tap-on and switch-off functions and is therefore particularly power-saving. Therefore, whatever demands you make: you will find your individual solution at seca.
Virtual slide for real analysis

The updated Olympus dotSlide digital virtual microscopy system can scan entire slides at high resolution and store them in a fully compatible and fully navigable database accessible worldwide.

Of the three models – dotSlide MD (manual), dotSlide SL (fully automated, with slide loaders and screen micro-array module) – users can examine a virtual slide as if seeing it with a real microscope. This allows pathologists and researchers, for example, to examine and compare thin sections of a single slide, when otherwise impossible. Olympus points out the technology also provides high throughput, high content capability.

The dotslide models use the Olympus MX51 microscope with the dotSlide MD, SL, and data are loaded manually and virtual file created automatically, based on the users preferences, so that slides can be directly linked to the slide. This facilitates the simple and comprehensive management of large clinical data. Further, the model documents each core separately, accurately recording its details, with each file containing all the image metadata.

For technology:

The dotslide workstation and server system enable full controllable acquisition, analysis and storing of enormous quantities of data – will be at the Munich event. Additional highlights will be sections dealing with the dotslide MD, SL and data.

Beckman Coulter’s UniCel LX20 system, an automated centrifugal extractor and refrigerated sample management system, is designed to be cross-functional, as are many other systems and product lines. The unit can need to acquire and analyze up to 1,000 slides per hour, and the system ensures that peak workloads can be handled quickly.

But in the future of this international fair for laboratory equipment, automation and biotechnology lab workers will find just about everything they need. With three exhibition categories – laboratory, technology, analysis and quality control; life sciences and diagnostics for the laboratory sector – the event draws around 1,000 exhibitors (in just the laboratory sector – the event draws about a third of these from countries beyond Germany).

AACC is expecting to grow even bigger between now and its next big event, which will be held in Washington, DC from 27–31 July 2008.

Cost cutting

Protein chips are increasingly used to ascertain which genetic products, i.e. which proteins, actually affect a cell. Decoding proteins gives pharmacy researchers a point of departure for new active ingredients. Biomarker tests, which filter out unsuitable active-ingredient candidates before they are tested on patients, also help companies to cut costs considerably. Pharmaceutical companies also profit from the improved clinical trials and quality assurance of medicine in another way; some blockbuster medicines would still be on the market today if the patients who had to take them had no bad reactions for genetic reasons that had been filtered out and created proper safety records.

A Peltier cooled, 1376 x 1032 pixel dotslide camera also offers a versatile possibility for true 3D rendering of virtual slides, with high very high sensitivity with an excellent signal-to-noise ratio, broad dynamic range and superior image quality.

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Flexible endoscopy
Achieving precise power output and proven argon plasma coagulation

Professor Martin Raithel MD* works alongside medical devices manufacturer Bowa on the use of argon plasma coagulation in endoscopy. The argon unit, in conjunction with the generators of the Bowa ARC range, is working very reliably in different disciplines," he says. It’s opening up new methods in flexible endoscopy with argon-assisted electrosurgery due to its outstanding ignition and power characteristics.*

Many publications have already appeared relating to the outstanding characteristics of ARC generators in conjunction with the ARC Plus, Bowa points out. "Like its big brothers in the ARC series, in conjunction with the ARC Plus, the Bowa ARC 200 makes an unbeatable system. An unbelievably low 10 Watt power setting enables argon plasma coagulation to be carried out safely and with particularly fine dosing. The penetration of argon plasma coagulation can therefore be almost steplessly controlled. In this way, efficient coagulation can be produced even more safely in areas that are sensitive to perforation, such as the small intestine, for example. Stuck electrodes and mechanical traumas are avoided thanks to the non-contact process."

In gastroenterology, the process is particularly suitable for polypectomy, papillotomy, double-balloon enteroscopy, colonoscopy, mucosectomy, rectoscopy and gastroscopy (Bowa provides the various flexible probes). "To guarantee reliable argon ignition, the ARC Plus argon coagulation unit and the ARC generators are optimally matched to one another. The wide argon gas control range of 0.1 to 9.5 l/min allows the system to be ideally adapted to the type of operation," Bowa adds. "Argon plasma coagulation can be used with rigid or flexible probes. Power settings from 1 Watt to 120 Watt are possible."

The Argon-Flex, GastroCut Pap and GastroCut Pol programmes are provided for flexible endoscopy, and the unit has an argon programme for open or laparoscopic surgery. "The combination of cutting and coagulation achieves outstanding results when using polypectomy loops or papillotomes," Bowa points out. In addition, the haemostatic effect of the cutting current can be finely controlled at the press of a button.*

"Applicability, effectiveness and safety of Bowa generators and argon units in gastroenterological endoscopy, " by M Raithel, M Hänsler and A Nägel of Bowa, was published in Endoscopy today 108.

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The UKE is the biggest Medical Center in Northern Germany. We combine research and medical treatment. The cornerstone of the UKE philosophy is the continual development of improved diagnostic methods and procedures for disease management, in particular cancer, transplantations, heart diseases, systemic children’s disease, special urology or special problems of the gastric tract, diabetes or special problems of the eyes, ear, nose or throat. The UKE has the worlds leading clinical faculty for prostate cancer.

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The UKE has a specialized department dealing with all International patients coordinating all organizational, financial, administrative and personal issues.

Please contact under: patients@uke.uni-hamburg.de or call +49 40 42 803 7294 or mobile +49 172 445 8641.

D. Dirk Böse

Московская медицинская выставка-ярмарка

Четырёхдневная выставка пройдет в этом году с 19 по 22 сентября в выставочном центре Манеж. На выставке представлен большой выбор медицинских центров, санаторий и массажных центров как из России, так и из других стран.

(См. страницы: 10)
МЕЖДУНАРОДНАЯ ШКОЛА ТЕЛЕМЕДИЦИНЫ В РОССИИ

Российская ассоциация телемедицины и Департамент здравоохранения Г.А. Захарова проводят в ИК Международной школе по теме «Современные аспекты телемедицины». Занятия будут проводиться с 16 по 26 октября 2007 в Москве (руководитель школы В.В. Стороп). В течение 10 дней для слушателей школы из РФ и стран СНГ будут представлены 72-часовой курс теоретических и практических занятий по телемедицине и совреченным медицинским инф ormационным технологиям. Лекторы — ведущие российские и зарубежные специалисты. Обучение рассчитано на организаторов работы телемедицинских центров (врачей) и технический персонал, обеспечивающий работу оборудования и каналов связи телемедицинского центра.

Обучение проводится на русском языке. Лекции зарубежных специалистов будут сопровождаться синхронным переводом. В ходе школы планируется проведение серии круглых столов по проблемам использования телемедицинских технологий и медицинских информационных систем, демонстрация новых технологий и оборудования.

Часть лекций проводится на базе видеоконференц-связи. По этой же технологии будет предпринято тестирование новых технологий и оборудования для связи телемедицинских центров.

Научными консультантами школы являются:
- президент Российской ассоциации телемедицины, врач-онколог О.Ю. Альвхокк (Россия);
- президент итальянской ассоциации телемедицины профессор Ф.Скуриполи (Италия);
- президент международной ассоциации телемедицины, профессор Регенсбургского университета М. Нерлих (Германия);
- президент ассоциации прикладных технологических систем, профессор М.Черна (Швейцария).

Контакт:
Наш адрес и телефон: Рублевское шоссе д. 135 121552 г. Москва Россия.
тел./факс: 700495 414-79-34
E-mail: Telemed@int.ru

Позвольте представиться - SanaFontis

Частная онкологическая клиника SanaFontis во Фрайбурге основана в апреле 2006 года и располагает 85 койками различных специализаций. Клиника SanaFontis представляет собой международный центр современной терапии рака и научных клинических исследований, базирующихся на комплексном подходе к профилактике, диагностике и лечению.

Клиника SanaFontis предлагает собой международный центр современной терапии рака и научных клинических исследований, базирующихся на комплексном подходе к профилактике, диагностике и лечению.

К вашим услугам для лечения пациентов с больными опухолями, лифрами и определенными видами лейкоза на основе обширной и целостной программы, которую в центре ведут врачи, не заболевший человеком заболеванием и его семейных.

Международная группировка врачей предлагает лечение пациентам из разных уголков мира, в том числе и русскоговорящим.

Мы работаем с перспективными технологиями - от современной лабораторной медицины для определения биомаркеров, до использования тестов на чувствительность к химиотерапии, а также новых средств и препаратов, от нас не останется ни одной ошибки, ни одного пациента.

Недавно, в результате приобритения корпорации «Opex» группы «Health», принадлежавшей ранее фирме «Kodak», настало время для нашей деятельности фирмы «Carestream Health Inc.» в качестве одного из ведущих международных компаний в области телемедицины.

Наша главная задача - лечение пациентов с большими опухолями, лифрами и определенными видами лейкоза на основе обширной и целостной программы, которую в центре ведут врачи, не заболевший человеком заболеванием и его семейных.

Контакт:
Kohtakt: Kevin I. Hober, CEO of Carestream Health Inc.
E-mail: Kevin.I.Hober@carestream.com

ит & телемедицина

вхождение в корпорацию «Opex» обещает предложить большую гибкость для фирмы, занимающейся получением медицинской информационной, а также информационными решениями.

в разряд независимых компаний не меняет принцип нашего подхода к обслуживанию клиентов. Благодаря этому, мы получили в настоящее время невероятно хорошие возможности инвестировать в будущее, основываясь на этом на всей нашей предыдущей работе по внедрению инноваций. Мы хотим перевести наших клиентов от бумаги и пленки к полноте диапазона процесса разработки, и благодаря этому переходу, помочь им улучшить качество и уменьшить затраты.

Кевин Хоберт подчеркнул также: «Наши достижения в получении изображений на молекулярном уровне очень существенны, мы можем предложить не только фотографию, но и фотохимики, но также дигитальные графические системы и контрастные средства, необходимые для получения графической информации. Мы настроены более чем оптимистично в отношении наших будущих возможностей, добиваясь в заключение Хоберта.

(см. страницу 20)
READER SURVEY – имеется возможность интересного выигрыша!

Молекулярная медицина в качестве оружия против склеротических бляшек высокого риска


Неожиданный разрыв так называемой нестабильной бляшки происходит без первичных симптомов в 70-75% случаев инфарктов миокарда. Поль Смит, ответственный за вопросы стратегии и развития фирмы «Philips Medizin Systeme», объясняет: «Предлагается примерно каждый год, прежде чем мы сможем идентифицировать опасные бляшки при помощи биомаркеров. Ранняя диагностика могла бы способствовать сокращению последующих загрязнений и открыть новые возможности терапии во благо пациентов.»

(См. страницы: 16)

Специалисты по лечению печени, желудка, кишечника и поджелудочной железы

Лечение в Университетской клинике Гамбург-Эппендорф (UK E), Германия

Магнитно-резонансная томография открывает новые перспективы в кардиологии

Магнитно-резонансная томография обеспечивает очень широкие диагностические возможности для кардиологов.

Профессор Бернд Хамм, Институт радиологии клиники Шарит, Берлин, разъясняет возможности этой методики полного исследования.

«Магнитно-резонансная томография новейшего уровня обеспечивает ангиографию всех сосудов организма и открывает возможности для визуализации всех сосудов человеческого тела, что невозможно этим методом. Мы проводим фундаментальные исследования в области получения медицинской графической информации на молекулярном уровне: цели визуализации и дифференциации стабильных и нестабильных атеросклеротических бляшек. Рабочая группа по нанотехнологиям, созданная для сотрудничества в исследованиях между «Шарит», и фирмой «Siemens», работает с мельчайшими металлическими частичками. Эти частицы могут сделать нестабильным бляшку видимой на магнитно-резонансном томографе. Мы можем обнаружить и анализировать степень риска с очень высокой точностью. Мы осуществляем также важное для сотрудничества с другими фирмами.»

(См. страницы: 8)

Диагностика артерiosklerоза и визуализация склеротических бляшек:

Клиника Гамбург-Эппендорф обладает наибольшим опытом в лечении пациентов из других стран. Международный офис клиники решает все организационные вопросы с иностранными пациентами на их родине. Существует широкий круг вопросов по выезду в Германию, финансовые вопросы, определение стоимости медицинского обслуживания, согласование сроков, подготовка медицинских заключений и оформление МРТ/КТ - рентгенологических исследований в клинике на русском языке.

В Международный офис Клиники можно позвонить 24 часа в сутки каждый день по телефону: +49 40 42803 7294, e-mail: patients@uke.uni-hamburg.de или отправить факс по номеру: +49 40 42803 1691.

Пожалуйста заполните купон и отправьте его в наш адрес: EUROPEAN HOSPITAL Verlags GmbH, Theodor-Althoff-Str. 39 45133 Essen, Germany e-mail tos@european-hospital.com

Пожалуйста укажите Ваше имя и адрес

Клиника/фирма: Фамилия: Номер телефона: Номер факса:
Долгота: Улица: Дата: Участия в розыгрыше: участвуете в розыгрыше:
Почтовый индекс: Город: Страна: e-mail:
Сроки работы: 31 октября 2007 г.

1 Члены редакции газеты EUROPEAN HOSPITAL выражают свою благодарность за предоставленные фотографии.

2 Профессор Нашан есть главный врач и директор клиники.

3 Профессор Бернд Хамм, директор Института радиологии клиники Шарит в Берлине, известен своими работами по магнитно-резонансной томографии.

4 Профессор Избики известен своими работами по склеротическим бляшкам.

5 Профессор Кампф автором проекта, связанного с компьютерной томографией.

6 Профессор Кройцман известен своими работами по склеротическим бляшкам.

7 Профессор Кройцман известен своими работами по склеротическим бляшкам.

8 Профессор Бернд Хамм, директор Института радиологии клиники Шарит в Берлине, известен своими работами по магнитно-резонансной томографии.

9 Профессор Избики известен своими работами по склеротическим бляшкам.

10 Профессор Кройцман известен своими работами по склеротическим бляшкам.

11 Профессор Кройцман известен своими работами по склеротическим бляшкам.

12 Профессор Кройцман известен своими работами по склеротическим бляшкам.
Шарите - Крупнейшая университетская клиника Европы

Университетский медицинский комплекс г. Берлин

Профессор Джованни Баттиста Мильори, доктор медицины, сотрудник Центра по контролю лечения туберкулеза и легочных заболеваний.

Шарите — это в целом европейское обследование 15 000 сотрудников в 80 специализированных клиниках, каждая из которых является высокотехнологичной единицей. Будучи учебной и научной базой знаменитых Берлинских университетов имени Гумбольдта и Свободного Университета, мы, образно говоря, концентрируем диагностику и лечение, научные исследования и обучение под одной крышей.

Медицинская исследовательская работа и используемых результатов являются душой университетского медицинского комплекса ШАРИТЕ. Около 55 научно-исследовательских институтов, относящихся к ШАРИТЕ, в том числе такие знаменитые учреждения, как Институт инфекционной медицины им. Макса Планка, Институт им. Роберта Коха и Институт микроbióологии и вирусологии ШАРИТЕ, обеспечивают нашим пациентам и ведра медицинское обслуживание высочайшего класса.

Ни в одной другой клинике Европы нет такого сочетания известных врачей, специалистов-учёных, как в Университетском медицинском комплексе ШАРИТЕ. Ответственно превосходным является и оснащение медицинской техникой. Взаимодействие между различными специальностями, комплексная медицина, коллегиальность и, конечно же, высочайшая квалификация всего врачебного профессорского состава обеспечивает медицинское обслуживание высочайшего качества. Главное в ШАРИТЕ — это здоровье и хорошее самочувствие наших пациентов. Личные консультации и доступная для понимания информация важны для нас так же, как и индивидуальное обслуживание пациентов. При этом международный коллектив врачей и медсестер учитывает, разумены, культурные традиции и религиозно направленность, иностранных пациентов.

Для организационной поддержки нашего стационарного лечения в ШАРИТЕ обращайтесь, по-крайней мере, в наш офис: Charité International Augustenburger Platz 1 13353 Berlin – Germany www.charite.de/International/
Email: charite.international@charite.de Tel: +49 30 / 450 570 000 Fax: +49 30 / 450 570 977

Дыхание

Международные стандарты защиты от туберкулеза (ISTIC)

Дыхание, жёсткость туберкулезом с расширенной лекарственной устойчивостью к противотуберкулезным препаратам. С января 2006 года начал осуществляться новый глобальный план антитуберкулевных мероприятий, рассчитанный на 2006-2015 гг. Этот план описывает стратегию, финансовую потребность, а также существующие узкие места и имеет в виду достижение в данной области во всех странах мира целей развития, поставленных в Декларации Миллингема ООН. Международные стандарты защиты от туберкулеза (ISTIC) имеют своей целью облегчить эффективное оказание высококачественной медицинской помощи всем пациентам без различия возраста и пола. Это 6 стандартов по диагностированию, 9 стандартов по лечению и 2 стандарта, относящиеся к обязанностям органов общественного здравоохранения.

(См. страницы: 22)