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January-February 2013

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Expansion

The past year has been good for healthcare in the region. We have seen considerable expansion of new infrastructure. Many new hospitals have opened in Saudi Arabia, the UAE, Jordan, Iraq and other countries in the Middle East. This is good not only for the many advertisers in this magazine who are now seeing greater demand for their products across the region, but importantly, it is good for many people on the ground who now have easier access to healthcare, where before it may have been more difficult. This is particularly the case in Saudi Arabia where a massive government-funded drive to build hospitals is ongoing. In this issue you can read the news about Saudi King Abdullah inaugurating 420 healthcare facilities across the kingdom and laying the foundation stones for a further 120 health infrastructure projects.

This phenomenal growth is reflected in this bumper issue of *Middle East Health*, our largest to date. Thanks to the excellent advertising support, we are able to cover a lot of ground editorially. We look at news of the novel coronavirus that has killed 5 people in the region and could potentially trigger another world-wide scare similar to SARS a few years ago. We report on a new *Atlas of Health and Climate* released by the WHO and the World Meteorological Organisation to help regional health organisations be better prepared to deal with weather-related disasters, which are expected to get more frequent and intense as climate change takes a hold. Also in this issue you will find news on an important study released in December that looks at the global burden of disease and the remarkable epidemiological changes that have occurred over the past two decades – people are now living longer, but ironically more people are living with sickness.

We run an interesting report on Iraq – potentially the next big healthcare market in the Middle East. A doctor, who volunteers for Médecins Sans Frontières, writes about his experiences doing surgery in a cave in Syria for victims of the bloody civil uprising there. We look at medical ethics and whether doctors are failing to disclose conflicts of interest on social media.

This is just a taste of what this expansive issue of *Middle East Health* encompasses. We hope you enjoy reading it as much as we did putting it together.

Thank you to the readers for your positive feedback during the past year and to the support of the advertisers which makes the production of this magazine possible.

We wish you all a productive, healthy and profitable 2013.

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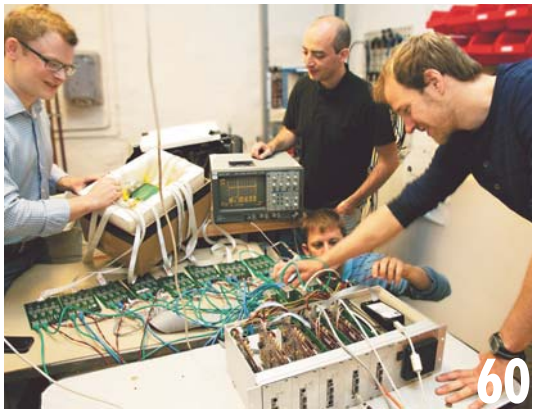

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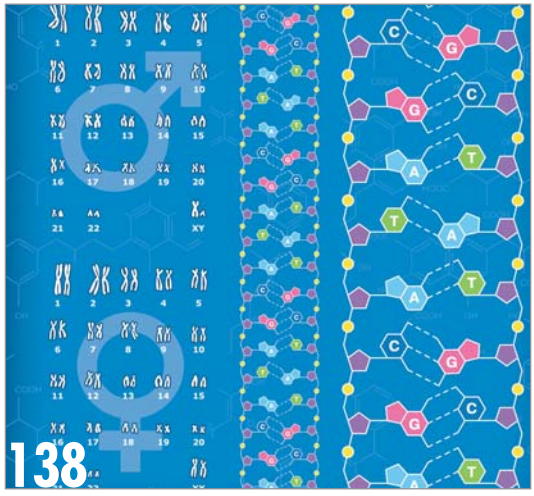

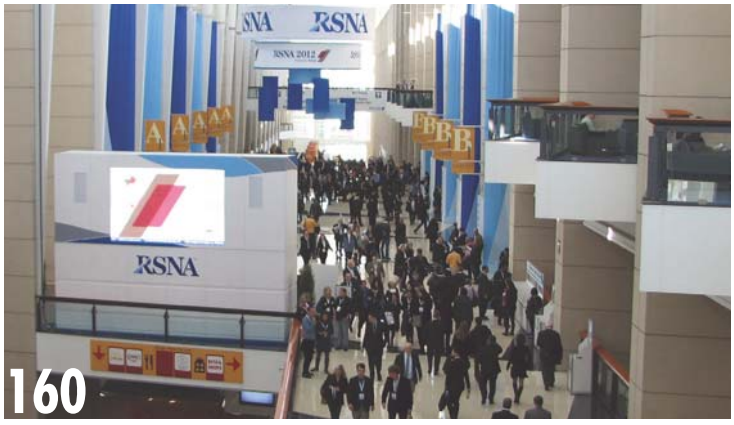

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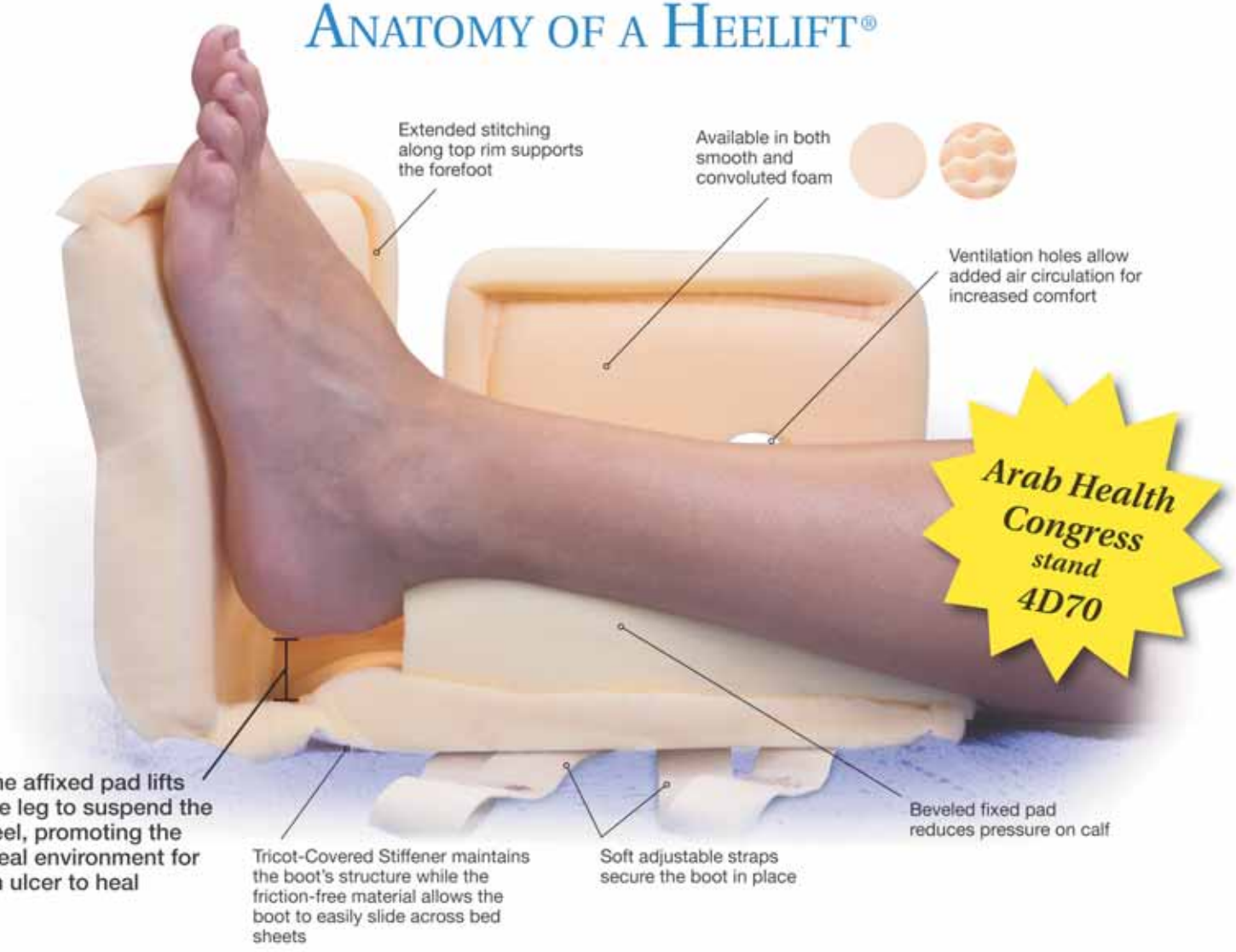

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Update from around the region

Farah Medical Complex

Philips strikes major installation deal with Jordan's Farah Medical Complex

Royal Philips Electronics has struck an agreement with the Farah Medical Complex in Jordan that will see the development of a new hospital which has patient experience firmly at the centre of its ethos. Through this partnership, Philips will provide a customised package of 15 advanced imaging solution systems, healthcare informatics and services, in addition to a suite of 20 Ambient Experience rooms, making this the largest installation of this kind to date in any hospital worldwide.

Philips Ambient Experience is based on a deep understanding of all emotional and physical aspects of patient care. It creates a relaxing environment for patients undergoing an imaging procedure by light, image and sound. It has been shown to decrease the duration of the procedure, whilst helping caregivers to work more efficiently. The deal will also allow Philips researchers to further study the positive impacts of ambient lighting on patients and clinicians.

"We are delighted to be working with Philips to fulfil our vision of creating a state-of-the-art hospital which not only offers access to advanced technologies, but is also designed to provide an environment uniquely conducive to patients' health and well-being," said Dr Zaid Kilani, founder and director of Farah Medical Complex. "We are confident that with the

customised offering developed by Philips, we will be shaping the future of patient care in the Middle East."

The deal includes the first sale in the Middle East region of several of Philips' advanced imaging systems, including MR HIFU for the treatment of uterine fibroids, offering patients an outpatient procedure with faster recovery and lower complication rates than surgical removal. Also new to the region will be the latest Philips X-ray technology.

Saudi king inaugurates new hospitals

The *Saudi Gazette* reported on 20 October last year that King Abdullah of Saudi Arabia inaugurated 420 health projects and laid the foundation stones for 127 healthcare projects across the kingdom valued at more than SR12 billion (about US$3.2 billion).

The projects include the King Faisal Hospital in Taif, a 500-bed Maternity and Children's Hospital in Makkah, a 500-bed Maternity and Children's Hospital in Dammam, the 200-bed Southern Riyadh Hospital, the 200-bed Al-Quway'iah Hospital in Riyadh, the 100-bed Al-Badayeh Hospital in Al-Qassim and the 100-bed Medical Tower inside Jazan General Hospital, among others.

Dr Abdullah Al-Rabeah, Saudi Arabia's Minister of Health, said that this inauguration has brought the number of hospitals and primary healthcare units completed over the last three years to 54 and 645 respectively.

He said that more than 29 hospitals and health institutes and 91 health centres were part of the projects inaugurated by the king. Among the projects whose foundation stones were laid by the king were two medical cities in the north and south of the kingdom and a specialist hospital, seven general hospitals, two medical towers and 111 primary healthcare centres, the minister said.

The ministry is planning to build a further 122 hospitals and medical towers, as well as 305 primary healthcare centres over the next seven years in order to meet the needs of citizens, Al-Rabeah was quoted as saying.

In November the newspaper reported the king had allocated land for the construction of a mental hospital, a general hospital and a centre for the treatment of drug addiction near Taif University, and a children's hospital next to King Faisal Hospital in Taif.

He also allocated land for a 400-bed maternity and children's hospital bordering the North Jeddah Hospital.

Qatar's Sidra in strategic partnership with Excellence in Paediatrics Institute

A new strategic cooperation was announced early December between the Excellence in Paediatrics Institute (EiP), an international paediatric association based in Geneva, and the Sidra Medical and Research Center, a new state-of-the-art facility in Qatar funded by a $7.9 billion endowment from the Qatar Foundation.

Commenting on the announcement, made at the EiP's annual conference Chairman of EiP, Professor of Paediatrics Dimitri Christakis, said: "This cooperation will strengthen EiP's ability to deliver advanced Paediatric education where it is

needed most, advancing global healthcare for children, especially in emerging markets."

World Health Organisation data shows that children are five-times more likely to reach their fifth birthday if they live in a country with sufficient numbers of qualified paediatricians, doctors, midwives and nurses.

EiP brings together top academics, scientists and clinicians from services and centres of excellence across the globe and EiP's members provide global paediatric education to over 60,000 providers and campaign for healthcare improvements based on the latest scientific research.

The Institute's 5th global conference will be held in Doha, Qatar, from the 4-7 December 2013. The Sidra Medical and Research Center will be playing host to over 3,000 healthcare professionals from 100 countries.

Currently under construction on the Qatar Foundation's 2,500-acre Education City campus in Doha, Sidra's focus will be the health and wellbeing of women and children. Sidra is actively recruiting up to 3,000 clinical and research staff.

Dr Edward Ogata, Chief Medical Officer at Sidra, says: "EiP is an important forum for those at the frontline of delivering paediatric healthcare, bringing clinicians together with scientists and academics to identify innovations and insights that have the potential to transform care for children all around the world. We are looking forward to working with the Institute and sharing our vision for Sidra with visitors to Qatar."

Sidra's Communications Project Director Khalid Al Mohannadi said: "Today is an important day for Sidra and for Qatar, and for children everywhere in the world. We are delighted to partner with the Excellence in Paediatrics Institute, which shares our vision of better care for children through innovation, training, education and partnership. Through this cooperation, we can contribute to global advances in paediatric care."

Yellow fever breaks out in Sudan

As of 4 December, the WHO reported a total of 732 suspected cases of yellow fever, including 165 deaths in Sudan's Darfur region.

At the time of reporting, Sudan's Federal Ministry of Health was organising an emergency mass vaccination campaign against yellow fever. The first phase of the campaign began on 21 November 2012, to cover 2.2 million people, and the second phase of the campaign was planned for December, to cover an additional 1.2 million at risk.

The vaccination campaign was supported by the International Coordinating Group on Yellow Fever Vaccine Provision (YF-ICG), GAVI Alliance, ECHO (European Community Humanitarian Office), Central Emergency Response Fund (CERF), Sudan Common Humanitarian Fund (CHF), and non-governmental organisations working where the campaign is being carried out, according to the WHO.

The International Coordinating Group on Yellow Fever Vaccine Provision (YF-ICG) is a partnership that manages the stockpile of yellow fever vaccines for emergency response on the basis of a rotation fund. It is represented by UNICEF, Médecins Sans Frontières, and the International Federation of Red Cross and Red Crescent Societies, and WHO, which also serves as the Secretariat. The stockpile was created by GAVI Alliance.

A comprehensive assessment of the outbreak is on-going, to obtain additional epidemiological, laboratory and entomological information to understand the evolution of the outbreak and the risk of the epidemic.

Yellow fever is an acute viral haemorrhagic disease transmitted by infected mosquitoes. The "yellow" in the name refers to the jaundice that affects some patients.

The WHO says up to 50% of severely affected persons without treatment will die from the disease and states that there are an estimated 200,000 cases of yellow fever, causing 30,000 deaths, worldwide each year.

In November an international expert in infectious diseases was quoted as saying Sudan's yellow fever outbreak should be seen as an international emergency, and asserted that typical efforts to battle the mosquitoes will be difficult in Darfur because of issues surrounding the scarce water supply.

In December WHO issued a statement saying the organisation had activated the Global Outbreak Alert and Response Network (GOARN) and is deploying additional experts including an entomologist, virologists and an epidemiologist to support the on-going response in Sudan.

Abu Dhabi launches cancer e-notification

As of October of last year, all healthcare facilities licensed by the Health Authority – Abu Dhabi (HAAD), including hospitals, clinics, polyclinics, diagnostic centres, and radiological centres, are mandated to report new cancer cases through a cancer e-notification system on the HAAD website. In addition, healthcare facilities are mandated to report on cancer screening visits and outcomes to the cancer e-notification. This includes cancer screenings for breast, colorectal and cervical cancers.

Dr Omniyat Al Hajri, director of Public Health and Policy Division at HAAD, said: "Key policies on cancer need to be based on reliable data. HAAD has recently created the cancer surveillance e-notification to establish the Abu Dhabi Cancer Registry (ADCR). It was officially announced to all healthcare providers, facilities and professionals on September 10, 2012. The aim of the cancer registry is to identify risk factors for cancer; and to plan, monitor and evaluate effective health interventions to control and prevent cancer."

Dr Jalaa Assad Taher, section head for Cancer Control and Prevention, said: "Cancer is a priority and there is a comprehensive plan to control and prevent it, including enhancing reporting of cancer cases and monitoring of quality screening services through establishing the cancer e-notification system."

Dr Clare Roberts

Dr Qasiem Nasser

Moorfields appoints new medical director, oculoplastic surgeon

Moorfields Eye Hospital Dubai has announced the appointment of Dr Clare Roberts MA (Cantab), BM BCh (Oxon), FRCOphth as the hospital's new medical director. Dr Roberts, who trained at Moorfields London, joined the Dubai hospital in 2010 as consultant paediatric ophthalmologist and strabismus surgeon. She assumes the role of medical director following the return to Moorfields London of Dr Chris Canning, who held the positions of CEO and medical director from the establishment of the hospital in 2006. Many of the hospital's consultants are Moorfields London trained and all are based permanently in the UAE.

Dr Roberts studied medicine both at Cambridge and Oxford University and trained in the UK acquiring the Fellowship of the Royal College of Ophthalmologists, and completing her subspecialty training in paediatric ophthalmology and strabismus at Moorfields London. Prior to joining Moorfields Eye Hospital Dubai, Dr Roberts was a consultant at Imperial College NHS Trust in London, where she managed a large paediatric ophthalmology service including screening and treatment for retinopathy of prematurity. Dr Roberts has a research interest in amblyopia (lazy eye) and retinopathy of prematurity and has published work in paediatric ophthalmology and strabismus.

The hospital also appointed Dr Qasiem Nasser as a Specialist Ophthalmologist and Oculoplastic Surgeon. Dr Nasser's specialist area of expertise is Ophthalmic Plastic and Reconstructive Surgery, including surgery on the eyelids, the orbit, and the tear drainage system.

Dr Qasiem Nasser is a Jordanian national and studied medicine at The Royal College of Surgeons in Ireland, following which he completed his Residency in Ophthalmology at The Royal Victoria Eye and Ear Hospital in Dublin. He then moved to the United States where he completed a 2 year Ophthalmic Plastic and Orbital Reconstructive Surgery Fellowship at The University of Texas MD Anderson Cancer Center in Houston, and Texas Oculoplastic Consultants in Austin.

Pakistan gets family planning support

Arif Naqvi, chairman of the Aman Foundation, and Bill Gates, co-chair of the Bill and Melinda Gates Foundation, have signed a five-year framework agreement on family planning and health in Pakistan. They will also explore further areas for collaboration to advance global health and development.

The maternal mortality rate in Pakistan is currently 276 per 100,000, and infant mortality at birth stands at 62 deaths per 1000 live births. In light of these worrying figures, both Aman and the Gates Foundation have pledged to invest US$5 million each to address the gaps in reproductive health and family planning services in Pakistan. Gates said: "This is a significant co-investment partnership for our foundation which leverages Aman's on-the-ground knowledge in family planning and maternal and child health in Pakistan. It is also an example of the kind of smart partnerships that hold huge promise for the future. Investments in family planning have a transformational effect on the health and wealth of nations."

Naqvi said: "We will benefit from mutual learning, co-funding opportunities and the expertise of both an international and local civil society. The Aman Foundation's innovative work in the health and education sectors will improve maternal and child health and family planning outcomes among women in underserved populations and specifically communities of Karachi."

Recently, Aman Foundation participated in the London Family Planning Summit which was organised by the Bill & Melinda Gates Foundation, the British Government and UNFPA. The aim of the summit was to "mobilise global policy, financing, commodity and service delivery commitments to support the rights of an additional 120 million women and girls in the world's poorest countries to use contraceptive information, services and supplies, without coercion or discrimination, by 2020." At the summit, Aman Foundation was recognised as the only private organisation from the developing world to have committed substantial funds towards this cause.

7% of Cairo addicted to drugs

The number of Egyptians aged 16 and above who are addicted to drugs has risen to 30%, according to a report written by the Health Committee of the Shura Council (consultative Upper Parliamentary House). Researchers found that during the past five years, the illegal use of drugs has shot up in Egyptians aged above 16 by 6.4% to reach 30% of 16-year-olds and over. In what has been described as a catastrophic incidence, the report underlined the fact that the incidence of addiction in Cairo has jumped to 7% of the capital's population.

In monetary terms addiction costs Egypt some 13 billion Egyptian pounds (about US$2.1 billion) per annum.

The security breakdown in the wake of the popular uprising in January has been blamed for failing to prevent a thriving drug trafficking industry, especially across Egypt's borders.

Korea to treat UAE soldiers

Korea Health Industry Development Institute (KHIDI) has agreed to a healthcare collaboration deal with the UAE

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Armed Forces. Following the agreement, the UAE military is expected to refer around 10% of their patients to four Korean medical institutions.

KHIDI has also been working to formalise cooperation with the Abu Dhabi Health Services Company (SEHA) and Saudi Arabia's government organisations. It plans to expand cooperation with other countries in the region.

WHO EMRO tackles diabetes

The WHO Regional Office for the Eastern Mediterranean has started working with countries in the region to strengthen laws limiting the marketing of unhealthy food items, regulating the nutritional value of items presented in school canteens and school vending outlets, and protecting the environment in which children can safely enjoy physical activity and sports.

Cinfa pharmaceuticals to set up operations in UAE

Cinfa, one of Europe's largest drug manufacturers, plans to enter the Middle East market via the UAE.

Cinfa, Spain's leading pharmaceutical company in Spain, has a comprehensive portfolio of products including prescription drugs, over-the-counter medications, dermocosmetics, and nutraceutical solutions.

With more than 40 years of experience as a developer, manufacturer, and marketer of drugs, Cinfa is present in more than 52 countries and has a drug portfolio composed of 102 active ingredients treating more than 30 major diseases and conditions.

"The UAE has always been at the forefront of regional medicine and continues to this day to push forward on all fronts to bring the very best treatment options to its residents," said Dr Wael Al Mahmeed, current board member of Emirates Cardiac Society. "The introduction of new market entrants in the pharmaceutical sector, such as Cinfa, is very positively received by the medical community because it expands patient and physician choice in medicine, and this helps competition and innovation."

Maher Abouzeid

GE Healthcare appoints new President & CEO for Middle East and Pakistan

GE Healthcare has appointed Maher Abouzeid as its President & Chief Executive Officer for Middle East and Pakistan. Based in Dubai, Abouzeid will be responsible for driving the continued growth and expansion of GE Healthcare's brand in the region. He will also focus on strengthening customer relationships and partnerships across all the countries in the Middle East and Pakistan.

Karim Karti, President & CEO for GE Healthcare's 84-country Eastern and Africa Growth Markets region covering Russia & CIS, Turkey & Central Asia, Middle East and Africa, said: "The Middle East and Pakistan are amongst the fastest growing emerging-markets in the world. Abouzeid's extensive experience in the region and in healthcare will be instrumental in his new role. He will specifically concentrate on developing our presence and footprint across 12 countries to help our customers and partners grow their capabilities. We remain fully committed to working closely with our partners towards addressing the most critical healthcare challenges in the region."

Abouzeid added: "The growing incidence of lifestyle diseases and rising costs are increasingly burdening healthcare systems across the region. Through GE Healthcare's focus on early health, we are partnering with the region's healthcare ministries and leading hospital groups to bring more affordable, high quality healthcare to more people, in line with our global healthymagination initiative. We will continue to focus on building sustainable partnerships and providing our advanced technologies, capabilities and solutions including training, skills development and knowledge transfer."

Qatar's PHCC holds workshop on new 48-hour cancer referral initiative

Qatar's Primary Health Care Corporation (PHCC), in cooperation with Hamad Medical Corporation (HMC), held the first training workshop on rapid and definitive diagnosis for assumed cancer cases in Qatar. This is one of the national cancer strategy recommendations shared between PHCC and HMC. The practice calls for a speedy 48 hour-window referral of suspected cases from the Primary Health Care Centers to specialist clinics via standardised process. Early diagnosis allows for better treatment.

The training workshop aimed at Family Physicians and General Practitioners gave a full account of the newly developed 48 hours referral process. This new process includes urgent referral forms that will be introduced by the end of 2012 with a goal to increase the number of referrals of suspected cases from the Primary Health Care setting to the Referral Management Office in Hamad Medical City.

Commenting on the initiative, Dr Maryam Ali Abdulmalik, the Managing Director of PHCC, said: "PHCC is strongly supporting the initiative to tackle a rapid and definitive diagnosis for suspected cancer cases in Qatar. With cancer being the third leading cause of death in Qatar, PHCC is committed to work closely with our colleagues within the health care community to support the role that our specialists have in tackling and dealing with it, and PHCC is committed to provide full support to the Qatar National Cancer Strategy 2011-2016." MEH

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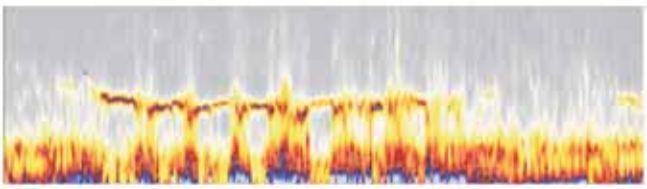

Severe Autonomic Dysfunction

There is a number of self-tests and methods available to analyse the level of burnout. But often the criteria are unclear and the patient's perception differs for the same symptoms. Therefore SCHILLER has developed a revolutionary new way of measuring the "fire of life". Through analysis of the HRV (Heart Rate Variability), the state of being of a patient is displayed in a "fire-of-life" graphic, showing how well he reacts to stress and recovery. If repeatedly analysed it can show if therapeutic actions or lifestyle changes are successful in reducing stress and improving recovery. This opens up new diagnostic possibilities!

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News in Brief

37 million cases of dengue estimated in India

CIDRAP quotes experts commenting in the *New York Times* on 6 November as saying dengue virus infections are widespread in India, and extreme underreporting of cases makes the problem worse. The government counts only lab-confirmed cases reported in public hospitals, which totalled 30,002 for 2012 through October, compared with 18,860 cases for all of 2011. Scott Halstead, MD, a tropical disease expert, estimated the true number of annual cases at 37 million, with 227,500 hospitalisations. Manish Kakkar, MD, MPH, a specialist at the Public Health Foundation of India, said India's "massive underreporting of cases" has contributed to the disease's spread. Other experts said that India's failure to build an adequate dengue surveillance system has hindered awareness of the illness's vast extent, discouraged efforts to clean up its sources, and slowed the quest for a vaccine.

New cell discovery could lead to treatment for blindness

Scientists at the University of Southampton have discovered specific cells in the eye which could lead to a new procedure to treat and cure blinding eye conditions. The study found that cells called corneal limbal stromal cells, taken from the front surface of the eye have stem cell properties and could be cultured to create retinal cells. This could lead to new treatments for eye conditions such as retinitis pigmentosa or wet age-related macular degeneration, a condition which is a common cause of loss of vision in older people.

doi: 10.1136/bjophthalmol-2012-301546

Obesity risk predicted at birth

A simple formula can predict a newborn baby's likelihood of becoming obese in childhood, according to a study published 28 November 2012 in the open access journal PLoS ONE. The formula, which is available as an online calculator, estimates the child's obesity risk based on its birth weight, the body mass index of the parents, the number of people in the household, the mother's professional status and whether she smoked during pregnancy.

The researchers developed the formula using data from the Northern Finland Birth Cohort Study, which was set up in 1986 to follow 4,000 children from early pregnancy onwards. They initially investigated whether obesity risk could be assessed using genetic profiles, but the test they developed based on common genetic variations failed to make accurate predictions. Instead, they discovered that non-genetic information readily available at the time of birth was enough to predict which children would become obese. The formula proved accurate not just in the Finnish cohort, but in further tests using data from studies in Italy and the US.

The study was led by Professor Philippe Froguel and Professor Marjo-Riitta Jarvelin from the School of Public Health at Imperial College London. "This test takes very little time, it doesn't require any lab tests and it doesn't cost anything," said Professor Froguel.

"All the data we use are well-known risk factors for childhood obesity, but this is the first time they have been used together to predict from the time of birth the likelihood of a child becoming obese."

The researchers suggest that services of dieticians and psychologists, for example, could be offered to families with high-risk infants to help them prevent excessive weight gain.

Although common genetic variants did not prove to be helpful for predicting childhood obesity, the researchers say about one in 10 cases of obesity are caused by rare mutations that seriously affect appetite regulation. Tests for these mutations could become available to doctors in the next few years as the cost of DNA sequencing technology falls.

on the WEB The obesity risk calculator *files-good.ibl.fr/childhood-obesity/*

Eradication of polio feasible, but political will necessary, says WHO

The United Nations health agency called for renewed efforts to boost the campaign against polio, stressing that its eradication is technically feasible but political will is necessary to realise this goal.

On World Polio Day – the first since India was removed from WHO's list of countries with active transmission of wild poliovirus, a spokesperson for the World Health Organization (WHO) Global Polio Eradication Initiative, Oliver Rosenbauer, said: "We have all the necessary tools to eradicate this disease, so now there is the question of political and societal will to make sure that the emergency plans are fully implemented and that they are fully financed." He continued, "We have seen time and time again that this is a virus which spreads to polio free areas and causes devastating outbreaks. If we don't finish the job now we could see, within the next decade, 200,000 new cases every single year all over the world. Given that we are under two hundred cases now we consider this a true humanitarian catastrophe that has to be averted at all costs."

According to WHO, more than 4,000 people have been deployed to assist the three endemic countries, supporting vaccination campaigns through the Global Polio Eradication Initiative. In Nigeria, traditional leaders are taking part in selection of vaccinators; in Afghanistan, permanent vaccination teams operate in insecure parts to ensure children are vaccinated regardless of who controls the area; and, in Pakistan, every district is being made accountable for reaching every child in the area with a vaccine.

New data shows progress with vaccination programmes

Four in five children (83%) worldwide received the recommended three doses of diphtheria–tetanus-pertussis (DTP) vaccine during infancy in 2011, according to new data released in the WHO Weekly Epidemiological Record (WER).

The new data show sustained progress from the previous two years, and a significant achievement from when WHO's Expanded Programme on Immunisation (EPI) was originally started nearly 40 years ago. At that time, fewer than 5% of the world's children were being vaccinated against these three deadly diseases.

Achieving DTP vaccination of children before the age of one is one of the most important indicators of how effective vaccination programmes are in reaching children with life-saving vaccines.

While substantial progress has been made since EPI was established, the new data show more than 22 million children, mostly living in less-developed countries, missed out on the three basic vaccinations during their first year of life in 2011.

About half of all incompletely vaccinated children live in one of three countries: India, Indonesia and Nigeria. These countries have large child populations and their immunisation programmes are hampered by occasional problems with vaccine supply and inaccessibility of vulnerable populations.

In May 2012, ministers of health from 194 countries at the World Health Assembly endorsed a landmark Global Vaccine Action Plan involving four mutually reinforcing goals: strengthening routine immunisation to meet vaccination coverage targets; accelerating control of vaccine-preventable diseases; introducing new and improved vaccines; and spurring research and development for the next generation of vaccines and technologies.

Depression a global health crisis

UN Secretary-General Ban Ki-moon has described depression, which afflicts 350 million people worldwide, as an "underappreciated global health crisis" and has called for an international effort to increase access to a wide variety of effective and affordable treatments and remove the social stigma attached to the illness.

"Among the barriers to care and services are social stigma and the lack of general healthcare providers and specialists trained to identify and treat depression," he said in a message marking World Mental Health Day on 10 October, in which he noted that about 1 million people commit suicide every year, the majority due to unidentified, or untreated, depression.

He stressed that although a wide variety of effective and affordable treatments are available to treat depression, including psychosocial interventions and medicines, these are not accessible to all people, especially those living in less developed countries and the least advantaged citizens of more developed nations. "We can all act to relieve the stigma around depression and other mental disorders, perhaps by admitting that we may have experienced depression ourselves, or by reaching out to those experiencing it now. This is the first critical step to removing one of the barriers to treatment and helping to reduce the disability and distress caused by this global crisis.

Ban's message was echoed by the WHO, which underscored how depression interferes with the ability to function at work, school or home. "We have some highly effective treatments for depression. Unfortunately, fewer than half of the people who have depression receive the care they need. In fact, in many countries

News in Brief

870 million suffer chronic malnutrition

Almost 870 million people, or one in eight, are suffering from chronic malnutrition, according to a new United Nations report – State of Food Insecurity in the World 2012 – released in October, which shows a sharp decline in the number of undernourished people over the past two decades, but warns that immediate action is still needed to tackle hunger particularly in developing countries.

Philips to equip Air France, KLM with AEDs

Philips and Air France-KLM Group have reached an agreement to equip all KLM Royal Dutch Airlines and Air France passenger flights with Philips' HeartStart automated external defibrillators (AEDs). The AEDs can be used to resuscitate people who have sudden cardiac arrest by resetting the heart's rhythm with an electric current, delivered by the AED. Philips says the HeartStart FRx AED has been tested and certified for airline use and does not interfere with airplane electronics. Rugged and durable, it features clear audio

News in Brief

instructions for both guided use and CPR coaching in addition to intuitive icon-driven operation for ease of use. Philips AEDs are used by more than 91 airlines and 195 airports around the world.

Bubonic plague in Madagascar

Since the beginning of October and the start of the rainy season in Madagascar, 6 people are reported to have died of bubonic plague, according to a report (14 November) in *L'Express de Madagascar*. The cause of the plague is rats – and their fleas – which take refuge from the rain and seasonal bushfires in villages. "The plague victims sometimes live in remote areas and they self-medicate before going to a health centre when the disease worsens. However, all health centres are equipped with rapid diagnostic test and medications to treat this disease immediately," said Alain Marcel Rahetilahy, head of epidemic and neglected diseases within the Ministry of Health.

UN calls for greater social protection

A new global initiative ensuring the social protection of the world's poorest people is a growing necessity, two United Nations independent experts said, noting that without such

this is less than 10%," said Shekhar Saxena, director of the Department for Mental Health and Substance Abuse.

WHO sets up global monitoring framework to tackle world's biggest causes of mortality

The first-ever global monitoring framework to combat several of the world's biggest killers has been agreed on by WHO Member States in November. The framework comprises nine voluntary global targets and 25 indicators to prevent and control diseases such as heart disease, diabetes, cancer, chronic lung disease and other noncommunicable diseases. The draft framework aims to focus efforts to address the impact of noncommunicable diseases and assess the progress made in reducing associated illness and death, the reduction of exposures to the main risk factors for the diseases, including tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity, and the response of national health systems to noncommunicable diseases.

"The new global monitoring framework will enable us to assess progress across regional and country settings and to monitor trends," said Dr Bjørn-Inge Larsen, the chairman of the formal WHO meeting. "The agreed voluntary targets are aspirational but achievable and they will drive progress in prevention and control at national, regional and global levels."

One of the global voluntary targets – to achieve 25% reduction in premature mortality from noncommunicable diseases by 2025 – had already been adopted by the World Health Assembly in May 2012.

The nine voluntary global targets are aimed at combating premature mortality from NCDs, harmful use of alcohol, tobacco use, physical inactivity, salt/sodium intake, raised blood pressure, diabetes, obesity, promoting drug therapy and counselling, and medicines and technologies for NCDs.

The 25 indicators are aimed at measuring premature mortality, cancer incidence, harmful use or alcohol, low fruit and vegetable intake, overweight and obesity, physical inactivity, raised blood glucose, raised blood pressure, raised total cholesterol, salt/sodium intake, tobacco use, fat intake, cervical cancer screening, drug therapy and counselling to prevent heart attacks and strokes, essential NCD medicines and technologies, palliative care, policies to reduce the marketing of foods and non-alcoholic beverages to children, vaccination against hepatitis B, policies to eliminate partially hydrogenated vegetable oils from food supply, and vaccination against human papillomavirus.

Noncommunicable diseases are the leading cause of death in the world and represent over 63% of all annual deaths. Of the 36 million people who die annually from these diseases, 14 million are under 70 years of age, and regarded therefore as premature and largely preventable deaths. 80% of the deaths related to noncommunicable disease occur in the developing world.

Calls for greater effort to fight TB

Despite progress in the global fight against tuberculosis (TB), the gains so far remain fragile and more needs to be done to eliminate the disease, according to the WHO. "The momentum to break this disease is in real danger," said Dr Mario Raviglione, the Director of the Stop TB Department of the WHO. "We are now at a crossroads between TB elimination within our lifetime, and millions more TB deaths."

Referring to the *WHO Tuberculosis Report 2012*, Dr Raviglione said: "In the space of 17 years, 51 million people have been successfully treated and cared for according to WHO recommendations. Without that treatment, 20 million people would have died."

The *WHO Tuberculosis Report 2012* features data from 204 countries and territories, and covers all aspects of TB, including multi-drug-resistant tuberculosis (MDR-TB), TB's links to HIV, research and development and financing.

Despite the progress, TB remains a major infectious killer, according to the report. Among its findings, the report notes there is continued decline in the number of people falling ill from TB, but still an enormous global burden, with 8.7 million new cases in 2011.

The report notes that there were an estimated 1.4 million deaths from TB in the past year, including half a million women,

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a programme, chronic unemployment, food insecurity, and natural disasters would pose continuous impediments to those seeking to emerge from poverty. Magdalena Sepúlveda and Olivier De Schutter, the UN Special Rapporteurs on extreme poverty and the right to food, respectively, urged the creation of a Global Fund for Social Protection, stating that 2% of the world's GDP would be enough to provide all the world's poor with basic social protection from the effects of unemployment, illness, disability, crop failure and soaring food costs.

Meningitis vaccine milestone

A revolutionary meningitis vaccine reached the 100 millionth person in December in a region of Africa that has been plagued by deadly epidemics for more than a century. The milestone took place in northern Nigeria, part of Africa's 'meningitis belt'. The historic achievement comes two years after the MenAfriVac vaccine was first launched in Burkina Faso. Since then, nine other countries have held vaccination campaigns to protect people from ages 1 to 29 against meningitis A.

Malaria prevention funding slows

The WHO reports that global funding for malaria prevention and control levelled off between 2010 and 2012, and progress in the delivery of some life-saving commodities has slowed. This comes in the wake of rapid expansion in malaria control between 2004 and 2009 during which a concerted effort by endemic countries, donors and global malaria partners saved 1.1 million lives during this period – 58% of these were in the ten highest burden countries. The *World malaria report 2012* says the slowdown could threaten to reverse the recent gains. MEH

underlining the disease as one of the world's top killers of women. It also points to persistently slow progress in the response to MDR-TB, with diagnosis of only one in five presumed cases worldwide.

The report also warns that there is a US$1.4 billion funding gap per year for research and development into new ways to combat TB – in addition to a $3 billion per year shortfall over 2013-2015, which could have severe consequences for TB control.

To address this, WHO is calling for targeted international donor funding and continued investments by countries themselves to safeguard recent gains and ensure continued progress. Currently, 90% of external donor financing for TB is provided by the UN-backed Global Fund to Fight AIDS, Tuberculosis and Malaria.

However, the report also offers reason for hope. It praises the worldwide roll-out of a new diagnostic device capable of testing patients for TB, including drug-resistant TB, in just 100 minutes. The fully automated nucleic acid amplification test (NAAT), which can diagnose TB and rifampicin-resistant disease, is now available in 67 low- and middle-income countries.

on the WEB WHO Tuberculosis Report 2012
www.who.int/tb/publications/global_report/en/index.html

New international treaty adopted to eliminate illegal tobacco trade

The delegates of more than 140 parties to the WHO Framework Convention on Tobacco Control (WHO FCTC) have adopted a new international treaty setting the rules for combating illegal trade through control of the supply chain and international cooperation. The Protocol to Eliminate Illicit Trade in Tobacco Products commits countries to establishing, as a central measure, a global tracking and tracing system to reduce the illicit trade of tobacco products.

"The elimination of all forms of illicit trade in tobacco products, including smuggling and illegal manufacturing, is an essential component of tobacco control," said Ricardo Varela, president of the Conference of the Parties (COP) to the WHO FCTC. "In adopting this new protocol today by consensus, countries have reiterated their historic commitment towards protecting the health of their citizens, particularly the young and vulnerable."

Dr Haik Nikogosian, head of the secretariat of the WHO FCTC, said: "Eradicating illicit trade in tobacco products constitutes a clear win-win situation for governments and their people. The new protocol establishes what actions constitute unlawful conduct and sets out related enforcement and international cooperation measures, such as licensing, information-sharing and mutual legal assistance that will help counteract and eventually eliminate illicit trade."

Product security for pharmaceuticals

Avery Dennison has launched a new anti-counterfeiting technology that enables existing serial numbers to be read directly through the label, providing an extra layer of product security for pharmaceutical brands.

The innovative thin and clear co-extruded film, called SharpTear, was designed for tamper-evident applications, where an easy tear is required in the label.

"The growth of internet sales, together with limited supplies of pharma products in some regions and significant price differentials, means that counterfeiting has become a very significant threat to all pharma brands," said Hans Eichenwald, senior product manager Specialty Segments at Avery Dennison Materials Group. "Today, around 10% of drugs sold are already counterfeit according to the World Health Organization. Sharp Tear offers a rapid and reliable way to secure both product safety and brand reputation without impacting productivity or product margins."

The product reveals tampering immediately by providing a seal that remains intact during normal handling, but which tears easily in one direction if attempts are made to open the package. It can either mask unwanted packaging information or allow important product details to be visible through the label. MEH

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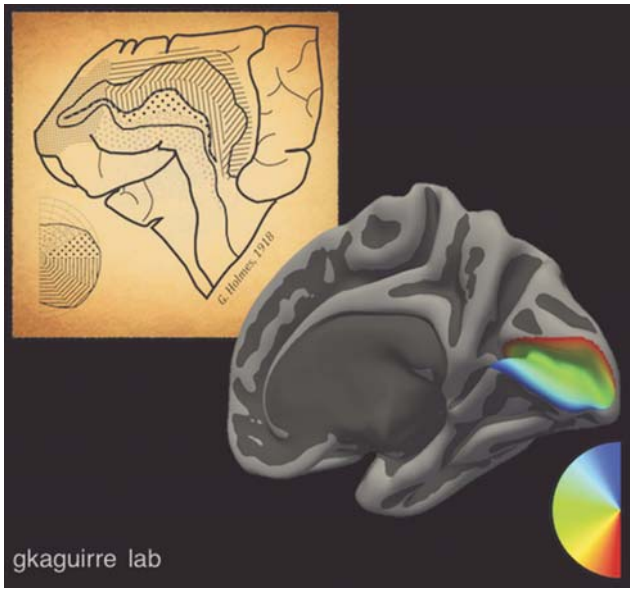

The modern map of the representation of vision in the brain is compared to the 1918 original.

Light shed on sight

Nearly 100 years after World War I neurologist, Gordon Holmes, first mapped the blind spots caused by missile wounds to the brains of soldiers, Perelman School of Medicine researchers at the University of Pennsylvania have perfected his map using modern-day technology. Their results create a map of vision in the brain based upon an individual's brain structure, even for people who cannot see. Among other things, this could help guide efforts to restore vision using a neural prosthesis that stimulates the surface of the brain.

Scientists frequently use a brain imaging technique called functional MRI (fMRI) to measure the seemingly unique activation map of vision on an individual's brain. This fMRI test requires staring at a flashing screen for many minutes while brain activity is measured, which is an impossibility for people blinded by eye disease. The Penn team has solved this problem by collecting traditional fMRI measures of brain activity from 25 people with normal vision. They then found a common mathematical description of the relationship between visual function and brain anatomy, thereby identifying a precise statistical relationship between the structure of the folds of the brain and the representation of the visual world.

Co-lead author Noah Benson, post-doctoral researcher in Psychology and Neurology at Perelman said: "At first, it seems like the visual area of the brain has a different shape and size in every person. Building upon prior studies of regularities in brain anatomy, we found that these individual differences go away when examined with our mathematical template."

Senior author Geoffrey Aguirre, assistant professor of Neurology, said: "By measuring brain anatomy and applying an algorithm, we can now accurately predict how the visual world for an individual should be arranged on the surface of the brain. We are already using this advance to study how vision loss changes the organisation of the brain."

● **doi:** 10.1016/j.cub.2012.09.014

Computer programme to prevent DVTs

Researchers at Johns Hopkins have devised a computerised checklist system to prevent potentially deadly blood clots in hospitalised trauma patients. According to the team, the programme, which help physicians identify and use the best methods of prevention, has been proven to dramatically reduce the number of dangerous venous thromboembolisms (VTEs) in patients.

The programme requires doctors to enter their patients' medical orders. Then, the automated checklist recommends evidence-based best treatments for each patient's needs, which usually involves the regular administration of low-dose blood thinners, or the use of compression devices to keep blood flowing in the legs. The researchers say this new system worked far better than previous methods, which included handing out laminated cards outlining best practices, or lectures on the topic.

The research team found a nearly two-fold improvement in prophylaxis orders among patients who had no contraindications to receiving low-dose blood thinners. Blood thinners are often not ordered in patients with bleeding risk, as they can exacerbate bleeding.

While the rate of pulmonary emboli, or PE events, stayed steady throughout the study period, the researchers found the rate of DVT (deep vein thrombosis) in legs dropped nearly 90%, from 2.26% of trauma patients to 0.25% of trauma patients.

Elliott R. Haut, MD, an associate professor of surgery at the Johns Hopkins University School of Medicine, and leader of the study, said: "VTE hits all segments of the population. All hospitalised patients are at risk for this complication and a huge number of these deadly clots are preventable if we give patients the right prophylaxis. We tried education alone for years and still only 40 to 60% of patients were getting optimal treatment."

More than 600,000 people get a VTE each year in the United States and one in six die as a result, more than the number who die annually from breast cancer, AIDS or in car crashes. In 2008, the US Surgeon General made a call to action to prevent DVT and PE. The Agency for Healthcare Research and Quality (AHRQ) has called appropriate prophylaxis the number one patient safety initiative needed to prevent in-hospital death.

Trauma patients are at a particularly high risk of developing DVT or PE, as risk factors for VTE include major surgery and extreme injury, especially to the spinal cord.

● **doi:** 10.1001/archsurg.2012.2024

Under anaesthetic, or just asleep?

A study by researchers at the Perelman School of Medicine at the University of Pennsylvania has demonstrated in an animal model that a commonly used inhaled anaesthetic drug, isoflurane, works by directly causing sleep-promoting neurons in the brain to activate, thereby hijacking our natural sleep circuitry. The findings are the latest work by investigators at the Center for Anesthesia Research at Penn who are exploring how anaesthetics interact

within the central nervous system to cause a state of unconsciousness.

"Despite more than 160 years of continuous use in humans, we still do not understand how anaesthetic drugs work to produce the state of general anaesthesia," said study author Max B. Kelz, assistant professor of Anesthesiology and Critical Care. "We show in this new work that a commonly used inhaled anaesthetic drug directly causes sleep-promoting neurons to fire. We believe that this result is not simply a coincidence. Rather, our view is that many general anaesthetics work to cause unconsciousness in part by commandeering the brain's natural sleep circuitry, which initiates our nightly journey into unconsciousness."

In the new study, Kelz and colleagues focused on a particular part of the brain, deep within the hypothalamus, which is known to increase in activity as one drifts off to sleep. Through a combination of direct electrical recording and other methods, they found that isoflurane boosts activity in this sleep-promoting brain area in mice. As further evidence of a connection, animals lacking the function of those neurons exhibited acute partial resistant to entering states of anaesthesia.

Being an anaesthesiologist himself, Kenz had long wondered just how accurate this notion of putting his patients to sleep really was. He said: "The development of anaesthetic drugs has been hailed as one of humankind's greatest discoveries in the last thousand years. Anaesthetics are annually given to over 230 million patients worldwide. Yet as a society, and even within the anaesthesia community, we seem to have lost our curiosity for how and why they work."

Clever medical tape for newborns

While commercial medical tapes are great at keeping medical devices attached to the skin, they can cause damage once it's time to remove them – especially to newborns and elderly who have fragile skin. However, a new quick-release tape designed by Brigham and Women's Hospital (BWH) offers the strong adhesion properties of commercial medical tape, but without the ouch factor upon removal.

BWH's Jeffrey Karp, senior study author in collaboration with The Institute for Pediatric Innovation, said: "Current adhesive tapes that contain backing and adhesive layers are tailored to fracture at the adhesive-skin interface. With adults the adhesive fails leaving small remnants of adhesive on the skin while with fragile neonate skin, the fracture is more likely to occur in the skin causing significant damage. Our approach transitions the fracture zone away from the skin to the adhesive-backing interface thus completely preventing any harm during removal."

The approach incorporates an anisotropic adhesive interface between the backing and adhesive layers. The anisotropic properties of this middle layer means that it has different physical properties dependent on direction. The researchers employed laser etching and a release liner to create the anisotropic interface resulting in a medical tape with high shear strength (for strong adhesion) and low peel force (for safe, quick removal).

the laboratory

Medical research news from around the world

Once the backing is peeled off, any remaining adhesive left on the skin can safely be rolled off with a finger.

Lead study author Bryan Laulicht said: "This is one of the biggest problems faced in the neonate units, where the patients are helpless and repeatedly wrapped in medical tapes designed for adult skin."

There are more than 1.5 million injuries each year in the United States caused by medical tape removal. Such injuries in babies and the elderly can range from skin irritation to permanent scarring.

Sensor detects early stage disease

Scientists have developed a prototype ultra-sensitive sensor that would enable doctors to detect the early stages of diseases and viruses with the naked eye, according to research from Imperial College London. According to their results, their visual sensor technology is ten times more sensitive than the current gold standard methods for measuring the specific biomarkers that indicate the onset of diseases such as prostate cancer and infection by viruses, including HIV. For instance, the sensor was able to detect minute levels of a biomarker called p24, which indicates HIV infection, in samples where patients had low viral loads. These low levels of p24 could not be diagnosed using existing tests such as the Enzyme-linked Immunosorbent Assay (ELISA) test and the gold standard nucleic acid based test.

The researchers say their sensor would benefit countries where sophisticated detection equipment is scarce, enabling cheaper and simpler detection and treatments for patients. Professor Molly Stevens, from the Departments of Materials and Bioengineering at Imperial College London, said: "It is vital that patients get periodically tested in order to assess the success of retroviral therapies and check for new cases of infection. Unfortunately, the existing gold standard detection methods can be too expensive to be implemented in parts of the world where resources are scarce. Our approach affords for improved sensitivity, does not require sophisticated instrumentation and it is ten times cheaper, which could allow more tests to be performed for better screening of many diseases."

The researchers also tested samples for the biomarker called Prostate Specific Antigen (PSA), which is an early indicator for Prostate Cancer. The team say the sensor can also be reconfigured for other viruses and diseases where the specific biomarker is known.

The sensor works by analysing serum, derived from blood, in a disposable container. If the result is positive for p24 or PSA, there is a reaction that generates irregular clumps of nanoparticles, which give off a distinctive blue hue in the solution inside the container. If the results are negative, the nanoparticles separate into ball-like shapes, creating a reddish hue. Both reactions can be easily seen by the naked eye.

Dr Roberto de la Rica, co-author of the study from the Department of Materials at Imperial College London, adds: "We have developed a test that we hope will enable previously undetectable HIV infections and indicators of cancer to be picked up, which would mean people could be treated sooner. We also believe that this test could be significantly cheaper to administer, which could pave the way for more widespread use of HIV testing in poorer parts of the world."

The next stage of the research will see the team approaching not-for-profit global health organisations, which could provide strategic direction and funding for manufacturing and distributing the sensor to low income countries.

● **doi:** 10.1038/nnano.2012.186

House dust triggers asthma

A bacterial protein in common house dust may worsen allergic responses to indoor allergens, according to research conducted by the National Institutes of Health and Duke University. The finding is the first to document the presence of the protein flagellin in house dust, bolstering the link between allergic asthma and the environment.

Study author Donald Cook said: "Most people with asthma have allergic asthma, resulting largely from allergic responses to inhaled substances. Although flagellin is not an allergen, it can boost allergic responses to true allergens."

After inhaling house dust, mice that were able to respond to flagellin displayed all of the common symptoms of allergic asthma, including more mucous production, airway obstruction, and airway inflammation. However, mice lacking a gene that detects the presence of flagellin had reduced levels of these symptoms.

"More work will be required to confirm our conclusions, but it's possible that cleaning can reduce the amount of house dust in general, and flagellated bacteria in particular, to reduce the incidence of allergic asthma," Cook said.

In addition to the mouse study, the research team also determined that people with asthma have higher levels of antibodies against flagellin in their blood than do non-asthmatic subjects, which provides more evidence of a link between environmental factors and allergic asthma in humans.

● **doi:** 10.1038/nm.2920

Linguists have stronger brain power

At the Swedish Armed Forces Interpreter Academy, young recruits learn a new language at a very fast pace. By measuring their brains before and after the language training, a group of researchers have had an almost unique opportunity to observe what happens to the brain when we learn a new language in a short period of time.

At the Swedish Armed Forces Interpreter Academy in the city of Uppsala, young people with a flair for languages go from having no knowledge of a language such as Arabic, Russian or Dari to speaking it fluently in the space of 13 months. From morning to evening, weekdays and weekends, the recruits study at a pace unlike on any other language course.

As a control group, the researchers used medicine and cognitive science students at Umeå University – students who also study hard, but not languages. Both groups

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were given MRI scans before and after a three-month period of intensive study. While the brain structure of the control group remained unchanged, specific parts of the brain of the language students grew. The parts that developed in size were the hippocampus, a deep-lying brain structure that is involved in learning new material and spatial navigation, and three areas in the cerebral cortex.

Johan Mårtensson, a researcher in psychology at Lund University, Sweden, said: "We were surprised that different parts of the brain developed to different degrees depending on how well the students performed and how much effort they had had to put in to keep up with the course."

Students with greater growth in the hippocampus and areas of the cerebral cortex related to language learning (superior temporal gyrus) had better language skills than the other students. In students who had to put more effort into their learning, greater growth was seen in an area of the motor region of the cerebral cortex (middle frontal gyrus). The areas of the brain in which the changes take place are thus linked to how easy one finds it to learn a language and development varies according to performance.

Previous research from other groups has indicated that Alzheimer's disease has a later onset in bilingual or multilingual groups. "Even if we cannot compare three months of intensive language study with a lifetime of being bilingual, there is a lot to suggest that learning languages is a good way to keep the brain in shape", said Johan Mårtensson.

● **doi:** 10.1016/j.neuroimage.2012.06.043

Researchers study new treatment for depression

Australian researchers at Monash Alfred Psychiatry Research Centre (MAPrc) are studying the potential of using Magnetic Seizure Therapy (MST) as an alternative treatment for depression, the results of which could directly benefit the 30% of patients suffering from depression who don't respond to traditional treatment.

Professor Paul Fitzgerald, deputy director of MAPrc and study lead, said depression affects up to one in five Australians during their lifetime. "Electroconvulsive Therapy (ECT) is one of the only established interventions for treatment resistant depression," he said. "But use of ECT is limited due to the presence of memory-related side effects and associated stigma."

For this reason, the MAPrc researchers began exploring new treatment options. MST is a brain-stimulation technique that may have similar clinical effects to ECT without the unwanted side effects.

"In MST, a seizure is induced through the use of magnetic stimulation rather than a direct electrical current like ECT. Magnetic fields are able to pass freely into the brain, making it possible to more precisely focus stimulation," Professor Fitzgerald said. "By avoiding the use of direct electrical currents and inducing a more focal stimulation, it is thought that MST will result in an improvement of depressive symptoms without the memory difficulties seen with ECT."

The study found that MST resulted in an overall significant reduction in depression symptoms; 40% showed overall improvement and 30% showed some improvement. None of the trial participants complained of cognitive side effects.

Professor Fitzgerald and his team have received funding to carry out a large-scale trial on MST as an alternative treatment for depression.

Diabetes study cut short

An intensive diet and exercise program resulting in weight loss does not reduce cardiovascular events such as heart attack and stroke in people with longstanding type 2 diabetes, according to a study supported by the US National Institutes of Health.

The Look AHEAD (Action for Health in Diabetes) study tested whether a lifestyle intervention resulting in weight loss would reduce rates of heart disease, stroke, and cardiovascular-related deaths in overweight and obese people with type 2 diabetes, a group at increased risk for these events.

Researchers at 16 centres across the United States worked with 5,145 people, with half randomly assigned to receive an intensive lifestyle intervention and the other half to join a general programme of diabetes support and education. Both groups received routine medical care from their own health care providers.

Although the intervention did not reduce cardiovascular events, Look AHEAD has shown other important health benefits of the lifestyle intervention, including decreasing sleep apnoea, reducing the need for diabetes medications, helping to maintain physical mobility and improving quality of life.

Dr Rena Wing, chair of the Look AHEAD study and professor of psychiatry and human behavior at Brown University, said: "Look AHEAD found that people who are obese and have type 2 diabetes can lose weight and maintain their weight loss with a lifestyle intervention. Although the study found weight loss had many positive health benefits for people with type 2 diabetes, the weight loss did not reduce the number of cardiovascular events."

Participants in the intervention group lost an average of more than 8% of their initial body weight after one year of intervention. They maintained an average weight loss of nearly 5% at four years, an amount of weight loss that experts recommend to improve health. Participants in the diabetes support and education group lost about 1% of their initial weight after one and four years.

In September 2012, the NIH stopped the intervention arm, acting on the recommendation of the study's data and safety monitoring board. At the time, participants had been in the intervention for up to 11 years. Because there was little chance of finding a difference in cardiovascular events between the groups with further intervention, the board recommended stopping the intensive lifestyle intervention, but encouraged the study to continue following all Look AHEAD participants to identify longer-term effects of the intervention.

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Medical research news from around the world

Diabetes reversed in mice

New research has found that a type of anti-tumour immune cell protects against obesity and the metabolic syndrome that leads to diabetes. Results show that natural killer T-cells (iNKT) – immune cells known to be protective against malignancy – are lost when humans become obese, but can be restored through weight loss. Marie Curie Fellow, Lydia Lynch at Trinity College Dublin, Ireland, made the discovery and has shown that therapies that activate iNKT cells could help manage obesity, diabetes, and metabolic disease.

iNKT cells had been thought to be rare in humans until work by Dr Lydia Lynch and others found they were plentiful in human omental fat and in fat tissue from mice. Dr Lynch said: "Now we have identified a role for these cells in the regulation of body weight and the metabolic state, likely by regulating inflammation in adipose tissue."

The team also discovered that a lipid called alpha-galactosylceramide (aGC) can lead to a dramatic improvement in metabolism, weight loss, and fatty liver disease, and can reverse diabetes by bolstering cells that have been depleted.

Dr Lynch first began this line of investigation in 2007 when her work at St Vincent's University Hospital, Dublin, focused on the immune systems of obese patients. "We knew that not only did obese patients have more heart attacks and a greater incidence of type 2 diabetes than lean individuals, but they also developed more infections than non-obese individuals," she said.

Blood samples taken from these patients revealed that both NKT cells and iNKT cells were decreased, and subsequent studies of fat tissue from a group of obese patients who had lost weight following bariatric surgery showed that iNKT cells had increased to normal levels.

The research team put a study group of mice on a high-fat diet and studied the outcome. Dr Lynch said: "Similar to the human subjects we had previously studied, the animals lost their iNKT cells when they became obese. Once we took them off this diet and put them back on a normal standard-fat diet, they lost the weight and their iNKT cells increased."

In the next experiment, the authors set out to better understand the exact role of the iNKT cells by examining two strains of mice, both of which are deficient in iNKT cells, and a group of control mice, all on a high-fat diet.

Although all the animals grew obese, the iNKT-deficient mice grew 30% fatter than the control animals and developed the mouse equivalent of type 2 diabetes over just six weeks. The mice also had greatly increased triglyceride levels, larger fat cells, and fatty liver disease.

Next, the authors removed iNKT cells from a normal mouse and injected them into obese NKT-deficient mice.

"We actually reversed diabetes, and even though the mice continued to eat a high-fat diet, they lost one to two grams of weight (normal mouse weight being 20 to 25 grams) and exhibited a host of features that suggested reduced inflammation, including improved insulin sensitivity, lower triglycerides and leptin, and shrunken adipocytes," Dr Lynch said.

Finally, in order to demonstrate if the remaining diminished pool of iNKT cells in obesity could be activated to improve metabolism, the scientists tested aGC, a lipid known to activate iNKT cells. They found that administering a single dose of aGC caused a dramatic improvement in metabolism and fatty liver disease, loss of much of the weight gained, and reversal of diabetes in the obese animals.

● **doi:** 10.1016/j.immuni.2012.06.016

Trial looks at stem cells from unrelated donors

A two-year clinical trial by Moffitt Cancer Centre and the Blood and Marrow Transplant Clinical Trials Network compared survival probabilities for patients transplanted with peripheral blood stem cells, or bone marrow stem cells, from unrelated donors.

The goal was to determine whether graft source, (peripheral blood stem cells or bone marrow), affects outcomes in unrelated donor transplants for patients with leukemia or other hematologic malignancies.

Fifty transplant centres in the United States and Canada participated in this phase III study, which randomized 278 patients to receive bone marrow and 273 patients to receive peripheral blood stem cells. According to the trial analyses, there were no observed differences in overall survival, relapse, non-relapse mortality, or acute graft-versus-host disease (GHVD) between the patients receiving peripheral blood stem cells or bone marrow stem cells from unrelated donors.

GVHD is a serious and often deadly post-transplant complication that occurs when the newly transplanted donor cells attack the transplant recipient's body.

While engraftment was faster in patients receiving peripheral blood stem cells, there was a higher incidence of overall chronic GVHD in these patients (53%) than in those transplanted with bone marrow stem cells (40%). Patients receiving transplants of peripheral blood stem cells from unrelated donors also had a higher incidence of chronic GVHD affecting multiple organs (46%) than patients who received bone marrow stem cells (31%).

Claudio Anasetti, lead author and chair of the Department of Blood and Marrow Transplant at Moffitt Cancer Center, said: "Although peripheral blood stem cells from related donors have demonstrated clinical benefits, our trial demonstrates that when these stem cells originate from unrelated donors, they are not superior to bone marrow stem cells in terms of patient survival, and they increase the risk for chronic GVHD. More effective strategies to prevent GVHD are needed to improve outcomes for all patients receiving unrelated donor transplants."

About one-third of patients who need a peripheral blood stem cell or bone marrow transplant for treatment of leukaemia or another blood disease are able to secure a related donor. According to the National Marrow Donor Program, for the 70% who cannot find a donor within their family, most will be able to find an unrelated donor.

● **doi:** 10.1056/NEJMoa1203517

The Center for Cancer Care at American Hospital Dubai

Cancer not only affects your health, but also your family and lifestyle. Understanding this, the Center for Cancer Care at American Hospital Dubai has launched the first Linear Accelerator Unit serving Radiation Therapy patients in Dubai.

The Center delivers advance and multi-disciplinary cancer care and is directed by Dr. Salim Chaib Rassou, a Radiation Oncologist who undertook specialties in Radiation Oncology, Breast Pathology and Breast Imaging and has garnered years of experience in France prior to joining American Hospital Dubai in 2011.

With the addition of the RapidArc® Linear Accelerator, Dr. Chaib Rassou and his team can offer radical treatment options. This technology delivers treatments faster and with more precision, a winning combination that enables physicians to improve the standard of care and treat patients more comfortably.

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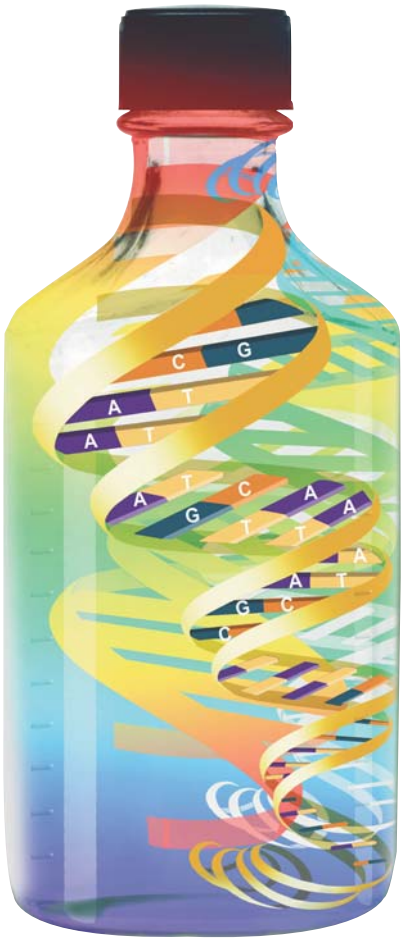
Genetic research news from around the world



Reprogramming cells moves a step forward

The idea of taking a mature cell and removing its identity (nuclear reprogramming), so that it can then become any kind of cell, holds great promise for repairing damaged tissue, or replacing bone marrow after chemotherapy. Hot on the heels of his recent Nobel prize, Dr John B. Gurdon has published research showing that histone H3.3 deposited by the histone-interacting protein HIRA is a key step in reverting nuclei to a pluripotent type, capable of being any one of many cell types. The research was published October 28, 2012 in BioMed Central's open access journal *Epigenetics & Chromatin*.

One way to reprogram DNA is to transfer the nucleus of a mature cell into an unfertilised egg. Proteins and other factors inside the egg alter the DNA, switching some genes on and others off until it resembles the DNA of a pluripotent cell. However, there seems to be some difficulties with this method in completely wiping the cell's 'memory'.

One of the mechanisms regulating the activation of genes is chromatin and in particular histones. DNA is wrapped around histones; alterations in how the DNA is wound changes which genes are available to the cell.

In order to understand how nuclear reprogramming works Dr Gurdon's team transplanted a mouse nucleus into a frog oocyte (Xenopus laevis). They added fluorescently tagged histones by microinjection, so that they could see where in the cell and nucleus the these histones collected.

Dr Gurdon said: "Using real-time microscopy it became apparent that from 10 hours onwards H3.3 (the histone involved with active genes) expressed in the oocyte became incorporated into the transplanted nucleus. When we looked in detail at the gene Oct4, which is known to be involved in making cells pluripotent, we found that H3.3 was incorporated into Oct4, and that this coincided with the onset of transcription from the gene." The team also found that Hira, a protein required to incorporate H3.3 into chromatin, was also required for nuclear reprogramming.

Dr Steven Henikoff, from the Fred Hutchinson Cancer Research Center, commented: "Manipulating the H3.3 pathway may provide a way to completely wipe a cell's 'memory' and produce a truly pluripotent cell. Half a century after showing that cells can be reprogrammed this research provides a link to the work of Shinya Yamanaka (who shared the prize), and suggests that chromatin is a sticking point preventing artificially induced reprogramming being used routinely in the clinic."

Immune system plays a part in AMD

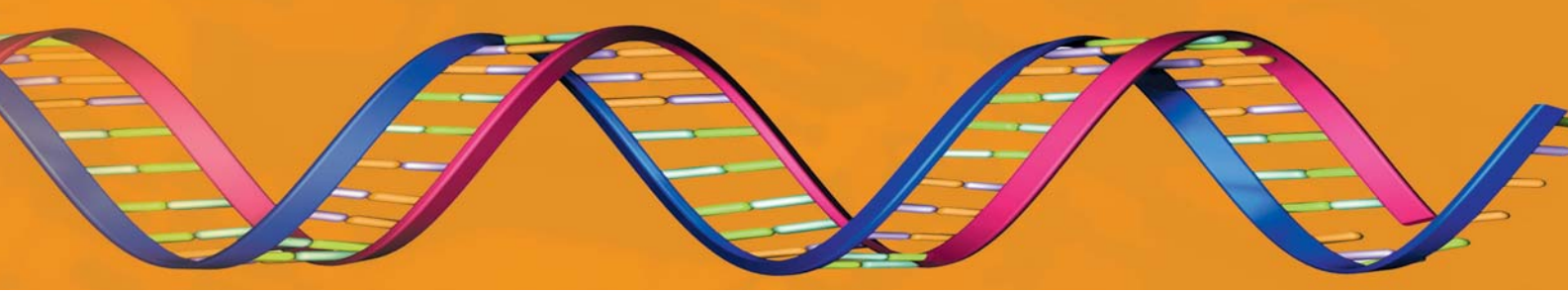
Changes in how genes in the immune system function may result in age-related macular degeneration (AMD), the leading cause of visual impairment in older adults, based on preliminary research conducted by researchers of the US National Institutes of Health (NIH).

"Our findings are epigenetic in nature, meaning that the underlying DNA is normal but gene expression has been modified, likely by environmental factors, in an adverse way," said Dr Robert Nussenblatt, chief of the National Eye Institute (NEI) Laboratory of Immunology. Environmental factors associated with AMD include smoking, diet, and ageing. The study identified decreased levels of DNA methylation, a chemical reaction that switches off genes, on the interleukin-17 receptor C gene (IL17RC). The lack of DNA methylation led to increased gene activity and, in turn, increased levels of IL17RC proteins in patients with AMD. IL17RC is a protein that promotes immune responses to infections, such as fungal attacks.

Recent studies have identified several genes with alterations that increase the risk of developing the disease. In addition, environmental risk factors have also been suggested as possible causes of the disease. One explanation may be that environmental exposures influence DNA methylation, which regulates gene expression. Changes in this process may result in the production of too much or too little of a gene's protein, leading to cellular dysfunction and disease. Changes in DNA methylation have been implicated in cancer, lupus, multiple sclerosis, and many other diseases.

To test whether changes in DNA methylation might play a role in AMD, the investigators evaluated three pairs of twins – one pair identical and two pairs fraternal – where only one of the siblings had AMD. When compared with the unaffected twins, methylation patterns were altered in 231 genes of affected twins. This finding is consistent with the hypothesis that environmental exposures may epigenetically regulate expression of many genes and lead to AMD.

Among the 231 genes, the investigators found that DNA methylation was absent in a region of the IL17RC gene in twins with AMD. The lack of methylation in the IL17RC gene led to increased gene activity and, in turn, increased levels of its protein in circulating blood. Based on these results, the authors propose that chronic increased



levels of the IL17RC protein in the retina likely promote inflammation and recruitment of immune cells that damage the retina and lead to AMD.

The investigators next plan to evaluate what environmental factors may be responsible for the regulation of IL17RC and how the epigenetic regulation leading to the chronic inflammation in AMD patients can be reversed by novel therapies. They will also evaluate the role of epigenetics in other eye diseases.

Genetic link found for uterine cancer

Researchers from the US-based National Human Genome Research Institute (NHGRI), have identified several genes that are linked to one of the most lethal forms of uterine cancer, serous endometrial cancer. The researchers describe how three of the genes found in the study are frequently altered in the disease, suggesting that the genes drive the development of tumours.

Cancer of the uterine lining, or endometrium, is the most commonly diagnosed gynaecological malignancy in the United States. Also called endometrial cancer, it is diagnosed in about 47,000 American women and leads to about 8,000 deaths each year.

Each of its three major subtypes – endometrioid, serous and clear-cell – is caused by a different constellation of genetic alterations and has a different prognosis. Endometrioid tumours make up about 80% of diagnosed tumours and is usually diagnosed at an early stage and treated with surgery.

Compared to other subtypes, the 2 to 10% of uterine cancers that comprise the serous subtype do not respond well to therapies. The five-year survival rate for serous endometrial cancer is 45%, compared to 65% for clear-cell and 91% for endometrioid subtypes.

Serous and clear-cell endometrial tumour subtypes are clinically aggressive and quickly advance beyond the uterus.

To determine which genes are altered in serous endometrial cancer, the team, headed up by Dr Daphne W. Bell from the Reproductive Cancer Genetics Section of NHGRI's Cancer Genetics Branch, undertook a comprehensive genomic study of tumours by sequencing their exomes, the critical 1 to 2% of the genome that codes for proteins.

They began their study by examining serous tumour tissue and matched normal tissue from 13 patients. National Cancer Institute and Massachusetts General Hospital pathologists processed the 26 tissue samples, which subsequently underwent whole-exome sequencing at the NIH Intramural Sequencing Center.

Then the researchers filtered through millions of data points to locate alterations, or mutations. They disqualified from the analysis any mutation found in a tumour and its matched healthy tissue, looking expressly for mutations that occurred exclusively in the tumour cells.

They also eliminated one of the 13 tumours from analysis because its exome had hundreds more unique mutations than any other tumour.

The researchers detected more than 500 somatic mutations within the remaining 12 tumours. They next looked for genes that were mutated in more than one of the tumours.

Dr Bell said: "When you identify a set of mutations, they could either be drivers that have caused the cancer or incidental passengers that are of no consequence; our goal is to identify the drivers. One way to do this is to home in on genes that are mutated in more than one tumour, because we know from experience that frequently mutated genes are often driver genes."

The team felt confident that alterations in nine genes could be driver genes in serous endometrial cancer. Three of the nine genes had previously been recognised by researchers in the cancer genetics field as a cause of serous endometrial cancer. To get a clearer picture of driver gene status among the other six genes, the researchers sequenced each gene in 40 additional serous endometrial tumours. They discovered that three of the six genes – CHD4, FBXW7 and SPOP – are altered at a statistically high frequency in serous endometrial cancer.

The team also found that this set of three genes is mutated in 40% of the serous endometrial cancer tumours and in 15 to 26% of the other endometrial cancer subtypes.

Researchers identify origin of chronic lymphocytic leukaemia

Researchers of Blueprint consortium have deciphered the first epigenomes of chronic lymphocytic leukaemia. The research, published in Nature Genetics, involved whole-genome DNA methylation analysis of 140 patients and identified the cell of origin of the disease as well as new molecular mechanisms involved in its development. This research, directed by Iñaki Martin-Subero from Universidad de Barcelona and IDIBAPS, represents the first collaborative effort between two European high-impact research initiatives, such as the EU-funded Blueprint Consortium and the CLL Genome Project funded by the Spanish Government. These two initiatives are set within the context of two world-wide Consortia, the International Human Epigenome Consortium and the International Cancer Genome Consortium, respectively.

Elias Campo, co-coordinator of the Spanish CLL Genome Project, said: "In the previous research activities of Spanish CLL Genome Consortium we focused on the analysis of mutated genes involved in the development of this disease. Now, thanks to our work within the Blueprint Consortium, we have analysed the full DNA methylome of CLL. This approach has allowed us to identify the cells of origin of this kind of leukaemia and to discover new mechanisms that contribute to its development."

Dr Lopez-Otin, co-coordinator of the CLL Project, said: "Our previous genetic studies identified over 1,000 genes mutated in the chronic lymphocytic leukaemia, whereas this epigenomic analysis has allowed us to detect over a million epigenetic changes in this disease. This unexpected finding indicates that the epigenome of the cell suffers a massive shift during leukaemia development."

● **doi:**10.1038/ng.2443 MEH

business monitor

Medical business news from around the world

Medtronic buys Chinese med companies

Weeks after it agreed to an US$816m deal for the acquisition of Chinese orthopaedic implant maker China Kanghui Holdings, US company Medtronic completed another business transaction reaffirming its company interest in the Chinese medical devices market. This time, the Minneapolis-based firm entered into a strategic alliance with LifeTech Scientific Corporation, a recognised industry leader in China, which is rapidly becoming one of the world's largest device markets.

Under the terms of the deal, Medtronic purchased 19% equity interest in LifeTech, and will receive the right to distribute current and future LifeTech products. In addition, Medtronic will have the opportunity to acquire additional ownership of LifeTech through the achievement of certain financial, or development milestones.

The deal is a bargain from Medtronic's standpoint, as the company will purchase its initial equity investment in LifeTech of approximately $46.6m at about HKD3.80 ($0.49) per share. This is approximately 23.7% less than the closing price of LifeTech's shares on the last day of trading before the alliance was announced (October 11, 2012).

LifeTech's executive director and chief executive officer, Zhao Yiwei, said: "An alliance with Medtronic provides LifeTech with access to world-class expertise and leading-edge technologies, and allows us to expedite bringing those technologies to patients who need them in China and global markets."

The alliance has strengthened Medtronic's position in China, thereby enabling it to increase its market share and sales in the country. Furthermore, the deal will provide the company with a wider coverage of other emerging markets if it successfully leverages LifeTech's current sales and distribution networks in the region. This would bring Medtronic closer to its goal of obtaining 20% of its annual sales from emerging markets by 2016.

Brainlab partners with Elekta

At the opening of the 2012 Congress of Neurological Surgeons (CNS) Annual Meeting in Chicago, radiosurgery and neurosurgery innovators Elekta and Brainlab announced a collaboration which will enable neurosurgeons and radiation oncologists to use Brainlab's iPlan software together with Elekta's Leksell GammaPlan treatment planning for Gamma Knife radiosurgery.

Through the collaboration, clinicians will be given the option to add the functionality of iPlan RT Image to the optimised dosimetry and precision of Leksell GammaPlan treatment planning. iPlan, including multimodality image fusion, contouring, atlas-based auto segmentation, fibre tracking and BOLD fMRI analysis, brings additional tools to account for organs-at-risk and other important anatomical and functional structures in the brain.

University of California San Francisco (UCSF) is the first institution to use iPlan pre-planning functionality with Leksell GammaPlan. Andrew T. Parsa, UCSF professor and vice chairman of Neurological Surgery said: "We are very excited at the possibility to complement our Gamma Knife radiosurgery treatment planning with advanced software features that have already provided an impact within our surgical environment."

Igor J. Barani, UCSF clinical research director and vice chair of the Department of Radiation Oncology, added: "With the iPlan RT data enrichment enabled for GammaPlan, we get additional tools to optimise functional sparing and the best ablative treatment for tumours."

Commenting on the collaboration, Âsa Hedin, executive vice president for Elekta Neuroscience said: "iPlan offers additional options to prepare data for treatment planning in GammaPlan. Many Gamma Knife users are already familiar with iPlan, and may now choose to also use the pre-planning tools in conjunction with Gamma Knife radiosurgery. In addition, this collaboration enables neurosurgeons who use Brainlab navigation to interact more easily with Gamma Knife radiosurgery."

Elekta and Philips integrate cancer technology

Elekta AB and Royal Philips Electronics announced they will expand a joint programme to develop a breakthrough in cancer care with an imaging-treatment platform that merges radiation therapy and magnetic resonance imaging (MRI) technology in a single treatment system. The programme for development will include a research consortium of leading radiation oncology centres and clinicians, which includes the University Medical Center Utrecht (the Netherlands).

The consortium's mission will be to merge precision radiation delivery with MRI in a single MRI-guided radiation therapy system. This will enable doctors to achieve exceptional soft tissue imaging during radiation therapy and to adapt treatment delivery in real-time for extremely precise cancer treatments.

Tomas Puusepp, president and CEO of Elekta, said: "The need to maximise therapeutic radiation on the target, while minimising the exposure of healthy tissue is entirely driven by the best interests of the patient – they deserve the best

chance for a cure and an improved quality of life. Elekta and Philips are leaders in the global healthcare community with a complete spectrum of expertise to fulfil this vision."

Working with University Medical Center Utrecht, the medical device companies have built and tested a prototype system that integrates a linear accelerator and a 1.5 Tesla MRI system. The success of early tests has enabled the project to move to the next phase of development and testing by a select group of consortium partners.

GE Healthcare acquires ultrasound breast screening tech company

GE Healthcare has acquired U-Systems, a manufacturer of ultrasound products specifically designed for breast applications.

With operations in Sunnyvale, CA and Phoenix, AZ, U-Systems has developed the somo.v Automated Breast Ultrasound (ABUS), the first and only ultrasound system approved in the US for breast cancer screening as an adjunct to mammography for asymptomatic women with breast density of more than 50% tissue and no prior breast interventions. Financial terms were not disclosed.

Tom Gentile, president and CEO of GE Healthcare Systems, said: "In addition to digital mammography and breast MR, GE can now offer breast screening ultrasound technology to our customers to help in early detection, which provides for more treatment options."

According to a published study in the New England Journal of Medicine, women with dense tissue in 75% or more of the breast have a risk of breast cancer four to six times as great as the risk among women with little or no dense tissue. Since dense breast tissue decreases mammography's effectiveness in detection, the somo.v ABUS has proven to be a tremendous advancement in the visualisation of cancer-hiding tissue in dense breasts.

"What 3D ultrasound will allow us to do is to help us use the information that we get from mammography and integrate that information together with the information we get from ultrasound to find more cancers," said Dr Rachel Brem, principal investigator of the SOMO-INSIGHT clinical study, which examined whether Full Field Digital Mammography along with the somo.v could improve breast cancer detection when compared to mammography alone in women with dense breasts. "Recently completed studies demonstrated with the addition of somo.v ABUS we find about 30% more cancers in women who have a normal mammogram, normal physical examination and dense breasts. For the women who have dense breasts, this is a significant advancement in their breast healthcare."

The somo.v ABUS received approval by the Food and Drug Administration (FDA) in September 2012 for breast cancer screening in the United States, and has also been indicated for screening in Canada and the European Union.

Maquet and Richard Wolf cooperate on sales

Maquet and Richard Wolf have announced a non-exclusive sales cooperation on a regional level. By joining forces, both companies will be in the unique position to offer complete, efficient and high-quality OR integration solutions for endoscopy.

Both companies have significant market share in their respective fields of expertise. Maquet offers a full range of products for the OR from tables, lights and ceiling supply units to intraoperative media management. Richard Wolf is one of the world's leading manufacturers of endoscopic equipment, providing best-in-class integrated solutions for minimally invasive surgery in all major surgical disciplines.

The announcement introduces the integration of Richard Wolf's endoscopy tower, including the device control solution core.control, into Maquet's TEGRIS system for OR integration. This combined solution will significantly improve intraoperative efficiency by streamlining device control and overall OR management, thereby accelerating procedures and making them safer by allowing the OR staff to concentrate on their primary task.

Bastian Diebald, head of Maquet's OR Integration Global Sales, said: "This stable cooperation provides an exciting opportunity for our two companies to combine forces and bring a lot more value to our customers."

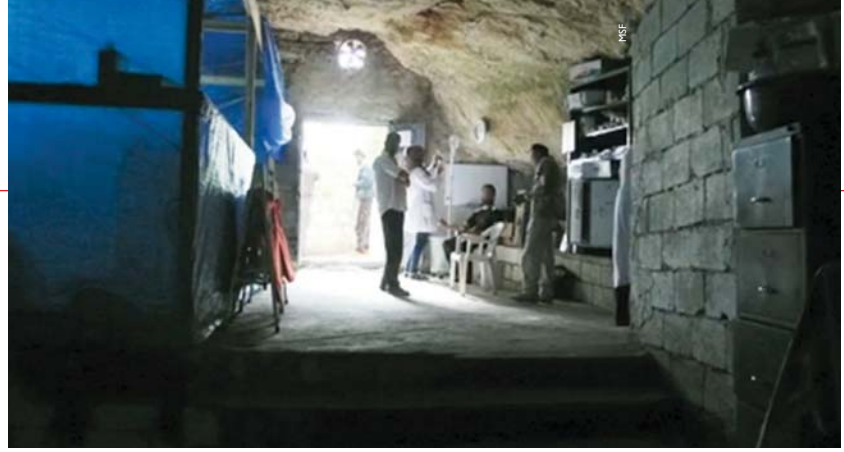
Mederi Therapeutics to distribute in Saudi Arabia

Mederi Therapeutics has signed an exclusive agreement with Farouq, Maamoun, Tamer & Co., for distribution of its minimally invasive therapies in the Kingdom of Saudi Arabia. Mederi manufactures the Stretta System for treatment of Gastroesophageal Reflux Disease (GERD), and the Secca System for Bowel Incontinence or Bowel Control Disorder (BCD).

Talaat El-Alfi, managing director of the Medical at Tamer Group, said: "As a result of a very successful physician training workshop, in which all patients treated with Stretta and Secca showed complete elimination of their symptoms, or marked improvement, Tamer is delighted to represent Mederi in the KSA. The reaction of the physicians and patients to these treatments has been tremendously enthusiastic."

Professor Mohammad Q. from Riyadh, said: "I was so impressed with the data on Stretta and the treatments I performed that I decided to have Stretta performed on me. I have suffered with symptoms of GERD for many years. Shortly after my Stretta procedure, I had remarkable relief of GERD symptoms. I couldn't be more pleased with my own outcome, and especially with the outcomes of the patients we treated."

Will Rutan, CEO of Mederi, said: "The addition of KSA brings the number of countries where the new Stretta and Secca are available to more than 35. We are very pleased with the rapid and widespread adoption of the second generation Stretta and Secca systems." MEH



Surgery in a cave

Treating the wounded in the Syrian civil war

British surgeon **Paul McMaster** recently returned from Syria, where he treated the wounded in an operating theatre set up by *Médecins Sans Frontières/Doctors Without Borders (MSF)* in a cave and then on a farm. Though McMaster has experience working in war zones, in Syria he found a "more oppressive type of danger". He reflects on his experiences.

I flew into Turkey, and then we went up to the low mountains near the border, where we were picked up by a guide who took us through forests and hills into Syria.

MSF has four surgical teams working in the conflict zone in northwest Syria. Our team was working in a cave. We went in through a very small entrance. Inside, there was an inflatable operating tent and six emergency beds. Everything took place in that area, and it was often hectic and difficult for people to move around. Still, it was remarkable to have created a sterile environment, with all the right surgical equipment, in what was essentially a dusty chalk cave.

We were staying 15 minutes away in a very small village. Most of us were sleeping on the floor in the basement room of the mosque. The villagers were happy for us to be there. Every day a lady in the village cooked a whole lot of flat bread, so we lived on that, and beans.

Quite a lot of the population had left the area for refugee camps on the other side of the border in Turkey. But there were still significant numbers of older people, women, and children remaining, and these are the areas that are being rocketed and bombed from helicopters.

The helicopters travel around slowly and hover over towns before dropping large bombs and these things cascade down and cause an enormous blast and destroy buildings. The bombing of the towns and villages was happening every day.

When they explode in the mountains, the bombs create enormous explosions of sound which reverberate through the hills and are clearly very frightening for people. On our last morning in the cave, several landed within a couple of hundred metres of us, shaking the cave and bringing down dust. You didn't quite know whether you were better off outside or inside. It's very unsettling for everybody, especially for wounded patients and children.

On our team there was a surgeon, an anaesthetist, an emergency nurse, two doctors, a Syrian nurse in her early 30s who was just inspirational -- never tired, always organised, always smiling – and about 11 young women from the villages who we were slowly training to do basic nursing.

The majority of our patients were civilians – old people, women, children, babies. Many had been wounded in bombings and had shrapnel injuries. Sometimes the injuries weren't physically serious, but emotionally and psychologically they were very damaging indeed.

One night we were called in and there were two distraught women with three screaming babies. Their house had been literally demolished by a bomb, and these children had shrapnel wounds to their faces – the wounds were not life threatening, but they were in great distress and anguish.

Another night a man in his late 30s was brought in by a very excitable crowd of fighters. He'd been shot through his chest, we had very limited blood supplies, and his condition was so unstable that I doubted he'd make it through the night. But he pulled through and the determination he showed was quite remarkable.

I remember another man who came in with severe shrapnel wounds to his leg. The blast had gone through his leg and damaged the main nerve, but not the main blood vessel. He had lost two or three of his family in the blast. We operated on him, but afterwards he lost all motivation to get better – he'd lost his home, he'd lost many of his family, and

he faced a potentially crippling injury. It's really very difficult for people.

Over the last five or six weeks, we did about 100 operations and treated many more casualties. We also saw diabetics who had run out of medication, children with asthma, women who needed Caesarean sections. These people have had no access to effective health care for over a year. Some people might be able to make it over the mountains to Turkey to get treatment, but for many that's just not an option.

When you're faced with casualties, the surgery is fairly straightforward. You do what's called damage limitation surgery to stop haemorrhages and deal with damaged internal organs. The difficulty came when we moved to the reconstructive phase – things like physiotherapy and rehabilitation and more complex orthopaedics – this was work we just couldn't do in the cave.

You can get overwhelmed. When it became fairly clear that medically we were struggling to cope with the patients in the cave, we closed it and transferred our patients and the team to a new location. It was a farm – so not a great upgrade.

The new hospital was a long, open building, and in the space of just four or five days, the logisticians managed to create an inflatable operating theatre, an emergency triage area, a sterilization unit, an outpatient consulting area, and an inpatient and recovery area – it was a staggering achievement.

It wasn't perfect, it still looked a bit like a farm, but it created much more space to treat casualties. We moved half the patients on Thursday and the rest on Friday, and by Saturday we were operating in the new location.

I've worked in many difficult places with MSF – war zones like Sri Lanka, Ivory Coast, and Somalia – but while in those countries it was dangerous on the ground, in Syria the danger always comes from the air. It's a much more oppressive type of danger, having a helicopter hovering in the sky above you.

Many of the towns are like ghost towns, with the buildings blasted or destroyed. There's a hopeless, desperate air about the place. Most people are living in cellars. They've had no electricity for eight or nine months. It's very bleak indeed and winter is beginning now. I think people are really going to struggle, and the most vulnerable will struggle most. For the civilian population, trying to light little fires in their basements, it's going to be a very long, hard, cold, dangerous winter. MEH

Providing healthcare to Syrian refugees in Domeez camp, Iraq

As the crisis in Syria intensifies, people continue to flee to neighbouring countries. More than 50,000 Syrians have sought refuge in Iraq, including 42,000 in the Kurdistan region where many live in overcrowded camps.

Domeez camp, near the city of Dohuk in the Kurdish region of Iraq, was set up at the beginning of 2012 and is home today (November 2012) to nearly 15,000 Syrian refugees of Kurdish origin. Since May 2012, MSF has been running a 24-hour clinic in the camp, in collaboration with Dohuk's Department of Health. Today, MSF is the camp's main health provider, offering medical consultations and mental healthcare to the refugees, and providing training for local health staff. To date, MSF teams have provided over 20,500 consultations.

"Until June there were about 2,000 people settled in Domeez, and the camp was running well," says Anja Wolz, MSF field coordinator in Dohuk. "But in August, the situation deteriorated because of a sudden massive arrival of refugees. With up to 1,000 people crossing the border each day, the camp quickly became overcrowded and, despite the efforts of the authorities, the level of assistance was clearly insufficient."

For the past few months, major efforts have been made to improve the situation before winter starts. But with around 500 people crossing the border every day into Dohuk governorate, some of the newly arrived refugees in Domeez camp still have to share tents, blankets, mattresses and food with other families.

"I arrived with two of my children, but had to leave my husband and my two other daughters behind," says a middle-aged Syrian woman. "We walked for more than six hours to cross the border. We don't have our own tent yet, so we must share with another family. I have a kidney stone and it is very painful. Since we arrived here I have been lying down all the time because of the pain. I need surgery to remove the stone. Here, we Syrians suffer from sickness, but also from the difficult situation we have gone through."

Most of the refugees in Domeez camp arrived with nothing, having left everything behind in Syria. Once in Iraq, they are issued with a six-month renewable residence permit by the Kurdish authorities, which allows them to look for work. Most find jobs as daily labourers. People who have been here for some time have begun to build extensions to their shelters and some have opened small shops within the camp. MEH

Médecins Sans Frontières is an international medical humanitarian organisation that delivers aid to people affected by armed conflict, epidemics, natural disasters or exclusion from health care in more than 60 countries around the world. Visit: *www.msf-me.org*

WHO assists with vaccination campaign amid conflict

The WHO Regional Office for the Eastern Mediterranean reported in December that a vaccination was underway in Syria to immunize children under 5 against polio and measles. The organisation noted that they faced many difficulties due to the escalation in the conflict in Syria.

The campaign was implemented by the Ministry of Health (MoH) with support from the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). In addition to the vaccines provided by MoH, UNICEF procured 1.5 measles vaccines and WHO provided doses of infant paracetamol and multivitamin syrup. The Ministry of Health has increased its advocacy messages in the media to create awareness about the campaign throughout the country.

Syria's total under-five population is almost 2.5 million children and the aim of the campaign was to reach every child, vaccinating all children below the age of five against polio and 2 million children against measles.

Due to the conflict, the national vaccination coverage for the first quarter of 2012 dropped from 95% to 80%, and it is expected to have dropped even further since then. Challenges in implementing the national immunization programme include difficulties in maintaining the cold chain (leading to destroyed vaccines) and reaching children in areas where access is limited due to blocked roads and security issues. Many vaccination /supply vehicles have been damaged or affected, resulting in critical shortages of transportation for the vaccines.

An estimated 4,000 health workers and volunteers participated in the campaign which took place across 13 of the country's 14 governorates from 26 November to 10 December. The governorate of Der El Zor was not included in the campaign as the majority of its residents have relocated to other areas in the country.

Field staff members working on the campaign have reported that some areas where the children live are inaccessible due to the on-going conflict. A the time of the WHO report (6 December) Othman Mohamed, field worker and supervisor of the Damascus field teams said that despite restrictions in accessibility, the teams have so far managed to reach all children targeted to date. There were eight mobile teams responsible for the vaccinations in Damascus, including one dedicated to reaching Internally Displaced Persons (IDPs) living in shelters.

The MoH has requested assistance from WHO in delivering vaccines to heavily affected areas. WHO has provided MoH with incentives for supervisory visits and field missions, and distributed 650,000 vaccine doses to areas in Aleppo, Homs and Rural Damascus where MOH has restricted access, according to the report.

Three days after the launch of the campaign, WHO visited 2 health centres and a medical point located in Adraa, Rural Damascus, an area hosting 200,000 IDPs. WHO reported that despite health staff being overburdened with an extremely high work load, the campaign at the facilities was well managed and vaccines were available and well stored. Almost 500 children were visiting the facilities every day, including many who had not been previously vaccinated. MEH

Syrian Expatriate Organization says doctors are being targetted

The Syrian Expatriate Organization (SEO) reports that the Syrian regime of Bashar Al Assad has embarked on a campaign to target physicians and hospitals treating pro-democracy fighters opposed to the regime – as fighting in an effort to topple the regime rages across the country.

The organisation refers to several reports that say physicians who treat wounded civilians and pro-democracy activists are often arrested, beaten or killed by Assad's forces. Hospitals treating the wounded are often targeted during Assad's aerial bombing campaigns resulting in no safe place for the sick and injured.

The SEO called on the international community to help address the issue of shortage of hospitals, physicians and medical supplies inside Syria. This includes delivery of medications, training of physicians and establishing humanitarian corridors so physicians can perform their professional duties without fear of reprisal.

Dr Nadim Al Sadat, a spokesperson for SEO, said: "Physicians often face a dire choice; risk their own lives to treat the wounded or disavow their professional oaths. Many physicians have chosen the former and have paid the consequences.

"More must be done to address the shortage of physicians and medical supplies inside Syria. Currently, Assad is able to operate within his country with impunity. Any hospital, any physician, any medicine factory can be attacked by Assad's bombs at any minute. This highlights the need for established humanitarian corridors and a no-fly zone. Syria's sick and injured need immediate help."

on the WEB Syrian Expatriate Organization
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5 dead in Middle East from novel coronavirus

The deaths of five people in the Middle East from a novel coronavirus is cause for concern. However, the WHO continues to monitor the situation and says the virus does not appear to transmit easily between people, but nonetheless encourages all Member States, particularly those on the Arabian peninsula to continue their surveillance for severe acute respiratory infections. This is the WHO's latest report available at the time of going to press.

The WHO issued this report on 30 November 2012: Over the past two months, WHO has received reports of nine cases of human infection with a novel coronavirus. Coronaviruses are a large family of viruses; different members of this family cause illness in humans and animals. In humans, these illnesses range from the common cold to infection with Severe Acute Respiratory Syndrome (SARS) coronavirus (SARS CoV).

Thus far, the cases reported have come from Qatar, Saudi Arabia and Jordan. All patients were severely ill, and five have died.

The two Qatari patients are not linked. Both had severe pneumonia and acute renal failure. Both are now recovering.

A total of five confirmed cases have been reported from Saudi Arabia. The first two are not linked to each other; one of these has died. Three other confirmed cases are epidemiologically linked and occurred in one family living within the same household; two of these have died. One additional family member in this household also became ill, with symptoms similar to those of the confirmed cases. This person has recovered and tested negative, by polymerase chain reaction (PCR) tests, for the virus.

Two confirmed cases have been reported in Jordan. Both of these patients have died. These cases were discovered through testing of stored samples from a cluster of pneumonia cases that occurred in April 2012.

The two clusters (Saudi Arabia, Jordan) raise the possibility of limited human-to-human transmission or, alternatively, exposure to a common source. On-going investigation may or may not be able to distinguish between these possibilities.

The current understanding of this novel virus is that it can cause a severe, acute respiratory infection presenting as pneumonia. Acute renal failure has also occurred in five cases.

WHO recognizes that the emergence of a new coronavirus capable of causing severe disease raises concerns because of experience with SARS. Although this novel coronavirus is distantly related to the SARS CoV, they are different. Based on current information, it does not appear to transmit easily between people, unlike the SARS virus.

WHO has closely monitored the situation since detection of the first case and has been working with partners to ensure a high degree of preparedness should the new virus be found to be sufficiently transmissible to cause community outbreaks. Some viruses are able to cause limited human-to-human transmission under condition of close contact, as occurs in families, but are not transmissible enough to cause larger community outbreaks. Actions taken by WHO in coordination with national authorities and technical partners include the following:

- Investigations are on-going to determine the likely source of infection and the route of exposure. Close contacts of confirmed cases are being identified and followed up.
- An interim surveillance recommendation has been updated to assist clinicians to determine which patients should undergo laboratory testing for the presence of novel coronavirus.
- Laboratory assays for the virus have been developed. Reagents and other materials for testing are available, as are protocols, algorithms and reference laboratory services. WHO has activated its laboratory network to assist in testing and other services. WHO has also issued preliminary guidance for 'laboratory biorisk management' (*http://tinyurl.com/bq3x9ft*).

Further, testing for the new coronavirus of patients with unexplained pneumonias should be considered, especially in persons residing in or returning from the Arabian Peninsula and neighbouring countries. Any new cases should be promptly reported both to national health authorities and to WHO.

- Guidance is available for infection control (*http://tinyurl.com/bvbl4wf*).

Based on the current situation and available information:

- WHO encourages all Member States to continue their surveillance for severe acute respiratory infections (SARI) and to carefully review any unusual patterns.
- Further, testing for the new coronavirus of patients with unexplained pneumonias should be considered, especially in persons residing in or returning from the Arabian peninsula and neighbouring countries. Any new cases should be promptly reported both to national health authorities and to WHO.
- In addition, any clusters of SARI or SARI in health care workers should be thoroughly investigated, regardless of where in the world they occur. These investigations will help determine whether the virus is distributed more widely in the human population beyond the three countries that have identified cases.
- WHO does not advise special screening at points of entry with regard to this event nor does it recommend that any travel or trade restrictions be applied. MEH

New research shows novel coronavirus could spread easier than SARS

Research on the novel coronavirus that has infected patients from three Middle Eastern countries show that the receptor it uses to infect human cells is different from the one used by its relative the SARS virus and that it can infect cells from a range of animals, and infected hosts may be able to pass on the virus easier than with SARS, according to a study released December 11, 2012.

The study was conducted by researchers from Germany and the Netherlands and appears in *mBio*, the online journal of the American Society for Microbiology (ASM).

The virus, called hCoV-EMC, has been linked to two illness clusters, including one that involved healthcare workers at a Jordanian hospital. All of the patients with confirmed infections had pneumonia, and several had severe renal complications.

The European Centre for Disease Prevention and Control (ECDC) said recently that though the case clusters raise the possibility of human-to-human transmission, so far there is too little information to confirm or rule it out. Regardless, concerns about transmission risk have prompted intensive monitoring of close contacts of case-patients and reminders about steps to protect healthcare workers.

Ina statement from the American Society of Microbiology, Christian Drosten of the University of Bonn Medical Centre in German, a lead author of the study, was quoted as saying: "This virus is closely related to the SARS virus, and looking at the clinical picture, it causes the same pattern of disease."

Given the similarities, Drosten and his colleagues wanted to know whether hCoV-EMC and SARS might use the same receptor, a sort of molecular "dock" on human cells that the virus latches onto to gain entry to the cell. The SARS receptor, called ACE2, is found mostly on pneumocytes deep within the human lung, so an individual must breathe in many, many SARS viruses for a sufficient number of them to reach this susceptible area and cause an infection. Drosten says this simple fact helped ensure the SARS outbreak didn't spread like wildfire and was mostly limited to healthcare workers and residents of overcrowded housing in Hong Kong. Also, once a person was infected with SARS in the deep part of their lungs, he or she felt sick almost immediately and therefore was not active in the community and infecting others, another aspect of the receptor that helped curb the outbreak.

"hCoV-EMC does not use the ACE2 receptor," says Drosten. This leaves open the possibility that hCoV-EMC could use a receptor in the human lung that is easier to access and could make the virus more infectious than SARS, but it is still not known what receptor the virus does use.

He pointed out another fundamental difference between SARS and hCoV-EMC. Like SARS, hCoV-EMC is most closely related to coronaviruses from bats, but unlike SARS, this study found that hCoV-EMC can still infect cells from many different species of bats. "This was a big surprise," says Drosten. "It's completely unusual for any coronavirus to be able to do that – to go back to its original reservoir." The virus is also able to infect cells from pigs, indicating that it uses a receptor structure that all these animals have in common. If that receptor is present in mucosal surfaces, like the lining of the lung, it is possible the virus could pass from animals to humans and back again, making animals an ongoing source of the virus that would be difficult or impossible to eliminate.

doi: 10.1128/mBio.00515-12 MEH

Predicting the next zoonotic pandemic

IRIN news reports that the chances are high the world's next pandemic will be a disease originating in animals, like 60% of current documented human infectious diseases. Even after hundreds of thousands of human deaths from zoonoses (diseases transmitted from animals to humans), experts say there is still limited information about how zoonoses are spread or just how to predict the next outbreak.

"There is no question of whether we will have another zoonotic pandemic," wrote Stephen Morse, a public health professor at Columbia University in New York, in a November 2012 series on zoonoses (*http://www.thelancet.com/series/zoonoses*) in the UK medical journal, *The Lancet*. "The question is merely when, and where, the next pandemic will emerge."

Despite virus hunters' (Virus hunter Nathan Wolfe presents a TED talk – *http://tinyurl.com/3waucwm*) best efforts, no zoonotic pandemic has, thus far, been predicted before it infected humans.

"The continuing effect of the HIV/AIDS pandemic is a reminder of the risk of zoonotic pathogens spreading from their natural reservoirs to man," wrote William Karesh from New York's EcoHealth Alliance in the Lancet series. The NGO, formerly known as Wildlife Trust, works to prevent the outbreak of emerging diseases by preserving biodiversity.

An estimated 1.8 million people die annually from AIDS, caused by HIV, which originated in primates.

"What is far less broadly appreciated is that none of the approaches commonly used to search for potential new human pathogens… probably would have identified simian immunodeficiency virus (SIV) as a potential risk to man," said Karesh.

Early warning?

The US Agency for International Development launched its Emerging Pandemic Threats Programme in late 2009 to build an early warning system to detect and reduce the impacts of zoonotic diseases.

But there are thousands of species of birds and animals that each host different diseases; where do you concentrate efforts? A virologist may focus on diseases easily spread from animal relatives, like chimpanzees, while a social scientist points out how rare contact is between humans and chimpanzees and focuses, instead, on poultry, with which people live and work in close quarters worldwide.

Between 2003 and 5 November 2012, 608 laboratory-confirmed human cases of infections from H5N1 bird flu were reported to the World Health Organization from 15 countries, of which 359 died.

Disease hunters are homing in on emerging disease "hotspots", mammal-rich areas with high, changing population densities. A group of experts led by Columbia University's Morse are creating a disease map, in which Rwanda and Burundi are bright red, as is the Indonesian island of Java, one of the world's most densely populated islands, and Egypt's Nile Delta. Other potential sites for future outbreaks include north India and Bangladesh, northern and western China, and – to a lesser extent – more densely populated parts of western Europe and along the west African coast.

Urbanization

"Urbanization has boosted zoonoses' outbreak risks as people get closer to animals," Sarah Schlesinger, a scientist from New York's Rockefeller University, told IRIN on the sidelines of a recent HIV vaccine conference.

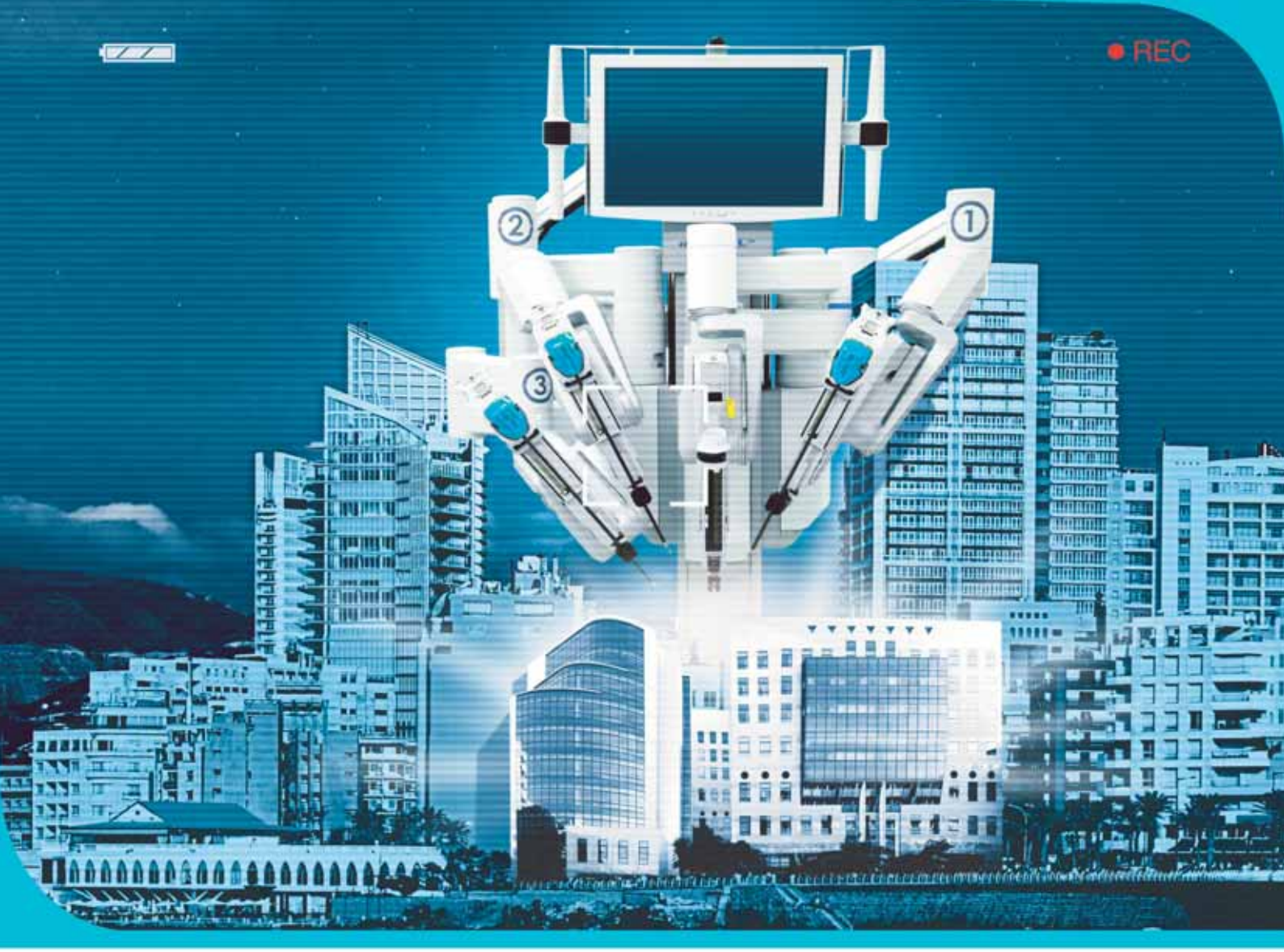
Cities are growing, with roads and industries penetrating previously uninhabited wildlife habitats; some 3.3 billion people live in urban areas (cities and their outskirts), according to the UN. By 2030, the world's urban population is expected to exceed five billion, with 80% located in the developed world. In places where animal "hosts" to disease start to disappear (as their habitats shrink), pathogens are finding a new home in human hosts.

Some 800 million people worldwide are engaged in urban agriculture, according to the World Bank, which identifies peri-urban livestock as a fast-growing sector that produces 34% of the world's meat and nearly 70% of its eggs.

The Nairobi-headquartered International Livestock Research Institute (ILRI) has pointed out how urban livestock and agriculture can breed disease in some of the world's most crowded places. In a recent survey in Dagoretti, one of eight districts of Kenya's capital, Nairobi, the institute found up to 11% of households were affected by cryptosporidiosis, a diarrhoeal disease caused by a pathogen found in cattle, raw milk, soil, vegetables and contaminated water.

Changing harvests may be another contributor to the spread of zoonoses. In the southwestern USA where El Niño (rising sea surface temperatures across the central and eastern Pacific Ocean) dumped more rain, vegetation growth increased, which then attracted more rats. Hantavirus is not fatal in rats, which carry the disease, but is in humans who became infected through the rats.

The interplay of biology, ecology and sociology make forecasting the next pandemic difficult, say experts in the Lancet series who call for boosting cooperation between experts (See: HIV/AIDS: Breaking science "silos" to find a vaccine – *http://tinyurl.com/c8kqpgz*) to meet the "huge, and rising" threat of zoonoses. MEH



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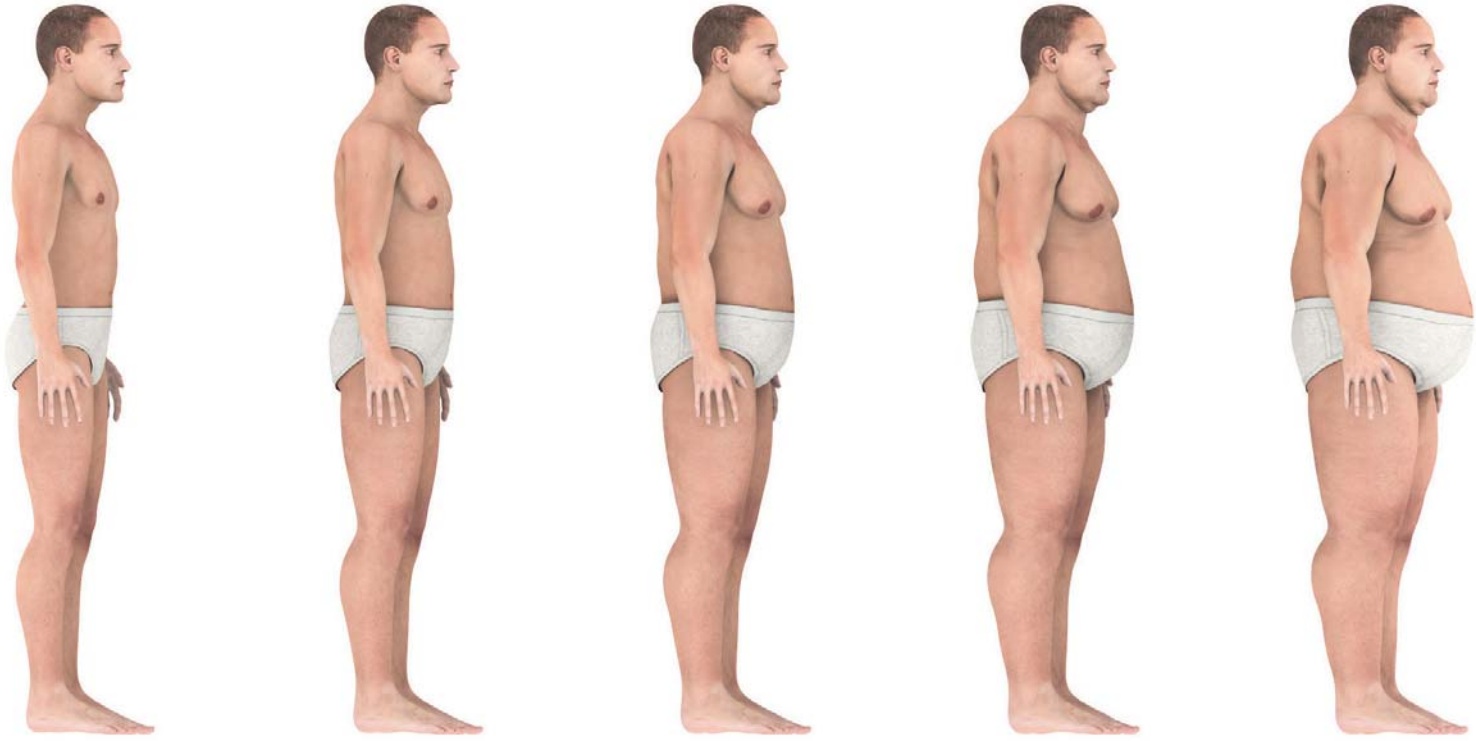


The way we live and die

New global burden of disease study reveals startling changes over past two decades

Globally, health advances present most people with a devastating irony: avoid premature death but live longer and sicker.

That's one of the main findings from the Global Burden of Disease Study 2010 (GBD 2010), a collaborative project led by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. The findings were announced at the Royal Society in London on December 14, 2012 and published in *The Lancet*, the first time the journal has dedicated an entire triple issue to one study. The seven scientific papers and accompanying commentaries provide a new platform for assessing the world's biggest health challenges, and then finding the best ways to address them.

The study reveals massive shifts in health trends around the world since 1990, the starting point of the first Global Burden of Disease study. Since that time, the world has grown considerably older. Where infectious disease and childhood illnesses related to malnutrition were once the primary causes of death, now children in many parts of the world – outside of sub-Saharan Africa – are more likely to live into an unhealthy adulthood and suffer from eating too much food rather than too little. Lastly, health burden is increasingly defined by what's making us sick rather than what's killing us. The biggest contributor to the world's health burden used to be premature mortality – driven by more than 10 million deaths in children under the age of 5 – but now the disease burden is caused mostly by chronic diseases and injuries such as musculoskeletal disorders, mental health conditions, and injuries. This burden intensifies as people live longer.

Essentially, what ails you isn't necessarily what kills you. While the world has done a tremendous job battling fatal illnesses – especially from infectious diseases – we are now living with more health problems that cause a lot of pain, impair our mobility, and prevent us from seeing, hearing, and thinking clearly.

"We're finding that very few people are walking around with perfect health and that, as people age, they accumulate health conditions," said Dr Christopher Murray, Director of IHME and one of the founders of the Global Burden of Disease. "At an individual level, this means we should recalibrate what life will be like for us in our 70s and 80s. It also has profound implications for health systems as they set priorities."

Hundreds of researchers worldwide

GBD 2010 started in 2007. IHME served as the coordinating centre working with six other core collaborators: the University of Queensland, Harvard School of Public Health, the Johns Hopkins Bloomberg School of Public Health, the University of Tokyo, Imperial College London, and the World Health Organization.

The researchers set out to completely overhaul the Global Burden of Disease process first created in the early 1990s by Dr Murray and Dr Alan Lopez, one of the founders of the Global Burden of Disease and Head of the School of Population Health at the University of Queensland. The project was initially funded by the World Bank. GBD 2010 grew to become a truly global effort. From 302 institutions and 50 countries, including 26 low- and middle-income countries, 486 authors have conducted the largest systematic scientific effort in history to quantify levels and trends in the world's health problems. The work was funded by the Bill & Melinda Gates Foundation.

First, researchers gathered more data than had ever been amassed for a health study. Using vital registration systems, surveys, censuses, and a meta-analysis of all available

Dietary risk factors and physical inactivity collectively caused 10% of the disease burden, and the burden due to excess weight and high blood sugar are rising substantially.

randomised controlled trials, they created a database covering everything from AIDS to zinc deficiency. They hammered out a set of criteria to determine which data should be included in the final analysis and which should not. If a study was not rigorous or was too specific to one place and one time to be broadly applicable, it was excluded. New analytical tools were developed to fill gaps in the data for countries where information is sparse. They tested those methods by using them to make estimates in areas where health data are more readily available, such as the United States or Japan.

"If the statistical models worked for a place where we have a lot of data, then we knew we were on the right track," Dr Lopez said. "And where we aren't as certain about the estimates, we have shown that, by providing a range of possible estimates. We know more about ischemic heart disease, for example, than we do whooping cough."

Ultimately, the GBD 2010 findings generated 650 million estimates for health challenges large and small.

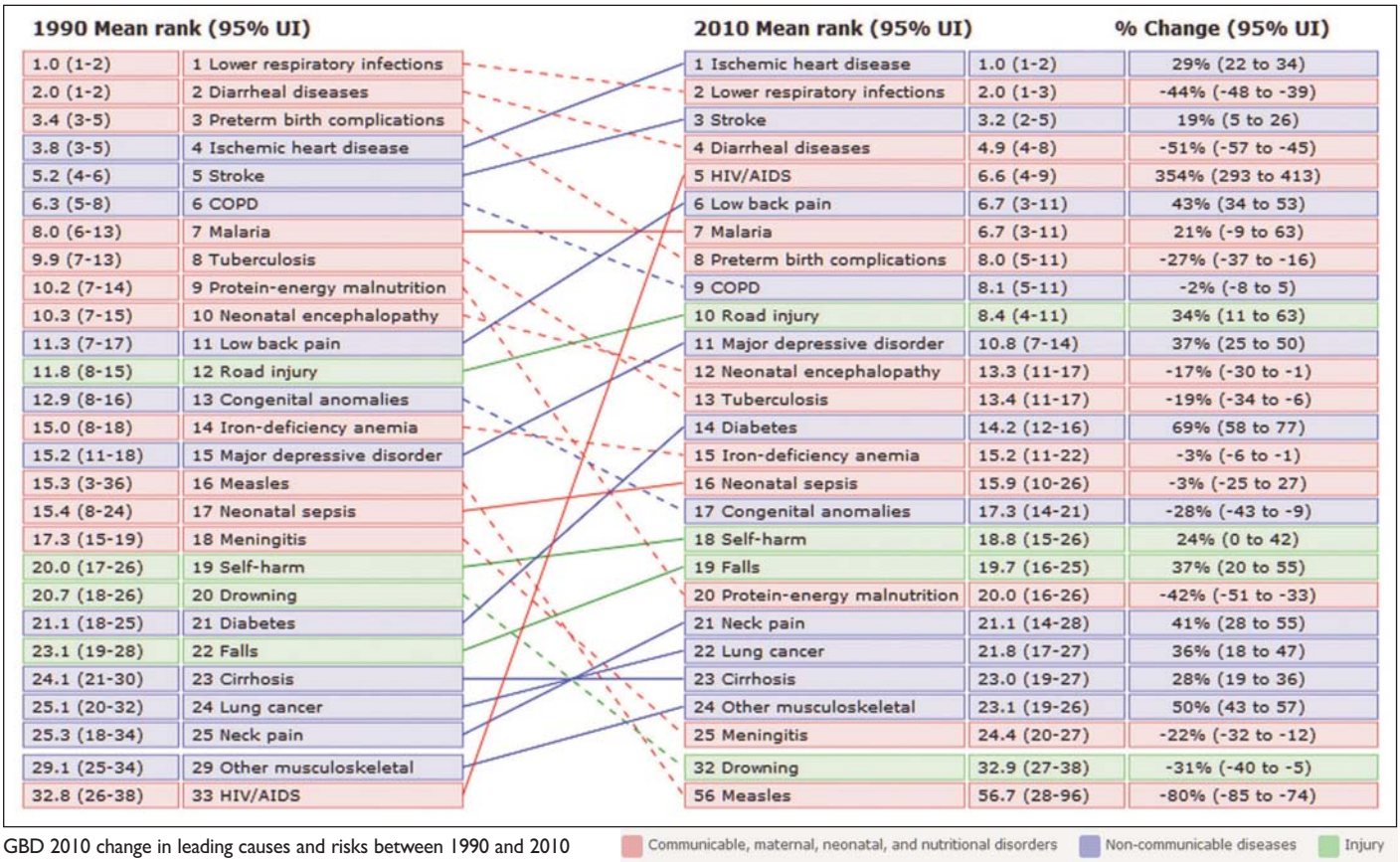
"While the GBD 2010 offers significant epidemiologic findings that will shape policy debates worldwide, it also recognises the gaps in existing disease epidemiology knowledge and offers new ways to improve public health data collection and assessment," said Dr Paul Farmer, co-founder of Partners In Health and Chair of the Department of Global Health and Social Medicine at Harvard Medical School. "Murray and his colleagues draw not only on their own research, which is well known and has been cited extensively over the past two decades, but also on the work of philosophers, ethicists, economists, and others whose perspectives are too often neglected in epidemiology. A broad audience – from public health authorities to funders and policymakers – will benefit from this impressive contribution to the epidemiologic evidence base."

Rapid changes

The study underscores significant achievements, such as the dramatic drop in child mortality, which has fallen so quickly that it has beaten every published prediction. But more work remains. Diseases such as diarrhoea due to rotavirus and measles continue to kill more than 1 million children under the age of 5 every year, despite effective vaccines against those diseases.

While child mortality has decreased, GBD 2010 found a startling 44% increase in the number of deaths among adults aged 15 to 49 between 1970 and 2010. This is in part because of increases in violence and the ongoing challenge of HIV/AIDS, which kills 1.5 million people annually.

Another mixed success is that while the burden of malnutrition has successfully been cut by two-thirds, poor diets and physical inactivity are contributing to rising rates of obesity and other lifestyle-related risk factors, including high blood pressure, tobacco smoking, and harmful alcohol use. Dietary risk factors and physical inactivity collectively caused 10% of the disease burden, and the burden due to excess weight and high blood sugar are rising substantially.



Institute for Health Metrics and Evaluation

GBD 2010 change in leading causes and risks between 1990 and 2010

"We have gone from a world 20 years ago where people weren't getting enough to eat to a world now where too much food and unhealthy food – even in developing countries – is making us sick," said Dr. Majid Ezzati, Chair in Global Environmental Health at Imperial College London and one of the study's lead authors.

These findings are consistent with one of GBD 2010's repeated themes: Disability is causing a greater and greater fraction of the burden of disease as demographics and epidemiology evolve. Much of this burden is caused by a relatively small group of ailments. Researchers examined more than 300 diseases, injuries, and risk factors and found that just 50 distinct causes account for 78% of the global burden. Just 18 of those account for more than half the burden.

"If we only could crack the code on just this small group of illnesses, we could make enormous progress in improving health," said Dr Kenji Shibuya, Chair of the Department of Global Health Policy at the University of Tokyo and one of GBD 2010's lead authors.

The types of illnesses and injuries causing death and disability are also changing. While ischemic heart disease and stroke remained the two greatest causes of death between 1990 and 2010, all the other rankings in the top 10 causes changed. Diseases such as diabetes, lung cancer, and chronic obstructive pulmonary disease moved up, and diarrhoea, lower respiratory infections, and tuberculosis moved down.

When looking at disease burden more broadly, taking into account both years of life lost due to premature death and years lived with disability, the changes have also been dramatic. Neonatal encephalopathy, an often fatal brain condition in newborns, fell out of the 10 leading causes between 1990 and 2010, as did protein-energy malnutrition, the leading cause of starvation. They were replaced by lower back pain and road injuries.

Trends

The trends identified in GBD 2010 occur across regions with one notable exception: sub-Saharan Africa, where infectious diseases, childhood illnesses, and maternal causes of death account for as much as 70% of the burden of disease. By comparison, these conditions account for only one-third of the burden in south Asia and Oceania, and less than 20% in all other regions. Additionally, while the average age of death throughout Latin America, Asia, and north Africa increased by more than 25 years between 1970 and 2010, it rose by less than 10 years in most of sub-Saharan Africa.

"Sub-Saharan Africa continues to present a special challenge for a variety of methodological, geographic, and economic reasons," said Dr George Mensah, Visiting Full Professor at the University of Cape Town and one of the GBD 2010 co-authors. "The evidence base for estimating causes of death in Africa remains limited. The data do show modest progress in lowering child mortality, but communicable and nutritional causes still account for half of premature deaths in Africa. Nearly as troubling is the rising burden of chronic illness, such as stroke and heart disease."

What have been historically considered "Western ailments" also menace millions in Africa, including the very young. Pain, anxiety, and depression – which erode quality of life and productivity – are ranked among the highest causes of years lived with disability throughout sub-Saharan Africa.

"African nations have not even begun to confront the consequences of exploding cases of mental illness, depression, pain, and the enormous burden of substance abuse that stem from those conditions," said Dr Felix Masiye, who heads the Department of Economics at the University of Zambia and is working with IHME in Zambia to study health interventions. "The direct link between mental illness and physical well-being is at the core of this unexplored terrain, and can only grow as the years go by."

Strategic policymaking

GBD 2010 provides the evidence for a range of new research projects and targeted policymaking. It also opens the opportunity for countries to conduct detailed burden studies of their own populations.

"GBD 2010 is an analytic undertaking of extraordinary scale and ambition. It provides the only truly comprehensive picture of human illness and death worldwide," said Sir Richard Feachem, Director of the Global Health Group at the University of California, San Francisco, Global Health Sciences and the former Under Secretary General of the United Nations. "It will be of immense value to policymakers and public health practitioners in all countries. It will also generate heated debate, which will lead to further advances in data collection and analysis and better estimates in the future."

Over two decades, the Global Burden of Disease project has driven powerful policy changes and health improvements worldwide. Following the GBD 1990 study, dozens of countries conducted their own disease burden studies and policy changes, including Mexico, France, Australia, and Iran.

"With a subnational burden of disease study, Mexico was able to see clearly where it should focus its limited health resources," said Dr Julio Frenk, former Minister of Health in Mexico, now Dean of Harvard School of Public Health and chair of the Board at IHME. "Those findings led to a major health reform that transformed the approach to improving population health through universal coverage."

The findings from the first GBD study also brought malaria back to the world stage after years of neglect, spurring the rise in policy attention that has lowered deaths. Depression had not been framed as a public health problem until the 1990s when the original GBD study showed its significant burden. GBD 2010 promises to bring new attention to a broader range of illnesses and conditions having an impact on health worldwide and to help guide new target-setting exercises for health improvement.

"At a time when world economies are struggling, it is crucial for health systems and global health funders to know where best to allocate resources," said Dr. Paul Ramsey, Chief Executive Officer of UW Medicine and Dean of the University of Washington School of Medicine. "I see GBD 2010 as much more than the health data it provides, which itself is of enormous value. I see it as a management tool for ministers of health and leaders of health systems to prepare for the specific health challenges coming their way."

on the WEB

- IHME – The Global Burden of Disease 2010 *http://tinyurl.com/cpljtxj*
- *The Lancet* – Global Burden of Disease Study 2010 *www.thelancet.com/themed/global-burden-of-disease*
- Institute for Health Metrics and Evaluation – Interactive tools *www.healthmetricsandevaluation.org/tools/data-visualizations*

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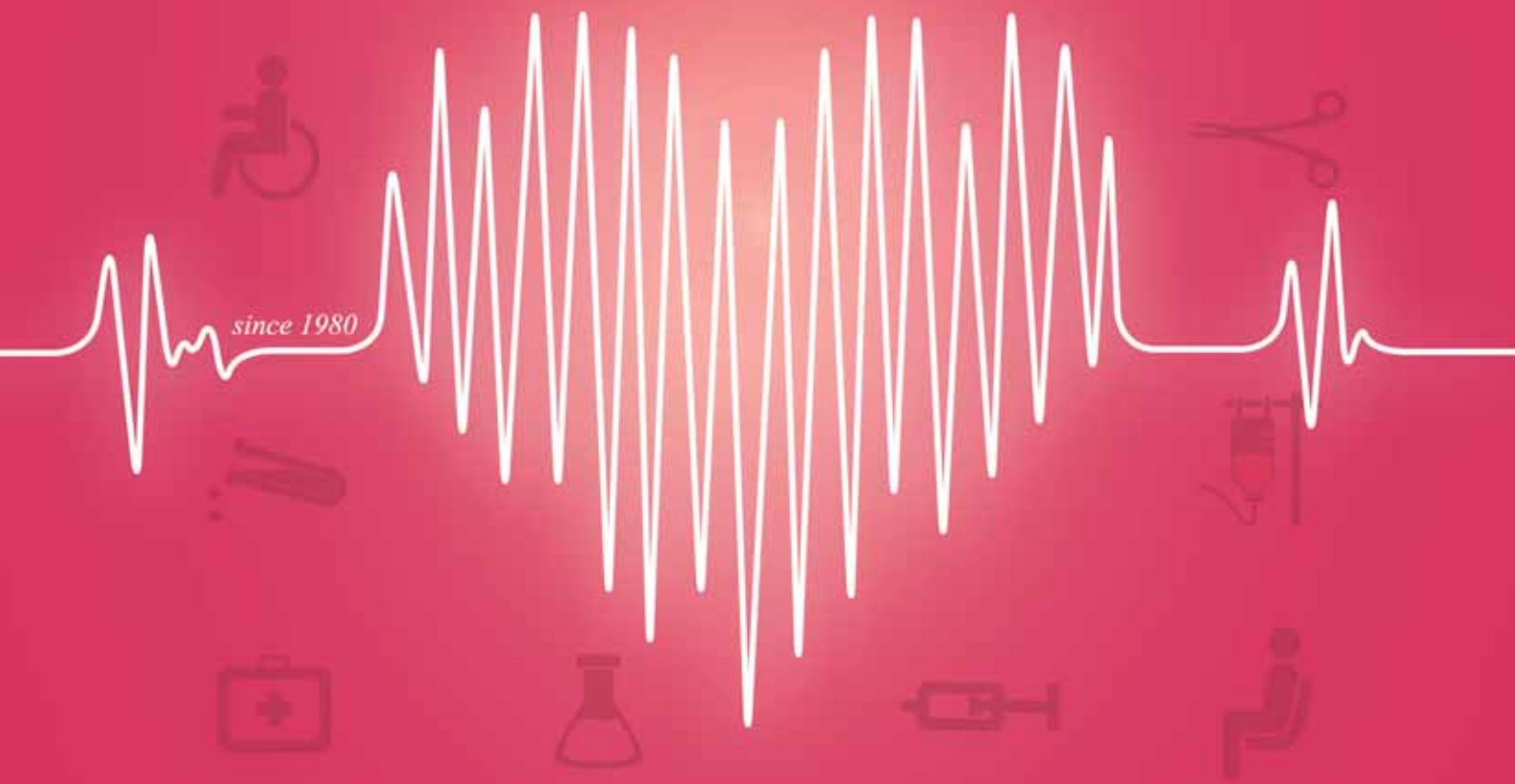

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New *Atlas of Health and Climate* shows climate-sensitive diseases can be forecast

As the world's climate continues to change hazards to human health are increasing. A new report published jointly by the World Health Organization (WHO) and the World Meteorological Organization (WMO), illustrates how it could be possible to forewarn countries about climate-sensitive infectious disease outbreaks months in advance.

The Atlas of Health and Climate maps the links between climate and diseases like cholera, malaria, dengue fever, meningitis and diarrhoea, according to a review of the report by IRIN.

Droughts, floods and cyclones affect the health of millions of people each year. Climate variability and extreme conditions such as floods can also trigger epidemics of diseases which cause death and suffering for many millions more. The Atlas gives practical examples of how the use of weather and climate information can protect public health.

These diseases take the heaviest toll, according to the Atlas, a collaborative effort between the UN's World Health Organization (WHO) and World Meteorological Organization (WMO), and real-time maps showing possible spread could help prevention and treatment efforts. Diarrhoea kills over two million people every year, for example, and malaria kills nearly a million; both are influenced by climate variability.

"Prevention and preparedness are the heart of public health. Risk management is our daily bread and butter. Information on climate variability and climate change is a powerful scientific tool that assists us in these tasks," said Dr Margaret Chan, Director-General of WHO . "Climate has a profound impact on the lives, and survival, of people. Climate services can have a profound impact on improving these lives, also through better health outcomes."

Around the world climate services have been generally been an underuti-

lized resource for public health.

"Stronger cooperation between the meteorological and health communities is essential to ensure that up-to-date, accurate and relevant information on weather and climate is integrated into public health management at international, national and local levels. This Atlas is an innovative and practical example of how we can work together to serve society," said WMO Secretary-General Mr Michel Jarraud.

The Intergovernmental Panel on Climate Change, an international scientific body, noted that rising temperatures and the increasing frequency of extreme events could exacerbate malaria, cholera, Rift Valley fever and dengue fever in developing countries.

Speaking to IRIN, Diarmid Campbell-Lendrum, who leads the climate change and health team at WHO and is an author of the Atlas said: "One of the functions that we illustrate through the Atlas is that we can correlate climate and health information in places where we have both, and use the climate data to make health predictions, either for places where we have climate but not health information, or for the future."

Much of the information in the Atlas is not new, says Campbell-Lendrum, but "what we are doing is to connect it together, and make it as accessible and clear as possible to decision-makers, from heads of health and meteorological agencies to field staff in disease-control programmes.

"This also includes the general public, who we hope will become increasingly 'climate-aware' in regards to their health. This is going to become more important as issues such as heat waves become more frequent through climate change, and vulnerability to health impacts increases through ageing, chronic disease, etc."

on the WEB

- Atlas of Health and Climate *http://www.wmo.int/ebooks/WHO/Atlas_EN_web.pdf*
- Climo – Climate and Mortality (PDF 3MB) *http://www.globalhealthaction.net/index.php/gha/article/view/20152/pdf*

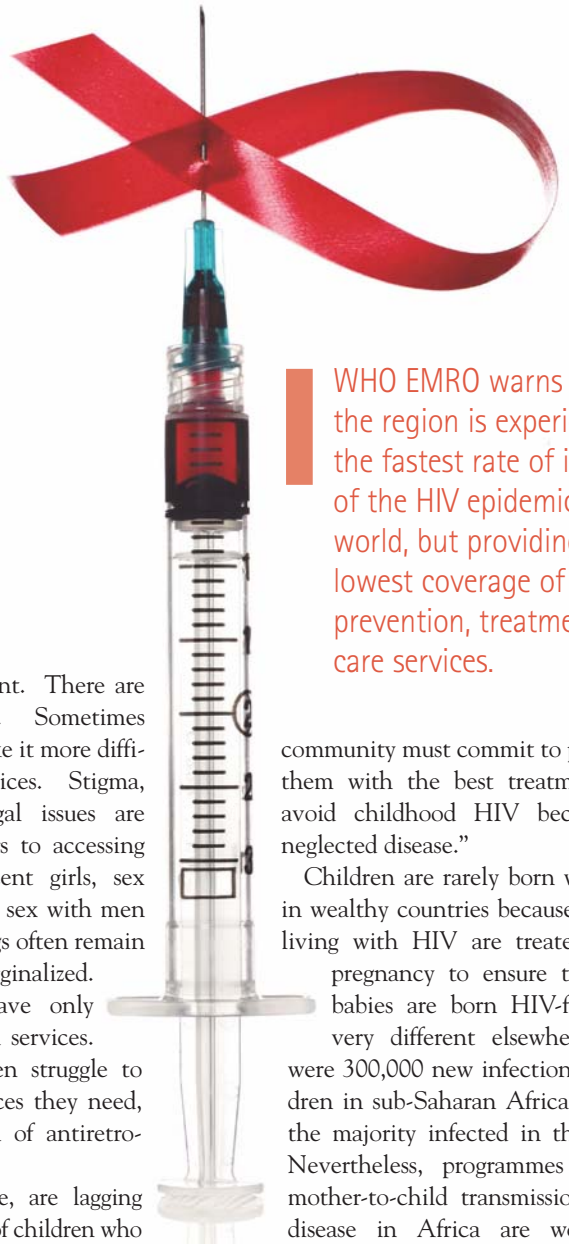
This also includes the general public, who we hope will become increasingly 'climate-aware' in regards to their health. This is going to become more important as issues such as heat waves become more frequent through climate change, and vulnerability to health impacts increases through ageing, chronic disease, etc.

Atlas of Health and Climate – key messages

The Atlas conveys three key messages. First, climate affects the geographical and temporal distribution of large burdens of disease and poses important threats to health security, on time scales from hours to centuries. Second, the relationship between health and climate is influenced by many other types of vulnerability, including the physiology and behaviour of individuals, the environmental and socio-economic conditions of populations, and the coverage and effectiveness of health programmes. Third, climate information is now being used to protect health through risk reduction, preparedness and response over various spatial and temporal scales and in both affluent and developing countries.

Numerous maps, tables and graphs assembled in the Atlas make the links between health and climate more explicit:

- In some locations the incidence of infectious diseases such as malaria, dengue, meningitis and cholera can vary by factors of more than 100 between seasons, and significantly between years, depending on weather and climate conditions. Stronger climate services in endemic countries can help predict the onset, intensity and duration of epidemics.
- Case studies illustrate how collaboration between meteorological, emergency and health services is already saving lives. For example, the death toll from cyclones of similar intensity in Bangladesh reduced from around 500,000 in 1970, to 140,000 in 1991, to 3,000 in 2007 – largely thanks to improved early warning systems and preparedness.
- Heat extremes that would currently be expected to occur only once in 20 years, may occur on average every 2-5 years by the middle of this century. At the same time, the number of older people living in cities (one of the most vulnerable groups to heat stress), will almost quadruple globally, from 380 million in 2010, to 1.4 billion in 2050. Cooperation between health and climate services can trigger measures to better protect people during periods of extreme weather.
- Shifting to clean household energy sources would both reduce climate change, and save the lives of approximately 680 000 children a year from reduced air pollution. The Atlas also shows how meteorological and health services can collaborate to monitor air pollution and its health impacts.
- In addition, the unique tool shows how the relationship between health and climate is shaped by other vulnerabilities, such as those created by poverty, environmental degradation, and poor infrastructure, especially for water and sanitation.



On the right road to zero

November 29 was World AIDS Day with the theme: *Getting to Zero: Zero new HIV infections. Zero deaths from AIDS-related illness. Zero discrimination.*

Although the disease continues to spread – there were 2.5 million new infections in 2011 and an estimated 1.7 million people died from the disease – there is hope that we could get to zero infections as we are now headed on the right track. Infections are decreasing – the number of infections in 2011 is 700,000 less than 10 years ago, according to the WHO.

Much of the progress is attributed to the life-saving antiretrovirals to treat those infected with HIV. These medicines reduce the amount of virus in the blood, which increases the chance they will stay healthy and decreases the risk they can pass the virus to someone else. In 2011, at the UN General Assembly, governments agreed to set the goal of getting 15 million HIV-infected people worldwide on the life-saving antiretroviral medicines by 2015. The latest global statistics suggest that, provided countries are able to sustain current efforts, this target is within reach.

Dr Gottfried Hirnschall, Director of the World Health Organization's HIV Department, said: "Many countries are facing economic difficulties, yet most are managing to continue expansion of access to antiretroviral medicines."

Currently 8 million people in low- and middle-income countries are accessing the treatment they need, up from only 0.4 million in 2003.

"The challenge now is to ensure that global progress is mirrored at all levels and in all places so that people, whoever they are and wherever they live, can obtain antiretroviral therapy when they need it," adds Dr Hirnschall.

In all regions of the world, some groups of people are still not able to access HIV prevention and treatment. There are many reasons for this. Sometimes geographical factors make it more difficult to deliver services. Stigma, discrimination and legal issues are often significant barriers to accessing effective care. Adolescent girls, sex workers, men who have sex with men and people who use drugs often remain vulnerable and marginalized. Migrants frequently have only limited access to health services.

As a result, they often struggle to obtain the health services they need, including the provision of antiretroviral therapy.

Children, for example, are lagging badly behind: only 28% of children who need antiretrovirals can obtain them.

"About 3.3 million children are living with HIV today," said Dr Philippe Douste-Blazy, Chairman of the UNITAID Executive Board. "The international community must commit to providing them with the best treatment, and avoid childhood HIV becoming a neglected disease."

> WHO EMRO warns that the region is experiencing the fastest rate of increase of the HIV epidemic in the world, but providing the lowest coverage of HIV prevention, treatment and care services.

Children are rarely born with HIV in wealthy countries because mothers living with HIV are treated during pregnancy to ensure that their babies are born HIV-free. It is very different elsewhere: there were 300,000 new infections in children in sub-Saharan Africa in 2011, the majority infected in the womb. Nevertheless, programmes to stop mother-to-child transmission of the disease in Africa are working – between 2009 and 2011 antiretroviral prophylaxis prevented 409,000 children from acquiring HIV infection in low- and middle-income countries, according to UNAIDS.

Eastern Mediterranean region

The WHO Regional Office for the Eastern Mediterranean estimates that there are 561,000 living with AIDS in the region.

WHO EMRO warns that the region is experiencing the fastest rate of increase of the HIV epidemic in the world, but providing the lowest coverage of HIV prevention, treatment and care services.

More than 85% of people living with HIV in the region who need life-saving antiretroviral therapy do not receive it.

On the occasion of World AIDS Day, Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, reiterated that without ending the treatment gap in the Region and without scaling up HIV testing and counselling and other prevention interventions, the Region is far from getting to zero.

The main contributor to this treatment gap is the low uptake of HIV testing and counselling services. In particular, people at higher risk of HIV, that is, people who inject drugs, men who have sex with men and sex workers, are still not being reached by available testing and counselling services.

Less than 15% of those who need treatment are actually receiving it. The main bottleneck is that less than 5% of the population of the Region knows its HIV status. Lack of awareness, fear of stigma and discrimination and inadequate service delivery prevent people from taking an HIV test. MEH

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Combination of aggressive surgery and hyperthermic intraperitoneal chemotherapy (HIPEC) improves patient outcomes

BEST HOSPITALS U.S.News NATIONAL CANCER 2012-13

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For more on Sue's story, scan at left.

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Management of colorectal liver metastases at King Hussein Cancer Center – The multidisciplinary approach

By **Osama Hamed**, MD

One third of patients with colorectal cancer presents with stage IV disease, the liver is the most common site for distant metastasis. Historically this group of patients was considered only for palliative interventions with dismal 5-year survival. Although synchronous presentation is considered a negative prognostic indicator, several studies have demonstrated that long-term survival is possible after complete surgical resection of all disease. The reported 5-year survival after resection of liver metastasis has doubled from 30% to 65% over the last 2 decades. Multiple factors have contributed to this improvement: Adoption of aggressive and safe surgical strategies is one factor, advancement in systemic chemotherapy and targeted therapy is another one, but perhaps the most important of all of these factors is the multidisciplinary (MDC) approach to this unique group of patients. This is thoroughly implemented at King Hussein Cancer Center (KHCC) in Amman, Jordan.

Physicians treating patients with stage IV colorectal cancer face multiple challenges in deciding where to start and what is the ideal sequence of interventions for optimal treatment of the primary tumour and metastatic disease. Lack of clear guidelines on the subject has resulted in the development of several new trends and strategies with variable results.

The King Hussein Cancer Centre in Amman, Jordan is one of the region's leading cancer referral centres

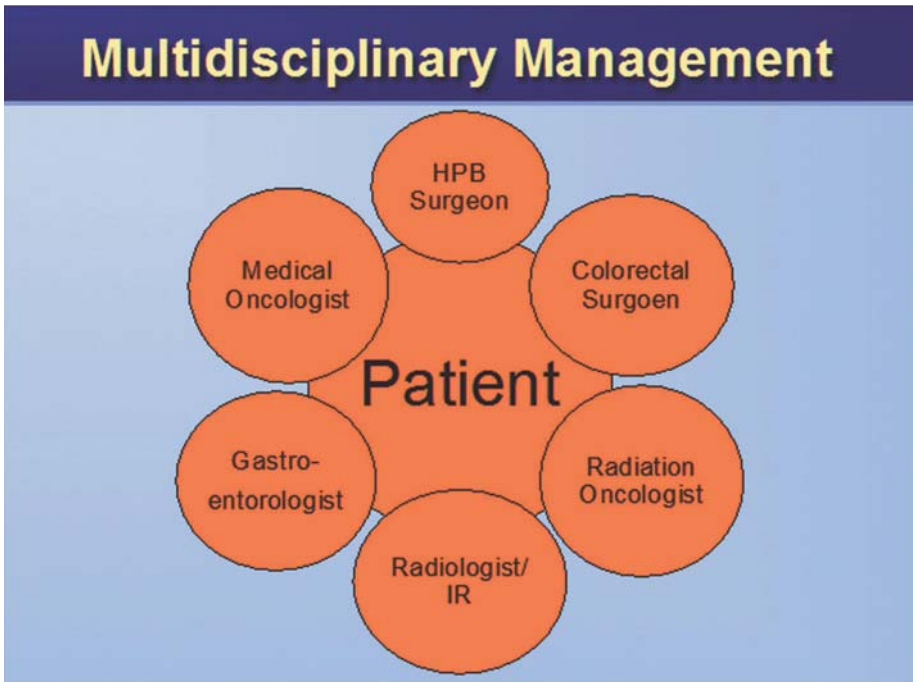

Figure 1: Multidisciplinary Management of CRLM

With this in mind, an experienced multidisciplinary team who is familiar with all options available in the literature is necessary to ensure best outcomes for patients with stage IV colorectal cancer.

At KHCC there are multiple MDC teams for all types of tumours, the strong adherence and belief in this approach since the establishment of the centre, is the key factor for our success.

All patients with tumours in the Gastrointestinal Tract (GI) are discussed in our weekly GI MDC conference (See Figure 1) in the presence of an expert panel of Hepatobiliary and Colorectal Surgeons/Surgical Oncologists, Medical and Radiation Oncologists, Diagnostic and Interventional Radiologists, and Gastroenterologists. Treatment plans are formulated based on individual patient case and according to well-established protocols at the centre. Every team member adds significant value to the treatment plan and contributes to the excellent outcomes achieved in this group of patients.

The surgical approach to patients with CRLM has evolved significantly over the past decade, once considered a very morbid operation with high mortality rate, it is well accepted now as a standard of care with excellent perioperative outcomes. Advancement in stapling, tissue sealing and haemostatic devices in addition to liver resection under low Central Venous Pressure, have helped liver surgeons to perform liver resection safely with minimal blood loss.

Historically, the definition of resectability of CRLM was based on the number and size of metastasis being resected, based on this only 25% of patients were considered for surgical resection and possible cure. Over the years and with better understanding of liver anatomy and disease pathophysiology, the definition of resectability has shifted from what is being resected, to what is being left after resection. Our main goal is to remove all disease in the liver and leave the patient with an adequate liver remnant. This is defined as: 2 adjacent segments with adequate inflow, outflow and biliary drainage with sufficient volume (20-25% in healthy liver and 30-40% in diseased liver) (See Figure 2).

This would not have been possible without the advancement in perioperative imaging modalities (Liver Protocol

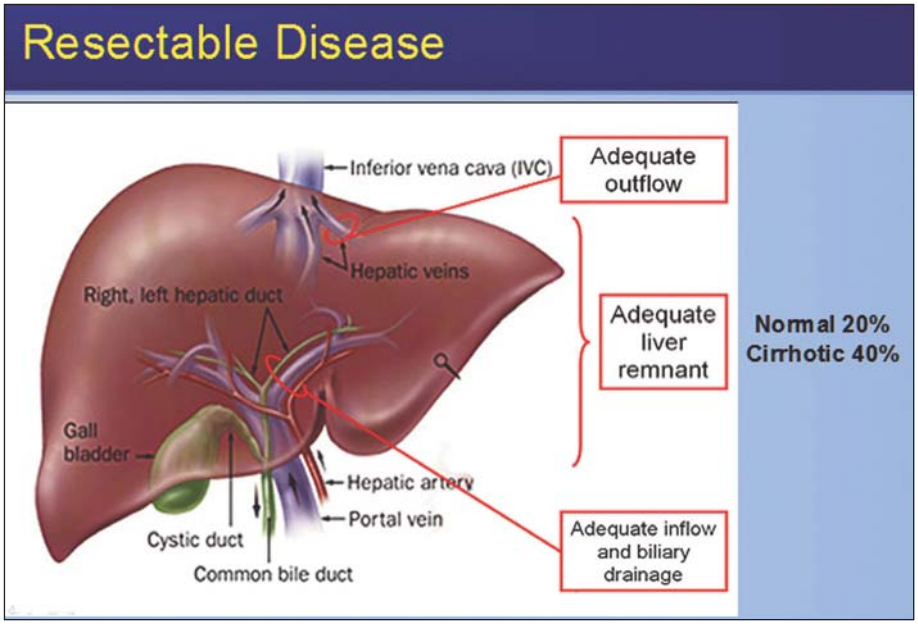

Figure 2: Current definition of resectability in CRLM

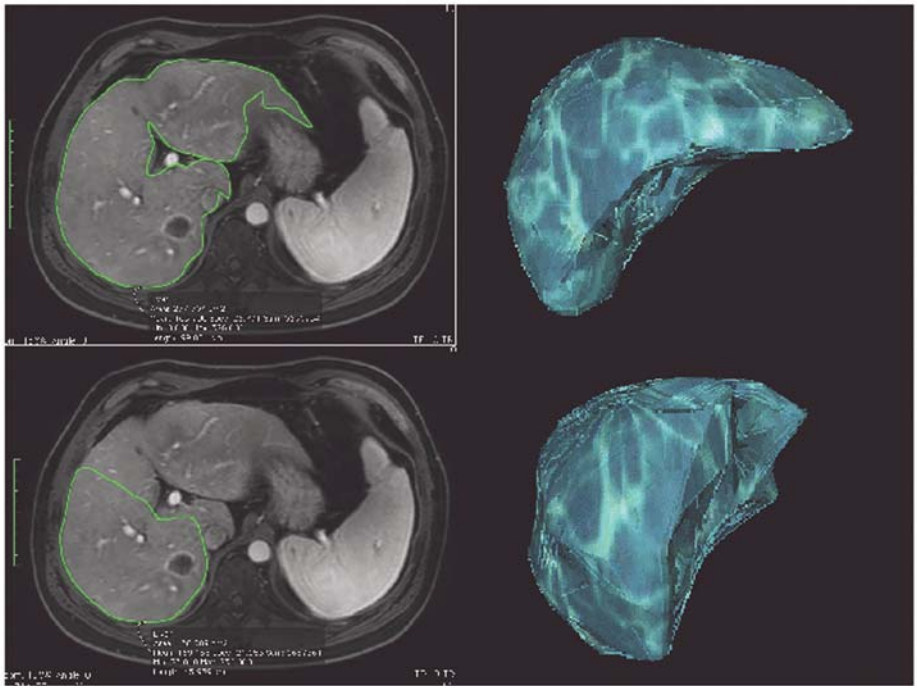

Figure 3: 3D software available for liver volume measurements

CT scan, MRI with contrast, and Intraoperative Ultrasound) and the 3D software available for liver volume measurements (See Figure 3). Complete surgical resection is still possible even in patients with inadequate future liver remnant, tow-stage liver resection (Figure 4) and technology like Preoperative Portal Vein Embolization by experienced Interventional Radiologists have helped to induce hypertrophy in the future liver remnant and avoid risk of post-operative liver failure. Moreover the approach to patients with synchronous presentation has shifted from the classic approach (treating the primary tumour first) to recently described the 'liver first' (reverse) approach (See Figure 5).

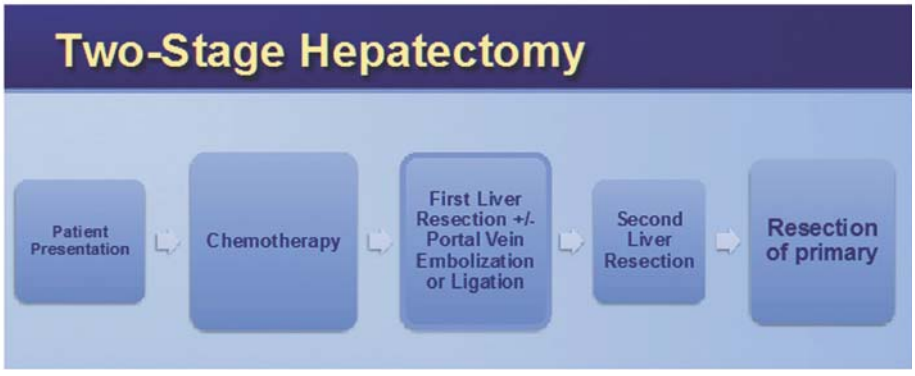

Figure 4: Two-Stage Liver Resection

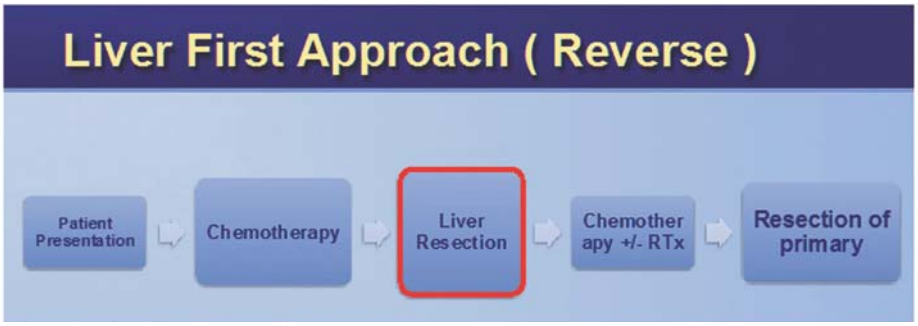

Figure 5: Liver first approach

Despite all these advances in surgery, diagnostic and interventional radiology, outcomes in this group of patients would be poor without advances in systemic treatment. As we all know, once the tumour has spread beyond its primary location, it becomes a systemic disease and should be treated with effective systemic treatment. In 1990's, 5-Flurouracil (5-FU) was the only effective systemic chemotherapy available for patients with CRLM. In unresectable cases 5-FU resulted in a median survival of around 10 months. The discovery of Irinotecan and Oxaliplatin in early 2000's and its addition to 5-FU (FOLFOX and FOLFIRI protocols) have resulted in significant improvement in median survival (up to 22 months) in unresectable CRLM.

Progress in systemic therapy didn't stop at this level. Advancements in molecular biology and understanding the key steps in carcinogenesis have opened the door wide for the era of Targeted Therapy. The discovery of Bevacizumab (Monoclonal Antibody against Vascular Endothelial Growth Factor Receptor) and Cetuximab (Monoclonal Antibody against Epidermal Growth Factor Receptor) has resulted in further improvement of median survival (up to 26 months) in patients with unresectable CRLM when added to FOLFOX and FOLFIRI. The presence of such effective systemic treatment is a key factor in making surgeons more aggressive in dealing with patients with stage IV colorectal cancer. It is well accepted that response to chemotherapy is considered one of the most important prognostic indicators after surgical resection of CRLM. Even in patients with initially unresectable disease, chemotherapy can render up to one third of them resectable with hope of cure.

Similar to all other interventions made by humans, chemotherapy comes with some cost. The issue of chemotherapy-induced liver toxicity should always be kept in mind by treating physicians. Liver toxicity can result in denying the patient a possible curative surgical resection. To avoid prolonged courses of chemotherapy and its associated liver toxicity, well-established treatment protocols by developed by the GI MDC team are used with patients at KHCC with open communication between all

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sense and simplicity

A cancer patient plays with one the staff in the Paediatric department at King Hussein Cancer Centre

disciplines involved all the process (Figure 6).

Stage IV rectal cancer

Management of patients with stage IV rectal cancer is even more complicated. This is mainly due to the need for radiation therapy for local control. The addition of this modality to the protocols requires extensive collaboration between different MDC members. For optimal outcomes, timing of surgical intervention and chemotherapy administration should be carefully decided in the MDC settings based on individual cases. To minimize radiation induced toxicity to adjacent organs, we utilise up-to-date protocols and techniques. This includes Intensity Modulated Radiotherapy (IMRT) by our well-trained staff (Figure 7).

Advances in Interventional Gastroenterology at KHCC has added significant value to the GI MDC team. In the past patients with symptomatic stage IV rectal cancer (bleeding or obstruction), were typically managed with resection of the primary tumour first. This resulted in significant delay in the treatment of liver metastasis with chemotherapy and liver resection. At KHCC Interventional Gastroenterology provides such patients with symptomatic relief utilising endoscopic stenting and Argon Plasma Coagulation. These temporary measures allow the patient to start the protocols of systemic treatment, without the need to first go through the morbid surgical resection of the primary tumour.

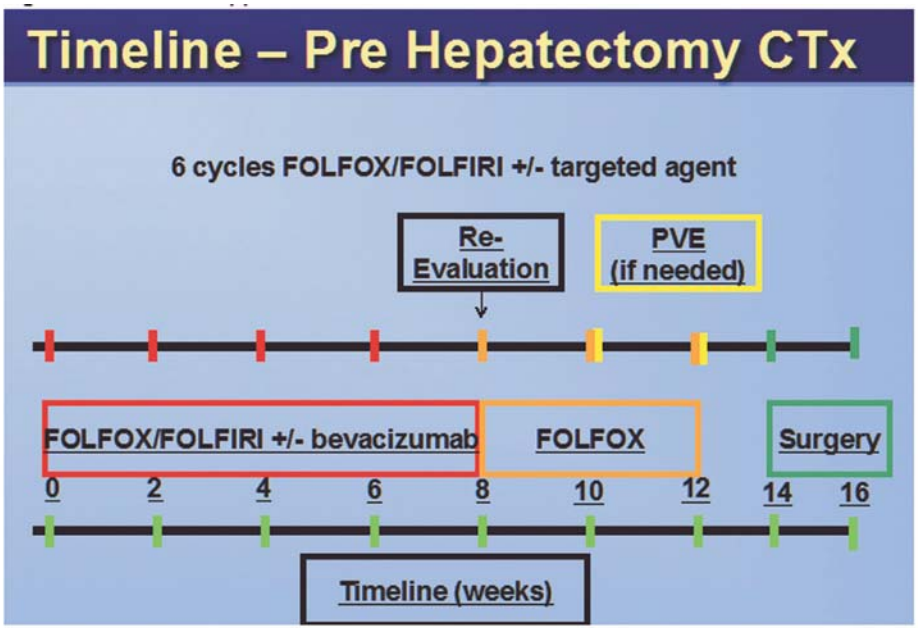

Figure 6: Protocols for Pre Hepatectomy chemotherapy

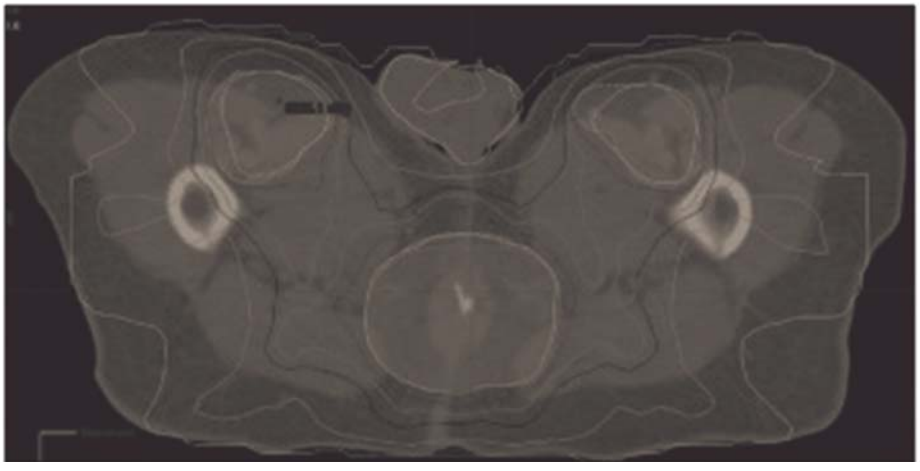

Figure 7: IMRT planning for pre-operative radiation therapy for male patient with stage T3 N + with inguinal LN matastasis

These efforts by different MDC team members will be fruitless without careful coordination. MDC team coordinators are crucial for this reason. They keep track of all patients under active treatment and ensure protocols are implemented in timely fashion. They facilitate communication between different physician members and between physicians and patients.

In conclusion, cure is possible in patients with stage IV colorectal cancer. The presence of an experienced multidisciplinary team is essential for their management. Every team member at KHCC adds significantly to the excellent outcomes achieved in this group of patients. This will not be possible without the presence of hospital administration and leadership that strongly believe in, and enforce, the multidisciplinary approach for cancer management.

The author

Osama Hamed, MD, is a Consultant Surgical Oncologist, and Hepatopancreatobiliary and Minimally Invasive Surgeon in the Department of Surgery at King Hussein Cancer Center.

Dr Hamed has won several honours and awards for his research in surgery. He has published numerous research papers on surgery for a variety of clinical journals and has contributed chapters to a number of books on the subject. MEH

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Scientists reveal how cancer cells break free from tumours

Although tumour metastasis causes about 90% of cancer deaths, the exact mechanism that allows cancer cells to spread from one part of the body to another is not well understood. One key question is how tumour cells detach from the structural elements that normally hold tissues in place, then reattach themselves in a new site.

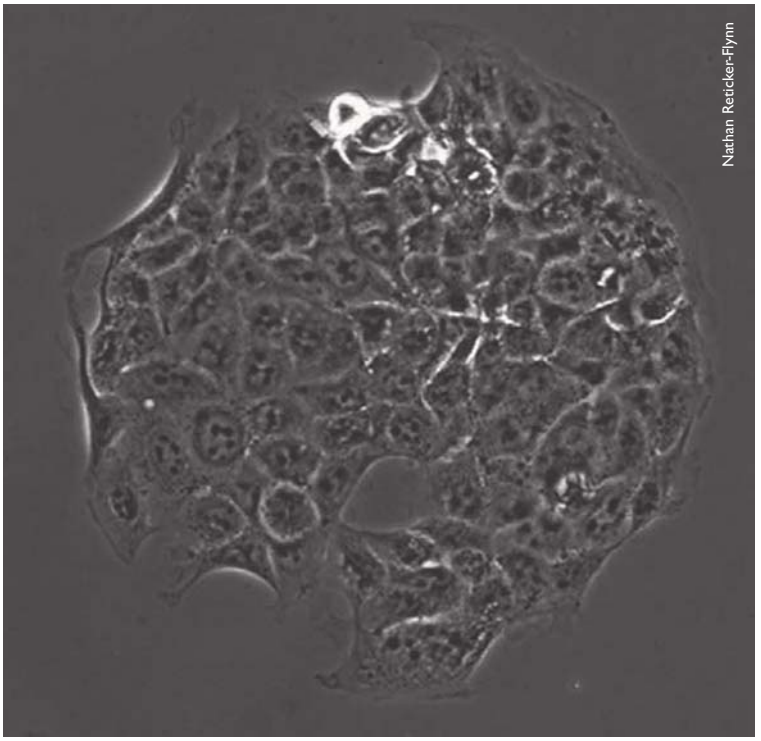
A new study from Massachusetts Institute of Technology (MIT) cancer researchers reveals some of the cellular adhesion molecules that are critical to this process. The findings, published 9 October 2012 in *Nature Communications*, offer potential new cancer drug targets, says Sangeeta Bhatia, the John and Dorothy Wilson Professor of Health Sciences and Technology and Electrical Engineering and Computer Science, and leader of the research team.

"As cancer cells become more metastatic, there can be a loss of adhesion to normal tissue structures. Then, as they become more aggressive, they gain the ability to stick to, and grow on, molecules that are not normally found in healthy tissues but are found in sites of tumour metastases," says Bhatia, who is also a member of the David H. Koch Institute for Integrative Cancer Research at MIT. "If we can prevent them from growing at these new sites, we may be able to interfere with metastatic disease."

Lead author of the paper is Nathan Reticker-Flynn, a PhD student in Bhatia's lab. Other authors are former students David Braga Malta and Mary Xu, postdocs Monte Winslow and John Lamar, and research scientist Gregory Underhill. In addition, Richard Hynes, the D.K. Ludwig Professor of Biology and a member of the Koch Institute, and Tyler Jacks, director of the Koch Institute, are contributing authors on this study.

Losing and gaining adhesion

Cells inside the human body are usually tethered to a structural support system known as the extracellular matrix, which also helps regulate cellular behaviour. Proteins called integrins, located on cell surfaces, form the anchors that hold the cells in place. When cancer cells metastasize, these anchors let go.



A microscopic image of cancer cells adhering to a spot coated with molecules found in the extracellular matrix.

In this study, the researchers compared the adhesion properties of four types of cancer cells, taken from mice genetically engineered to develop lung cancer: primary lung tumours that later metastasized, primary lung tumours that did not metastasize, metastatic tumours that migrated from the lungs to nearby lymph nodes, and metastatic tumours that travelled to more distant locations such as the liver.

Building on a system they first described in 2005, the scientists developed technology allowing them to expose each type of cell to about 800 different pairs of molecules found in the extracellular matrix. After depositing cells onto a microscope slide in tiny spots – each containing two different extracellular matrix proteins – the researchers could measure how well cells from each tumour type bound to the protein pairs.

The new technology is a huge step forward from current experimental methods for studying cellular adhesion, which are limited to much smaller numbers of cells and adhesion molecules, says Jan Pilch, an assistant professor at the University of Pittsburgh School of Medicine.

"They've not only scaled this up dramatically, they're able to study the adhesion proteins in combination, which allows them to identify adhesion synergies," says Pilch, who was not part of the research team.

The researchers were surprised to find that adhesion tendencies of metastatic cells from different primary tumours were much more similar to each other than to those of the primary tumour

from which they originally came. One pair of extracellular matrix molecules that metastatic tumours stuck to especially well was fibronectin and galectin-3, both made of proteins that contain or bind to sugars.

Although metastatic tumour cells share adhesion traits, they may take different pathways to get there, Reticker-Flynn says. Some tumour cells alter the combination of integrins that they express, while others vary the types of sugars found on their surfaces. All of these changes can result in higher or lower affinities for certain molecules found in the extracellular matrix of different tissues.

In an analysis of human tumour samples, both primary and metastatic, the researchers saw similar patterns. Specifically, they found that the more aggressive the metastasis, the more galectin-3 was present.

Previous studies have suggested that tumours pave the way for metastasis by secreting molecules that promote the development of environments hospitable to new cancer growth. Accumulation of galectin-3 and other molecules that help tumour cells colonise new sites may be part of this process, the researchers say.

"There's a lot of evidence to suggest that a hospitable niche for the tumour cells is being established prior to the cells even arriving and establishing a home there," Reticker-Flynn says.

Preventing cancer spread

The findings offer potential new ways to block metastasis by focusing on a specific protein-protein or protein-sugar interaction, rather than a particular gene mutation, Reticker-Flynn says. "If those changes do confer a lot of metastatic potential, we can start thinking about how you target that interaction specifically," he says.

The researchers tested this approach by genetically knocking down the amount of an integrin found on the surface of cancer cells, which they had identified as interacting with fibronectin and galectin-3. In those mice, tumour spread was reduced. Other possible therapeutic approaches include blocking binding sites on fibronectin and galectin-3 with antibodies, so tumour cells can't latch onto them.

To help with efforts to develop such drugs, the research team is now trying to figure out the details of tumour cells' interactions with galectin-3 and is developing new candidate therapeutics aimed at inhibiting those interactions.

The research was funded by Stand Up to Cancer, the Koch Institute Circulating Tumor Cell Project, the Harvard Stem Cell Institute, the US National Cancer Institute, the Howard Hughes Medical Institute and the Ludwig Center at MIT. MEH

Researchers in Norway develop PET scanner that produces 50% less radiation than current PET technology

Small device will fit in MR scanner for simultaneous PET/MR imaging

By **Yngve Vogt**

Current cancer examinations involve high levels of radiation. Based on the Big Bang research in CERN, particle physicists at University in Oslo have created a brand new technology that combines the PET and MR medical imaging technologies. This combination involves much less radiation than current technology.

PET (Positron Emission Tomography) provides a spatial image of where the cancer cells are located in the body. PET scans are harder to interpret if medical staff cannot situate the location of cancer cells in relation to the skeleton and soft tissue. This can be done by comparing PET images with an anatomical picture such as CT (Computerised Tomography) or MR (Magnetic Resonance) scans.

CT scans provide a three-dimensional x-ray image of the body. MR scans photograph the body using radio waves and a powerful magnetic field. MR provides far better images of soft tissue than CT does. The drawback of MR scans is that the examination is more expensive and takes much longer. The advantage is that MR does not emit ionising radiation.

Currently, most hospitals combine PET and CT, but this combination has a significant weakness.

"The radiation from such an examination is 10 times higher than the average background radiation over the course of a year. Many cancer patients must be examined multiple times to test whether the treatment is working. The total radiation during treatment can therefore be very high," says Erlend Bolle, a researcher in particle physics in the Department of Physics at University of Oslo (UiO), Norway.

PET tech

Currently, there are two types of PET technologies, each adapted to a particular use: One is adapted for clinical examinations of patients. The other technology is optimised to let researchers find new and better cancer treatments by testing new medicines on animals.

Siemens and Philips have recently launched a new PET/MR combination for patients. However, particle physicists at UiO are the first in the world to develop a specially adapted PET/MR solution for research scans of animals.

"The high resolution in our PET scanner provides better images, and the high sensitivity makes it possible to use only half as much radioactivity in the examinations without it affecting the image quality. This opens new possibilities in research, and may also contribute to reducing radiation in clinical scanners, especially within mammography and brain scans. We therefore hope that Philips and Siemens find our technology interesting," says Bolle.

Together with his three colleagues, he has constructed a PET machine that is so small that it can be placed inside an MR machine. Both images can therefore be taken at the same time, and medical personnel do not have to correct the errors that occur when two images are combined after they have been taken.

Photon eater

In a standard PET examination, radioactive isotopes are attached to sugar molecules and injected into the body. The PET image is taken one hour later, when the sugar has been distributed to the entire body. Cancer cells burn sugar quicker than healthy cells. Radioactive gamma particles therefore accumulate in cancer cells. The gamma particles send out two sets of photons in opposite directions. They are referred to as parallel photons.

In order to trace the radioactive source, the PET scanner must find which parallel photons are linked. This is one of the great challenges for current PET scanners.

As long as the photons hit the detectors at a right angle, all is well. When they are

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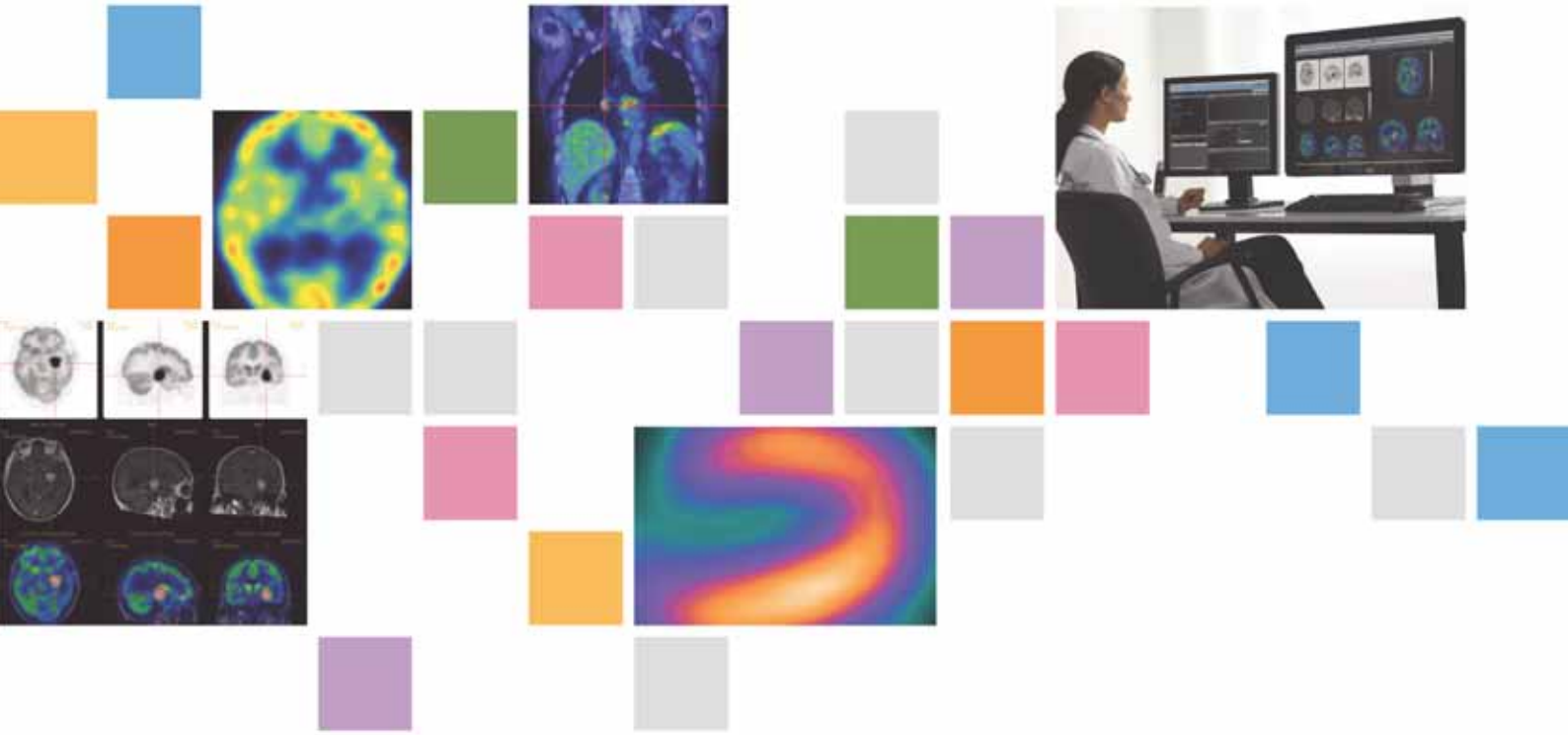

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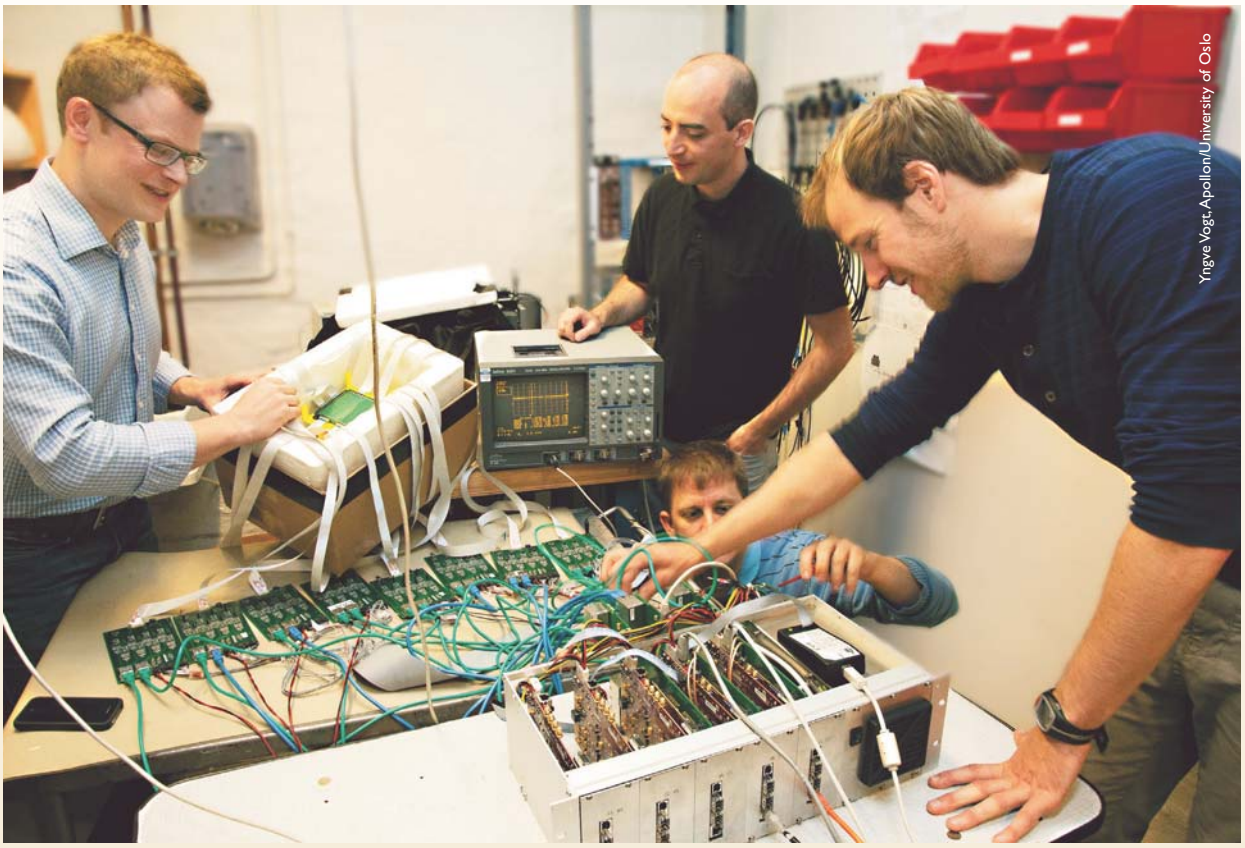

50% less radiation. The particle physicists Erlend Bolle, David Volgyes, Michael Rissi and Kim-Eigard Hines have developed a completely new technology that makes it possible to halve radiation from a PET scanner. The PET scanner is also built at such a small scale that it can be placed inside an MR scanner. This makes it possible to take the MR and PET images at the same time.

captured, it is possible to calculate which two photons are linked. The problem arises when the photons hit the detector at an angle other than a right angle. This leads to a risk of imprecise measurements of the collision points and diminishes the image quality.

Only half of the photons deposit all their energy on first impact. On subsequent impacts, only some of the energy is deposited before the photons change direction and deposit the rest of the energy elsewhere. Current detectors have no depth information and therefore cannot reconstruct the positions of these photons.

"In order to capture all the photons, we measure the position in three dimensions in a five-layer detector," Bolle says.

In current machines, in order to have the photons hit the detectors at as straight an angle as possible, it is important that the entire patient is as centrally positioned in the machine as possible. It is therefore important that there is great distance between the patient and the detector. This solution has a major weakness.

"When there are large openings on both sides of the scanner, too many photons go astray. This diminishes the image quality. The closer the patient is to the detector, the higher the sensitivity of the image."

In the new UiO PET scanner, good image quality can be achieved even if the test subject is lying right next to the detectors.

"We have managed to double the sensitivity. In practice, we can take the pictures twice as fast, or only use half of the radioactive dose in order to get the same image quality as previously."

Crystal pins and light fibres

The new detectors are made from entirely new crystals and light guides. In each of the five layers of the detectors, crystal pins are placed on top of a transverse layer of light guide fibres.

"This is a completely new way of measuring gamma particles," says Bolle.

"The detectors are placed so that the space within the new scanner is square.

"Today, the scanners form a circle. This means that there is a gap between each detector block, and photons disappear through the gaps. Now, we have full coverage of crystals on all sides. We can capture several million particles a second. However, this does not happen at regular intervals. We measure each nanosecond. If we do not measure fast enough, we can get errors."

Digitalising the data

All the parts of the PET scanner are put together like Lego bricks. The system digitalises the data at an earlier stage than the current PET solutions. The data can be sent to any number of computers. The image processing takes place in parallel with the examination.

"Though we are making a scanner for animals, it can easily be rebuilt for hospital use," Bolle notes.

He got the idea from the large Big Bang experiment in CERN, in which enormous detectors in the world's largest physics experiment are being used to trace the world's smallest particles.

We have managed to double the sensitivity. In practice, we can take the pictures twice as fast, or only use half of the radioactive dose in order to get the same image quality as previously.

The research is funded by the Research Council of Norway and the Swiss National Science Foundation. MEH

Only a handful of hospitals in the United States have been recognized by *U.S. News & World Report* for excellence in both adult and pediatric care.

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BEST HOSPITALS U.S.News HONOR ROLL 2012-13

NewYork-Presbyterian
The University Hospital of Columbia and Cornell

The Nebraska Medical Center, located in Omaha was recently named by *U.S. News & World* Report as one of America's Best Hospitals for cancer treatment.

New heated chemotherapy treatment offers hope to patients with peritoneal surface malignancy

By **Jason Foster**, MD
Surgical Oncologist,
The Nebraska Medical Center
Associate Professor of Surgery,
University of Nebraska Medical Center

Often when people think about cancer and the concept of cancer metastasis, most people think of cancer traveling either through lymph nodes or the blood stream and involving distant organs like the liver, lung, brain, or bone. A less recognized form of cancer metastasis, termed peritoneal metastasis (PM) or peritoneal carcinomatosis (PC), involves the spread of cancer throughout the abdomen and the surfaces of abdominal organs. Cancers that are more commonly known to develop this form of metastasis include: appendix, colon, rectal, ovarian, gastric, small intestine, carcinoid and mesothelioma. Peritoneal metastasis occurs in approximately 70,000 patients per year in the U.S. and appears to be increasing worldwide. The one thing all of these cancers that develop PM have in common is that they originate from an organ housed in the abdominal cavity. The mechanism for developing PM involves the microscopic shedding of tumors cells from the surface of a tumor and subsequently, these microscopic tumors implant on the surface of other adjacent organs in the abdominal cavity. Once the tumors become established, they can continue to spread on the surfaces that are distant from the primary tumor. Sometime as these tumors grow, they can invade or obstruct the function of organs in the abdominal cavity, such as the intestines or stomach. Common symptoms that develop for patients with progressive disease include abdominal pain, bowel obstructions, infection, bleeding, weight loss, increasing abdominal girth and unexplained hernias. When PM is not treated, the prognosis and the quality of life for patients is poor, with most patients living less than six months.

At The Nebraska Medical Center, there is a dedicated program for optimizing and improving the treatment of patients who develop PM. Each case requires an individualized approach to care. In general, patients often require a combination of systemic (IV) chemotherapy, surgery and hyperthermic intraperitoneal chemotherapy (HIPEC) to treat PM and for many patients. This course of treatment can result in long-term survival and excellent quality of life. The first step in this treatment is to perform surgery called cytoreductive surgery (CRS). This surgery

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involves removing all the visible sites of tumor which often requires multiple abdominal organs to be removed. Essentially we perform many of the routine cancer operations such as colon, gallbladder and appendix all in one operative procedure. Once the visible tumor is removed we then administer HIPEC treatment. It is chemotherapy in a balanced solution, heated to 42 degrees Celsius (108 degrees Fahrenheit), delivered directly to the surfaces of the abdomen. This treatment is performed in the operating room following the tumor removal. The benefit of the HIPEC treatment of 60 to 120 minutes is that is destroys any residual microscopic tumor cells and small subcentimeter tumor nodules that may remain after CRS. The risk of bleeding and infection with this procedure is similar to other abdominal procedures and patients occasionally can have chemotherapy-related side effects. The recovery time in the hospital is about five to 10 days.

As with many forms of metastatic cancer, not all patients may be cured or achieve long-term remission. The outcome following CRS/HIPEC for each patient is a function of the type of cancer, previous treatments, baseline health and fitness and the intrinsic biology of the cancer. This is factored into patient selection for the procedure and also the magnitude of the procedure that is performed. A key factor in the success of CRS/HIPEC is early treatment when the disease is first diagnosed, typically after the first course of chemotherapy. The other benefit for almost all patients with PM that is less commonly discussed is quality of life; particularly the relief. More importantly, this treatment can prevent symptoms such as bowel obstruction, infection and pain that develop with progressive peritoneal disease. At The Nebraska Medical Center, we strive to achieve improving outcomes and educating all patients about their disease, as well as having patients become participants in the process of optimizing their care. In this current era in medicine our ability to detect metastatic disease in its early stages is improving. In conjunction with the progress and improvements in available treatments, both medical and surgical, we continue to extend the lives of patients with advanced metastatic cancer. The University of Nebraska Medical Center is establishing research to help unlock the mechanisms involved in PM which will lead to the development of new treatment strategies. Ultimately, it is paramount that patients are informed of all of the available treatment modalities and the risk benefits associated with each therapy so they know they have pursued all options.

Patients who have weighed those risks and benefits and decided to move forward with the treatment have shared their success stories publicly. Sue Vincent had been healthy most of her life. When she started gaining weight at an unexplained rate, she suspected something was wrong. Her weight gain was caused by an appendix neoplasm, a large tumor growing in her abdomen. She underwent HIPEC to remove the cancer and give her a fighting chance at preventing a recurrence. Our experience has shown that if we do aggressive removal of the tumor and do intraperitoneal chemotherapy, we can often control people's disease for decades. The first part of Vincent's surgery lasted more than 14 hours. Our surgical team removed 20 liters of mucus and tumor from her abdomen. Because of the cancer's spread, we also removed her spleen, gallbladder, omentum, ovaries, uterus, and portions of her colon, liver and pancreas. The following day, we proceeded with the second phase: instilling the heated chemotherapy solution. During this procedure, our team used catheters and a circulation pump to fill Vincent's abdominal cavity with the heated chemotherapy solution. The chemo was then able to penetrate up to eight millimeters into the tissue and be absorbed in the surfaces where these tumor cells were laying. And the cells that are free-floating will either be killed by the heat or by the chemo itself. Washing away the cancer cells left behind greatly improves a patient's odds of living many more years without a recurrence of cancer. Vincent's outlook is excellent. Her odds of living another 10 or more years are 75 to 80 percent.

Patients who are candidates for HIPEC treatment are facing very steep odds. They are typically stage four cancer patients and in many cases have already experienced surgery and chemotherapy.

Ann Connealy had survived a previous bout with appendix cancer. Her first treatment involved several surgeries and intravenous chemotherapy. As is often the case, her cancer returned three years after she completed the traditional treatment. She felt she would never be well again. But a year after her surgery and HIPEC treatment, Connealy is optimistic about her future. With her surgery behind her, the future will hold at least a few traditional chemotherapy treatments.

Patients who are candidates for HIPEC treatment are facing very steep odds. They are typically stage four cancer patients and in many cases have already experienced surgery and chemotherapy. I look forward to a time when more people are aware of HIPEC as an option for cancer treatment. I am hopeful that new applications will be found. There is more research to be done, but maybe one day, this approach can work for other parts of the body as well.

The peritoneal surface malignancy and HIPEC program is a significant option for our international patients who come to our center for treatment. The International Health Services department at the medical center has collaborative relationships with over a 120 healthcare institutions in 44 countries. The department coordinates patient referrals, training, education and research opportunities for the healthcare-international professionals. It is also one of the few institutions in the U.S. that provides customized training programs for healthcare professionals that best fit the objectives of the individual professionals as well as the healthcare centers.

- For more information about HIPEC treatment or the international program, please call: +1 (402) 559-3090 or email *oihs@nebraskamed.com* MEH

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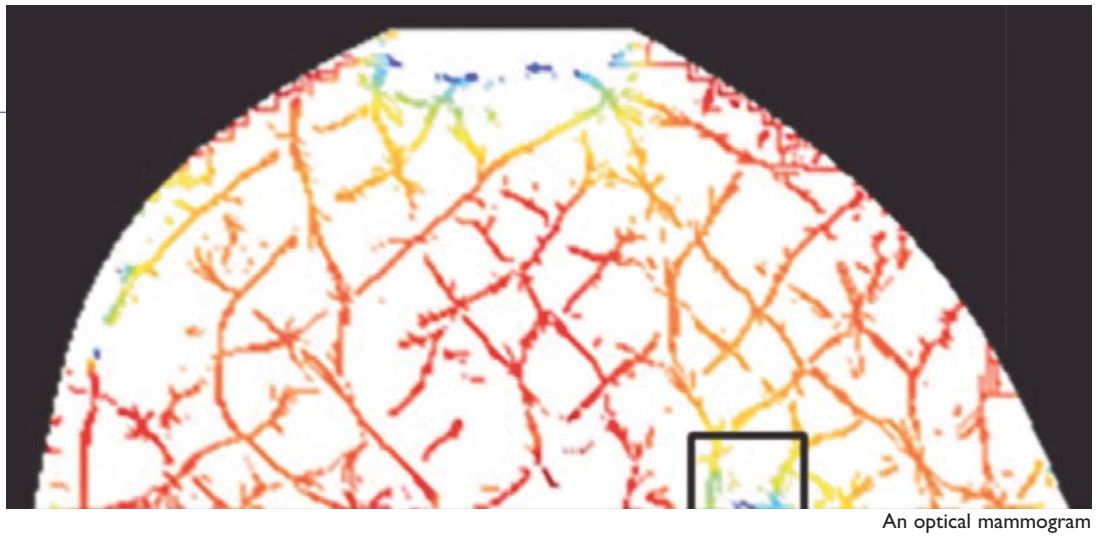

An optical mammogram

Optical mammography may offer better way to detect breast cancer

By **Niharika Midha**, MSc

Breast cancer remains the largest prevalent form of cancer in women and its early detection is essential to improve survival rates. To combat a disease that is the leading cause of cancer death in women, claiming an astounding 458,000 lives worldwide in 2008, we need to rely on advances in diagnostic technologies including imaging and gene testing. Despite many debates on how effective diagnosis is using mammography, it still remains the most widely used technique for the screening and detection of breast cancer. Now, with the advent of cutting-edge technologies that address the flaws with traditional mammography techniques, are we ready for a new era in breast cancer diagnostics?

A recent portable optical scanner developed by the Tufts University School of Engineering offers several promising advantages over the current gold standard – mammography. This new Tufts optical scanner would be a stand-alone device which does not need to be combined with an adjunctive modality or contrast agent, further allowing differentiation between benign and malignant tissues, unlike in mammography which is usually combined with other imaging techniques such as ultrasound for breast cancer diagnosis. In essence, such a device could possibly replace the use of mammography/ultrasound.

The Tufts scanner lightly presses the breasts between glass plates for illumination with Near Infrared (NIR) light and scans them by using an optical system; this information is then interpreted with the help of an algorithm. Optical mammography, also known as diffuse optical imaging, measures changes in blood oxygenation and blood flow of a tissue when illuminated with NIR light. This technique is also capable of differentiating between fats and water based on varying light absorption.

Other advantages of this technique include non-invasiveness, cost effectiveness and patient comfort. Since the technique uses non-ionizing radiation, real-time detection is possible without the risk of radiation exposure and, unlike in traditional mammography, the breast tissue does not need to be greatly compressed. A five year clinical study to test the Tufts scanner's effectiveness, funded by a $3.5m grant from the US National Institutes of Health, is currently recruiting patients.

The global mammography equipment market is expected to grow from $897.2m in 2009 to $1.2 billion by 2016. A research study conducted by the Cancer Registry of Norway in 2010 suggests that traditional mammography might not be as effective as was previously perceived. The study indicated that routine mammography only reduced breast cancer mortality by 10%, much less than the World Health Organization's estimate of 25%. This failing, combined with the associated high number of false positive diagnoses and use of ionizing radiation (leading to a significant health risk), points to a clear unmet need for accurate and early diagnosis of this deadly disease. The new Tufts device also focuses on reducing the number of false positives and providing more specific breast screenings, explained Sergio Fantini, Professor of Biomedical Engineering at Tufts.

"The consensus is that x-ray mammography is very good at detecting lesions but it's not as good at determining which suspicious lesions are really cancer," says Fantini., who is leading the research effort. The Tufts NIR technique could complement standard mammography, particularly for women younger than 40 who may have dense breast tissue that tends to obscure detail in x-rays.

"It's been reported that patients who respond to breast cancer chemotherapy show a decrease in hemoglobin and water concentration and an increase in lipid concentration at the cancer site," explains Fantini. "This suggests that NIR imaging can be valuable not only in diagnosing breast cancer but in monitoring individual response to therapies without requiring repeated x-rays. For example, it could help determine if a patient is responding to neoadjuvant chemotherapy administered to shrink a tumour before surgery."

For a new technology to be adopted, it should exhibit specificity and sensitivity that is at least as good as, if not better than, the current methodologies, while addressing the safety issues. If optical mammography succeeds at this, there is no reason why it will not be embraced rapidly by the medical community, as it clearly offers several advantages, and since the technology is comparatively cheap, the cost would not be a bar to its adoption. MEH

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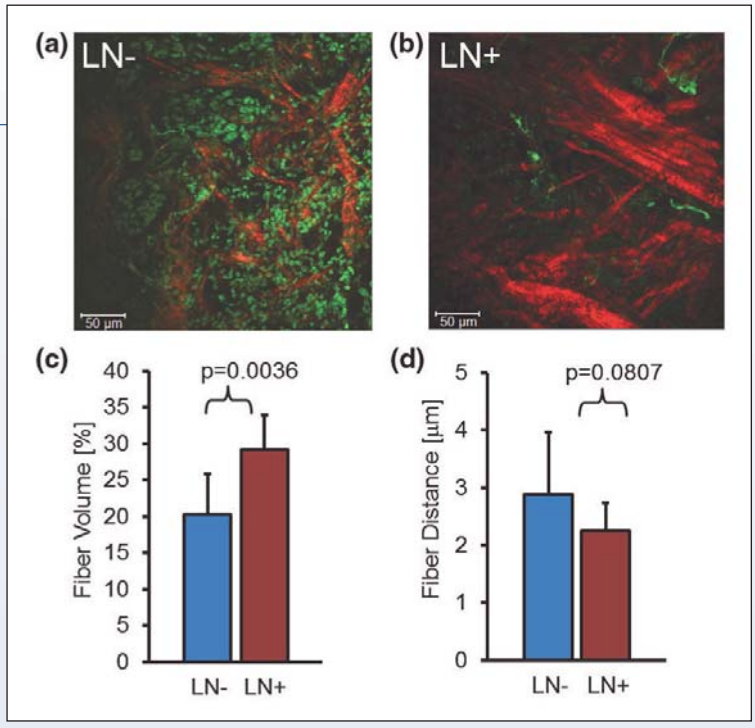
New laser light testing technique for breast cancer may help prevent it spreading



Breast tumour collagen fibre patterns (as seen in red) are much more dense (and radially spread out) in women whose cancer has spread beyond the breast and to the lymph nodes (on the right, image "b") than in women whose cancer has not spread (image "a").

Using advanced microscopes equipped with tissue-penetrating laser light, cancer imaging experts at Johns Hopkins have developed a promising, new way to accurately analyse the distinctive patterns of ultra-thin collagen fibres in breast tumour tissue samples and to help tell if the cancer has spread.

The Johns Hopkins researchers say their crisscrossing optical images, made by shining a laser back and forth across a biopsied tissue sample a few millionths of a metre thick, can potentially be used with other tests to more accurately determine the need for lymph node biopsy and removal in women at risk of metastatic breast cancer.

In what is believed to be the first study to measure minute changes in tumour connective tissue fibres, researchers found that eight women whose cancers had spread beyond the breast through the body's lymphatic system had about 10% more densely packed and radially spread-out collagenous structural proteins than six women whose cancers had not yet spread. Collagen fibres in the non-metastasized tumours, also obtained during breast biopsy, were more diffuse and arranged in a transverse or horizontal pattern. All 14 women in the study had aggressive, malignant breast cancer.

In the new report, published online in the 1 November 2012 *Journal of Biomedical Optics*, researchers say that if these "proof of principle" findings hold up in testing now under way in hundreds more women with or without metastatic breast cancer, then their new optical imaging tool could simplify testing for spreading disease and help people avoid unnecessary lymph node surgery.

"Our new diagnostic technique has the potential to help reassure thousands of breast cancer patients that their cancers have not spread to other organs, and could help them avoid the risks and pain currently involved in direct inspections of lymph nodes for the presence of cancerous cells," says study senior investigator Kristine Glunde, PhD.

Women with denser tumour fibre patterns would likely stand a greater chance of needing lymph node biopsy and removal and inspection of such tissue for malignant cells, says Glunde, an associate professor at the Johns Hopkins University School of Medicine Russell H. Morgan Department of Radiology and the Sidney Kimmel Comprehensive Cancer Center.

Glunde says complications from lymph node biopsy and more invasive dissection include risk of infection, pain, severe swelling and leakage of lymph fluid around the armpit, as well as stiffening in the arm, which can be permanent. An estimated 230,000 Americans were diagnosed in 2011 with invasive breast cancer, while another 57,000 were found to have non invasive, or in-situ breast cancer.

Cancer imaging experts have known for more than a decade that the fibrous connective tissue located between cancer cells changes and bunches together as tumours grow and disease spreads, says study co-investigator Zaver Bhujwalla, PhD, a professor at Johns Hopkins and its Kimmel Cancer Center.

"Until now, however, we had no proof in principle that such minute and progressive changes outside cancer cells, in the tumour micro-environment or extracellular matrix, could be measured and potentially used to better guide our staging and treatment decisions," says Bhujwalla, who also serves as director of the Johns Hopkins In Vivo Cellular and Molecular Imaging Center (ICMIC), where the latest imaging study was performed.

It was also at ICMIC in 2010, supported with funds from the US National Cancer Institute (NCI), that Glunde, Bhujwalla and fellow study co-investigator Meiyappan Solaiyappan, B.S., developed the specialized computer software used to analyze the microscopic spaces between tumour collagen fibres and calculate their density.

The tissue fibre images were obtained using an optical imaging technique called second harmonic generation microscopy, in which a long-wavelength laser light is deflected off the collagen fibres for a few seconds, allowing for several planes and fields of view to be captured. The longer infrared wavelength, at 880 micrometres, was chosen because it can penetrate the tissue beyond the colourful light waves visible to the human eye, but does not damage and heat up the cancer cells, as a slightly longer infrared wavelength would. Glunde says the many fields of view were randomly taken throughout the tissue sample, providing a "realistic representation of each breast cancer sample." Breast biopsy samples came from tissue research collections in Maryland. MEH

Diabetes in the UAE
– Portrait of a country at risk

In its few short years of existence the United Arab Emirates has achieved remarkable economic growth, significantly raising the prosperity of its citizens and the many expatriates who have come to work in the country. However, along with this new-found wealth the country is struggling to cope with a growing epidemic of diabetes, that if left unresolved could significantly affect the future prosperity of this land. **Grant McLaughlin**, **Jason Kemp**, and **Katherine Stoltz** of Booz Allen Hamilton highlight key issues raised during a convention of business leaders who came together to discuss this critical issue.


Grant McLaughlin


Katherine Stoltz


Jason Kemp

The United Arab Emirates (UAE) has achieved an impressive level of economic development. In particular, its healthcare sector is among the best performing in the world. By many measures of health status (infant mortality, life expectancy, eradication of numerous infectious diseases), the UAE has reached levels comparable with other developed nations. In addition, the health infrastructure which includes facilities, equipment, and staff, are of high quality. This healthcare is offered freely or at low-cost to citizens and highly subsidised to residents and tourists. The fact that the UAE has made such great strides in achieving a high level of excellence in accommodating the healthcare needs of so many people is a testament to wise resource management policies. However, at least one health pandemic threatens to unravel the system's stability: diabetes.

The World Health Organisation (WHO) and the International Diabetes Federation (IDF) call diabetes the 21st century's leading healthcare challenge. Diabetes complications and mortality create social and economic challenges that affect individuals, families, businesses, and society as a whole. Six Middle East North Africa (MENA) region countries – Bahrain, Egypt, Kuwait, Oman, Saudi Arabia, and the United Arab Emirates (UAE) – are among the world's 10 highest for prevalence of diabetes and impaired glucose tolerance. By 2020, 32% of the adult UAE population (age 20-79) may have diabetes or pre-diabetes, while other data indicate that the adult UAE population (ages 18 and above) has already reached a diabetes or pre-diabetes rate of 44%. If trends continue, the IDF projects that by 2030, the number of people with diabetes in the Middle East North Africa (MENA) region will almost double, reaching 59.7 million.

Booz Allen Hamilton, a leading provider of management and technology consulting services, has been studying the effect of diabetes on governments, business, and society in the MENA region. On November 5, 2012, Booz Allen Hamilton convened executives from leading companies operating in the UAE in an event, "Diabetes in the UAE: Workplace Strategies Tabletop," which aimed to foster collaborative solutions to the crisis. It is the first in a comprehensive series of events across the Gulf Cooperation Council (GCC) countries over the next six months that will explore various elements of economic competitiveness and the role that issues like the diabetes crisis can play with regard to charting the course for long-term sustainable socio-economic growth in the region. Due to the rapid increase in diabetes cases and complications that threaten to overstrain the health system within the near future, it is important to begin conversations now.

The diabetes pandemic

In order to inform diabetes prevention efforts in the UAE, Booz Allen Hamilton

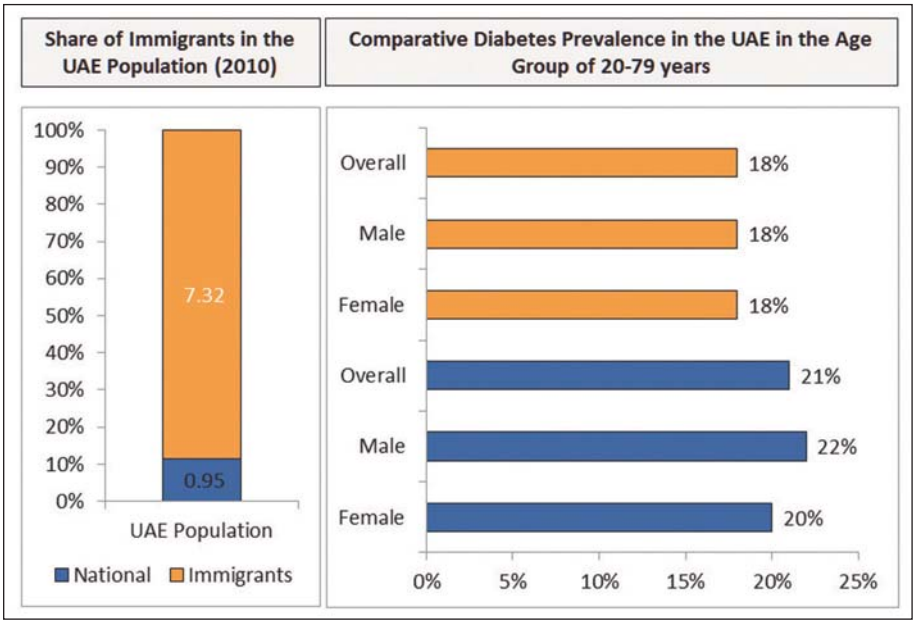
commissioned two studies in 2012. The first assessed diabetes prevalence and incidence, risk factors, prevention programmes, and economic costs in the country; reiterated the scope of the problem; and examined contributing lifestyle and genetic factors. This study also categorised existing prevention programmes and highlighted collaborative efforts and outcomes. Booz Allen Hamilton then commissioned a survey to understand the attitudes and behaviours that put Emiratis at risk of developing diabetes and to identify possible ways to mitigate risk factors and encourage healthy behaviours. This survey found that while high levels of awareness exist among Emiratis, there are widespread obstacles to preventative behaviours.

The UAE has the second-highest diabetes rate in the world, with an estimated 20% of residents and 25% of nationals suffering from the disease. Nearly three-quarters of diabetes patients in the UAE do not have their diabetes under control, a challenge particularly pronounced among children and young adults. It is estimated that 40 to 50% of diabetics in the UAE are unaware they even have the disease. Left unchecked, the spread of diabetes portends devastating social and fiscal consequences, including threats to economic progress and investment stability in the region.

Delegates discuss the critical issue of diabetes at the 'Diabetes in the UAE: Workplace Strategies Tabletop' event held in Abu Dhabi, UAE on November 5, 2012.

Obesity, hypertension, and cardiovascular diseases (CVD) are often comorbid to diabetes. Diabetics in the UAE, along with Qatar, have the highest prevalence of cardiovascular disease among GCC countries. This is significant because comorbidities complicate treatment and contribute to mortality rates. Of adult Emiratis, 71% have at least one risk factor for CVD. In 2005, 31% of all deaths in the country were due to diabetes and CVD. The risk of a heart attack is three times greater and the risk of a stroke is two to four times greater for all individuals with diabetes, leading to the sobering statistic that approximately 50% of diabetics eventually die from CVD. However, studies have demonstrated that effective treatment can lead to over a 50% reduction in heart failure.

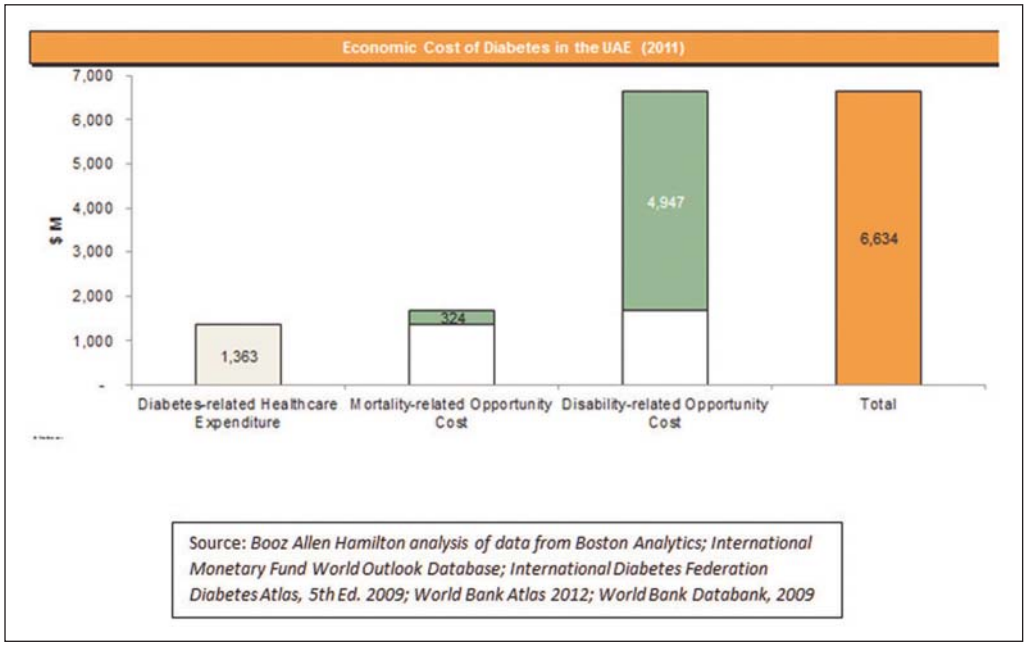
Table 1



Economic costs of diabetes to the UAE

These startling statistics regarding diabetes in the UAE are driving the enormous associated costs borne by the government, civil society, and private sectors. Direct treatment of diabetes constitutes approximately 40% of the UAE's overall healthcare expenditures. In 2011, the total cost of diabetes to the Emirates was nearly $6.6 billion or 1.8% of GDP, higher than in any other GCC country (See Table 2). As diabetes is predicted to escalate in the region, associated costs will skyrocket. By 2020, if current trends continue, diabetes may cost the country $8.52 billion. The growth of diabetes is so serious that healthcare systems are already struggling to cope with treatment costs. Medical expenditures for those with diabetes are on average 2.3 times higher than for those without the disease, while at the same time health insurance premiums have seen a 20% rise due to the withdrawing of premiums that were sold at far below cost in an extremely competitive market. The high level of undiagnosed and poorly controlled

Table 2



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● Source: *Booz Allen Hamilton analysis of data from Boston Analytics; International Monetary Fund World Outlook Database; International Diabetes Federation Diabetes Atlas, 5th Ed. 2009; World Bank Atlas 2012; World Bank Databank, 2009*

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diabetes threatens to lead to an increase in related complications and to increased healthcare costs in the future.

Exploring solutions: Private sector participation

These epidemiologic and economic findings demonstrate an imperative need to dramatically increase diabetes prevention and management efforts within the UAE. Healthcare professionals are a critical piece of the puzzle, but commitment is needed from every sector of society to prevent and mitigate the disease.

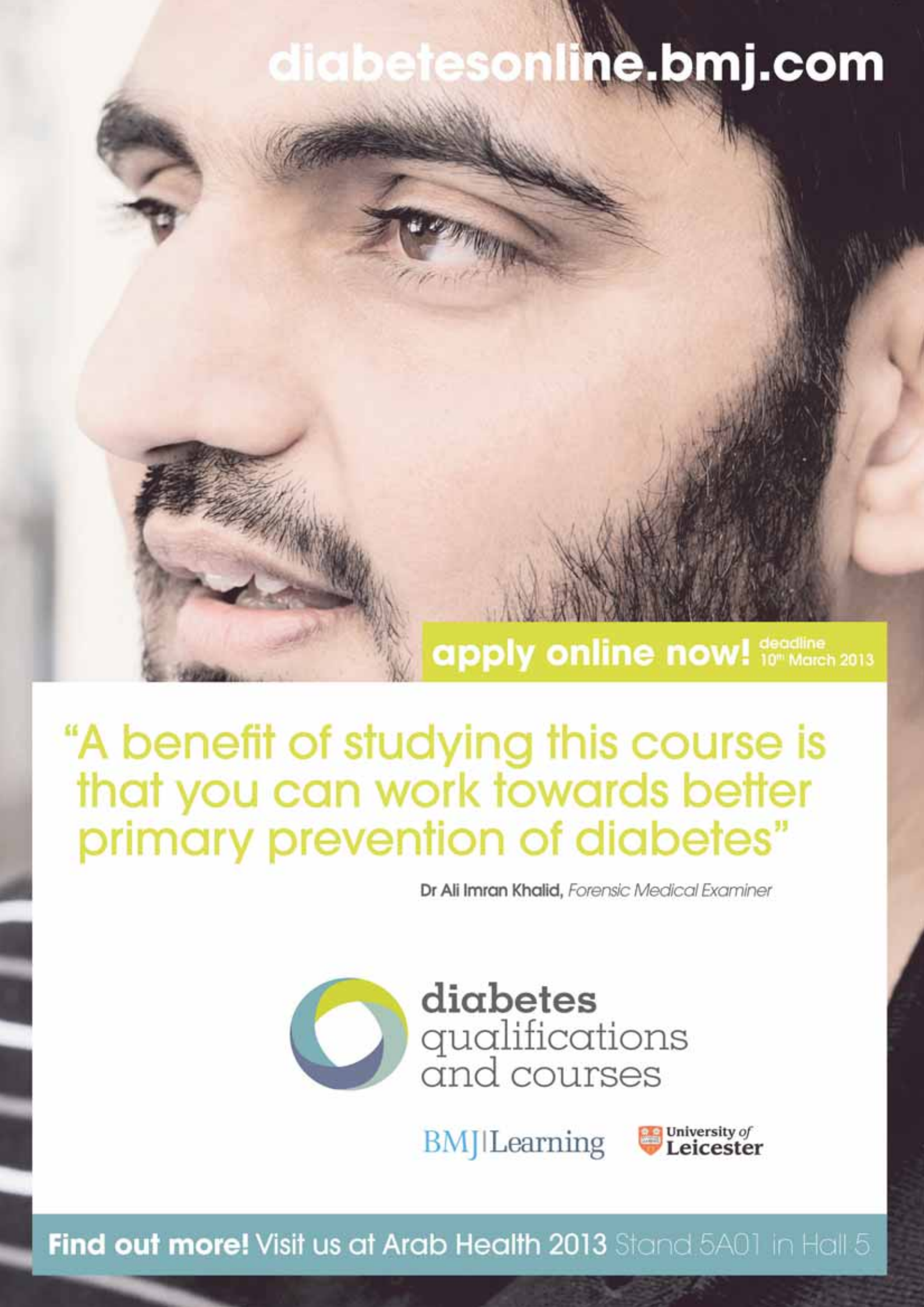
The event, "Diabetes in the UAE: Workplace Strategies Tabletop," held on November 5, 2012, in Abu Dhabi included representatives from the food and beverage, hospitality, pharmaceutical, and healthcare industries, among others. The group engaged in a dynamic, participant-driven simulation exercise designed to provide stakeholders an opportunity to explore cooperative strategies about how to effectively address the growing problem of diabetes amongst employees and their families. During the simulation, participants acted as managers of a fictional multinational corporation operating in the UAE and had to make choices to address employee health circumstances in near-, mid- and long-term time frames. Using a fixed budget, participants had the opportunity to evaluate, prioritise and purchase choices from a menu of programmes that could help their employees. Recommended programmes were evidence-based and designed specifically for this event by subject matter experts at Booz Allen Hamilton; they focused on nutrition, fitness, mobile health, disease management, screening, cash incentives, and awareness.

Over the course of the exercise, participants found the highest value in prioritising three types of programmes: disease management measures, fitness and nutrition programmes offered by employers, and cash incentives. Most participants consistently chose to support a comprehensive disease management programme that would provide automatic prescription refills and weekly meetings with an on-site wellness coach. They prioritised nutrition and fitness programmes, wanting to provide literature on healthy eating habits and company-sponsored memberships to an on-location gym, given that the company had sufficient resources to carry out these initiatives. Participants also expressed a strong interest in implementing cash incentive programmes to promote healthy practices, but understood that such initiatives would not be appropriate for many types of workplaces.

As participants explained and debated their choices, several valuable insights became clear throughout the course of the day that should influence future decision making:

- Institutions cannot take a "one size fits all" approach to implementing corporate wellness programmes. It is especially important for multinational organisations to establish wellness programmes that can be customised and adapted for the unique needs and challenges of employees within its operating countries.
- Leadership is critical for motivating behaviour change. Methods such as setting a positive example and creating an environment where employees feel safe and encouraged to participate in programmes can drive behavioural changes.
- Comprehensive wellness programmes should not be limited to workplace solutions. Programmes that also encourage employees to extend behavioural changes to other critical areas of their lives (e.g., the home) and other risk behaviours (e.g., smoking cessation) are integral elements of a comprehensive wellness programme.

Underscoring the importance of the event's open dialogue, Don Pressley, Regional Managing Director for Booz Allen Hamilton Middle East said: "Increasingly,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leaders are realising that in an era of growing complexity, old ways of approaching problems are no longer successful. [During this event,] business leaders from all over the Emirates demonstrated unique insight and strong motivation to fight our number one public health priority – the diabetes crisis. Given our unique position in Abu Dhabi, we are eager as a firm to support future collaboration between sectors on mutually-important goals such as anti-diabetes initiatives."

Encouraging behaviour change in the UAE

The November 5th event yielded a number of important observations. Participants across industries recognised the need for collective action to address the challenge of diabetes in the UAE. They noted, however, that a sense of urgency around the problem is still missing from the conversation. Participants agreed that the overwhelming evidence about diabetes presenting a growing health and economic challenge required more than just a series of short-term solutions. These business leaders suggested that in order to create a sense of public urgency around a crisis of this magnitude, multiple sectors across the healthcare spectrum – providers, patients, and payers (often private businesses) – would need to collaborate to identify solutions. In particular, participants recognised not only the important role the government could play to encourage this dialogue and to foster a sense of urgency, but also that the government was not the only actor that could promote change. Reggie Van Lee, Executive Vice President at Booz Allen Hamilton and co-author of "Megacommunities: How Leaders of Government, Business and Non-Profits Can Tackle Today's Global Challenges Together," (www.megacommunities.com) underscored the importance of what such cross-sector engagement can achieve: "Stakeholders are brought together based on their overlapping vital interests, and they can pursue those interests, to their benefit, without worrying about giving up their identities or betraying their core constituencies."

The following day, on November 6, 2012, Booz Allen Hamilton convened a group of leaders representing public relations, advertising and mass media institutions at a roundtable event as a corollary to the "Diabetes in the UAE: Workplace Strategies Tabletop" event to discuss the role that the media could play in addressing diabetes in the UAE. Participants agreed with their business leader counterparts that while awareness around diabetes in the UAE is high, the public perception of its importance is low.

To increase awareness and create a sense of urgency, a longer-term and more comprehensive communication strategy is necessary. Sustained awareness campaigns which use multiple methods such as testimonials, social media, and mass media can help create the necessary public sense of urgency to influence lifestyle behaviour changes. Media leaders agreed with the private sector participants that leadership and government support is critical to generating the kind of awareness necessary to encourage the behaviour change needed to stop the spread of diabetes in the UAE. They cited examples of how a champion from the governing leadership or another prominent figure supporting and bringing attention to an issue can motivate this form of behaviour change. They also thought that a key to the future of changing behaviour around diabetes prevention and management might be finding ways to engage personally with individuals through innovative methods such as mobile phone applications that can help individuals manage their disease through fitness, nutrition, and overall health tracking.

A call to collective action

Organised public responses and research have argued that as the diabetes crisis continues to grow, the need for more collaborative and effective efforts to improve the health and well-being of Emiratis increases. Though public, private, and civil sector organisations across the country have worked hard to positively impact the escalating diabetes crisis, it is clear that more remains to be done to raise the level of action in the UAE around it. Through a dedicated network of stakeholders, tailored interventions can be designed that are both culturally appropriate and can engage all sectors of society to create immediate, sustainable impact on behalf of Emiratis and their families.

The authors

Grant McLaughlin is Vice-President, Jason Kemp, Senior Associate and Katherine Stoltz, Lead Associate at Booz Allen Hamilton. MEH

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Booz Allen Hamilton has been at the forefront of strategy and technology consulting for nearly a century. Today, the firm provides services to US and international governments in defense, intelligence, and civil sectors, and to major corporations, institutions, and not-for-profit organizations. Booz Allen Hamilton offers clients deep functional knowledge spanning strategy and organization, engineering and operations, technology, and analytics – which it combines with specialized expertise in clients' mission and domain areas to help solve their toughest problems. Booz Allen Hamilton is headquartered in McLean, Virginia, employs approximately 25,000 people, and had revenue of $5.86 billion for the 12 months ended March 31, 2012. To learn more, visit *www.boozallen.com*.

Daniel Whitehead is the MENA Region Healthcare Lead for Booz Allen Hamilton

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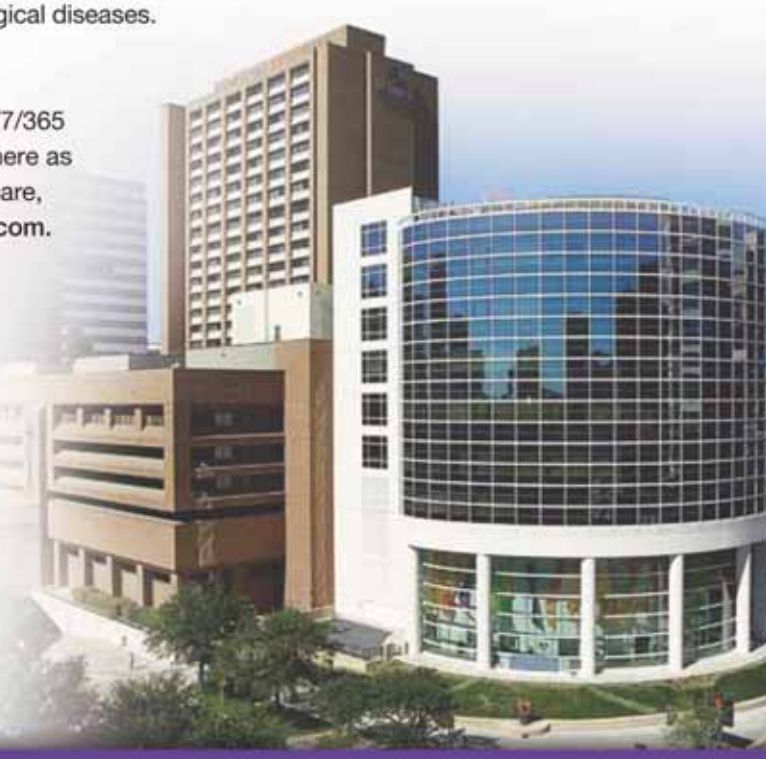

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[1] U.S. News & World Report
[2] NeuStrategy, Inc.

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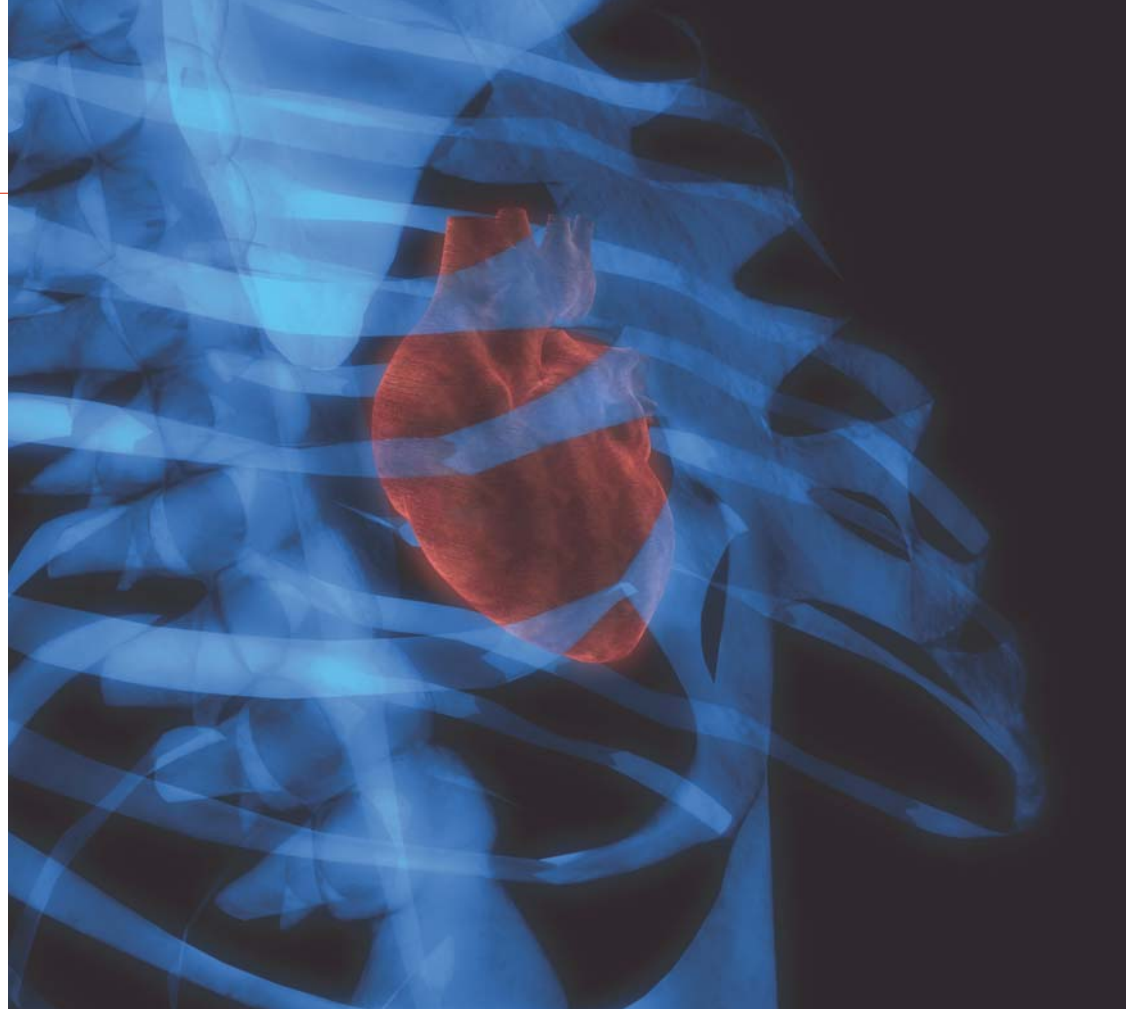

Risk factors and the growing burden of cardiovascular disease in the Arab world

The rapid urbanization and changing ways of life in the Middle East has led to an alarming escalation in cardiovascular disease in the region. **Ronney Shantouf**, MD looks at the risk factors related this complex issue and what can be done to modulate them.

The Arab world is an eclectic mix of countries that bind together on many common themes and history, yet individual countries vary in their own unique way regarding social and societal ways of life. The region has become a growing hotbed of economic, political, and cultural shifts, contributing to the rapid urbanization in the region. Although not fully explained by urbanization alone, rapid shifts in ways of life coupled with slow adaption to wide spread public healthcare policies have contributed to the alarming prevalence of cardiac risk factors and its associated cardiovascular morbidity and mortality.

The heavy burden of cardiovascular disease (CVD) relates to the high prevalence of well-known risk factors including hypertension, smoking, dyslipidemia (high cholesterol), diabetes, obesity, and sedentary lifestyle. These risk factors translate into cardiovascular events, such as devastating heart attacks, taking a high toll on Arab individuals at an early age.

Prominent research such as the Gulf-RACE and INTERHEART study found that patients in the Arab world present with heart attacks at a significantly younger age, on average 10-12 years sooner, compared to their Western counterparts. This intriguing, yet highly alarming finding deserves focus not just from a clinical or research standpoint, but also from an overall public health

UN launches text messaging campaign to support preventive health

Two United Nations agencies recently launched an initiative called 'm-Health' to use mobile technology, particularly text messaging and applications, to help tackle non-communicable illnesses such as diabetes, cancer, cardiovascular diseases and chronic respiratory diseases.

"Technological innovations are changing the landscape of disease prevention and control. The widespread availability of mobile technology, including in many of the least developed countries, is an exceptional opportunity to expand the use of e-health," said Hamadoun I. Touré, the secretary-general of the International Telecommunication Union (ITU).

Through the initiative, the ITU and the World Health Organisation will provide evidence-based and operational guidance to encourage partners worldwide, especially governments, to implement m-Health interventions to address prevention and treatment of non-communicable diseases (NCDs) and their common risk factors – tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol.

"By joining forces, ITU and WHO will fight against debilitating non-communicable diseases that can be controlled through the intervention of m-Health solutions and services that are at once cost effective, scalable and sustainable," said Touré. "In doing so, we will help end a scourge that hinders economic growth and development around the world."

The initiative will initially run for a four-year period and focus on prevention, treatment and enforcement to control non-communicable diseases.

lens. While genetics may play a part, the rapid urbanization of the region, the increased sedentary lifestyle, lack of well-developed public health and screening programmes, and suboptimal medical management both at the primary and secondary level have likely contributed to this rapid rise in both risk factor prevalence and subsequent cardiovascular complications in the region.

Epidemiology

Basic epidemiologic statistics, mostly from the World Health Organisation (WHO), outline a very grim and challenging pathway for the region.

For example, hypertension is very common – 39% in Lebanon and 28% in United Arab Emirates, for example. Six of the world's top 10 countries with diabetes are in the Middle East – United Arab Emirates, Kuwait, Qatar, Saudi Arabia, Bahrain, and Lebanon. What's more concerning is that the 32.8 million (2011 figure) adults with diabetes in the Arab world are expected to double to 59.7 million by year 2030.

The incidence of obesity, a risk factor for several health problems as well as CVD, is astoundingly high in the Arab female population. 55.2% of Kuwaiti women (age >15) are obese (BMI > 30 kg/m2) according to WHO 2010 statistics, making it the 9th highest ranked nation in the world in terms of female obesity. In the Arab world, Egyptian women follow at 48%. Kuwaiti men rank 13th in the world (29.6%) compared to other nations. This epidemic of obesity is prevalent throughout the Middle East. The prevalence of obesity in women in countries such as Lebanon, Syria and Iraq is 27.4%, 24.6%, and 19.1% respectively. In almost every Arab country, female obesity rates are significantly higher than men and are nearly double that of men in some countries (Kuwait 55.2% vs. 29.6%, UAE 42% vs. 24.5%, Lebanon 27.4% vs. 14.9%) – making women a unique target for intervention.

Other risk factors such as smoking are extremely prevalent in Jordanian males at 61% (8th highest ranked nation). Males in Tunisia follow suit at 58% (Rank 11). Among men, Oman has one of the lowest smoking prevalences in the Arab world (20%) which is still relatively high. Smoking prevalence among males in the United States is 25%, for example. The reported differences between smoking rates among men and women based on 2006 WHO statistics was again extremely eye-opening. Jordanian women have the highest prevalence at 10% followed by Lebanon and Tunisia at 7%. Gulf nations such as Kuwait, Saudi Arabia, UAE, and

> If we look at age-standardized cardiovascular death rates in countries such as Iraq, Yemen, Egypt, Lebanon, and Jordan, they are more than double the comparative figures for the United States.

Bahrain report a very low prevalence of 3-4%. Moroccan women have an impressively low prevalence of just 0.2%. These sweeping differences again create a unique opportunity for intervention.

Data from 2003 showed that while trends in cigarette consumption have decreased in the Americas since the 1980s, trends continue to rise in parts of the Arab world in general.

There is a growing perception that more and more younger men and women in nations such as Lebanon are smoking at extremely higher rates than what these numbers may reflect.

Overall this has resulted in a relatively high mortality from CVD in the Middle East. If we look at age-standardized cardiovascular death rates in countries such as Iraq, Yemen, Egypt, Lebanon, and Jordan, they are more than double the comparative figures for the United States. On estimate, approximately 25-40% of deaths in many Arab countries are due to cardiovascular disease. As such, these risk factors contribute to the growing burden of strokes, heart failure, myocardial infarction and peripheral vascular disease, leading to amputations, blindness and death.

While interventional cardiologists, vascular surgeons, cardiothoracic surgeons and other specialists intervene following a cardiovascular event in patients with more advanced cardiovascular disease, there needs to be a massive societal push towards both targeted primary and secondary prevention for the Arab world. More specifically, since the prevalence of particular risk factors vary by country, the preventive approach should be developed and targeted with this in mind.

Education

What can be done? The most effective method of curbing such risk factors and hopefully reducing morbidity and mortality outcomes is via strong, successful preventive programmes. Many of these risk factors such as smoking, high blood pressure and high cholesterol are silent and show no symptoms until devastating complications ensue such as a debilitating stroke or heart attack. The public needs to be educated and encouraged to address these risk factors despite their silent nature.

Many patients may not want to take blood pressure medication or change their dietary habits because they “feel fine”. An individual may not always grasp the burden of suffering a heart attack or debilitating stroke until it occurs, as they may feel shielded from it ever happening to them or their family members. As such, it becomes the job of educators, scientists, public health workers, physicians, dieticians, and policy makers to continue to shed light on the subject. People have to be shown the benefits of changing their way of life through, for example, increased physical activity, eating a healthy diet, and regular health check-ups.

Several Arab countries have acknowledged the issue and are developing appropriate policies and investing in public health programmes. For example, Lebanon recently banned smoking in closed public places despite strong opposition and societal pressure against it. This needs to be encouraged and supported at local and regional levels.

And efforts are being made in other spheres to address this issue. For example, the World Congress of Cardiology held their biannual conference in Dubai recently and offered a two-day course on ‘Preventive Cardiology’ which focussed on teaching young healthcare workers about the importance of prevention. Such high level meetings not only sheds light on preventive medicine for doctors, but also helps spread general awareness in the public sphere through increased public media on the subject.

This large and growing burden needs to be addressed on all fronts. Many would advo-

Decline in incidence of heart attacks appears associated with smoke-free workplace laws

A decline in the incidence of myocardial infarction (MI, heart attack) in one Minnesota county appears to be associated with the implementation of smoke-free workplace laws, according to a report published online 29 October 2012 by Archives of Internal Medicine.

Exposure to secondhand smoke (SHS) is associated with coronary heart disease (CHD) in non-smokers, and research suggests that the cardiovascular effects of SHS are nearly as large as those with active smoking, according to the study background. Elimination of smoking in public places, such as by smoke-free laws and policies, has the potential for reducing smoking and perhaps cardiovascular events.

Richard D. Hurt, MD, and colleagues at the Mayo Clinic, Rochester, Minnesota, US, evaluated the incidence of MI and sudden cardiac death (SCD) in Olmsted County, Minnesota, during the 18-month period before and after implementation of smoke-free ordinances. In 2002, a smoke-free restaurant ordinance was implemented and, in 2007, all workplaces, including bars, became smoke free.

"We report a substantial decline in the incidence of MI from 18 months before the smoke-free restaurant law was implemented to 18 months after the comprehensive smoke-free workplace law was implemented five years later," the authors comment.

When comparing the 18 months before implementation of the smoke-free restaurant ordinance with the 18 months after implementation of the smoke-free workplace law, the incidence of MI declined by 33% from about 150.8 to 100.7 per 100,000 population, and the incidence of SCD declined by 17% from 109.1 to 92 per 100,000 population.

"All people should avoid SHS exposure as much as possible, and those with CHD should have no exposure to SHS," the authors conclude.

Commenting on the research, Sara Kalkhoran, MD, and Pamela M. Ling, MD, MPH, of the University of California, San Francisco, said: "The results of the study by Hurt et al highlight some of the potential benefits of 100% smoke-free policies in workplaces, restaurants and bars: significantly decreased incidence of myocardial infarction and a trend toward decreased sudden cardiac death."

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cate for health education to start in the classroom with clear goals to teach the youth about the dangers of smoking and the benefits of healthy lifestyle habits, especially regarding physical activity and food choices.

Screening programmes and implementation of well-known therapeutic options such as managing high blood pressure and high cholesterol need to be encouraged and structured.

Physicians on the front line, whether general practitioners or cardiologists, should be trained to identify high-risk individuals so that they may seek further intensive medical care.

Research

Although research is underway in some countries in the region, much more is required within the Arab world to gain a better understanding of the epidemiology of the disease, its burden and treatment options within each country. This will help guide medical therapy and the development of treatment protocols specifically targeting the Arab population.

We have started to see excellent research and home grown clinical databases emerge from countries such as the United Arab Emirates, Lebanon, Qatar, Bahrain, and Saudi Arabia and such research efforts to collect rigorous datasets and registries should be encouraged and supported financially, as they will provide robust primary local and regional data for future medical strategies.

History repeats itself. It's well known. But it seems that in some cases it does so more rapidly and forcefully. The health issues associated with the rapid urbanisation that the developing world currently faces were experienced decades ago by cities in what I now the developed, or economically advanced, world. However, there appears to be a difference – in the newly urbanising world changes in people's diet, lifestyle, and sedentary habits seem to be occurring at a more rapid rate and more aggressively than they did in the past.

The Arab world never got to experience the gradual increase in caloric density of foods or beverages. Many younger individuals did not experience the 8 oz soda grow to the 12 oz, 20 oz, 32 oz and so on over the course of decades.

Sport makes middle-aged people healthier … and smarter

High-intensity interval training makes middle-aged people not only healthier but smarter, showed a Montreal Heart Institute (MHI) study led by Dr Anil Nigam of the MHI and University of Montreal, in collaboration with the Montreal Geriatric University Institute.

The participants all had a body-mass index (BMI) between 28 and 31 (overweight) in addition to one or more other cardiovascular risk factors. High-intensity interval training involves alternating between short periods of low and high intensity aerobic exercise – for example, a series of 30 seconds of sprinting followed by 30 seconds of walking or jogging.

"We worked with six adults who all followed a four-month programme of twice weekly interval training on stationary bicycles and twice weekly resistance training. Cognitive function, VO2max and brain oxygenation during exercise testing revealed that the participants' cognitive functions had greatly improved thanks to the exercise," Dr Nigam said. VO2max is the maximum capacity of an individual's body to transport and use oxygen during exercise. It impacts on the body's ability to oxygenate the brain and is related to cognitive function.

"Our participants underwent a battery of cognitive, biological and physiological tests before the program began in order to determine their cognitive functions, body composition, cardiovascular risk, brain oxygenation during exercise and maximal aerobic capacity," Dr Nigam explained. The cognitive tests included tasks such as remembering pairs of numbers and symbols. To see what was actually happening in the brain, the researchers used near-infra red spectroscopy (NIRS), a technique that works with light (in the near-infra red range) sent though human tissue that reacts with oxygen in the blood (light absorption). It is so sensitive that it detects the minute changes in the volume and oxygenation of blood occur in our brains when we exercise or think.

"After the program was finished, we discovered that their waist circumference and particularly their trunk fat mass had decreased. We also found that their VO2max, insulin sensitivity had increased significantly, in tandem with their score on the cognitive tests and the oxygenation signals in the brain during exercise," Dr Nigam said. Insulin sensitivity is the ability of sugar to enter body tissue (mainly liver and muscle.) MEH

Rather children in the Middle East (and other developing regions) essentially were introduced directly to the highly caloric, highly processed foods and beverages common today – resulting in the obesity epidemic and it co-morbidities we currently face.

Smoking, a well-known cardiotoxic habit, has for decades been allowed to flourish unacceptably in the Middle East. The harmful effects of smoking are well known, yet men and women in the Arab world continue to smoke at dangerously high rates. It is only recently that effective public health policies have started to emerge.

Developing regions such as the Arab world have the unique opportunity to learn from the mistakes, lessons and experience of its Western counterparts. The examples are numerous. Arab countries should make a strong effort to target their unique risk factors – such as obesity in Kuwaiti women and smoking in Jordanian men. With this specific focus they are more likely to achieve the lifestyle changes they seek in their populations. It will take a concerted effort by teachers, public health workers, dieticians, physical training specialists, primary care physicians, preventive cardiologists, endocrinologists, policy makers, and politicians to implement successful change.

Both primary and secondary prevention methods continuously need to be developed in concert so as to help reduce the overall cardiovascular disease burden. And although cardiovascular medical care is effective via medications, revascularization procedures, and surgeries, this is not an effective stand-alone solution to a widespread public health problem in the region. There should be a push for strong primary preventives measures, while having the safety net of medical technology, highly skilled physicians, and therapeutic options ready and available for those that still end up suffering cardiovascular complications such as a heart attack or stroke.

These ideas are not new. History repeats itself. A quote from an ancient Chinese medical text is just as relevant today as it was then: "The superior doctor prevents sickness; The mediocre doctor attends to impending sickness; The inferior doctor treats actual sickness."

About the Author:
Ronney Shantouf, MD, cardiologist, is currently completing his cardiovascular fellowship at Harbor-UCLA Medical Center. He has served as the Health Editor of UCLA newspaper, *The Daily Bruin*, and currently writes about emerging medical technologies for the website *www.medgadget.com*.

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Highlights of the European Congress of Cardiology 2012

By **Dr Mary Ellen Kitler**, PhD, FCP

The European Society of Cardiology is a knowledge-based professional association, representing more than 75,000 cardiology professionals from Europe and the rest of the world. Its mission is to reduce the burden of cardiovascular disease in Europe.

The European Society of Cardiology held their 60th European Congress of Cardiology in Munich, Germany, 25 to 29 August 2012. This congress is the largest medical meeting in Europe. The Congress was attended by 27,500 delegates from 130 countries. The Society accepted 4,200 abstracts from the 9,600 submitted abstracts. The largest number of abstracts came from Japan. The programme highlighted the most relevant issues in the diagnosis, management and treatment of cardiovascular disease, which includes basic research, clinical research and population research. There were 426 sessions. Additionally, there were 70 industry-sponsored satellite sessions and 200 exhibiting companies.

European Heart for Children

During his tenure as President of the European Society of Cardiology in 2009, Professor Roberto Ferrari from Italy established the capacity building ESC humanitarian project called "European Heart for Children (EHC)". The project is simple and straight forward with three stages:

1. Medical missions in a given country to demonstrate to the medical and political community that it is possible to treat children with congenital heart disease.
2. Providing training for physicians, technicians,

and nurses to be trained outside their own country on how to treat congenital heart disease by offering scholarships.

3. Creating the necessary conditions for suitable healthcare development in countries in transition so that the country can build and equip a healthcare structure able to treat congenital heart disease.

EHC Global Forum

EHC has formed the EHC Global Forum by collaborating with three humanitarian organisations, i.e, Chaîne de l`espoir from France, Bambini Cardiopatici nel Mondo from Italy and Chain of Hope from the UK. From 2009 to 2010, the EHC Forum conducted missions in Syria, Morocco, and Egypt, examined 414 children, operated on and saved 38 children, and took 9 children to Italy for complex surgery. EHC is supported by sales of EHC merchandise, donations of money and equipment, donations of expertise by cardiologists and related healthcare professionals, and fundraising events. The theme that unites these four organisations is transparency towards their generous donors.

From Bench to Practice

The theme of this year's congress was "From Bench to Practice". Translating innovative science into daily clinical practice is a challenge shared by clinical scientists and clinical physicians. By choosing this theme, the ESC encouraged critical discussion of new techniques and their rapid adoption by clinical medicine. The exhibition hall had an emerging technologies section that showcased the newest developments from start-up companies at the forefront of research.

Galectin-3

BG Medicine, MA, USA presented their novel commercially-available quantitative blood assay for the biomarker, galectin-3, which is used for the evaluation and management of patients with heart failure. Galectin-3 is an independent marker for outcome in heart failure patients. Furthermore, the level of the biomarker is particularly useful to predict the outcome of heart failure patients with preserved left ventricular ejection fraction. Elevated galectin-3 levels are common in 30% to 50% of heart failure patients and these particular patients are at greater risk of adverse outcomes. The BGM assay is US FDA-cleared to be used in conjunction with clinical evaluation as an aid in assessing the prognosis of patients with chronic heart failure.

ABI

Huntleigh Diagnostics Products Division, Cardiff, UK has developed the dopplex ABIlity automatic ankle brachial index system. The portable system can be easily used in a primary care clinic, hospital or the patient's home. The patient does not need to rest before the test can be performed. Leads are simultaneously placed on both arms and both legs. In three minutes, the ABI is automatically accurately calculated, interpreted and displayed with pulse volume waveforms on the LCD panel. Results can be printed on the integral printer.

Genotyping

Spartan Biosciences, Ottawa, Ontario, Canada presented their point-of-care genetic test for cytochrome P450 CYP2C19 *2. The test is simple to conduct since it requires only a buccal swab, which is inserted into the instrument. The test is automatic and requires only 60 minutes to identify the CYP2C19* carrier status. Use of patient-specific factors, such as CYP2C19 genotype, offers promise for developing a personalised medicine approach to antiplatelet treatment regimens. Spartan Biosciences presented data from a clinical trial in patients undergoing percutaneous coronary intervention (PCI) followed by antiplatelet therapy. For two arms of the clinical trial, physicians based their prescriptions on the rapid genotyping results from the Spartan Biosciences assay. Patients, which were CYP2C19 *2 carriers, were prescribed prasugrel. Patients, which were CYP2C19 *2 non-carriers, were prescribed clopidogrel. Patients in the third arm in the clinical trial were not tested for genotype and were prescribed clopidgrel. Results showed that rapid genotyping resulted in overall improved health outcomes for the patients tested.

Coronary ischemia

Premier Heart, NY, USA presented their multifunctional cardiogram (MCG). Premier Heart describes the MCG system

as "a revolution in cardiac care, leveraging the principles of computational biology and systems analysis to assist physicians in the detection of coronary ischemia". MCG can be used for quantitative early detection of coronary ischemia and evaluation of treatment effectiveness. MCG is a stress-free, radiation-free, and non-invasive method for point of care diagnosis. The test results from MCG are available in 15 minutes. The diagnostic reports are designed so that both clinicians and the general public can understand the reports. The report includes a disease severity score, which can be used to aid in diagnosis. The MCG system is able to detect coronary artery disease at early stages. Premier Heart presented data from a clinical trial in the emergency room in Verona, Italy. The investigators stated that the system had a low expense. Furthermore, the high sensitivity of the MCG method may allow delaying coronary angiography to allow more appropriate management of these patients.

Practice guidelines

The ESC produces practice guidelines on many clinical conditions. Their purpose is to improve the quality of clinical practice and patient care in Europe. The Committee for Clinical Practice Guidelines of the ESC presented five new guidelines during 2012 and gave them to each congress participant. The five 2012 practice guidelines were Guidelines for the Management of Atrial Fibrillation (AFib), Guidelines on the Management of Acute Myocardial Infarction in Patients Presenting with Persistent ST-Segment Elevation (AMI-STEMI), European Guidelines on CVD Prevention (CVD Prevention) by the Fifth Joint European Societies Task Force on Cardiovascular Disease Prevention in Clinical Practice, Guidelines for the Diagnosis and Treatment of Acute and Chronic Heart Failure (Heart Failure), and ESC/Facts Guidelines on the Management of Valvular Heart Disease (VHD).

Congress participants also received the consensus document, entitled The 3rd Universal Definition of Myocardial Infarction (3rd Universal MI). The ESC Guidelines are updated regularly whenever new information is available. Normally, the various task forces work for two or three years and cooperate with different groups to ensure that the guidelines contain the latest evidence-based recommendations. The guidelines set standards of clinical excellence. Their implementation normally has a major impact on the treatment of these various clinical problems.

Optimal antiplatelet therapy

Professor Willem Dewilde, Sint Antonius Nieuwegein, Netherlands presented the results of the randomized trial, entitled: What is the Optimal antiplatelet and anticoagulant therapy in patients with oral anticoagulation and coronary stenting (WOEST). Triple therapy, i.e., oral anticoagulants, aspirin and clopidogrel, is recommended according to the guidelines but is known to increase the risk of major bleeding. Major bleeding increases mortality. WOEST was the first randomized trial to address the optimal antiplatelet therapy in patients on oral anticoagulants undergoing coronary stenting. The primary endpoint was reached, showing that oral anticoagulants plus clopidogrel causes less bleeding than the triple antithrombotic therapy. The secondary endpoint was also met, i.e., with dual therapy, there is no excess of thrombotic or thromboembolitic events, such as stroke, stent thrombosis, target vessel revascularization, myocardial infarction or death. The dual therapy group had less all-cause mortality. Professor Dewilde proposed that the strategy of oral anticoagulants plus clopidogrel, but without aspirin, could be used in this group of high-risk patients on oral anticoagulants when undergoing percutaneous coronary stenting.

The MADONNA study

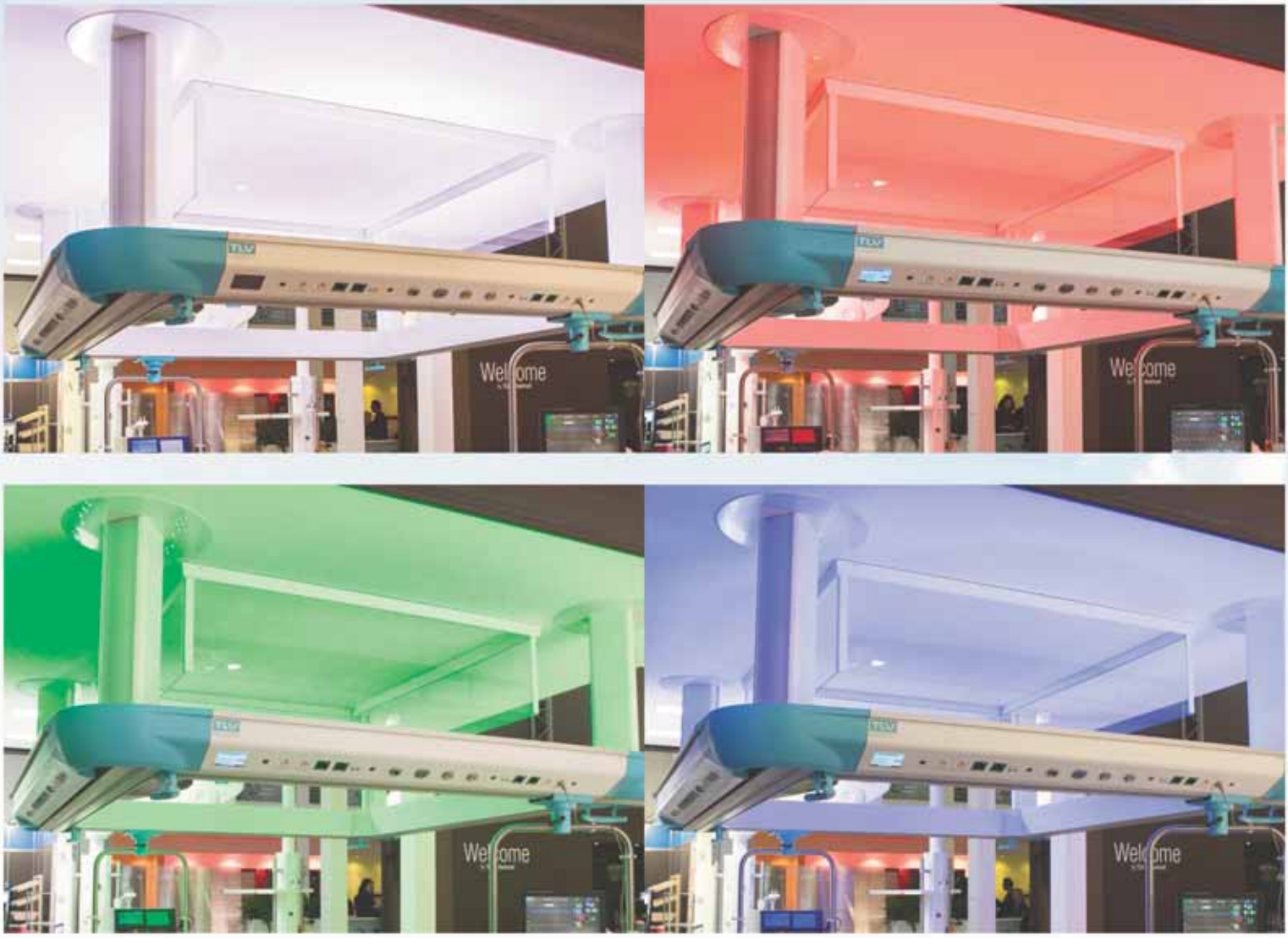
Dr Jolanta Siller-Matula, Vienna, Austria discussed the results of the randomized trial, entitled: The MADONNA study – Multiple electrode aggregometry in patients receiving dual antiplatelet therapy to guide treatment with novel platelet antagonists. Standard antiplatelet treatment in patients undergoing percutaneous coronary intervention (PCI) normally uses two antiplatelet medications, aspirin and clopidogrel. However, measurements of platelet aggregation in clopidogrel-treated patients shows that one patient in four is a non-responder. The aim of the study was to determine if individualised treatment with platelet inhibitors according to the results of whole blood aggregometry improves clinical outcomes in patients undergoing PCI. The investigators used the whole blood aggregometry test to determine if a patient was a clopidogrel-responder or a clopidogrel-non-responder. The test gives an answer in 10 minutes.

Patients were randomly assigned to a "guided group" and a "non-guided group". The non-guided group received the standard therapy of aspirin and clopidogrel. In the guided group, clopidogrel non-responders received personalised antiplatelet therapy, consisting of upward titration of clopidogrel or after the registration of prasugrel, prasugrel. Results showed that patients in the non-guided group were at a 7.9% higher risk to develop stent thrombosis compared to patients in the guided group.

Furthermore, no patient in the guided group had acute coronary syndrome but 2.5% of the patients in the non-guided group had ACS. Dr Siller-Matula recommended that all clinics introduce whole blood aggregometry testing for all patients scheduled for PCI. Based on the results of the test, PCI patients should receive personalised therapy. He estimated that providing individualised therapy for PCI patients would save medication costs of approximately €410 (US$XXX) per patient each year. Since individualised antiplatelet therapy is cost-effective, Dr Siller-Matula said health authorities and medical insurance companies should introduce this personalised therapy.

The Aldo-DHF trial

Professor Burkert Mathias Pieske, Graz, Austria, reported on the randomised multicenter international (Germany and Austria) 12 month clinical trial, entitled Aldosterone receptor blockade in diastolic heart failure (The Aldo-DHF trial). The trial compared spironolactone to placebo. More than half of heart failure patients in Europe have diastolic heart failure (DHF), which is also known as heart failure with preserved ejection fraction. In the elderly,



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particularly elderly women, DHF is the major type of heart failure. DHF patients have a poor quality of life and have a high rate of hospitalisation and mortality. In spite of the importance of DHF, to date, no therapy has shown therapeutic benefit. Spironolactone significantly improved diastolic function but did not change exercise capacity. Additionally, spironolactone induced cardiac remodelling, reduced left ventricular hypertrophy, which is known to be a detrimental consequence of diabetes and hypertension, and reduced both systolic and diastolic blood pressure. In this trial, spironolactone was safe without relevant adverse events. Professor Pieske emphasised that clinicians should consider prescribing spironolactone for patients with DHF in order to improve cardiac function and reduce blood pressure.

Psoriasis increases risk of diabetes

Dr Ole Ahlehoff, Copenhagen, Denmark presented results from the study, entitled Psoriasis is associated with increased risk of incident diabetes mellitus: a Danish nationwide cohort study. Approximately 125 million people in the world have psoriasis, which is a common chronic inflammatory disease. The study evaluated more than 4 million people, including approximately 50,000 psoriasis patients, who were followed for 13 years. The risk of new onset diabetes mellitus was increased in all patients with psoriasis compared to people without psoriasis. The risk was highest in patients with severe psoriasis. Dr. Ahlehoff stressed that more must be done to increase awareness in physicians that psoriasis patients have a high risk for diabetes mellitus and should be screened regularly for diabetes mellitus.

Stroke in women

Anders Mikkelsen, Copenhagen, Denmark presented the study entitled: Female sex as a risk factor for stroke in atrial fibrillation – a nationwide cohort study. The aim of this population study was to investigate the association between female gender and stroke/thromboembolism (TE). The study included 87,202 non-valvular atrial fibrillation patients, of whom 44,744 (51.3%) were female and had a follow-up of 12 years. The results showed that female gender did not increase the risk of stroke in female patients less than 75 years old. However, for female patients older than 75 years, female gender was associated with 20% increased risk of stroke after one year follow-up. Mikkelsen noted that a female patient older than 75 should receive anticoagulation therapy since the age of more than 75 is an independent risk factor for stroke/thromboembolism (TE).

- The next European Congress of Cardiology will be held in Amsterdam, Netherlands from 31 August to 4 September 2013. Further information can be found at *www.escardio.org* MEH

EECP Therapy: Treating heart failure via improving endothelial dysfunction

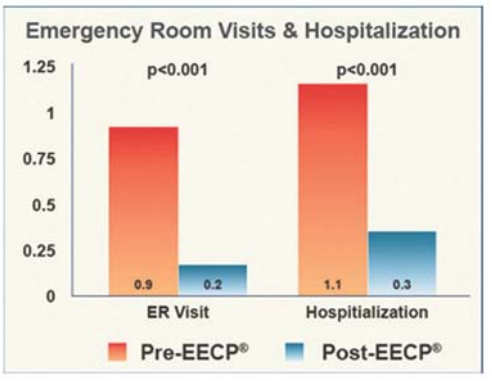

Figure 1 - After EECP treatment, emergency department visits for refractory angina patients with left ventricular dysfunction reduced by 78% and hospitalization reduced by 73% (CHF 2007;13:36-40)

By **Gregory W Barsness**, MD,
Division of Cardiovascular Disease and Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA.

Enhanced external counterpulsation (EECP) is an outpatient therapy cleared for marketing by the US FDA for the treatment of stable ischemic heart disease, angina and heart failure. Although a non-invasive therapy, EECP treatment produces a marked acute hemodynamic effect similar to that produced by the invasive intra-aortic balloon pump. To achieve this effect, cuffs on the calves, the lower thighs, and upper thighs of each leg are sequentially inflated with compressed air during the diastolic phase of the cardiac cycle and are simultaneously deflated in early systole. This rapid inflation and deflation raises diastolic aortic pressure, reduces cardiac afterload and increases central venous return, resulting in an increase in cardiac output and improved coronary perfusion pressure. The safety and efficacy of EECP therapy for angina and heart failure have been well documented in several large international studies, a number of observational studies and multiple independent registry studies published in peer reviewed medical journals.

Several recent investigations have studied the mechanisms of action of EECP therapy, including improvement in endothelial function caused by increased systemic blood flow velocity and beneficial vascular shear effects. Our group and others have demonstrated a reproducible global endothelial function improvement that is associated with an observed dose-dependent increase in the release of endothelial nitric oxide synthase (eNOs) and the vasodilator nitric oxide (NO), as well as reduction of the vasoconstrictor endothelin (ET-1). Others have shown that EECP therapy is associated with an increase in vascular endothelial growth factor levels and, together with the mechanical pressure gradient generated during EECP, may promote coronary collateral flow, improve coronary flow dynamics and increase microcirculatory density. We have also documented an association between EECP-derived improvements in endothelial function and decreased circulating levels of inflammatory cytokines and activated endothelial progenitor stem cells. In this way, EECP has been proposed as a modality to promote vascular homeostasis through to replacement and repair or the endothelium, thereby enhancing endothelial function and modifying the atherosclerotic process and progression of cardiovascular disease.

The beneficial actions of EECP therapy to modify the progression of disease can be illustrated in its use as a treatment for heart failure in the randomized, controlled Prospective Evaluation of EECP in Congestive Heart Failure (PEECH) trial, in which 187 patients with NYHA II or III heart failure symptoms were randomized into either EECP + pharmacologic therapy (PT) or PT alone. The PEECH trial found that a larger proportion (35%) of EECP treated patients achieved a 60-second or more increase in exercise duration while only 25% of patients in the PT control group achieved a similar result at 6 months post treatment, with a 25 second increase in average exercise duration for the EECP group verses a 10 second decrease for the control group at 6 months post treatment. There was also an interesting hypothesis-generating finding of a significant improvement in favor of EECP therapy for the subgroup of patients 65 years or older, which included an improvement in exercise duration, peak oxygen uptake, symptom status and quality of life. Patients in the trial who had an ischemic etiology (i.e. pre-existing coronary artery disease) demonstrated a greater response to EECP therapy than those who had an idiopathic (non-ischemic) etiology.

Given the beneficial effect of EECP therapy in improving endothelial dysfunction, the potential use and benefit of EECP in patients with heart failure, whether due to systolic or isolated diastolic dysfunction, is an attractive consideration. Currently, EECP therapy is reimbursed in the United States as a covered benefit by the Centers for Medicare and Medicaid Service (CMS) and many private insurance companies for the treatment of patients with disabling angina. Approximately 1/3 of patients, however, present with concomitant symptoms or history of heart failure. The safety and efficacy of EECP in this patient subset has been confirmed among 8000 patients enrolled in the International EECP Patient Registry (IEPR). Among this group, approximately 70% to 80% have demonstrated beneficial outcomes with EECP therapy.

EECP therapy remains an important therapeutic tool for the safe and effective outpatient management of a broad spectrum of symptomatic cardiovascular disorders. Recently, investigators from the University of Florida reported that EECP therapy improved peripheral arterial function, glucose tolerance and the inflammatory milieu in patients with abnormal glucose tolerance. Continued investigation into likely therapeutic mechanisms, such as improved vascular endothelial function, along with exploration of benefit in new patient subgroups, such as those with heart failure, diabetes and peripheral arterial disease continues, while the application of this novel treatment modality continues to increase as the data supporting a beneficial effect continue to accrue across the globe. MEH

Cardiac bypass surgery superior to non-surgical procedure for adults with diabetes and heart disease

Adults with diabetes and multi-vessel coronary heart disease who underwent cardiac bypass surgery had better overall heart-related outcomes than those who underwent an artery-opening procedure to improve blood flow to the heart muscle, according to the results from an international study. The research was supported by the National Heart, Lung, and Blood Institute (NHLBI), part of the US National Institutes of Health.

The study compared the effectiveness of coronary artery bypass graft (CABG) surgery with percutaneous coronary intervention (PCI) – a non-surgical procedure – that included insertion of drug-eluting stents. After five years, the CABG group had fewer adverse events and better survival rates than the PCI group.

Principal investigator Valentin Fuster, MD, PhD, of Mount Sinai School of Medicine in New York City, presented the study findings November 4 at the American Heart Association's annual meeting in Los Angeles. The findings appear online in *The New England Journal of Medicine*.

"These study results confirm that bypass surgery is a better overall treatment option for individuals with diabetes and multivessel coronary disease and may assist physicians' efforts to prevent cardiovascular events such as heart attacks and deaths in this high-risk group," explained Gary H. Gibbons, MD, director of the NHLBI.

In coronary heart disease, plaque builds up inside coronary arteries. This often leads to blocked or reduced blood flow to the heart muscle and can result in chest pain, heart attack, heart failure, and/or arrhythmia. In 2010, nearly 380,000 Americans died from coronary heart disease. Approximately 25% to 30% of patients needing CABG or PCI have diabetes and multi-vessel coronary heart disease.

In the United States, more than one million procedures (CABG and PCI) are performed each year to restore circulation to patients with blocked arteries.

In CABG, surgeons try to improve blood flow to the heart muscle by using a healthy artery or vein from another part of the body to bypass a blocked coronary artery.

PCI is a less invasive procedure in which blocked arteries are opened from the inside with a balloon. A stent, or small mesh tube, is then usually inserted to prop the opened arteries so that blood continues to flow into the heart muscle. A drug-eluting stent was used in the study.

The study, called Future Revascularization Evaluation in Patients with Diabetes Mellitus: Optimal Management of Multivessel Disease (FREEDOM), involved 140 international centres and a total of 1,900 adults enrolled from 2005 to 2010. The participants had diabetes and coronary heart disease that involved narrowing of multiple blood vessels, but not the left main coronary artery, which usually requires immediate treatment with CABG.

At each clinical site, a team of specialists in neurology, heart disease, diabetes, and general medicine screened potential participants to ensure that they were eligible for both CABG and PCI. Those who were selected for the trial were randomly assigned to receive one of the interventions. As recommended by international guidelines for patients who receive drug-eluting stents, the PCI group also received anti-clotting therapies. A drug called abciximab was administered intravenously during the procedure, and clopidogrel was given orally for at least 12 months after the procedure, accompanied by aspirin for those who could tolerate it. Study participants were followed for at least two years.

During the trial, participants received standard medical care for all major cardiovascular risk factors such as high LDL cholesterol, high blood pressure, and high blood sugar. Participants also were counselled about lifestyle choices such as smoking cessation, diet, and regular exercise.

After five years, the CABG group had a lower combined rate of strokes, heart attacks, and deaths (18.7%) than the PCI group (26.6%). Strokes, which are a well-known risk of bypass surgery, occurred slightly more often in the CABG group (5.2%) than in the PCI group (2.4%). However, more people died from any cause in the PCI group (16.3%) than in the CABG group (10.9%). The survival advantage of CABG over PCI was consistent regardless of race, gender, number of blocked vessels, or disease severity.

"The advantages of CABG over PCI were striking in this trial and could change treatment recommendations for thousands of individuals with diabetes and heart disease," said Fuster. MEH

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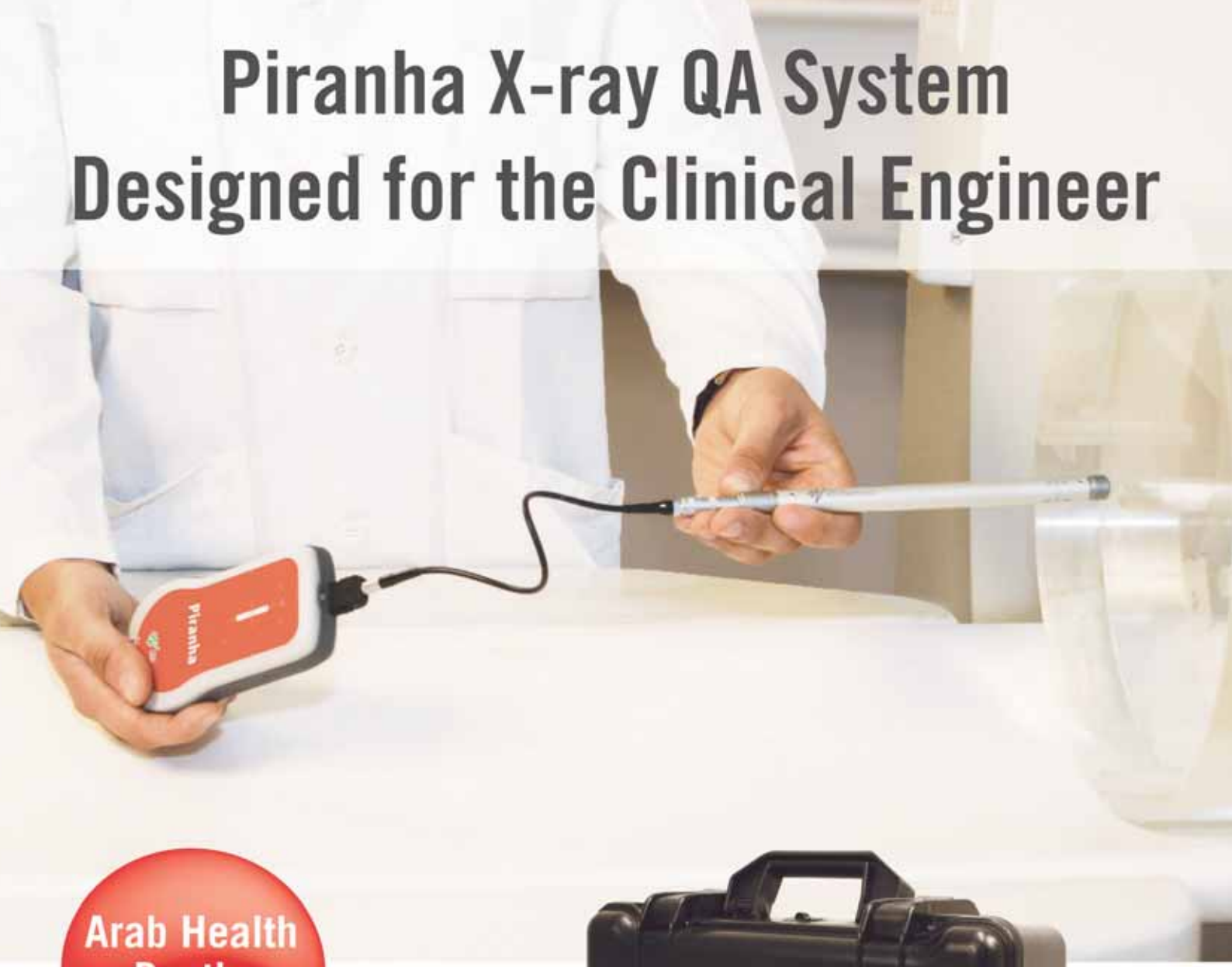

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Breakthrough: Researchers develop cardiovascular progenitor cells from induced-pluripotent stem cells

A novel therapeutic advancement in the search for heart muscle progenitor cells has been developed. The research team of Professor Katja Schenke-Layland of the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB in Stuttgart has discovered cell surface markers that enable the identification and isolation of living functional cardiovascular progenitor cells. *Middle East Health* reports.

For the first time, therapeutically relevant cardiovascular progenitor cells (CPCs) can be derived from induced-pluripotent stem cells (iPS) cells. CPCs, which are typically only found in foetal development, can become all of the different cell types of the heart and can integrate into heart muscle tissue after injection.

An estimated 17 million people die from cardiovascular disease each year. Although mortality rates are declining, heart attacks are still among the most frequent causes of death in the developed world. Often, the cause of a heart attack is the closure of a coronary artery that supplies blood to the heart, which kills heart muscle cells. Cardiomyocytes, which are the heart muscle cells responsible for the contraction of the heart, are not able to regenerate after a heart attack. The massive loss of cells and tissue, and the highly restricted regeneration capacity of the adult heart, lead to an impaired blood supply throughout the body that drastically affects a patient's quality of life. To restore the heart's function after a major heart attack, clinicians require functionally mature cardiomyocytes that perform like the native cells in the adult heart to replace the cells that were killed.

The production of such functional cardiomyocytes from well-defined cardiovascular progenitor cells (CPCs) is the focus of the research team led by Prof Dr Katja Schenke-Layland from the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB in Stuttgart and her colleagues, Dr Ali Nsair of the University of California Los Angeles (UCLA) and Prof Dr Robb MacLellan of the University of Washington in Seattle, who have now succeeded in identifying such cells in a mouse model. The work, which could revolutionize the treatment of heart disease, was recently published in the journal PLoS ONE.

Embryonic development

Myocardial cells – as well as endothelial cells and smooth muscle cells – develop from CPCs during the embryonic development of humans and other animals. There has been a significant amount of research effort towards discovering a path for the clinical application of these cells in patients. The reason for the lack of success is that the markers that help to identify CPCs, such as Islet1 or Nkx2.5, are located in the nucleus of the cells. The use of these cell markers modifies the cells rendering them therapeutically unusable, making the identification of safe cell-surface markers essential.

Surface markers

On this task, the research team of Prof Schenke-Layland et al focused their research. They were able to identify two markers, the receptors Flt1 (VEGFR1) and Flt4 (VEGFR3), on the surface of CPCs with which these cells can be clearly identified while fully preserving their biological function. This discovery allows scientists to isolate clinically relevant cardiovascular progenitor cells that can be functionally matured.

In the search for surface markers, the researchers investigated the cardiovascular progenitor cells using microarray gene expression profiling. These studies show exactly which genes are active at a specific point in time. The resulting data from this analysis were compared to the sequencing data from existing databases of already known as cell markers.

Induced-pluripotent stem cells

Encouraged by the success of being able to identify and isolate living CPCs, the researchers sought to derive the cells from induced-pluripotent stem (iPS) cells. For this purpose, they used a method for which the Japanese scientist Shinya Yamanaka was recently awarded the 2012 Nobel Prize for Medicine. This work, published just six years ago, demonstrated that only four proteins are responsible for the embryonic state of cells (Takahashi K, Yamanaka S.

> We are currently focusing on research with human iPS cells. If we can show that cardiovascular progenitor cells can be derived from human iPS cells that have the ability to mature into functional heart muscle, we will have discovered a truly therapeutic solution for heart attack patients.

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Cell 2006, 126 (4): 663 -676). He brought those four genes into differentiated – mature and specialised – cells, which then returned them back to an embryonic state. From these cells, which he called iPS cells, scientists can develop all cells of the body, such as liver cells, nerve cells or heart muscle cells.

In their study, the researchers used cells from a mouse strain in which the cells are labelled with a visible green fluorescent protein (GFP) that can be identified with a fluorescence microscope. The cells from these mice were then reprogrammed with the same four genes discovered by Yamanka, resulting in iPS cells that could be easily identified.

In a next step, the researchers cultured the GFP-labeled iPS cells in the laboratory under different conditions with cell-influencing solutions such as growth factors.

"Using our newly established cell surface markers, we could detect and isolate the Flt1 and Flt4 positive CPCs in culture," says Schenke-Layland. "When we cultured the isolated mouse CPCs then in vitro, they actually developed – as well as the embryonic stem cell-derived progenitor cells – into endothelial cells, smooth muscle cells and more interestingly into functional heart muscle cells."

But how do the developed CPCs behave in living organisms? Can these cells really integrate into tissue and regenerate heart muscle? To answer these questions, the scientists injected the GFP-labeled CPCs into the hearts of living mice. After 28 days, the researchers analysed the hearts and saw that the green fluorescent cells had developed into beating heart muscle cells and had fully integrated into the myocardial tissue of the mouse.

Research potential

Researchers have long tried to stimulate the regeneration of heart muscle cells. For this purpose, they inject stem cells or stem cell-derived cardiomyocytes into the heart. Although the majority of studies found a slight improvement in heart function, in most cases, neither long-term integration nor the differentiation of the cells into heart muscle has been demonstrated.

The result of the group from Schenke-Layland, Nsair and MacLellan provides the first opportunity to generate functioning heart muscle cells, which integrate into the heart muscle. "We are currently focusing on research with human iPS cells. If we can show that cardiovascular progenitor cells can be derived from human iPS cells that have the ability to mature into functional heart muscle, we will have discovered a truly therapeudic solution for heart attack patients," hopes the scientist.

Funding

The work of the research group has been funded by the German-American funding from the Federal Ministry of Education and Research (BMBF) and the California Institute for Regenerative Medicine (CIRM), as well as the Fraunhofer-Gesellschaft (Attract Program), the Ministry of Science, Research and the Arts of Baden-Württemberg, and the US National Institutes of Health (NIH).

● **doi:**10.1371/journal.pone.0045603).

Routine electrocardiograms predict health risks for patients with atrial fibrillation

Canadian scientists have determined that routine electrocardiogram (ECG) results for patients with atrial fibrillation (AF) – the most common form of irregular heart beat – can help doctors identify those at higher risk of adverse cardiovascular outcomes, including death. This knowledge will help doctors improve the treatment and prognosis of atrial fibrillation.

Through a retrospective analysis of thousands of patient files, researchers at the Montreal Heart Institute and the University of Calgary learned that a routine 12-lead surface ECG – in which 12 different electrical signals are recorded – conducted at the time of AF diagnosis is an accurate predictor of later adverse events.

Research presented in October at the Canadian Cardiovascular Congress found that patients with AF do not all face the same risks for disease; determining the extent to which any individual patient is at risk of adverse events has been a challenge for doctors, until now.

"The ECG has recently received resurging attention due to its simplicity, relatively cheap cost and near universal availability," says Dr Jason Andrade, cardiologist at the Montreal Heart Institute. "This knowledge, combined with the recognition that all patients with AF will receive an ECG as part of their diagnostic work-up, makes it highly useful as a method for assessing risk."

ECG is used to measure the rate and regularity of heartbeats, as well as the size and position of the chambers, the presence of any damage to the heart and the effects of drugs or devices used to regulate the heart, such as a pacemaker

Researchers found that the strongest indicators of risk were prolonged QRS duration and prolonged PR and QT intervals, each of which is a measure of electrical waves that regulate heart rhythm.

For example, a prolonged QRS duration is associated with an increased risk of multiple adverse cardiovascular outcomes including death and hospitalisation.

An increased PR interval is associated with cardiovascular death and sudden cardiac death. A prolonged corrected QT interval is associated with an increased risk of cardiovascular hospitalisation and sudden arrhythmic death in men.

Dr Andrade noted that the research team was "somewhat surprised at the strength of the relationship between the identified ECG predictors and the adverse cardiovascular outcomes".

Their data analysis showed that a prolonged QRS duration was associated with a 40% increased risk for all-cause mortality, a 50 to 60% increased risk for cardiovascular mortality and a 90 to 120% increased risk for sudden cardiac death. MEH

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The next big medical market

Adapted from the *2013 Iraq Healthcare Sector Outlook* report by Geopolicity

Iraq is set to become an exceedingly attractive healthcare investment destination in the long term as the Government continues to increase funding for healthcare infrastructure development and medical training and services on the back of growing oil revenue. This is expected to spur huge demand for medical equipment and services and attract foreign interest in the country's healthcare market estimated to be worth some US$10-12 billion by 2014. However, numerous challenges remain, not least of which is the sectarian violence which continues to flare up sporadically. *Middle East Health* looks at the state of heath in Iraq by outlining key points discussed in the new *2013 Iraq Healthcare Sector Outlook* report by Geopolicity.

Iraq at a glance

Iraq has a land area of 435,052 square kilometres and borders Jordan to the west, Syria to the northwest, Turkey to the north, Kuwait and Saudi Arabia to the south and Iran to the east.

The Head of State is President Jalal Talabani (since 6 April 2005). The head of Government is Prime Minister Nouri Al-Maliki (since 20 May 2006). A new government was announced in December 2010 following elections held on 7 March of the same year.

The Minister of Health in Iraq is Majid Hamad Amin Jamil.

The Iraq Government has expressed its commitment to improving the healthcare sector through increased investment in funding, training and infrastructure development. This in turn is expected to spur huge demand for medical equipment and services. The country is not short of money. The healthcare budget was increased to US$6 billion in 2012 from $4.5bn in 2011 and $3.8bn in 2010. These increases come on the back of strong GDP growth – forecast at 14.7% for 2013.

The Government plans to triple oil production between 2012 and 2017/18 (to 8-8.5 million barrels per day which is expected to boost funding for healthcare and push the healthcare budget over $10-12 billion by 2014, once private financing is included.

Challenges

However economically attractive Iraq may appear, a number of challenges threaten to stifle this development. These include ongoing internal sectarian violence, balancing interests between USA, Iran and Syria, and the centralisation of power.

Specifically in the healthcare sector, in the absence of a strong public health system, a private sector has emerged which includes a black market for legal and counterfeit drugs. The private sector currently accounts for 25% of health facilities providing healthcare services to almost 50% of the population. With the considerable black market trade occurring in pharmaceuticals, greater regulatory enforcements are needed which can be achieved with re-structuring plans. As such, weak regulatory oversight, especially in the private healthcare market, is seen as another key factor affecting this sector.

The number of healthcare personnel is inadequate and geographically uneven. The World Health Organisation (WHO) has estimated a doctor : patient ratio of 0.7 to 1,000, highlighting the need for recruitment of trained personnel.

Iraq also is also short of medical equipment, an issue which may take years to address. In the past five years, there has also been an increase in demand for medical appliances, medical equipment, laboratory equipment & consumables and hospital management systems.

Governance and regulations

Although there is no formal health policy document or framework in Iraq, policies are formed through laws, regulations and strategy documents. The Ministry of Health manages the health system in Iraq. However, health policy execution is also influenced by other stakeholders such as the Ministry of Finance (budget), Ministry of Planning and Development Cooperation (capital budget), Ministry of Higher Education (training of health personnel) and the Ministry of Municipalities and Public Work (water and sanitation).

KIMADIA (the State Company for Marketing Drugs and Medical Appliances) oversees the import and distribution of pharmaceuticals, medical appliances, laboratory equipment & consumables, and medical equipment for all public healthcare facilities. The preferred means of market entry is usually through a joint venture with a local company or a "scientific office".

There are no regulations on the import of medical appliances and no requirement of qualification of dealers. Imported pharmaceutical products and other technologies are subject to pre-shipment inspection by KIMADIA, a function that is currently outsourced to two foreign companies. All products are subject to quality testing, including local products, by the National Centre for Drug Control and Research (NCDCR) and the Central Public Health Laboratory, before they are released for distribution.

SAMARRA (the State Company for Drug and Medical Appliances) and NINEWA (the State Company for Drugs Industry and Medical Appliances) produce drugs to meet domestic demands.

Economic Growth

- Iraq is going through an intense period of growth that will last a decade. Real GDP growth in 2012 is expected around 10.2%, increasing to 14.7% in 2013. Given the commitment of the Government of Iraq to almost triple oil production by 2017, medium term growth could be sustained at this level and even reach 15 18%.
- As oil production increases from 2.9 million bpd in 2012 the draft budget for Iraq for 2013 is set to increase to US$115 billion (ID 138 trillion), an 18% increase over 2012. With oil production likely to reach 8-8.5 bpd by 2017, the national budget would increase to more than US$250 billion in 5 years.
- With 30% of the national budget already dedicated to capital spending, the Government has earmarked between $250 to $275 billion for infrastructural investments over the next 5 years, requiring public private partnership arrangements, of which a substantial share could be targeted for the health sector.

– *2013 Iraq Healthcare Sector Outlook*

GlaxoSmithKline is setting up a production plant in the country in partnership with an Iraqi company, Modern Drug Industries.

Public health funding

Public funding accounted for 80.5% of health spending in 2010. Private funding and International Donor Support were 18.7% and 0.8%, respectively. The public health workforce consumed 47% of MOH budget in 2010.

One area where MOH has made great gains is in increasing doctor salaries, which are roughly US$1,000 a month for starting doctors and go up to US$2,500 to US$3,000 for doctors with experience. The continued growth of dual practices suggests that while major gains have been achieved, doctors are still not making sufficiently competitive salaries since the cost of living in Iraq is also rapidly increasing. While a competitive salary will depend on the region of service, one estimate placed the necessary doctor salary for someone with moderate experience (7-8 years) at US$5,000 a month. There is also no performance-based merit pay system in place, although the MOH has apparently recommended this, according to the report.

New service delivery model

In line with the move toward devolution of power, Iraq's current healthcare system is gradually evolving from a state-centric approach in healthcare provision to a hybrid approach that includes a combination of both public and private provision. The sector is also moving away from a specialist model centred around hospitals to the primary health care model, including greater focus on promotive health.

Under this model, one or more family medicine organisations and their branches will provide preventative, diagnostic and curative services for a population of about 20,000. District health offices will lead health promotion.

This model will need an increase in physical facilities to reach the 2020 goal of:

- 2,000 family medicine organisations
- 100 general hospital organisations
- 20 tertiary services organisations

Under this proposed model, the health workforce of around 340,000 would be developed to counteract the current lack of skilled personnel. The population of Iraq is projected to reach 40 million by 2020/21 and the new service model reflects the need to serve such a demographic.

The next level of care will be delivered by General Hospital Organisations (GHOs), who will provide 24/7 emergency and referral services to a minimum of 400,000 people/GHO.

Conclusion

Iraq stands at 165 in the World Banks' global ranking of 183 economies on the ease of doing business. While this ranking is indicative of the current business environment in the country, it is not entirely conclusive on the regulatory regime defining Iraq's health care and pharmaceuticals industry in terms of registration, licensing, inspection, promotion and clinical trials, as well as selection, procurement and distribution of supplies, according to the report.

While the government is actively promoting foreign direct investment (FDI) through a set of benefits set out under the Investment Law No. 13 (2006) and its 2009 amendment, regulatory constraints, state-sanctioned monopoly in the pharmaceutical sub-sector, bias towards local providers, perceptions of corruption, political instability and unreliable national health data continue to constrain both Greenfield and Brownfield FDI. However, the progressive liberalisation of the trade regime towards WTO standards and greater openness of public procurement options and processes indicates the beginning of a more open healthcare market and national trading regime, with substantial implications for competition. MEH

What the future holds

A snapshot of contracts awarded and planned investments in 2012 gives an indication of the scale of infrastructure development that the government has embarked on.

- The Ministry of Health will build 18 new hospitals at a cost of US$2 billion
- The Ministry of Health has contracted Turkey's Universal Hospitals Group and German Medical Services (GMS) to build 6 new 100-bed hospitals in Samarra, Al-Dur, Tuz Khurmatu and Dujail
- The construction of the 600-bed Al Bayaa Teaching Hospital in Baghdad ($210 million)
- Construction of the 200-bed Haditha General Hospital in Al Anbar province ($75 million)
- A German company has started work on a $200 million hospital in the Al-Qayara district of Nineveh
- A 150-bed Hiwa Hospital for Children is being built in Erbil ($30 million – financed by KRG)

According to the report, Iraq has signed contracts worth a total of $152 million with four European companies to build medical facilities throughout the country. Sorima Hospital Development of Italy, Ermedi International of France, Viessmann Technologies of Germany, and HT Labor & Hospital Technik AG, also of Germany, will each build 19 operating theatres. The MOH was expected to announce further tenders for the construction and supply of a further 76 operating rooms in 19 hospitals across the country.

The report goes on to list numerous other partnerships and planned developments.

2013 Iraq Healthcare Sector Outlook report at a glance

The 30-page 2013 Iraq Healthcare Sector Outlook by Geopolicity's Business Intelligence Unit is essentially aimed at businesses interested in investing in Iraq. The report looks in depth at the current and projected status of healthcare in Iraq and covers key areas such as healthcare governance, legislation, reform and funding. It discusses investing in Iraq and the regulatory requirements and looks in detail at industry trends.

- To view, purchase and download the full report, visit: *www.geopolicity.com*

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The Ministry of Health of the United Arab Emirates (UAE) is engaged in an ambitious drive for technology-led healthcare improvement. With its 'Wareed' Programme, the UAE is building a fully integrated health information system to radically improve delivery of care. The vision is to integrate 15 hospitals, 68 affiliated clinics and 18 other facilities in Dubai and the Northern Emirates via a single platform. This will link virtually all public sector medical establishments throughout the six Emirates and automate all healthcare processes across radiology, pathology, pharmacy, surgery, emergency and registration departments.

Supported by state of the art data centers and network infrastructure, speech recognition is also a key part of the project. Speech leader Nuance Healthcare has been chosen as lead partner in this technology, delivering highly accurate, real-time speech recognition and powerful, self-editing tools to meet the demands of busy clinicians. The company's regional distribution partner Emerging Technologies manages the delivery and implementation of the system, as well as training.

"Nuance is providing simple, accurate and specific support for our clinicians, especially around some of the specialized vocabulary and short terms we use, which are all in the database now," says Wareed Project Manager at the UAE's Ministry of Health, Mohamed Nabeel AlDoy.

So far 200 such specialists at three busy hospitals have been given access to the tool, after what for many was a surprisingly short but comprehensive training session – often under an hour. The benefits of the approach have become clear to all quickly. So far, radiologists, surgeons and pediatricians introduced to the new system have all praised the accuracy and quality of the reports they are producing, praising in a step that means what had often been weeks of correcting transcriptions of their notes has been reduced to literally hours or even minutes.

"Use of speech recognition has changed my working life dramatically; in fact, all our lives in the department have," says Dr. Hatem Abu Abbass, Head of Medical Diagnostic Imaging at Al Qassimi Hospital. "I used to have to work at the weekend to catch up with reports, often having to try and do 10-15 at a time; now, if I get in to work 15 minutes early, I can generate five reports in just that time."

UAE health managers say the system is also boosting patient safety. "Use of the pen can be one of the major issues for faulty care; so many pharmacists, for example, struggle to fully understand the handwritten instructions from doctors," warns Mohamed AlDoy.

The verdict's clear: to quote another Nuance speech recognition convert, Dr. Somaya Abdullatif Al Zaraooni, Head of the Pediatric Department at Al Qassimi Hospital, "This is a good system and it is nice to see this new technology. I think it can be helpful for many aspects of what we do."

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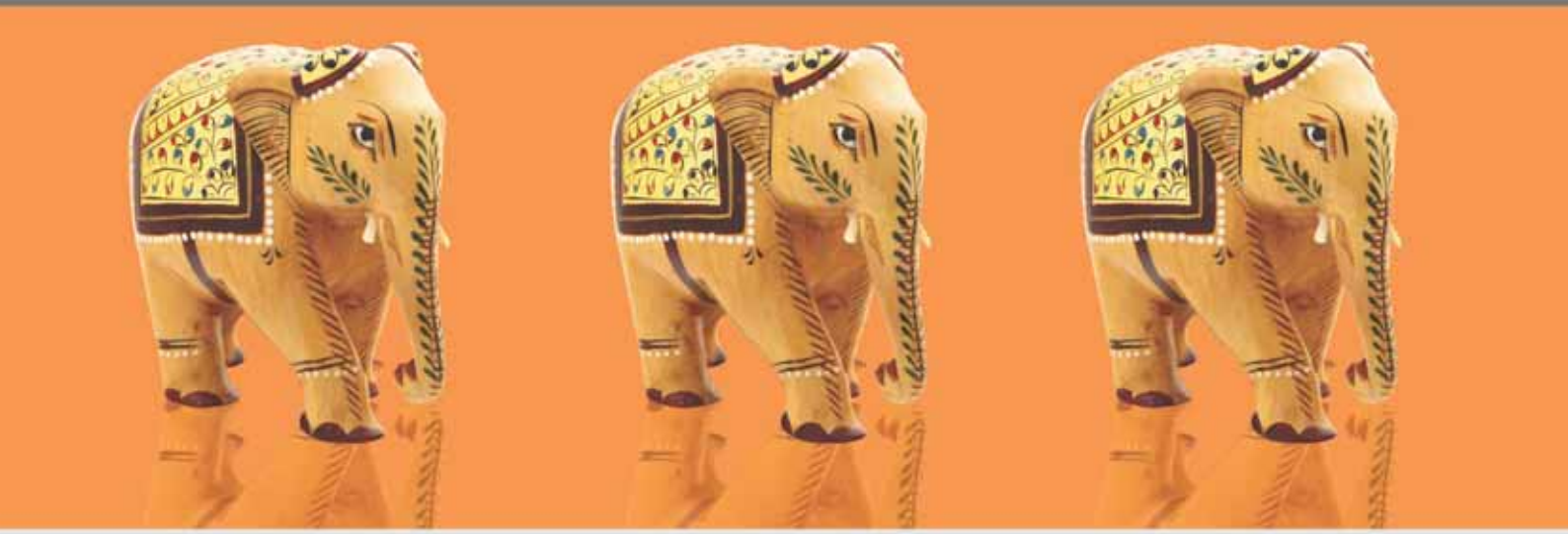

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Roundtable Talk

How can we improve the patient experience in Middle East hospitals?

Methodist International Dubai and *Middle East Health* magazine jointly hosted and sponsored a roundtable discussion at the Ritz Carlton DIFC, Dubai on 22 October 2012. The objective of this event was to discuss the importance of patient-centred care in the region as well as best practices for creating and maintaining a unique and highly successful 'Patient Experience'. Thirteen healthcare leaders from different areas of the healthcare industry including healthcare regulatory agencies, hospitals, and technology related companies participated in the discussion. Following are some of the highlights of the session.

Dr Sarper Tanli, Vice President of Methodist International, welcomed the guest of honour Cathy Easter, President and CEO of Methodist International in Houston, Texas. He pointed out that Cathy believes that a comfortable environment should be formed where all patients feel special and unique, and that this philosophy stands at the core of the international patient services for Methodist.

The Presentation

Cathy Easter opened the roundtable discussion with a 15-minute slide show about Patient Experience and the importance of having patient-centred care.

In summary, she said: "I would love to see the Texas Medical Center move towards not just being the largest, certainly in volume, but becoming one of the best in creating patient experiences. We see a lot of international patients from all over the world.

"The Methodist Hospital is well recognised and has won many accolades. If I had to pick one from the list, it would have to be that we are one of the best companies to work for. We engage our employees and educate them on why the patient experience is important. We help them understand how our patients view us and what we do, and stress that every interaction our patients have with us – nurse, housekeeping, guest relations, doctor – impacts the patient's overall opinion of our organisation. We let our employees know that they're part of something more important than just coming to work and doing a job. Ultimately, positive results can only occur when every employee is personally responsible and active in driving safety, quality and the patient experience.

"At Methodist, we want all our patients to feel special and unique. A personalised healthcare experience fosters these feelings

The Host and Moderator

	NAME	TITLE	ORGANISATION
1	Dr Sarper Tanli	Vice President	Methodist International, Dubai

The Panelists

	NAME	TITLE	ORGANISATION
1	Dr Hassan Al Rayes	Chief Clinical Auditor	King Faisal Specialist Hospital Riyadh, KSA
2	Lina Shadid	Healthcare Industry Leader MENA Global Business Services	IBM Dubai
3	Dr Joseph Naoum	Medical Advisor	TMH, Houston
4	Greg White	Vice President and Managing Director EMEA	Cerner, Dubai
5	Sami Alom	Director of Strategic Planning	Al Noor Hospital, Abu Dhabi
6	Fida Ghantous	Managing Principal	GE Healthcare, Dubai
7	Dr Naeema Aziz	COO	Apex Medical Group, Oman
8	Dr Amir Adolf Edward	COO and CQO of Revenue Cycle Management Services	Dell, Dubai
9	Ala Atari	CEO	MedCare, Dubai
10	Randy Edwards	Vice President	HDR, Dubai
11	Thomas Murray	CEO	American Hospital, Dubai
12	Cathy Easter	President and CEO	Methodist International, Houston, Texas
13	Dr Rashid Al Abri	Director of Development and Quality	Sultan Qaboos University Hospital, Oman

by addressing physical, emotional and spiritual needs. Our commitment to our patients remains our priority. As essential shared objectives that we carry out every day, the Methodist ICARE (Integrity, Compassion, Accountability, Respect, and Excellence) values are fundamental to the Methodist experience. In conjunction with an emphasis on service and safety, Methodist values are essential to creating a personalised patient experience. Every patient and guest deserves to be treated with our highest standards of care and hospitality."

The Discussion

The roundtable discussion was moderated by Dr Sarper Tanli who used leading questions to direct a relatively informal and free-flowing discussion among the panellists.

Dr Sarper Tanli

As regional experts what does patient experience mean to you? From the things you see in your organisation what are the elements in terms of standards or techniques that you wish to implement to try and improve the patient experience?

Thomas Murray

I have noticed that the concept of time here is more valuable than in the United States. This is particularly evident in our call centre. In the United States we would allow maybe 10 rings, but here the caller will hang up after five. We bring employees in from across the world to work here and we have to inform them that they cannot wait. We train them on the expectations of timeliness and speed of response to our patients.


Dr Sarper Tanli


Cathy Easter


Lina Shadid


Dr Joseph Naoum


Greg White


Sami Alom


Fida Ghantous


Dr Naeema Aziz


Dr Amir Adolf Edward


Ala Atari


Randy Edwards


Thomas Murray


Dr Hassan Al Rayes


Dr Rashid Al Abri

Dr Hassan Al Rayes
When you talk about patient experience, you really have to individualise it and try to suit everyone's needs based on their own background or expectations. That's what we have to work with.

Dr Amir Adolf
In response to what Mr Murray was saying about the patient experience – being hyper active doesn't necessarily mean that they are actually communicating to or with the patient. I think if we can slow the patients down to allow for a better connection with them, we can explain the realities of the care in front of them. When we actually inform the patients, we start to win them over.

Greg White
In hospitals, I like the fact that someone knows me personally or greets me by my name. It's great that some organisations are doing this. But when I am at a hospital I am also concerned about the quality of care and that my family member is receiving the correct treatment, for example.

Cathy Easter
I think that you raise a really excellent point. People know if their food is hot and they know that they have been treated respectfully, but they don't always know if the treatment is perfect. But if you are paying attention to every guest all the time and say hello, make him feel good, that attention to detail certainly can alleviate other fears. You don't really know if your surgical incision was absolutely the best incision it could have been. But a lot of times the attention to other non-clinical details, we believe can set the right patient-experience culture, not just for care givers but also for non-clinical caregivers as well.

Ala Atari
Customer service is not the same around the world and it has to be personalised based on where you are located. What works in the United States, doesn't always work in Saudi or other parts of the world. To write a book about customer service, it will not be a general international book because we really have to customise everything to where we are.

Thomas Murray
I would go along with that. Our patients resent the nurses taking time away from them to document. Some people don't mind it, but I noticed many of the folks especially one's that come from little farther away from Dubai, are saying wait a minute, are you worried about me or are you worried about the screen there? Maybe we need to do a better job at explaining some of these things. It is that interface, like you said Cathy, that creates a problem and it is a significant one here. In America people like to see the technology being put into play. They can see the value of it, but it is not so here.

Greg White
We have had a lot of backlash over the years from introducing technology into what used to be doctor-patient experience, nurse-patient experience, etc. We have seen a huge growth in technologies, like iPads, voice-recognition software, etc, which have increased the speed of delivery and convenience, but we do still see people saying: "We really don't want you doing that. I want you to discuss and interact with me."

Going back to the patient experience, I think the bar is being raised. We are still humans, we want care and we want the best quality care. The way it's delivered and the way that it's experienced is different from one place to another, but I think that one thing is universal and that is the level of demand is going up. I do think that organisations like Methodist are on a bell curve. However, we're at the upper end of that bell curve where our concern for quality is demonstrated. A lot of organisations are not that driven by that.

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Dr Sarper Tanli
We talk about individualised health plans and other things and obviously when we are outside Dubai, the expectations of the population are different because of the varying demographics and profiles. In terms of the standards and techniques, it was wonderfully noted earlier that adapting is a technique.

What are the challenges that you see in terms of adapting and putting these standards and techniques in place?

Dr Naeema Aziz
We are definitely focused on patient experience. But what I have noticed in this region is that patient education is lacking. That is a very big factor in introducing any new technology, anything that is going to help us to provide the best customer service to them. It goes both ways, the patient has to be cooperative and I think that insurance companies can play a big role in that because patient education is the ideal.

Randy Edwards
I think technology will enhance the educational experience that we can provide patients. It will allow us to not have to gather that white board information every time, like your name, address, zip code, etc. but to help coordinate, standardise and provide some of their medical records. Why wait 3 days for the report, when they can get it within a few minutes or a couple of hours. There has to be a balance between how much new technology, or new elements of it, are introduced to healthcare. The practice of healthcare is really an old practice that we are trying to enhance in order to adapt it to a fast-paced world.

Lina Shadid
Being a patient, I think that education of the providers is much more important than putting the EMR [Electronic Medical Record] system in place or installing the best IT tools, because they don't know how to use it effectively and it ends up looking bad for the patient.

Greg White
Going back to the personal experience, you can look at technology as a benefit when an organisation like Methodist has this desire. I think the impetus is to create a better personal experience with better outcomes and better personalised health with more attention to detail. It goes back to the organisation and at its core has to be clear the reason why we are going do this and why it matters – and then you start filling in the blanks.

Ala Atari
At our hospital, we ask for our customer's feedback in the form of electronic media and phone calls. I also visit patients while they are being treated at the hospital and ask for their feedback in person regarding complaints, food, temperature etc. I noticed that less than 1% of the complaints were about patient's not receiving good customer service. In fact, the patients literally had to think about the complaint they wanted to bring up. I think we overdo it and ask for so much feedback about customer service that patients are sort of being forced to just complain.

Dr Amir Adolf
I think Methodist has invested in the structure and process as well as the environment of care, outcomes of which affect the patient. There are other systems I think we should pay close attention to. In fact, if we invest our time (not necessarily money) early on and upfront, technology should be inserted naturally to the process and not forced on providers. I appreciate what Shadid was saying earlier about how we can really educate doctors. Doctors love to be educated and love to be informed, but when you force unnatural events into the natural experience of encountering a patient, they question why they should do it.

Fida Ghantous
Any kind of engagement that we have – either here, the United States or Europe – has always been that you put yourself in the patient's shoes. You start looking at your processes, where do I customise my interactions with the patients and how do I drive that experience to increase the touch points with my patient care at the end of the day. And on the enabling technologies I completely agree. You can't really force feed it, it has be something that not only facilitates the change but actually makes a system.

Technology to enhance the patent experience

Dr Sarper Tanli
If you look at the journey from the patient's point of view, how can we re-engineer the processes? How we can implement elements of technology? I am not only talking about e-health, but interactive media, other things that really have a touch point with the patients … how can we do that better?

Randy Edwards
I think it is more about the process. The tools are great, but I think it is the process. Compared to the experience I've had in the United States, [the experience I had at the Dubai Mall Medical Center] is a 100% better than in the United States. The way they shared information, the way they treated you, it really isn't technology per se. The technology was there, but it was the way they approached the patient. So again technology is great, but it is the process that will take care of it. So I think it goes back to organisational values and support.

Cathy Easter
You have to accommodate people where they are and I think that's where technology can be your gift because you really can schedule a lot of the things. They can schedule their own appointment, although not every time if it's an emergency or other things. But if it is outpatients, there are lots of ways we could utilise the technology in a way that it is actually a gift to the patient and not intimidating. Not as much in the direct care-giving experience, but a whole lot more to support the patient experience. In some of the outpatient areas we make sure that we have magazines or an iPod loaded with music that they said were their musical preferences. It would surprise them and again give them some level of comfort that you care about some of these little touches.

Dr Hassan Al Rayes
In many of these innovations and processes what I see is that we have two issues. We have the medical and we have the patient care part. Traditionally people tend to concentrate more on

medical – so in designing these structures, the doctors and nurses are doing everything. It is very rare that we have patients participating in that process. You ask the question how can we do this better? How can I make sure this medication is safe? You can only look at it from the perspective of the physician, or perhaps the nurse giving the medication.

I can see why we can get further away from a patient-centred experience. Perhaps we need to have more patient input.

Dr Joseph Naoum
One point that we have to consider, especially about what Dr Al Rayes said, is to know what a patient wants. We really need to ask the patient, and often times we just need to give them choices. Patients don't want more technology; patients want a hello, a clean environment, good care, outcomes and so forth.

Hospital design and the patient experience

Dr Sarper Tanli
What is the role of design in the environment… the environment that we create for our patients? How does it affect the patient's experience?
Randy Edwards
I think the big change you have seen in the last 10 years is a big push towards [design] being much more about the patient and towards having an exceptional patient experience. Getting away from institutional [style] and bringing in more hospitality and a healthy environment where you have a lot more open space. The patient experience really starts from the time they pull into the complex.

Dr Joseph Naoum
In general, hospitals have been moving towards getting the family involved not just by having rooms with areas for families to sit and then spend the night with the patient, but also outside gathering places for the family or areas where the family can have internet access.

Dr Hassan Al Rayes
Randy, you mentioned that patients want large rooms. How would you then integrate or get what patients really want into the decisions and the processes you have? Are there patient committees or surveys? How do you know what patients really want?

Randy Edwards
Well some of the main processes that we have had, where we have the had the opportunity to go talk with patients through the user groups was part of it, but we also, if you look at lot of the user groups that are practicing, understand the culture fairly well, understand what the demands are from the family and the religion that supports them. It is a combination of the user groups and the patients. Historically it's mainly been through the user groups which would be your surgeons and your department heads.

Fida Ghantous
There is a disconnect between a lean design that is usually copied from somewhere else or adapted from somewhere else and the actual operations that are on the ground in the hospital today in a location like Dubai, Riyadh or Doha. So when you put these two together you end up with inefficient patient transport, you end up with a number of staff that is ridiculous because hospitals are always bigger. This is a pandemic we have in the region, where it has to be bigger and it has to be nicer than the next one.

Randy Edwards
I think that the biggest challenge has been with work in KSA. They demand efficiency. Because their standard rooms are historically smaller, we talk about increasing room spaces. A lot of this analysis has to be put in to the design

process. It needs to be demonstrated to them, because if you don't demonstrate it they won't pay for it.

Dr Joseph Naoum
I think an important element of the environment when you build a 50-bed hospital, is that it has to be simple. People can go in and out without any problem, but when we build a 200-bed hospital (specialty or multispecialty hospital), it becomes hard to navigate. It is not going to be simple especially for someone who is visiting for the first time. Some options we can provide to the patients are valet parking and have someone to greet them at the door to help guide them to the right place instead of trying to figure it out themselves.

Cathy Easter
Patient flow is a huge issue. This is an area where IT really can help your patient experience. I think that you can take it too far. We visited a hospital in Colorado and their onstage-offstage process was so segregated that I didn't feel like anyone was there. I felt it was merely too separate, we didn't see any employees and felt like we were isolated.

I think that these are really important issues in this region and other places where your nurse satisfaction is not going to be extremely high if they walk 10km a day just to get supplies and other things that they need. What ends up happening, however beautiful that design is, they will stockpile their stuff and it is not going to look good. This can lead to a negative patient experience. I think this idea of bigger and bigger can at times really create unintended consequences and can negatively impact your employee experience.

Dr Sarper Tanli
How do you get your employees to engage with patients to really enhance the patient experience? How can you improve communication and have a more sustainable patient experience that grows over the years?

Ala Atari
In the US, we used to take people who are smart and send them to school and invest two to three years and in return they would work and give back to the company. But here we simply cannot do that as people would just disappear after all the investment you have put into them.

Dr Amir Adolf
One thing you can have is an employee contract and within that contract you can specify the drivers and have limitations for your investment. People will sign up for these things when you offer it, but I see that there is a lack of interest in high prolonged education for physicians and nurses and allied health professionals.

Dr Rashid Al Abri
The experience in Oman is that we enrolled the nurses and the doctors in communication skills courses. Based on the scores they received, they would be awarded with the certificate of appreciation from the Director General or at the end of the year we give them some sort of reward.

Dr Joseph Naoum
I think the tone is really set from the top down. The management, the administration and the board needs to really set the attitude and the plan to move forward. Like you said there are contractual agreements, there is loyalty building, and there are incentives.

Dr Amir Adolf
I know we are limiting the discussion really to patient experience, but in fact we are seeing a new kind of consumer today in healthcare. IBM just finished a study a few years ago from CEO's around the world and one of the things that came out of that study from the healthcare side was the rise of something that is now called a pro-sumer. These are producers and they are also consumers. They are hybrids that are empowered by information, technology and knowledge not seen before in our encounters. So when you add those pieces together what you are basically saying is that the environment of engagement between us as a healthcare system and the educational system of a country have got to rapidly advance what is available, when is it available and how it is available.

Dr Naeema Aziz
We have to keep another very important point in mind. This region is not used to paying for their healthcare costs. For example in Oman 80% of the healthcare system is public. If you try to convert that system into private can you imagine how many would like to pay? Saudi tried to come up with mandatory insurance, but with a government fund. The model here should be different because for centuries people have not paid for their healthcare.

Dr Sarper Tanli
What elements from the processes – from design to IT to education – should we implement to improve the patient experience in this region?

Dr Amir Adolf
Dell has reintroduced a very simplistic model. Arab hospitality is well known around the world, they do it very well in hotels and it can be duplicated here at the entry points of all the hospitals. We are working with that model in all of the Sohar facilities.

Randy Edwards
Going back to a tailored Patient Centre experience for the region is important and that needs to be addressed. You have to enhance the experience of the employees. Patients need to be happy and the best way to assess whether they are happy is to ask them. But then hospitals need to provide that environment and that care. Again it has to be tailored to the region and it has to be tailored to each particular hospital, because each hospital is different from the other due to the patient population.

Conclusion

Dr Sarper Tanli thanked all attendees for sharing their views on patient experience and concluded the roundtable by saying: "We have come up with a couple of ideas on how to connect with patients, and how to understand the expectations of the patients for each community. We focused on customer service, local nuances and how much technology you need. We talked about how to use technology more as background information to improve patient care. We also talked about the close family expectations and their experiences in terms of developing communication skills and training for staff and how we can engage them overall." MEH

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NUANCE

The growing importance of population health management

Greg White, Vice President & Managing Director, Cerner Middle East and Africa and **Mike Pomerance**, General Manager and Managing Director, Cerner Middle East, discuss the growth of healthcare spend and projects in the Middle East and the rising importance of 'population health management' to proactively keep communities healthy.

Mike Pomerance (L) and Greg White (R)

The Middle East healthcare industry has shown record growth over the past few years and is expected to continue growing in the future for reasons that include increasing population and the rising prevalence of lifestyle diseases such as those related to obesity, smoking or lack of exercise. This has led to a boost in the demand for better healthcare services. As a result, an estimated US$10 billion worth of healthcare projects are planned or underway in the GCC. The Middle East healthcare sector is expected to be worth US$60 billion by 2025 as the need for investment in facilities and services continues to escalate.

The outlook for healthcare technology adoption in the region is promising due to factors such as increasing population, rising income levels of residents, increased penetration of insurance, etc. With the adoption of new technologies, as well as the support lent by authorities, it is expected that healthcare standards in GCC will match or even surpass those in developed countries of the world. High investment projects and new regulations to ensure international healthcare standards are also other contributing factors to this positive outlook.

According to estimates from the World Health Organisation, the average human lifespan increased to 68 years in 2009 from 64 in 1990 with advances in healthcare facilities. Consequently, the annual growth rate of the aged population (60 years or older) surged to twice that of the overall population; this is expected to continue over the next few decades.

At Cerner, we believe that older patients need to have greater access and control over their care. Just as the banking and travel industries have taken a lead in their own respective sectors, Cerner makes the case that the same thing needs to happen in health care. For example, we have a personal health record (PHR), Cerner Health, which allows users to access their medical records online and input data such as diet, exercise and other personal and lifestyle information. This will help doctors better understand the lifestyle of their older patients, thereby delivering more efficient quality of care.

In addition, the electronic health record (EHR) within Cerner Millennium allows for an integrated approach to health and care so that different care settings are joined together to treat the patient throughout the care pathway in order to deliver better outcomes. This is particularly important, considering the increase in the average human lifespan.

We have used individual and team-based programmes, supported by information technology, to help people address the

self-inflicted causes of ill health such as lack of exercise, poor diet and smoking. We emphasise the importance of managing one's own health, and aim to place the power and responsibility back in the hands of individuals.

Our Cerner Health PHR also houses a set of personally-controlled health management tools and capabilities that allow people to connect with their health information.

One of the most attractive features of this is the personalized messages it sends including recommendations, alerts and education to help better manage one's own health. Cerner Health also enables people to connect devices to their PHR. Cerner currently has three in use by the company's staff: the Fitbit; Withings scale; and a glucometer. All of these devices automatically upload information to the employee's PHR and in turn, with their permission, enables the information to be shared with the employee's care team.

We are engaging people and giving them a reason to interact with their PHR whilst at the same time automating the process to make it easy and effective.

Our initiatives have yielded strong results. In 2010 we had 96% employee completion rate of their Personal Health Assessment. Our employees now actively managing their health; in the period from 2007 to 2010, 80% of a consistent cohort of over 2,800 employees maintained or reduced their number of health risk factors.

Slimdown throwdown

In 2011, Cerner staff competed in a global weight loss challenge called the 'Slimdown-Throwdown'. Employees from around the globe formed teams of between four and six staff members and attempted to reach a percentage target weight loss; this was a great success and produced some interesting results. The analysis showed that between the 1,865 participants over 10 tons in weight were collectively lost. Our competition winners were awarded with an all-expenses paid Caribbean holiday.

At an individual level, there have been some rewarding stories of how employees' lives have been changed for the better as a direct result of our initiatives. One employee said in an interview: "It's really helped putting a number to it. It's more concrete than just 'oh, I need to lose weight."

By setting her targets, sticking to a rigid plan of exercise and maintaining a healthy diet, this employee won our February Fit Challenge competition by losing more than 11% of her body weight. She went on to say: "I used to get out of breath walking down the hallway to conference rooms. Now I can walk anywhere. I can even run a little bit, and I can do stairs. I don't get out of breath."

> One of the most attractive features of this is the personalized messages it sends including recommendations, alerts and education to help better manage one's own health.

Healthy M.E. Steps Challenge

Earlier this year, Cerner's Middle East office developed the Healthy M.E. Steps Challenge for all its clients and employees in the region to help them lose weight and improve fitness by motivating each other. This was Cerner's first health competition involving clients in the Middle East.

The Healthy M.E. Steps Challenge was a nine-week competition in which Cerner Middle East employees and client employees formed separate teams competing on the number of steps taken, using a Fitbit to help track their steps. Cerner created an interactive website, called Cerner Health Wins, to help client employees and employees set up teams, configure their individual profiles and manage the competition online by tracking their progress and the progress of others using a real-time scoreboard.

The winning team of the Healthy M.E. Steps Challenge with the highest average steps per participant was from Children's Cancer Hospital – Egypt. The four-member team lost more than 34 kilogrammes collectively during the competition.

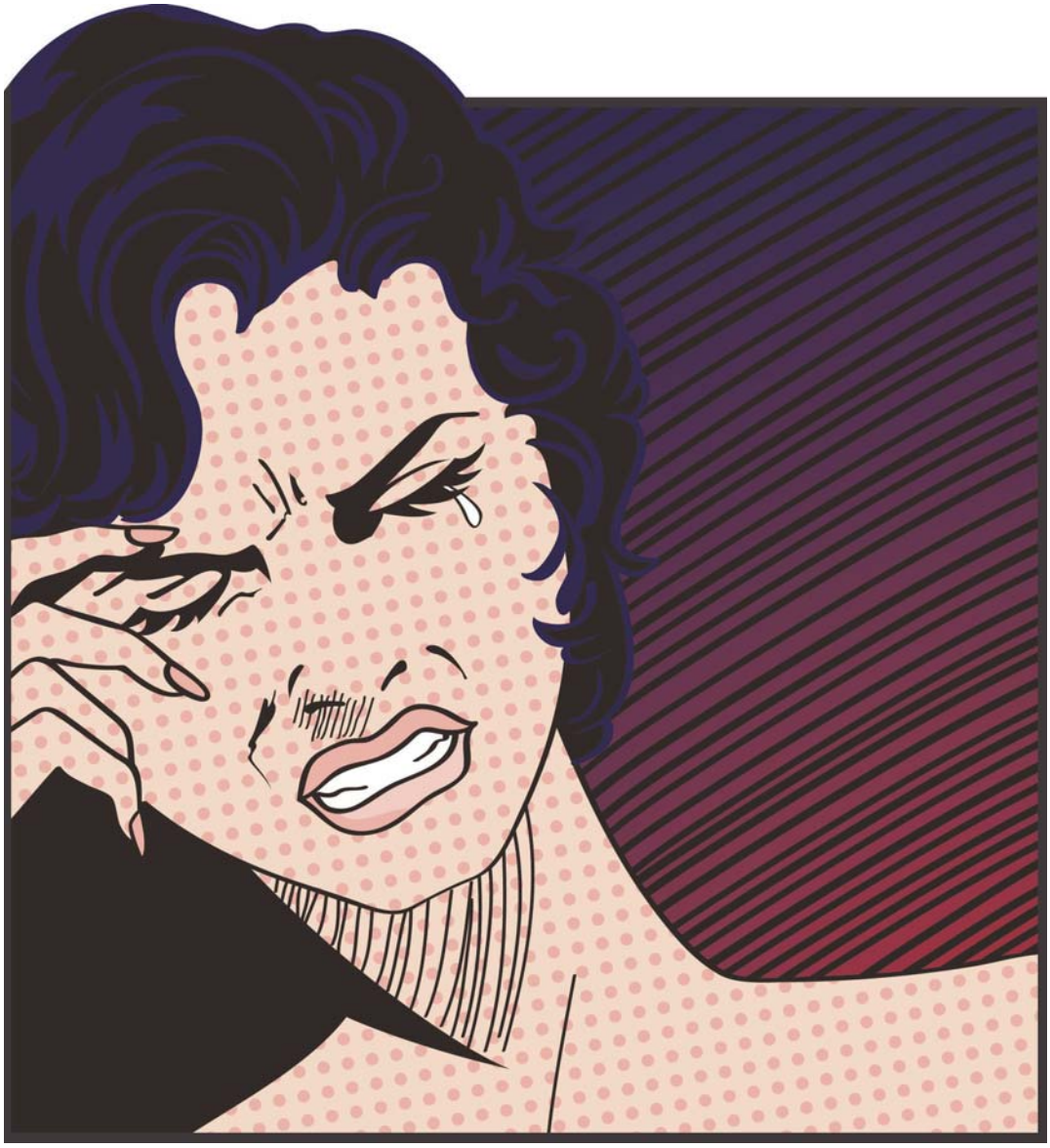
Ahmed Badrawy, a member of the winning team called it an unforgettable experience for the organisation, emphasising the importance of leading a healthy lifestyle. He said that the team spirit, daily workouts and tracking of steps on a regular basis using Cerner's competition website provided the boost and motivation needed to win this fun challenge.

Cerner received a lot of positive feedback from participants on how this competition effectively improved their health. For example, a participant in the Kingdom of Saudi Arabia reduced his Hb1AC (blood glucose level) from 0.64 to 0.58 (normal) and, after consulting with his physician, was able to stop taking his regular medication to control his sugar level before breakfast and supper.

Many employees already know what they need to do – lose weight, be more active, improve cardiovascular health, etc. but they may find it hard to get started. Our Middle East health competition provided a kick-start and improved overall determination. People are more engaged and motivated when opportunities to improve their health are competitive and social. This is evidenced by the amount of positive feedback we received from our clients and other heath associations asking Cerner to arrange similar competitions in the future to include participants who did not get a chance to be part of this year's competition.

It is through initiatives and incentives such as these which have made wellness and exercise a huge part of the Cerner culture.

We are continuing the momentum with new competitions and incentives all the time, such as our current 'Stay Slim' weight loss competition. We continue to analyse the outcomes of our initiatives in order to make adjustments to achieve optimal engagement and results. This, in turn, further enables us to better understand our population and its health needs. MEH



Effectively managing patients' pain

– Best Practice recommendations for hospitals

Gallup consultants have worked with more than 600 leading healthcare providers around the world to better understand how to effectively manage patients' pain. **Richard Blizzard**, D.B.A., Senior Practice Consultant, Gallup, reports.

Many healthcare professionals consider pain management critical not only to a patient's recovery but also to his or her positive engagement with a healthcare facility. A healthcare provider's ability to understand and respond appropriately to patients' pain affects those patients' overall experience with their care provider. Hospitals should make sure that there are policies in place that answer the following questions:

- What methods do we use to manage pain?
- Do our patient-facing healthcare professionals have a good understanding of a patient's personal or spiritual needs regarding pain management?
- What alternatives to medication do we discuss with patients, and how do we stay current in this area?
- How can we ensure that discharged patients will be able to properly manage their pain?

In working with more than 600 leading healthcare providers around the world on patient engagement, safety, and experience, Gallup has discovered that these are best practices related to pain management:

Patient and staff interventions

- Set patient expectations appropriately. Pain control doesn't necessarily mean the absence of pain. Sometimes a certain level of pain is necessary to properly diagnose and treat a condition.
- Anticipate the pain medication schedule. Don't wait for patients to ask for pain medication. Visit patients before it is time for their next medication to ask them their level of pain, and be prepared to administer the next pain medication.
- Stay in constant communication with patients while trying to control their pain. Ask yourself: "Have I done everything I can to control this patient's pain?" You should also be aware of and treat symptoms that might be associated with

pain management. Different cultures have differing tolerance of or willingness to reveal pain. Cultural sensitivity includes talking about pain with patients and their family, being aware of differences in sensitivity, and building a relationship with patients to encourage them to communicate about their pain.

- Understand that pain is emotional as well as physical. Pain management must address both the physical and emotional symptoms of pain. For example, a cancer patient is awake and in pain during the night. Although she is in physical pain, emotional distress is keeping her awake. A good nurse will sit beside the patient, hold her hand, and say: "I understand."
- Record current pain levels on a whiteboard. Noting pain levels where patients and staff can see them facilitates staff communication and coordination. In many hospitals, for example, a whiteboard is placed at the foot of the bed or on the wall where the patient can view it and staff members have easy access to it. Staff members update the board with key information, such as the nurse's name and the patient's pain level at each round or check-in. Staff members can use this information to answer questions about the patient's pain levels when discussing treatment options with the patient.
- Educate patients about how to manage their pain after being discharged. One hospital discovered that most patients who called the hospital the day after they were discharged reported that they were in pain, even though the pain was under control when they left the facility. Further investigation revealed that patients were failing to take their pain medications as prescribed. Some thought the prescription would be expensive, so they tried to avoid the expense and did not get the prescription filled; others filled the prescription but rationed their pain medication by taking it when they felt they needed it instead of according to schedule. Because pain pills do not work immediately, the delay in taking the medication caused patients' pain to increase dramatically. Hospital staff used two tactics to help patients understand why they needed to take their medication on schedule after discharge. First, they printed the warning: "If you do not take your pain medicine, you will be in pain" in bold at the top of the written discharge instructions. Then, during discharge, a staff member verbally cautioned patients: "If you do not take your pain medicine, you will be in pain." This may seem blunt, but patients needed this message in language that was easy to understand.

Staff and hospital interventions

- Initiate a pain-control policy. Healthcare professionals must be familiar with their hospital policies and openly discuss pain control with patients and their families. Consult with patients about methods that have – and have not – worked well in the past. Patients also should have a chance to voice their concerns about medications and how to administer them. When appropriate, healthcare professionals should discuss their roles in managing pain and the potential limitations and side effects of treatment with patients and their families.
- Review the process for pain medicine delivery from the pharmacy to the nursing unit. Pay particular attention to off-shifts and weekends. Poor coordination or the lack of timely delivery between the pharmacy and the nursing unit is a frequent cause of patient pain. Both the nursing staff and the pharmacy should look at communication policies and procedures to ensure that medication is available or delivered promptly when patients need it. Many hospitals have adopted Toyota's "lean" approach to quality management; this review process could prompt a joint lean project between the nursing staff and the pharmacy.
- Educate all hands-on providers about pain assessment and management. Proper education for providers results in a cohesive pain-management programme for patients.
- Become familiar with non-medication pain control to provide patients with "high-touch" pain management options. The American Nurses Association (ANA) differentiates between medication and non-medication pain management. Teach patients breathing exercises and the benefits of massage, positioning, cold pack care, and relaxation. All of these are high-touch ways to provide patient-friendly care.

> Set patient expectations appropriately. Pain control doesn't necessarily mean the absence of pain. Sometimes a certain level of pain is necessary to properly diagnose and treat a condition.

Pain is a major barrier to engaging patients during their hospital stay and after they are discharged. Following best practices in pain management will result in better clinical outcomes because patients will be more engaged in their care and more likely to follow instructions after they leave your care. MEH

Value in Healthcare

The History of Medicine in the United States – 1930-2011

– And the lessons that can be learned in the Middle East

Part 4 of the 5-part series

Continued from *Middle East Heath* Sept-Oct 2012
(The series is also published online at: *www.MiddleEastHealthMag.com*)

By **Arby Khan,** MD, FACS, MBA

Summary of previous article: The period of 1850 – 1930 was a critical period of development for the medical field. Older but disparate developments by Hippocrates (medical ethics), Galen (anatomy and the science of direct observation), Harvey (circulation of the blood), Vesalius (definitive human anatomy), Pare (early advances in surgical techniques), Morgagni (the anatomical concept of disease), and Jenner (discovery of vaccination) served as a foundation upon which were added subsequent discoveries such as the stethoscope, the germ theory, and the discovery of anesthesia. Put together, this totality of knowledge created, during 1850-1930, a critical mass of information that signaled the dawn of a medical profession that could actually *heal* suffering patients. Especially visible to all was the success of surgery – as integration of anesthesia, advanced surgical techniques, and infection control created eminently successful outcomes. As the number of such successful outcomes increased, so did the patients' willingness to pay for procedures. This initiated the era of profit in medicine and, consequently, hospitals started to multiply rapidly. As the medical industry developed, various stakeholders appeared on the scene and, over time organized themselves into powerful lobbies that tried, and mostly succeeded, in molding the healthcare infrastructure and legislation in their favor. The medical profession and allied stakeholders lobbied for autonomy, and aggressively supported legislation that made a strong case for public aid to medicine but without public control. The consequence, as we see it today, is a fragmented, inefficient, and expensive system that ignores the healthcare needs of 50 million Americans. *The major lesson to be learnt by Middle Eastern countries, which are currently developing their medical infrastructure, is that comprehensive (universal) medical care for all citizens – the very young, the very old, and everybody in between – is the only way to effectively distribute the risk and cost of medical care. Additionally, parochial interests should be limited in their influence in shaping the healthcare system.*

A curious aversion

The American public, and of course many political leaders, historically had a viscerally negative response to "universal" health care – which still exists today[1, 2]. This aversion to universal health care does not have a clear explanation in either underlying ideology or political inclination. Before World War I, the reformers of the Progressive Era won the enactment of food and drug regulation, antitrust law, labor legislation, national parks, the Federal Reserve, and workers' compensation – but did not win on national health insurance. During the 1930s and '40s, the New Deal and its successor, the Fair Deal, definitively established federal responsibility for the overall stability and growth of the economy and led to the passage of Social Security, collective bargaining laws, financial regulation, and minimum wage – but not national health insurance. And again, in the era of liberal reform in the 1960s and '70s, there was civil rights legislation, antipoverty programs, regulation of occupational safety and consumer products, environmental protection, Medicare for the elderly and Medicaid for some of the poor – but not national health insurance[2]. In fact, for the next 80 years there would be continued and fierce opposition to "universal" health care by various groups for different reasons.

Progressive health insurance: 1915-1919

The idea of universal health coverage in the United States came from Europe. It is useful to briefly look at the evolution of universal health care in Europe. Initially, many European workers were "insured" through sickness funds established by mutual societies, unions, and employers. These funds provided cash benefits to make up for lost wages and paid for doctors' services. Germany led the way, in 1883, and enacted *Sickness Insurance*, while Britain followed in 1911. Interestingly enough, both countries enacted such legislation based on political and economic objectives and not because they were concerned with the health of their citizens. Politically, leaders in both countries were trying to diminish the appeal of the socialist, or somewhat more liberal, parties by providing economic support to citizens in the form of health insurance. From the economic standpoint these countries realized that *Sickness Insurance* enhanced the wealth and power of their nations through improved health and efficiency of its labor force and army[2].

The socialist party in America was rather weak and even though it endorsed universal and compulsory health insurance in 1904, it made little difference. The United States' general disposition was towards less regulation – in fact to such an extent that the Supreme Court struck down a statutory limit on the working day on grounds that the law interfered with freedom of contract (*Lochner v. New York: 1905*). The Federal government, in that era then, had essentially no role in public health or in financing medical services.

The first significant reference to health insurance in American politics was in 1912 when the Progressive Party was formed and health insurance was part of their platform[2]. Their reasoning was as sound as arguments for universal coverage ever were in the US. They felt that universal health care was not a special interest of labor or of the poor, but of significant interest to an "enlightened society". Since healthcare costs, it was recognized even in those days, led to poverty, they argued that spreading the costs of sickness would reduce the prevalence of destitution and dependency and equally importantly, reduce the social burden of disease. Prior to this time, the labor-law reformers had made similar arguments in promoting worker's compensation (also compulsory) and succeeded. This success gave the Progressives logical hope that universal health care would also be successful.

However, that would not be the case – and again, the reason was parochial interests of various groups. Businesses and employers in general had supported worker's compensation purely on financial grounds. Jury verdicts for accidents in the work place were on the rise and elementary mathematical calculations revealed that it would be financially beneficial to provide health insurance for accidents in the work place. However, it was quite another story if employers were asked to cover *any* illness that their workers happened to acquire – businesses saw no benefit for themselves and thus opposed it. It was the same for physicians of the American Medical Association (AMA) – they opposed universal health insurance because they felt it would decrease their ability to charge patients on a fee-for-service basis. Oddly enough, the labor unions (American Federation of Labor - AFL) also opposed universal health care – their reasoning was that workers should look to unions and not to the government for help. Of course this also was a power play as it was a way for unions to build memberships and solidify their influence. Parenthetically, at that time AFL also opposed a minimum wage for workers. The most vociferous opponent of universal health care, however, was the insurance industry even though at that time they had no stake in the healthcare business. The only reason was that universal health coverage also covered some benefits for funeral expenses – and this was the insurance companies' most profitable line of business[2]. Thus, right from the start powerful, parochial interests thwarted the passage of universal health care and this opposition continued for the next 80 years and continues to this day.

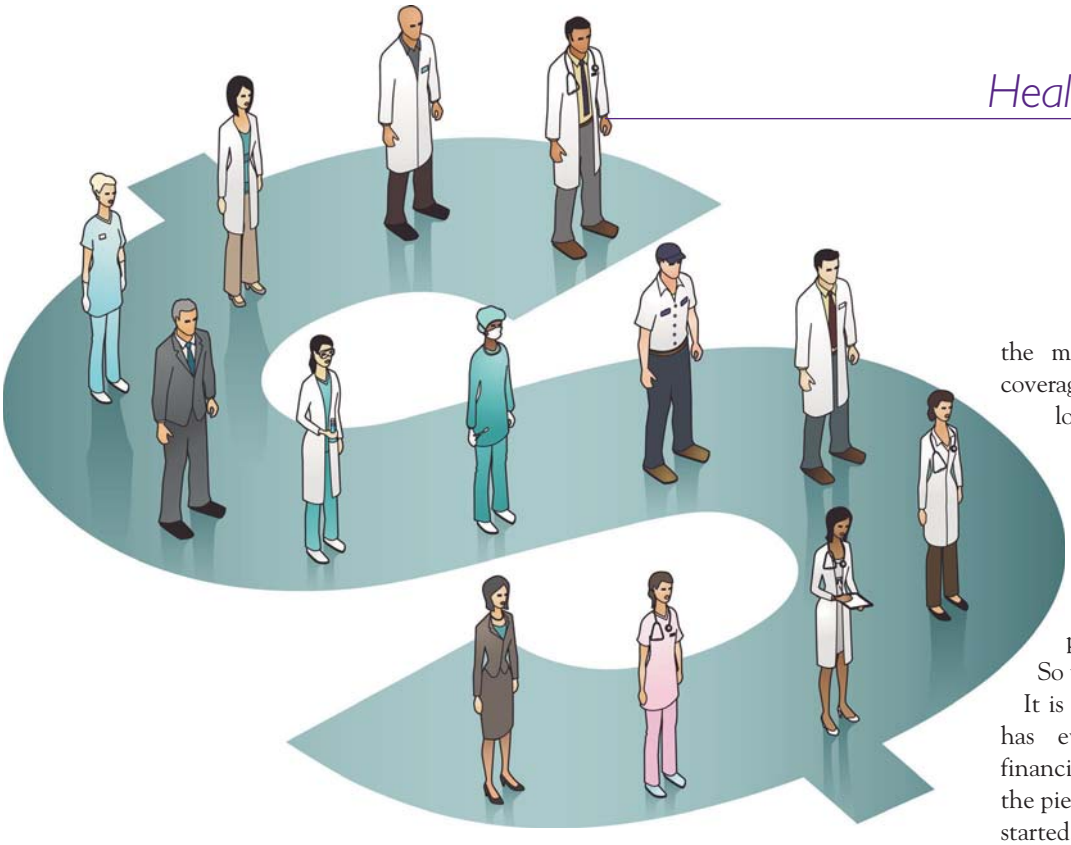
Middle Eastern countries that are developing their healthcare systems should study these lessons carefully and create a system of healthcare that is optimally designed for the delivery of comprehensive care to all citizens and should not let any individual group or institution have undue influence in its design.

In April 1917, the US entered World War I and the nation's attention was diverted from domestic reform to distant hostilities. This was actually a bonanza for opponents of universal health care since the concept had arisen in Germany. Now that Germany was an enemy, of course any idea that may have originated there was a bad one.

Multiple attempts to pass universal health care fail: 1935-1950

Against the above background, it will be easier to understand what happened after World War 1. Proposals for health insurance that were brought forward after 1930 were different in nature, perhaps because of the stinging defeats of the past. Over the subsequent four decades, many partial plans were passed but universal health coverage was never enacted. The time frame represented by the New Deal (technically the series of economic programs enacted by Presidential Order or Congress between 1933 and '38 in response to the Great Depression) was the moment in American history which was most favorable for the passage of universal health coverage. The Great Depression had caused such misery and the desire to "do something" was so great that every piece of legislation that President Roosevelt asked for in his first 100 days in office in 1933 was passed[3].

During the 1930s the cost of health care continued to rise and it was increasingly difficult for even middle class families to pay for health care. For example, in 1918 average hospital expenses were 7.6% of family medical bills (less than $50/year). However, by 1929 these figures rose to 12% and $108 respectively[4]. This reality shifted the focus of reformers from coverage of narrow, specific elements, such as replacement of lost wages during sick-



ness, provision of paid maternity leave, and funeral benefits, to more expanded coverage of healthcare benefits. This reality also meant that hospitals began to have financial problems since fewer citizens could pay for their services. In response to this reality, hospitals and hospital associations in Texas, California, and other states created the first health insurance plans for groups of employees to cover hospital expenses. These plans were run on a non-profit basis and eventually evolved into the Blue Cross system[1, 2].

Throughout President Roosevelt's tenure there were multiple efforts to implement some form of universal medical insurance but he was thwarted every time by the same groups discussed above. Especially, vociferous in its opposition was the AMA who had only their parochial, financial interests in mind. During the late 1930s the Second World War erupted and the US declared war on Japan on December 8, 1941. This clearly had an effect as the nation's attention was once again diverted from domestic reform to substantial military engagements until 1945 when WW2 ended[5].

Harry Truman, who took over after Roosevelt died in 1945, was the first President to actually propose a federally run, compulsory, essentially universal health insurance plan. As expected, the battle was fierce and this was the one moment in US history where the nation came very close to actually adopting universal health care – but it was not to be. Once again, WW2 was pivotal and the fact that a significant part of the war was against "socialist" countries played a major, but illogical, role in the campaign against universal health care. Opponents deemed it "socialized" medicine. Defeat of the Truman plan was equated with "preserving the American way" and preventing insidious and subversive forces from foisting socialism and communism on an unsuspecting American public. The detractors won the day and universal health care was defeated. However, in this fray, what survived was the aid for hospital construction and medical research (of course supported by those who benefited financially by building more hospitals). In 1950, Congress also enacted a small program of healthcare benefits using federal aid to states for welfare recipients – the birth of Medicaid[4].

The creation of Medicare/Medicaid: 1950 – 1965

This time period was critical to the eventual creation of the current US healthcare system. There was a decisive shift towards private, employer-based health insurance with separate programs for the elderly (Medicare) and the poor (Medicaid). This was the beginning of a costly, extremely complicated system which protected enough of the public to make the system resistant to change. When private insurance was born (Blue Cross), it provided coverage at a "community rate" – the same price for all employee groups in an area. However, as commercial insurers entered the market they cherry picked, selling coverage to younger, healthier people at lower rates. This left Blue Cross with all the high cost, sicker, people to insure – which was not financially viable and eventually Blue Cross had to adjust its rates to be competitive with the commercial insurers. This was the beginning of higher premiums for sicker, older patients. So what were the elderly to do?

It is interesting to note that no country has ever created separate healthcare financing for the elderly. Of course, once the piecemeal approach to health care had started, and employer-based insurance took hold, then the rationale for having a separate program for the elderly also made sense – especially since the elderly were neither employed nor could afford the high premiums demanded by commercial insurers. This is a critical lesson for countries in the Middle East that are currently developing their healthcare infrastructure – *piecemeal coverage of various groups in the population will lead to an inevitable cascade of increasingly complex and expensive healthcare and make it more difficult to enact universal health care since the groups already covered have nothing to gain by supporting coverage of uninsured groups in the population*.

Congress eventually passed a broad Medicare bill (health insurance for the elderly) in 1965 which was a result of political compromises – Democrats' compulsory hospital insurance program (became Medicare Part A), the Republican voluntary program to cover physicians' bills (became Medicare Part B), and an expansion of other aid to the poor (which became Medicaid). This, in essence, created separate and unequal programs for the elderly and the poor – the elderly receiving the upper tier, mostly an "earned right", and the poor, receiving "undeserved" help. This was reflected mostly in the fact that Medicare was the same in every state whereas Medicaid was left to the vagaries of each individual state. Medicaid was also linked to eligibility for welfare. However, since states varied in their criteria for welfare and in their criteria for what was covered under Medicaid if one did receive welfare, many

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people who qualified for Medicaid in one state did not qualify in another state. Additionally, states decided on the reimbursement for doctors' services, which were so low in certain states that doctors just refused to accept Medicaid patients.

The Medicare legislation itself was also far from perfect. One of the major deficiencies was the absence of any cost restraints – reimbursement to hospitals was based on cost. Thus, the higher the cost of health care provided, the more money hospitals received. As it later became clear – a better way to exponentially inflate the cost of healthcare could not have been devised.

As this time period and the legislation created are responsible for the immensely complex system the US deals with today, it would be useful to summarize the results of this legislation:

- It added a tremendous amount of complexity to healthcare finance
  - Medicare was divided into two parts – both working on different principles
  - Coverage was not adequate so many elderly bought private supplemental insurance
  - Some elderly, if poor enough, or spent down their assets, could also be covered by Medicaid
- It forced hospitals, doctors, and other providers to add numerous administrative personnel
  - Sorting out the myriad private plans and multiple government payment systems required extra personnel
- It led to infinitely more bureaucracy
  - Critics of a single, federal insurance plan stated that it would be a bureaucratic nightmare to administer. In reality, it was the Medicare/Medicaid legislation that led to the bureaucratic nightmare
- It linked healthcare coverage to poverty
  - This had the perverse effect of keeping people from taking low paying jobs. Many people on welfare faced the loss of health coverage if they took the kind of job typically available to them – low-wage work without health insurance. This was a strong incentive for people to stay on welfare. The Medicaid-welfare link increased the welfare rolls by about 25%[6]
- It created a class of Americans without healthcare coverage that was disproportionately the working poor and the sick
  - Working poor had no access to either employment-based insurance or to a public program
  - The sick and high risk individuals were deemed "uninsurable" by private insurance companies
- It covered just enough people that there was not a broad enough base of uninsured people to force the issue of national health care
  - In 1970, the uninsured was about 12% of the population[7]
  - This relatively low percentage gave the false impression that "universal coverage" through these piecemeal approaches was reachable
  - Once employment-based insurance and Medicare were established, a large block of voters saw little for themselves, except higher taxes, in a program to cover the remaining uninsured
  - This hope of universal coverage was quickly dashed when the number of uninsured (50 million in 2010 – about 16.3% of the population) and healthcare costs began to rise exponentially.

These consequences should serve as a pivotal lesson for Middle Eastern, and other countries in the process of creating their healthcare infrastructure.

Realisation of a healthcare crisis: 1970 – 1980

As costs of health care escalated out of control (from 1965 to 1970 state and federal health expenditures rose at an annual rate of 20.8% – an unsustainable rate) and the number of uninsured increased, there was significant alarm registered by the press and the politicians. Certainly, by the early 1970s most agreed that there was a "healthcare crisis" in the making. President Richard Nixon said in July 1969, "unless we take action within the next two or three years…we will have a breakdown in our medical system[8]". Nixon, despite his party affiliation (Republican), proposed a healthcare plan that was as close to "universal" as could have been accomplished at that time – although mostly due to competition with, and in response to, Senator Edward Kennedy's healthcare proposal. However, as the 1972 presidential election approached, Congress and Nixon were unable to reach an agreement. At the beginning of his second term, however, Nixon made healthcare reform a top priority. However, by this time, the Watergate Scandal had begun to unfold. Despite this, however, he sent his healthcare plan to Congress in February 1974. There is evidence that there was enough support for his healthcare bill that it would most likely have been passed by Congress[8]. However, once again, it was not to be, and as the Watergate Scandal reached its peak, and impeachment seemed essentially unavoidable, Nixon resigned on August 6, 1974. In 1975, President Gerald Ford did not resubmit Nixon's health insurance plan to Congress.

Like in the past, the general state of the country now also played a significant role in the path that healthcare reform took. The 1970s was marked by decreasing economic growth, inflation, increasing economic inequalities, decreasing personal incomes, and consequently, a growing anti-government, anti-tax sentiment. In this climate, the focus changed from healthcare coverage to healthcare cost-containment. Additionally, President Jimmy Carter, elected in 1976, had no significant interest in universal health care and he generally balked at taking any significant action. In 1979, he submitted a half-hearted, Nixon-type plan but it went nowhere. In response to the faltering economy, and high inflation, Ronald Reagan was elected in 1980, which completely pushed universal coverage off the national agenda.

Incremental changes to the existing system: 1980-1990

In the 1980s, health policy followed an unexpected course. Under the Republican Presidency of Ronald Reagan, it would have been expected that government spending would decrease and health care would tilt towards the stewardship of private insurers and be left to the mercy of market forces. The opposite happened – Medicare was expanded and there was stronger regulatory authority to control prices that Medicare paid hospitals. This was essentially a continued focus, from the

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Carter years, on cost control rather than coverage, mostly due to fiscal realities. In 1983, Congress passed the biggest change in Medicare payment systems by introducing the diagnosis-related groups (DRGs) – where hospitals were paid prospectively for certain related diagnoses. *This was the first time that hospitals actually had an incentive to control costs*. DRGs also led to a rise in the popularity of Health Maintenance Organizations (HMOs) – e.g. in 1978, 95% of employees with health benefits had traditional fee-for-service insurance compared to 71% in 1988[8].

Universal coverage is considered again: 1990-2006

As the cost of healthcare insurance spiraled out of control during the 1980s, and significantly increased numbers of employees began to feel the brunt of this cost, universal health coverage rose from the ashes in the 1990s as a major issue. There was astounding consensus, even from the American Medical Association (AMA), Health Insurance Association of America, American Hospital Association, and business leaders, that radical change in healthcare financing and delivery was needed[9]. However, there was a problem – nobody agreed on a solution. There was no clear imperative that compelled action by the Government, no political imperative that forced the supporters of competing visions of reform to resolve their differences. None of the strategies devised by President Bill Clinton or congressional leaders could bridge the fissures among democratic factions, moderate Republicans, and influential interest groups. Thus, while supporters of the reform fought over possible solutions, the opponents took advantage of the delay and confusion and, framing the issue as a decisive ideological test, convinced business groups, elite opinion, and a large part of the public to reject it[10].

The conservative republicans who swept into power in Congress in January 1995 reframed the national agenda in health care and the priority became cutting taxes and decreasing government spending. This effort went through three phases. First, during 1995-96, efforts by the Republican Congress to substantially roll back existing rights to Medicare and Medicaid created a historical confrontation with then President Clinton. However, Clinton proved more agile and determined than the Republicans expected, and he allowed the Federal Government to shut down rather than accede to the Republicans' demands. Clinton was to be, as he himself put it, a defender of "Medicare, Medicaid, education, and the environment"[11]. Second, a somewhat quieter phase began in mid-1996 when the economy began to recover. There were some bipartisan compromises on health policy and budget but not much changed in favor or reduction of health benefits. In fact, the Republicans actually agreed to a new government health insurance program for children. Third, when George W Bush came to office in 2001, there was some inclination that there would be renewed momentum to challenge the basic tenets of Medicare and Medicaid. However, quite surprisingly, President Bush and the Republican Congress actually enlarged Medicare by passing a new Medicare prescription-drug benefit – although this was done on terms that were quite lucrative for the pharmaceutical industry and associated with conditions that promoted high-deductible private health insurance combined with a tax–free health savings account. In the end, the period of 1995-2006, of Republican control of the Congress, did not see the destruction of the welfare state. And even though the central issue of universal health care was not resolved, there was creation of yet two new programs – first for children in 1997 and then for the elderly in 2003 (Medicare Modernization Act). Additionally, Medicaid was decoupled from the requirement that beneficiaries be eligible for welfare. However, a dozen years of not addressing the central issue – universal health care – essentially "kicked the can down the road" and the delay rendered the economic challenges and costs of healthcare reform even more formidable[11].

Universal health care – the final push: 2006 – Present

Multiple realities were now coming together in the period from 2006-2010 that forced all stake holders to try and reconcile differences. Especially persuasive was the bare reality that more and more people were being forced out of healthcare insurance because they simply couldn't afford it (50 million in 2010). Thus, all major stake holders – hospitals, doctors, insurance companies – would experience decreased revenues. Once again, ironically, it was the parochial, financial interests of the stake holders that would lead to support of universal health care, the very same parochial interests that had blocked universal health care over the past many decades. Had all these stake holders been trumped by a strong national policy of universal health care early in the 20th century, the US would have had a comprehensive, inclusive, and lower cost healthcare system. *This is a critical lesson for countries in the Middle East that are developing their medical infrastructure – a strong national policy that keeps the interests of the nation's health and its fiscal realities foremost is important to create a responsible, universal, and comprehensive healthcare infrastructure*[12].

In addition to the financial realities enumerated above, including the country's financial free fall of late 2008, the 2008 US elections further prepared the ground for passage of universal healthcare. The democrats won the Presidency (Barack Obama) with a majority in both the Senate and the House. The details of how the healthcare bill (Patient Protection and Affordable Care Act - PPACA – aka Obamacare) was passed by the Senate and the House with razor thin margins are intricate, complex, and fascinating, but beyond the scope of this article. An account can be found in the references[13].

On March 25th 2010, the PPACA officially became law. This was, of course challenged by opponents but the Supreme Court of the United States upheld most of the PPACA in June 2012. Of special note, and which was upheld, was the "individual mandate" which required all individuals to acquire health insurance. Additionally, private insurance companies would not be able to refuse anyone coverage because of preexisting conditions. A summary of the PPACA is referenced for further details[14]. It is clear that when history is written, the PPACA will most likely be hailed as Obama's greatest accomplishment.

Summary

It is interesting that after almost 80 years of trying to deliver health care in every way except universal coverage, the United States finally decided that universal health coverage was the right way forward. Although universal health care can be delivered in multiple ways (single payer/single program – most efficient administratively, multiple programs, Government vs. private coverage, combination of Government and private, and many others), it is curious that, among other things, the somewhat vague and illogical, but deliberately promulgated, association of universal health care with socialism, communism, and a single payer system prevented the early acceptance of universal health care. In fact, even the PPACA passed in 2012, by barely a whisker of a vote, would certainly not have passed if it had as its central tenet a single payer system. Thus, the American healthcare system developed essentially in reverse compared to other universal healthcare systems by providing piecemeal coverage to various groups of people. This created a political, economic, and ideological climate that made opposition to universal health care hard to overcome. First, there were enough people (employed, elderly, veterans, disabled, etc.) that were covered and most of these groups, such as the elderly and veterans, were well organized and enjoyed wide public sympathy. Thus, trying to change to a system that didn't necessarily benefit these groups but actually asked them to pay more to cover others was difficult. Second, a financing system, like Medicare, which essentially gave hospitals and doctors carte blanche to charge whatever they wanted, and financially enriched the healthcare industry, created powerful special interests that did not want any change at all. A combination of these factors led to the enormously complicated, fragmented, and exponentially costly healthcare delivery system in the US. It is ironic that the same special interests that prevented implementation of universal healthcare delivery throughout the 20th century, because they would lose money, supported universal health care in 2012 for the very same reason – they stood to lose money because increasingly people could not afford to purchase healthcare insurance. It would seem that the 80-year journey to avoid universal health care may not have been worth it.

■ *The next, and final, article of the series will propose a system of metrics that measures efficiency of healthcare delivery and emphasizes the development and continuous improvement of a comprehensive healthcare delivery system.* MEH

■ **Arby Khan**, MD, FACS, MBA is the Deputy National Director for Surgery for the United States Veterans Health Administration - which oversees 151 hospitals and more than 1000 outpatient clinics. Dr Khan is a regular contributor to *Middle East Health*. He has written on a range of subjects – such as Human Resources management in hospitals, Change Management in GCC hospitals, Brain Death and Hospital Resource Management and organ transplant-related legislation, among others – with a view to improving healthcare in the UAE and the wider region. He is a multi-organ Transplant Surgeon and Immunologist and has successfully started, from the ground up, two multi-organ transplantation programmes – one in the United States and one in Abu Dhabi. He is the author of many clinical and basic immunology papers, and has been educated, trained and employed variously at University of California - Berkeley, McGill University, University of California - San Francisco, Harvard Medical School, Yale University - Graduate School of Immunobiology, University of Pittsburgh - Starzl Transplantation Institute, University of Vermont - School of Medicine, and Columbia University (NY). He also holds an MBA, with Distinction, from London Business School.

– The views expressed in this article are those of the author and do not necessarily represent the views of the institutions for which Dr Khan has worked or currently works.

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Treating patients as customers

By **Penny Couchman**

According to Fred Joyal, who is one of the world's leading experts on dental marketing and author of "*Everything Is Marketing*," 81% of patients come to you by word-of-mouth referral. On the downside, 85% of your patients will leave you for what they perceive is a bad experience. And whilst this study was conducted in America, our own qualitative research for clients in the UAE has a similar conclusion; that a recommendation from friends and family is the biggest driver for new patients.

This might not be so surprising, and its why 3rd party endorsement is the holy grail for modern marketers. Yet in many hospitals, clinics and practices a positive patient experience, which is the catalyst for a recommendation, is the responsibility of the operations department who have KPIs that centre on efficiency – such as reducing waiting times. But healthcare now exists in a 'buyers market' and if healthcare institutions, whether they be major hospitals or specialised clinics, want to compete amongst increased competition (especially privatised competition) the patient experience needs to be considered beyond the bricks and mortar of the respective clinic.

To understand why everything about healthcare is marketing, as Joyal suggests, you need a new definition for marketing. In reality, "marketing" is anything and everything you do to attract, engage, retain or motivate patients and it encompasses everything that in any way impacts the patient experience, at any touch point, for better or for worse. And therefore, everyone within your healthcare organisation is 'in' marketing. This includes doctors through to cleaners.

Let's consider patients as customers and start thinking about hospitals and clinics as brands, then we can start to think differently about what constitutes a 'customer experience' and offer relevant services that introduce a more unique and holistic experience, fostering a longer term relationship and enhancing overall brand value.

An appropriate place to start is with first impressions. Besides treating pathologies, it is of the highest importance to provide patients with comfort and reassurance as well as clean, hygienic surroundings where the risk of hospital acquired infections is minimized. At the same time visitors and accompanying family members are often more stressed or anxious than the patient. So likewise, they have to be treated with care and educated to ensure awareness upon entering and leaving the premises.

In-house experience

You may think that this is well beyond the remit of marketing but consider for a moment, if you will, that a patient spends only 25% of their time undergoing medical treatment, so the remaining 75% of their in-house experience consists of non-core activities that fall directly or indirectly under the responsibility of a facilities management team. It is thus very important that non-clinical workforce is motivated, efficient and effective because their productivity is a key driver of patient satisfaction. This is why the future of non-core services goes beyond the operational department and the importance of employee engagement will ensure they create a warm, caring and hygienic environment that contributes to a better hospital performance and patient experience.

To do so, the facilities manager's role is to understand and share the challenges faced by the healthcare establishment and to understand the brand reputation it has, as indicated by marketing. The establishment is then able to meet and operate above a certain level of expectation, staff will understand how to communicate with customers and understand what affects their opinions.

Likewise, doctors need to operate under similar parameters and just as a car is the product in a showroom, doctors are the product in a hospital. So in the same way, doctors need to be part of the marketing strategy and create a more public profile that communicates experience, knowledge and trust on behalf of the hospital. Essentially, creating enough visibility to become someone recognised for a specific skill-set.

In this regard, social media is the perfect platform and today it should feature in any marketing strategy thanks to its ability to

create 3rd party endorsement and word-of-mouth recommendations, without showing any pretence or ulterior motive.

Through social media, doctors can become the brand ambassadors and face for the bricks and mortar of the healthcare establishment – connecting on a more personal and emotive level with customers or potential customers.

Social media also has many other advantages – firstly it can engage a whole community under the umbrella of a common cause, especially when a healthcare provider is rolling out a Corporate Social Responsibility-based campaign, which they frequently do. Furthermore, customers are frequently turning to social media for advice, rather than Google. For example, a facebook group for new mothers in Dubai is consistently sharing health-based advice for babies and any questions are answered somewhere by someone immediately. 'TriDubai' has an equally active page and athletes use it to source the best treatment and clinics for specific injuries. So it is forums and groups like these where doctors need to be present, personal and offer impartial advice to build up a level of trust amongst the community.

Likewise, new-media, especially in the case of mobile marketing, allows doctors and their healthcare practices to provide an added-value service such as appointment time reminders, prescription updates and even minutes of the original appointment and suggestions of next steps.

In this way, healthcare is not too different from any other industry. Patients, just as customers, have a certain path to purchase and will be influenced by specific touch points and attracted by unique services that differentiate a hospital or clinic from its competition. This means hospitals need to engage with potential patients before they have considered or even need treatment. In turn a healthcare practice must have a brand essence and patient experience for which it becomes externally known.

Hence, every experience inside or outside a hospital affects opinion and it's the public opinion that is controlled by marketing, not the operations department, which they should surely welcome if it means delegating the role of reducing waiting times!

The author
Penny Couchman is the Group Director for da Vinci marketing.

About da Vinci

da Vinci marketing is a consultancy that business leaders partner with for independent and trusted advice. It works with leading organisations and brands across the private, public and social sectors – using its trusted experience to build, manage and implement marketing strategies that achieve enduring results.

Functioning as an outsourced marketing provider, da Vinci will help create the necessary change to elevate market share through a spectrum of strategic services that includes market and customer research, customer segmentation, CRM, product positioning, price analytics, channel effectiveness, employee engagement, digital marketing, event management and marketing systems development.

Interview

Clemenceau Medical Center, Beirut

Dr Mounes Kalaawi, CEO, Clemenceau Medical Center

Beirut's Clemenceau Medical Center installs advanced da Vinci surgical robot

Middle East Health speaks to Dr Mounes Kalaawi, the CEO of Clemenceau Medical Center, about the hospital, its use of the latest technology and the current expansion project.

***Middle East Health*: Can you give our readers a bit of background about Clemenceau Medical Center. Where is it based? How big is it? What are its key specialties? What accreditations does the centre have, and so on?**

Dr Mounes Kalaawi: Clemenceau Medical Center in affiliation with Johns Hopkins Medicine International is an ultra-modern medical institution located in Beirut. Its mission is "Caring, Safety, Excellence", and it aims to provide quality healthcare services for patients from Lebanon and the region.

CMC got its first JCI accreditation in January 2009 and was reaccredited in January 2012. CMC is proud to adopt the world's most optimal quality Standards and Ethics for the healthcare industry, and to join an elite group of a few hospitals worldwide who really embrace the culture of excellence and relentless commitment for high quality patient care.

The hospital, with 100 operating beds, provides all the essential medical services a patient might need from outpatient to inpatient care – doctor's visits, testing, surgery, laboratory, imaging and hospital care – all under one roof.

By the end of 2010, CMC's Clemenceau Clinic Building was inaugurated. This facility incorporates 28 consultation clinics, including: the Eye and Laser Vision Correction Center, the ENT and Hearing Center, the Plastic Surgery and Dermatology Center and the Women Wellbeing Center, a Dental Clinic, and an Aesthetic Medicine clinic and Medical Spa.

MEH: Your patient population base – are they mostly Lebanese or do you also see a significant number of foreign patients? Can you give me a breakdown of numbers and which countries they are from?

MK: Yes our patient population is mostly Lebanese, although we see a significant number of international patients. Around 15% of our patients are foreign. About 80% of the foreign patients are Arab while 20% are from the other countries.

MEH: I understand the medical center is the first and only facility in Lebanon to use the da Vinci Robot for robotic surgery procedures. When did you install the robot? Did you have to build a special theatre to house it?

MK: Indeed, CMC is the first and only hospital in Lebanon and the surrounding countries to introduce the da Vinci Robotic Surgery. The robot was installed and ready for use at the end of July 2012. Our operating rooms were already fitted out in terms of technology and space to host the robot. We didn't have to build a special theatre.

MEH: For what surgical procedures are you using / will be using the robot? How does this benefit the patient?

MK: Robotic technology is being used in General Surgery (bariatric surgery, stomach, colorectal, hepato-biliary, pancreatic , abdominal wall), in gynaecology (fibroids, hysterectomy, ovarian surgery), urology (prostate, kidney, urinary tract) and will be used in cardiothoracic and paediatric surgeries in the near future. This benefits the patients in terms of less pain, shorter hospital stay, better cosmesis, less complications and shorter recovery.

The da Vinci surgical robot

MEH: Does it make the surgical procedure more expensive for the patient?

MK: The robot was purchased for US$2.5 million by CMC. This cost is almost completely covered by the hospital. There is a small percentage of extra cost that is due to the use of the instrument during surgical procedures. As most of the cost is covered by the hospital only a small percentage is incorporated into patient's bill.

MEH: Surgeons require specialised training to use the da Vinci robot. How many surgeons do you have at Clemenceau that can use the robot – and in what specialties do they work?

MK: Four trained surgeons are using the robot for the time being at CMC. The team includes Professor Claude Tayar, General Surgeon and one of the pioneers of robotic surgery in Europe. He has been using this technology for 10 years in Paris University Hospital and also doing clinical research in this field. Also on the team is Dr Karim Nawfal, Gynecologist, who has been using this technology for the last 3 years in Detroit, Michigan. We also have two leading urologists, Dr Nadim Ayoub and Dr Firas Zahwa that were trained in France during the past four years.

MEH: Keeping up to date with the latest technology is important for any modern medical facility. Can you tell us what CMC does in this regard?

MK: CMC prides itself on always being up to date in terms of technology. Some examples of the latest technology the hospital has adopted are: Imaging and radiology services at CMC hospital have been updated to offer low dose CT scans which cut patients' radiation exposure by up to 83% in cardiac CT and more than 50% in other CTs compared to traditional scanners. The system employs the ASiR (a new and advanced image reconstruction technique that dramatically reduces radiation dose to patients). This radiation reduction is especially beneficial for children, women of child-bearing age and patients who may need multiple imaging tests, such as cancer patients.

In addition to this, CMC has introduced the use of the Green Light High performance system, which is a new innovation in the treatment of benign prostatic hyperplasia, a very common disease for men in their sixties. This treatment gives the urologist more power to effectively fragment all the stones with great precision and to reach difficult spaces while protecting the surrounding tissue.

With the introduction of the PACS system and CRMA (Centricity Radiology Mobility Access), our physicians can check their patients' images while on the move with their iPhone, iPad or any Android device.

In our Endoscopy department, we use the latest medical technology to better assist our patients, such as capsule endoscopy and endoscopic ultrasonography. Capsule endoscopy is a procedure that uses a small wireless camera to take pictures of a patient's digestive system. The camera fits inside a small pill-sized capsule that you swallow. As the capsule travels through your digestive tract, the camera takes thousands of pictures that are transmitted to an external recorder that you wear on a belt around your waist. Endoscopic ultrasonography is a procedure that combines endoscopy and ultrasonography to visualise internal organs of the chest and abdomen. The probe is inserted through the mouth or rectum similar to standard endoscopy, however the ultrasound component allows accurate visualisation of the walls of the digestive tract and the organs surrounding the gastrointestinal tract such as the pancreas, bile duct, gallbladder and lymph nodes among others.

MEH: I understand CMC is undergoing expansion. Can you tell us about the project?

MK: Currently, CMC is working on an expansion project – an annex to its main building that will accommodate an additional 40 beds and 5 operating rooms and provide specialized centres of excellence including, but not limited to, a Cancer Center, a Neuroscience and Bone Marrow Transplant Center. The new medical centre encompasses state of the art radiotherapy and a 3 Tesla MRI to meet the needs of CMC patients. MEH

Interview

Innovation in imaging

Philips Healthcare is one of the world leaders in developing innovative medical equipment. **Callan Emery** spoke to Maarten Hovers, Business Manager Imaging Systems, Philips Healthcare, Middle East & Turkey, about their latest developments in the field of Computed Tomography.

Callan Emery: Philips has a range of CT scanners – from the top end (iCT), to the performance segment, the Ingenuity CT and Brilliance CT range, and the entry level MX16EVO. Can we expect any new scanners to be added to this range in the near future?

Maarten Hovers: Philips will unveil a new configuration in the Ingenuity family of CT scanners. The Ingenuity Flex32 will be the next CT scanner configuration of the Ingenuity Family. Built with outstanding flexibility, the Ingenuity Flex32 will be designed to deliver high image quality at low dose, with the speed needed for excellent patient care.

In addition to scanner announcements, Philips CT offers a unique knowledge-based model approach to iterative reconstruction techniques that have industry-leading low contrast resolution. IMR is transforming CT imaging and is designed to provide virtually noise-free image quality with improvements in low contrast detectability.

At RSNA in Chicago in November, Philips introduced the the iCT Elite configuration – the next generation of the iCT. It delivers all of the benefits of the iCT TVI — including the iDose4 Premium Package, the Rate Responsive Toolkit, Step & Shoot Complete, Jog Scan and Advanced Brain Perfusion. Moreover, the Elite Package workflow is powered by iPatient, the new NanoPanel II3D detector, and is IMR-ready – making it a truly Elite scanner!

As mentioned earlier, Philips also introduced the Ingenuity Flex32 which uses Ingenuity DAS technology, which utilises a 32-slice acquisition providing an improvement in z-axis visualisation.

CE: Why is Philips introducing these scanners? What is the driving force behind your innovation?

MH: Philips CT is committed to strengthening the backbone of diagnostics in revolutionary ways. We are focused on delivering innovations that can have an impact on the clinical value of CT and to give clinicians new ways to enhance patient care and increase diagnostic confidence. Philips' new products and solutions will transform patient-centred imaging.

CE: In the Middle East – the GCC – what is Philips' top selling CT scanner? Why this particular model?

MH: By far, the top selling model in the Middle East has been the Brilliance 64, with over 100 sold in the region.

It is a cardiac workhorse with high image quality. However, with the introduction of the Ingenuity platform, people are now starting to notice the unique capabilities it provides. In addition, the iCT, in our premium segment continues to impress users, particularly those who need advanced cardiac capabilities. The top selling item in the Middle East, is the iDose4 Premium Package, which continues to draw significant interest throughout the market.

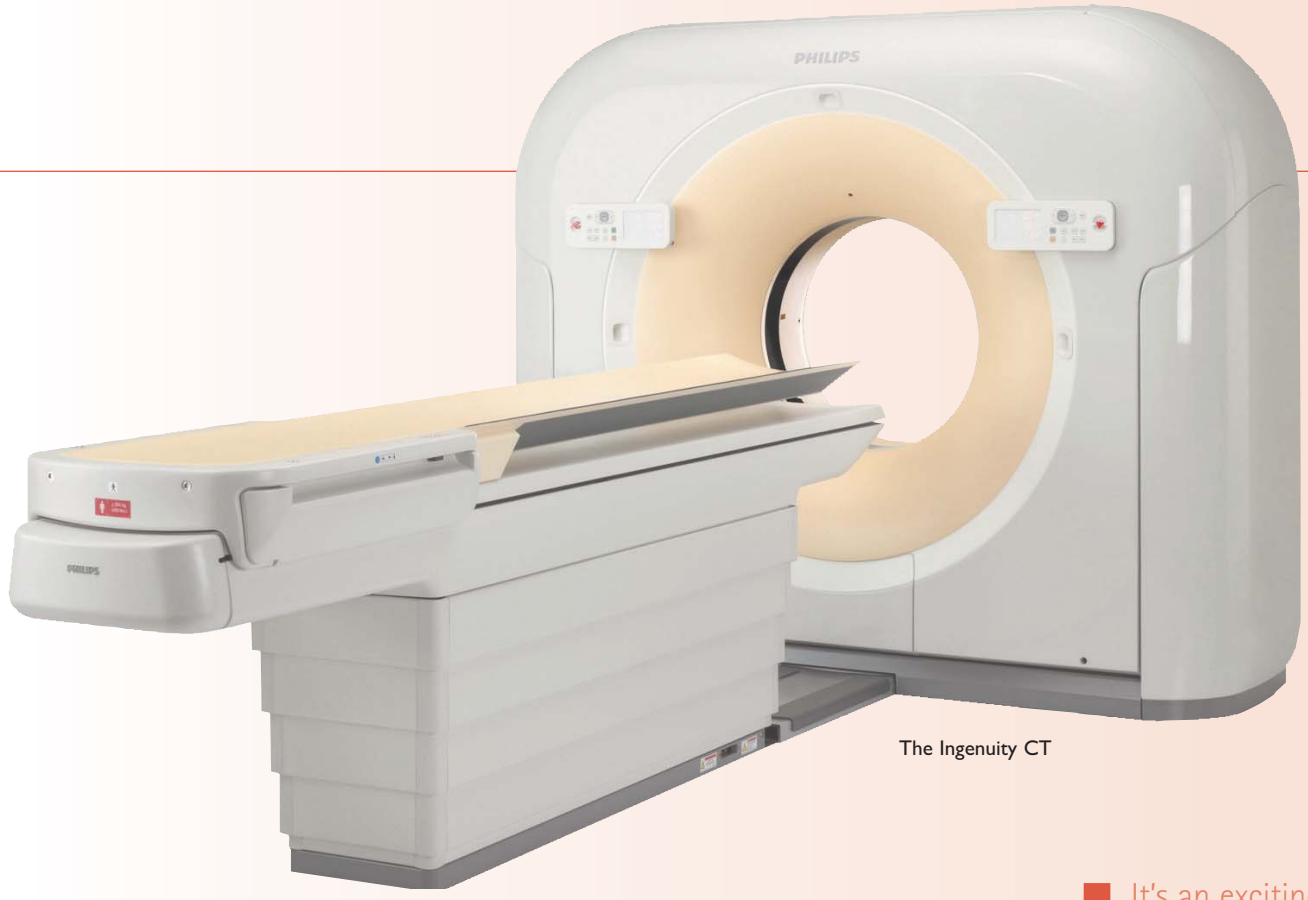
CE: What exactly is iDose4 and how does it work?

MH: iDose4 gives you control of the dial so you can personalise image quality and dose based on your patients' needs at low dose. When used in combination with the advanced technologies of the iCT, Ingenuity, and Brilliance scanner families, this provides a unique approach to managing important factors in patient care – a new era in low energy, low dose and low injected contrast imaging. iDose4 reconstruction is achieved in seconds rather than minutes. The majority of reference protocols are reconstructed in 60 seconds or less. It's easy to use and easy to adopt into your existing standard of care.

In addition, Philips recently announced the iDose4 Premium Package, which includes two leading technologies that can improve image quality- iDose4 and metal artefact reduction for large orthopaedic implants (O-MAR). iDose4 improves image quality through artefact prevention and increased spatial resolution at low dose. O-MAR reduces artefacts caused by large orthopaedic implants. Together they produce high image quality with reduced artefacts.

CE: Is the CT market in the Middle East expanding year on year? At what rate?

MH: Yes, we continue to see CT growth in the Middle East market as government's across the Middle East invest in increased healthcare infrastructure, both in the form of new hospitals and also in upgrades of



The Ingenuity CT

existing facilities. It's an exciting time for the Middle East healthcare system. The increase in facilities also comes with an overall growth in healthcare professionals across the region who expect to use the latest medical imaging equipment. The rate of growth is still being realised.

■ **CE: Can you explain what Philips' Brilliance Workspace is?**
MH: The award winning (EBW) Brilliance Workspace is a powerful workstation featuring state-of-the-art CT post-processing capabilities designed to enhance workflow and increase productivity by working the way you do. The Brilliance Workspace with its friendly CT user environment is rich in applications and scalable to future needs. Brilliance Workspace has a vast amount of clinical applications and is designed around four major areas: ease of use based on the Guided Flow principle; advanced clinical solutions, powerful performance and outstanding image quality.

■ **CE: You have also developed Visualisation Software for CT. What does this do?**
MH: The Philips IntelliSpace Portal turns standard configuration computers into an advanced multimodality imaging systems workspace. Users can work on advanced visualisation in a preferred environment, using patient data without worrying about the modality of origin or moving to a specialised workstation. Users can also unlock the power of CT, magnetic resonance (MR) and nuclear medicine systems with rich clinical applications that are accessible virtually anywhere whether in the home, at the office or on the road. Radiology is the hub of the healthcare facility. Easy clinical workflow and collaboration tools can help streamline daily routines. Reaching out to referring physicians and specialists is easy with Philips' medical networking platform.

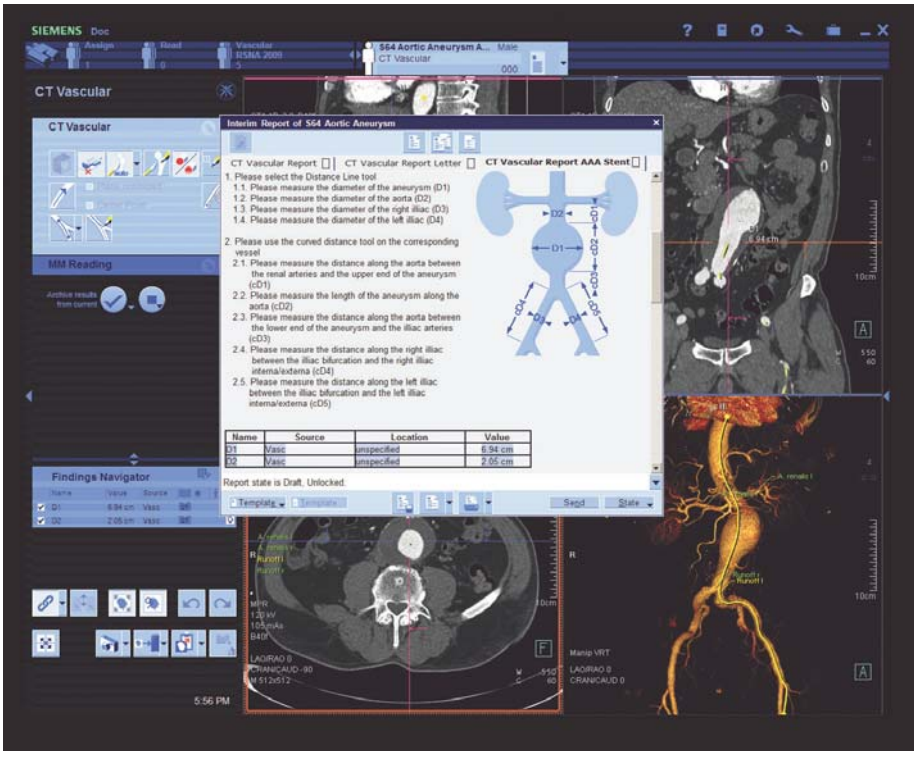
■ **CE: A few years back development in CT focused on developing increasing strength, going from a 16 to 256 slice CT, for example. The development focus appears to have changed. Besides developing methods to reduce radiation dose, in what other facets of CT is your research and development taking place?**
MH: Philips CT is dedicated to reshaping imaging in ways never thought possible through its continued leadership in the scientific advances of iterative reconstruction techniques, workflow, advanced visualisation and detector technologies. We are focused on how these innovations can improve patient care. At this year's RSNA, Philips CT showcased new products, solutions, and future technologies that will transform patient-centred imaging in radical new ways.

■ **CE: Where do you envision CT going in the future? Where does Philips want to take it?**
MH: It's one thing to build meaningful technologies that reshape imaging, it's another to make sure they are inherent in the way our clinicians work. For example, Philips' iPatient is an advanced platform that delivers focused innovations to facilitate patient-centred imaging now, and in the future. Based on the award winning EBW, iPatient puts you in control of innovative solutions that drive confidence and consistency through personalised patient-centric workflow. It helps to deliver more from your investment by allowing the ability to do complex and advanced procedures. And, iPatient is the platform for delivering future CT discoveries like Spectral Imaging and IMR – moreover, it is built to speed up implementation of new innovations. Our continued focus is on the impact innovations such as iPatient and IMR have on improving the care being delivered to patients. MEH

It's an exciting time for the Middle East healthcare system. The increase in facilities also comes with an overall growth in healthcare professionals across the region who expect to use the latest medical imaging equipment.

Faster abdominal aortic stent planning
with syngo.via and the CT Cardio-Vascular Engine

By **Philip Stenner**, PhD,
Computed Tomography,
Siemens Healthcare



The success of endovascular aortic repair strongly depends on correct pre-procedural planning. syngo.via and the CT Cardio-Vascular Engine provide a powerful means for efficient and reliable assessment of the abdominal aortic anatomy and all parameters necessary for stent planning.

Abdominal aortic aneurysms (AAA) pose a serious threat to patients as a rupture will cause abdominal bleeding which is a life-threatening condition. Ruptured aneurysms are responsible for roughly 9,000 annual deaths in the US.[i] With an occurrence of 4%-7% in adults of 65 years and older, AAAs are a common disease worldwide.[ii] Up until the late 80s, the conventional treatment was an open repair of the aorta. The treatment of AAAs was revolutionized in 1991 by the first endovascular aortic repair (EVAR)[iii]. With this technique, a stent is inserted through a catheter to the place of the aneurysm and expanded to stabilize the surrounding vessel. Today, compared to an open repair, the risks for the patient are dramatically reduced, leading to 30-day mortality rates of only 1.2%[iv].

Crucial for the success of an EVAR procedure is correct pre-procedural planning to assess the anatomy and optimal stent size for each patient. With its high spatial resolution, Computed Tomography (CT) is the method of choice. With Somatom scanners on the scanner side and syngo.via on the post-processing side, Siemens Healthcare provides an excellent solution for the planning of EVAR procedures. The software syngo.CT Vascular Analysis* provides an efficient and reliable assessment of the abdominal aortic anatomy. Due to comprehensive automated pre-processing, like automated bone and table removal, an immediate vascular-only view is provided. The Autotracer** automatically segments and labels the vessels even before the case is opened. The aorta is displayed in a curved planar reformation and the centerline is automatically created providing the basis for important length measurements.

Since 95% of aortic aneurysms are infrarenal, i.e. below the ostia of the renal arteries, syngo.CT Vascular Analysis provides a dedicated stent planning template for these cases (Fig. 1). The template guides the user through measuring the length and diameters of the aneurysm, the aorta, and the left and right illiac arteries. The distance of the aneurysm to the renal arteries and to the illiac bifurcation are also included.

Along with the registration of all measurements in the Findings Navigator, all diameter measurements are automatically saved in the stent planning template which is easily accessed in the report editor. The automation greatly facilitates the workflow and allows for a reliable assessment of abdominal aortic stent parameters thus providing a sound basis for EVAR procedures.

*syngo.CT Vascular Analysis is available either as a stand-alone software package or as one of several software and hardware features in the CT Cardio-Vascular and Acute Care Engines.

**Available in the Acute Care Engine Pro and CT Cardio-Vascular Engine Pro

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NIHON KOHDEN

Intuitive Screen with Hemodynamics Graph

Improving the standard of non-invasive hemodynamic monitoring

Hemodynamics Graph will be available on following NIHON KOHDEN patient monitors

Life Scope VS

Life Scope TR

Life Scope J

Visualizing Volumetric Information

For quality patient care, comprehensive management of different hemodynamic parameters is crucial.

Nihon Kohden's Hemodynamics Graph provides a more intuitive approach to diagnostic and therapeutic decision making in hemodynamic management.

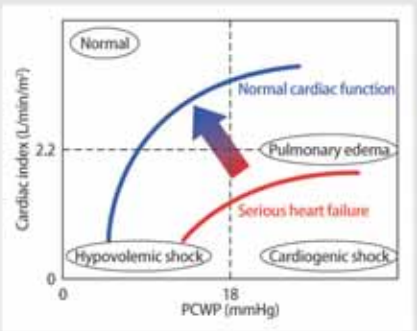

Figure 1: Forrester Classification

This new tool helps clinicians easily see the direction and trend of hemodynamic change while imaging the Frank-Starling curve, and help to objectively determine the optimal therapeutic strategy based on the Forrester Classification[1].

New Hemodynamics Graph

The Hemodynamics Graph is a new monitoring tool which shows overall hemodynamic information. A trendgraph at the top and two target graphs below show the relationship of two hemodynamic parameters.

This screenshot of a Hemodynamics Graph shows the time course of hemodynamic response through the administration of 200 ml of glycerin.

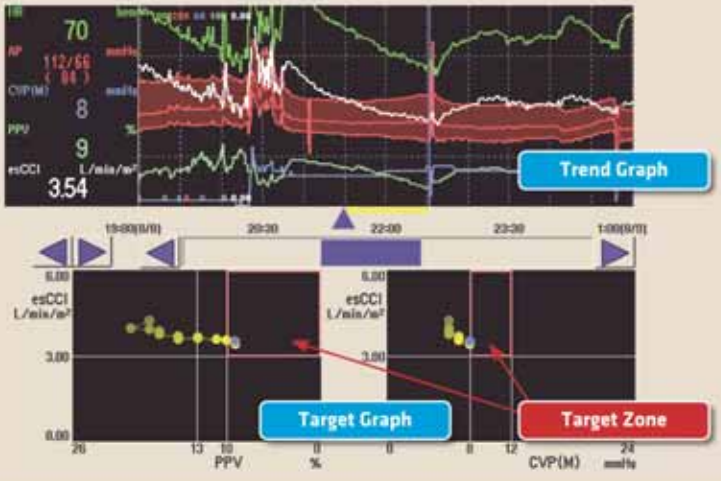

Figure 2: Hemodynamics Graph

The yellow bar below the Trendgraph indicates the time interval of the Target Graphs below. The yellow bar starts with a purple triangle which represents the Event Mark recorded at the time of intervention. In this Hemodynamics Graph screenshot, the traces on both Target Graphs show that hemodynamics is falling within the Target Zones (red boxes) in response to the administration of glycerin.

Target Graph Features

- Preload parameters such as CVP and PPV on the X axis
- Cardiac function parameters such as cardiac index on the Y axis
- Brightness level of the traces and plots shows hemodynamic change over time
- Red target zones show target areas of treatment
- Text-entry for prescribing necessary treatments

Various Combinations of Hemodynamic Parameters

Much evidence supports the idea that goal-directed fluid management guided by several hemodynamic parameters will reduce postoperative hospital stay and complications[2][3].

The Hemodynamics Graph displays necessary parameters for fluid optimization therapy in a visually intuitive manner and can help to improve the standard of care with hemodynamic monitoring.

The Target Graphs can show different hemodynamic parameters for different clinical conditions. For example, target graphs for PPV and esCCO™ (a non-invasive continuous cardiac output monitoring method using ECG and pulse oximeter waveform[4][5]) provide minimally invasive hemodynamic monitoring for fluid management. Or, blood pressure and CVP target graphs can support therapy according to the guidelines for initial resuscitation of severe sepsis and septic shock[6].
Intermittent invasive parameters such as cardiac output by bolus thermodilution and pulmonary wedge pressure can also be used for the Target Graphs.

The Hemodynamics Graph can open up new ways to manage hemodynamics for all care levels more efficiently and effectively.

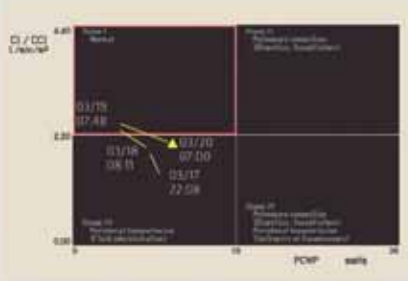

Figure 3: PCWP/CI starged graph when using a pulmonary atery catheter

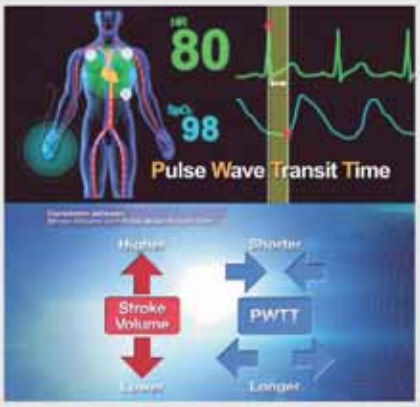

Figure 4: Principle of esCCO™. The esCCO is a new technology to determine the cardiac output non-invasively based on the Pulse Wave Transit Time (PWTT). PWTT is the time from the ECG R-wave peak to the pulse wave rise point and calculated from ECG and SpO_2 pulse waves at the fingertip. There is inverse correlation between PWTT and stroke volume, which has been confirmed by many experiments and data analysis, and has been shown to be unaffected by administration of drugs including vascular agents.

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Early Decision Making in Goal Directed Fluid Management

Fighting Disease with Electronics

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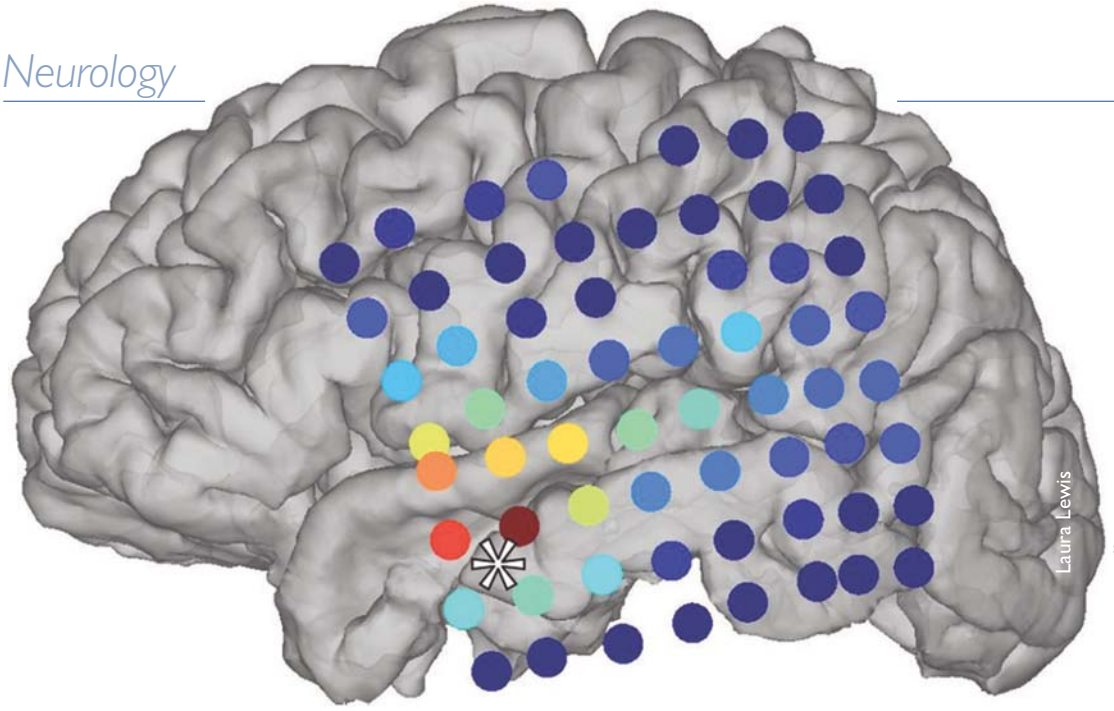

The coloured dots in this image represent locations of the electrodes used to measure brain activity. As the brain wave oscillations become more asynchronous relative to the position of the star, the colours fade from red to blue.

Researchers reveal what happens to the brain as patients lose consciousness under anaesthesia

A new study from Massachusetts Institute of Technology (MIT) and Massachusetts General Hospital (MGH) reveals, for the first time, what happens inside the brain as patients lose consciousness during anaesthesia.

By monitoring brain activity as patients were given a common anaesthetic, the researchers were able to identify a distinctive brain activity pattern that marked the loss of consciousness. This pattern, characterised by very slow oscillation, corresponds to a breakdown of communication between different brain regions, each of which experiences short bursts of activity interrupted by longer silences.

"Within a small area, things can look pretty normal, but because of this periodic silencing, everything gets interrupted every few hundred milliseconds, and that prevents any communication," says Laura Lewis, a graduate student in MIT's Department of Brain and Cognitive Sciences (BCS) and one of the lead authors of a paper describing the findings in the (November 5, 2012) Proceedings of the National Academy of Sciences.

This pattern may help anaesthesiologists to better monitor patients as they receive anaesthesia, preventing rare cases where patients awaken during surgery or stop breathing after excessive doses of anaesthesia drugs.

"We now finally have an objective physiological signal for measuring when someone's unconscious under anaesthesia," says Patrick Purdon, an instructor of anaesthesia at MGH and Harvard Medical School and senior author on the paper. "Now clinicians will know what to look for in the EEG when they are putting someone under anaesthesia."

Other MIT authors of the PNAS paper are co-lead author Veronica Weiner, a graduate student in BCS, and Emery Brown, professor of brain and cognitive sciences and health sciences and technology at MIT and an anesthesiologist at MGH.

Breakdown of communication

For this study, the researchers focused on propofol, one of the most commonly used anaesthesia drugs. Propofol activates receptors found on neurons that are likely to make the neurons less active, but its precise effects on the brain were not known.

The researchers studied epileptic patients who had electrodes implanted in their brains to monitor their seizures, and were undergoing surgery to have the electrodes removed. Loss of consciousness occurred within 40 seconds of propofol administration, and was defined by the moment when patients stopped responding to sounds that were played every four seconds.

Using two different-sized electrodes, the researchers were able to obtain two different readings of brain activity. The larger electrodes, slightly bigger than a penny, were spaced about a centimetre apart and recorded the overall EEG, or brain-wave pattern.

Smaller electrodes, in an array only 4 millimetres wide, recorded from individual neurons, marking the first time anyone has recorded from individual neurons in human patients as they lost consciousness. Between 50 and 100 electrodes were implanted in each patient, clustered in different regions.

From the large electrodes, the researchers observed that within a couple of seconds of losing consciousness, the brain EEG abruptly took on a pattern of low-frequency oscillation, about one cycle per second. At the same time, the electrodes recording from individual neurons revealed that within localised brain regions, neurons were active for a few hundred milliseconds, then shut off again for a few hundred milliseconds. This "flickering" of activity created the slow oscillation seen in the EEG.

"When one area was active, it was likely that another brain area that it was trying to communicate with was not active. Even when the neurons were on, they still couldn't send information to other brain regions," Lewis says.

Information integration theory

Michael Avidan, a professor of anaesthesiology at Washington University School of Medicine, says the findings are exciting

because they offer neurobiological evidence for one of the theories of how the brain gives rise to consciousness. That theory, known as information integration theory, suggests that large-scale brain networks integrate many types of sensory input to generate our overall experience of the world.

When consciousness is lost, "there may still be information coming into the brain, but that information is remaining localised and doesn't get integrated into a coherent picture", says Prof Avidan, who was not part of the research team.

Failure of information integration had previously been suggested as a possible mechanism for loss of consciousness, but no one was sure how that might happen. "This finding really narrows it down quite a bit," Prof Brown says. "It really does, in a very fundamental way, constrain the possibilities of what the mechanisms could be."

A delicate balance

Patients who receive too little anaesthesia risk awakening in the middle of their surgery, while too much drug can cause respiratory problems and even halt breathing. Anaesthesiologists must give just the right amount of drugs to keep patients in the appropriate state.

Currently, anaesthesiologists monitor anaesthesia with recordings that compute an index from the EEG. That index obscures the physiology that can be observed directly in the slow waves.

"What this study says is that you should be looking at raw EEG in order to observe the oscillations and interpret them. If you do that, you have a physiologically linked way to know when someone is unconscious," Prof Brown says. "We can take this into the operating room today and give better patient care."

> We now finally have an objective physiological signal for measuring when someone's unconscious under anaesthesia. Now clinicians will know what to look for in the EEG when they are putting someone under anaesthesia.

The team is now planning to study what happens to brain activity as consciousness is regained. They have also begun studies of other anaesthesia drugs, to see if they produce the same slow oscillation.

"There are many other drugs – based on EEG studies – that seem like they might be producing slow oscillations. But there are other drugs that seem to be doing something totally different," Purdon says.

doi: 10.1073/pnas.1210907109 MEH

Information overload

How will the healthcare industry cope with the exponential growth and massive volumes of data being generated in the clinical and operational settings? How will they protect it, manage it, store it and ultimately delete it in compliance with evolving regulations? **Jay Savaiano**, the director of healthcare business development, CommVault, discusses these issues.

The explosion of 'Big Data' continues to ignite persistent challenges within the healthcare sector in the Middle East as organisations grapple with how to best secure, protect, retain and ultimately delete content in compliance with evolving regulatory requirements. Healthcare's struggle with Big Data starts with sheer volume generated by a growing number of solutions being deployed in both clinical and operational environments. Solutions such as electronic medical records, expansive picture archiving and communication systems, operational applications in support of time tracking, finance, HR and messaging all compound the demands on healthcare IT to support complex Big Data environments.

According to IDC[1], the world generated more than one zettabyte (ZB), or one million petabytes, of data in 2010. By 2014, growth is predicted to reach 7 ZBs a year, fuelled in part by the rapid rise of machine-generated data. Clearly, exponential data growth, diversity of data types and never-ending demands for optimised retention will create the perfect storm unless healthcare IT steers toward a more holistic approach to data management.

Technology solution providers that understand these challenges are best positioned to become valued and trusted advisors for healthcare organisations. Solution providers need to assist healthcare organisations in embracing the core principles for holistic data management and retention by viewing backups and archives more strategically while leveraging integrated solutions. As a result, healthcare institutions can lower storage costs, mitigate compliance risks and extract maximum value from information in ways that produce valuable clinical and operational benefits.

The archive chasm

For too many healthcare organisations, backup and archive functions are deployed and maintained as separate "silos" within an overall data management strategy. Multiple, disparate hardware and software products typically manage these data silos, which leads to duplicate copies of information that must be protected and preserved.

Unfortunately, effective and efficient healthcare recordkeeping has been severely constrained by data silos, traditional approaches and legacy (out-dated) systems, which now make it nearly impossible to streamline the search of information for legal discovery and compliance audits, not to mention the inability to expedite responses to individual privacy access requests. As a result, proper personal health information policies are enforced through violations and penalties rather than organisational best practices and technology innovations.

Compounding the problem is the fact that different groups are traditionally responsible for data protection and preservation. Storage and backup administrators oversee data protection and therefore are heavily focused on the impact Big Data has on backup windows and recovery SLAs. While information architects, clinical application specialists and compliance officers are fixated on how Big Data affects retention, discovery and information governance policies, they usually operate without much regard for how these functions can also be extended to address backups.

A chasm exists between backup and archive in on-going Big Data conversations. According to Gartner[2], backup complements archive and vice versa – yet backup administrators and information architects traditionally haven't spoken the same language, and most tools and technologies address either one or the other of these disciplines.

Data convergence

However, with advances in data management technology, enterprise-wide data retention is now within reach of healthcare organisations. It's possible to unify the way data is processed for both backup and archive which presents a new opportunity for the channel particularly in this era of Big Data.

To converge backup and archive, solution providers must understand how applications, users and critical business processes need to access data throughout its lifecycle. This effort requires collaboration among clinical and healthcare IT stakeholders responsible for both data recovery and preservation. Solution providers need to work with this collective group to examine all the different policies and practices used to move, copy, catalog and access data for backup, recovery, discovery, retention and disposition.

Solutions providers need to implement a modern solution that consolidates data in a single content store leveraging a common software infrastructure for backup and archive that is hardware agnostic.

The notion of a single data repository that eliminates redundancies and silos is compelling on many levels, including the opportunity to reduce the strain on congested IT networks, restricted hardware/software budgets and overburdened administrative teams. A holistic approach that captures data once and then repurposes it for data protection and preservation provides invaluable benefits for multiple stakeholders within a healthcare organisation.

In the world of Big Data, any opportunity to reduce the Tsunami-like flow of information is a step in the right direction. And solution providers can play a leading role in helping healthcare organisations converge data management and retention by embracing a unified approach to backup and archive. In doing so, healthcare companies can meet compliance requirements and improve accessibility to patient and clinical data while elevating overall protection.

> The world generated more than one zettabyte, or one million petabytes, of data in 2010. By 2014, growth is predicted to reach 7 zettabytes a year.

The author

Jay Savaiano is director of healthcare business development for CommVault. In this position he has a focus on expanding CommVault's OEM and reseller relationships within the healthcare market. In addition, he works with independent software vendors of PACS and clinical applications to integrate CommVault technologies for protection, retention and access of data across clinical and operational environments.

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Are physicians failing to disclose conflicts of interest on social media?

As the use of Twitter and other social media by physicians and patients rises, more and more physicians seem to forget to do what many consider crucial for building doctor-patient trust: disclose potential conflicts of interest. However, physicians are not entirely at fault: prominent medical societies have failed to lay out comprehensive guidelines for physicians on when and how to disclose a conflict of interest when utilizing social media.

In a commentary published online in the *Journal of General Internal Medicine*, Matthew DeCamp, MD, PhD, a postdoctoral fellow in the Johns Hopkins University School of Medicine's Division of General Internal Medicine, argues that some physicians use social media to give advice to patients and the public without revealing drug industry ties or other information that may bias their opinions. Without serious efforts to divulge such information – standard practice when publishing in medical journals and recommended in one-on-one contacts with patients – DeCamp says consumers are left in the dark.

"As physicians and patients increasingly interact online, the standards of appropriate behaviour become really unclear," says DeCamp, who also holds a fellowship at the Johns Hopkins Berman Institute of Bioethics. "In light of norms of disclosure accepted throughout medicine, it's surprising that major medical guidelines fail to adequately address this issue."

Among the organisations in the United States that have issued social media guidelines are the American Medical Association and the Federation of State Medical Boards.

DeCamp acknowledges that use of social media has the potential to improve patient care and trust by increasing patient access to information, but vigorous online "boundaries" are needed to not only assure privacy and confidentiality, but also to protect patients from misinformation and biased advice.

In an office setting, for example, when doctors prescribe a blood pressure medication, professional guidelines say they are ethically bound to tell patients if they have any financial relationship – such as receipt of consulting fees – with the company that manufactures the drug. Guidelines also call for disclosure when they publish studies about blood pressure medication, and medical journals require them to fill out a detailed disclosure form. But online, it's "an unacceptably grey area", DeCamp says.

One reason may be difficulty in determining just how to disclose within the constraints of the online world, DeCamp notes. The popular social media tool Twitter, for example, allows each entry to be just 140 characters long. But a generic disclosure – "The author has no conflict of interest to report related to this tweet" – has 70, leaving little room to discuss the research itself.

DeCamp says one solution is the use of electronic tags that disclose conflicts of interest and follow the information tweeted – and re-tweeted – by a physician. At the very least, he says, doctors should post potential conflicts in their online profiles, and consumers should be wary of posts and advice from anyone claiming to be a doctor.

One social networking website known as *Sermo.com* is open to physicians only and is designed to facilitate discussions of treatment options. But DeCamp says the relative anonymity of the site means users don't know about the potential conflicts of peers they encounter there, and whether information is biased because of financial conflicts. Although the site recommends voluntary disclosure, it is not required or monitored, he says.

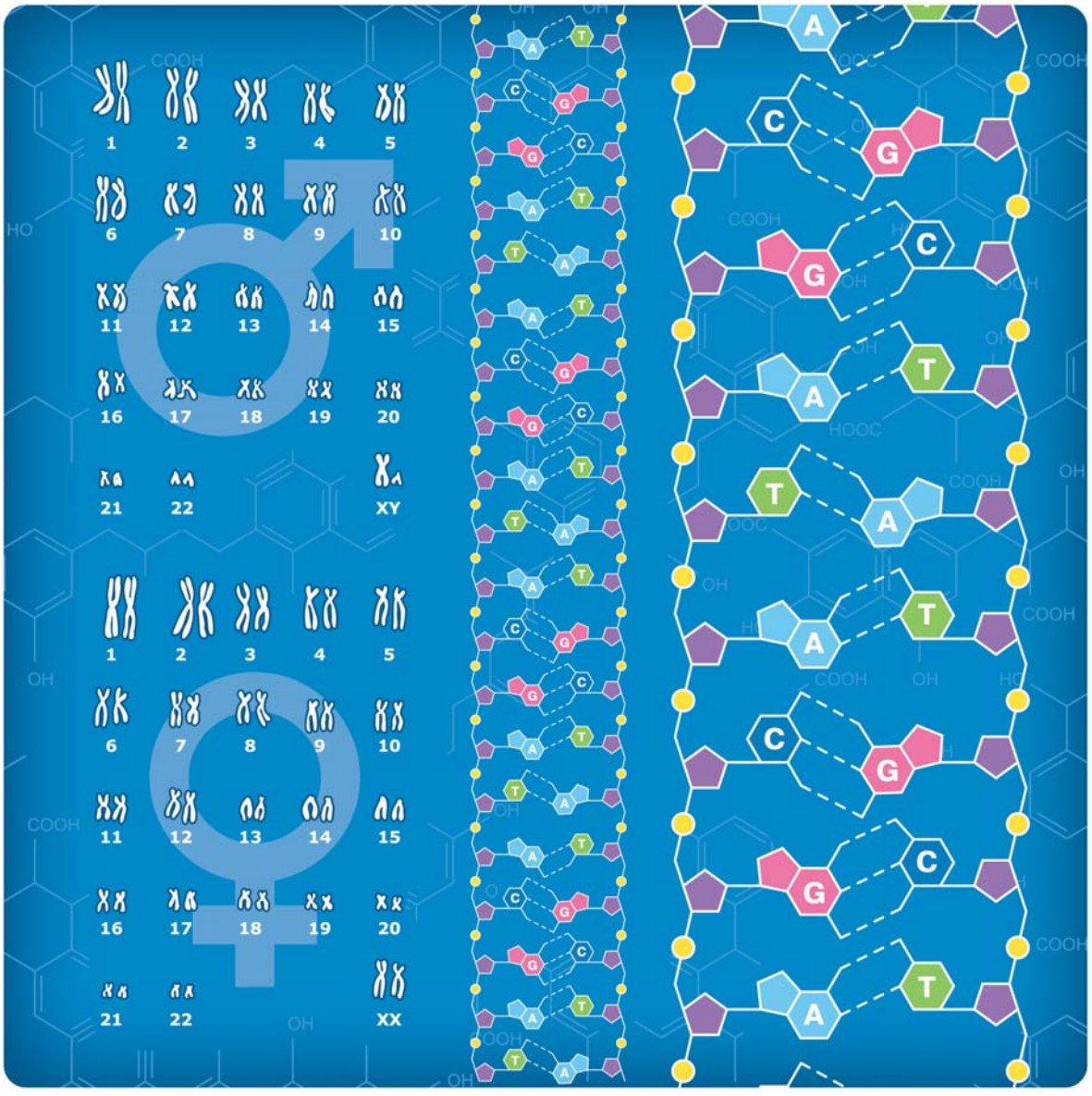
Healthtap.com is billed as a free virtual "house call" service linking patients with physicians who quickly provide online answers to patients' questions. Although physicians are identified by name, and the site terms require physicians to disclose, studies suggest physicians sometimes fail to disclose in the online realm. Patients again might be unable to tell whether conflicts have biased the answer.

Use of social media has the potential to improve patient care and trust by increasing patient access to information, but vigorous online 'boundaries' are needed to not only assure privacy and confidentiality, but also to protect patients from misinformation and biased advice.

The absence of stricter guidelines for online doctor-patient interactions is especially puzzling, DeCamp says, given the move to ever-stricter disclosure requirements offline. There has been a movement from simple disclosure to better efforts to manage and eliminate conflicts.

While some professional guidelines do recommend disclosure in social media, DeCamp says, they don't lay out how it should be done, while many ignore the topic altogether.

"The history of conflict of interest in medicine is such that you don't want to be late to the table," DeCamp says. "You need to be proactive so that your undisclosed conflict doesn't end up on the front page of *The New York Times*. Conflicts need to be disclosed and it's surprising that we have so far to go regarding disclosure and management on social media." MEH



What is the range of human genetic variation?

Completing the second phase of the 1000 Genomes Project, a multinational team of scientists reports that they have sampled a total of 1092 individuals from 14 different populations and sequenced their full genomes. The researchers described the feat as a collegial effort to equip biologists and physicians with information that can be used to understand the normal range of human genetic variants so that a patient's disease genome can be interpreted in a broader context.

A report on the research, published online November 1, 2012 in *Nature* represents the culmination of five years of work, says Aravinda Chakravarti, PhD, professor of medicine and paediatrics and a member of the Institute of Genetic Medicine at the Johns Hopkins School of Medicine. Chakravarti helped to design the population genetics sampling plan.

"The DNA donors in the study were not known to have any diseases, so the study gives us the genomic background we need for understanding which genetic variations are 'within the normal range'," Chakravarti says. "With this tool, scientists now have a standard with which they can compare the genome of someone with diabetes, for example." That in turn, Chakravarti says, will increase opportunities for understanding the disease and creating targeted, individualised treatment.

The selection of the 14 populations sampled was based on their ancient migratory history and their genetic relationship to the other populations studied. Within each population, healthy, unrelated donors were randomly chosen for blood draws. The blood samples were first transformed into cell lines that can be stored and grown indefinitely so that they will always be available for future studies. After cell lines were grown, the DNA was sequenced and added to a public database.

The first human genome to be sequenced, published in 2003, made clear that as much as 98.5% of human genetic material does not encode proteins, as had been thought. Scientists now know the role of some of the non-protein-coding regions and, although

much of the genome remains a mystery, there is reason to suspect that at least some of it plays a part in the variability seen in disease susceptibility and prevalence.

"The 1000 Genomes Project started at the beginning, with the whole genome and with no bias in the search for disease-related variants toward protein-coding genes," Chakravarti explains. "Regulatory sequences and sequences we still don't understand were also catalogued, so this information widens the areas of the genome we can search when looking for disease-causing variants." Most of the genetics research done to date has begun with a disease or a protein that is known to be malfunctioning, followed by a hunt for the responsible genetic variants.

The genetic variations found in the populations analysed were categorized by how frequently they appeared in the individuals tested. Variants seen in more than 5% of the samples were classified as common variants, while low-frequency variants appeared in 0.5 to 5% of individuals and rare variants in less than 0.5% of the samples.

Stars mark the 14 populations throughout the world that donated DNA for this study

Ancestry groups

The 14 populations sampled were divided into four ancestry groups: European, African, East Asian and American. As expected, most of the common variants had already been identified in previous studies, and their frequencies varied little between ancestry groups.

By contrast, 58% of the low-frequency variants and 87% of the rare variants were described for the first time in this study. Rare variants were sometimes twice as likely to be found within a particular population as in that population's broader ancestry group. Different populations also showed different numbers of rare variants, with the Spanish, Finnish and African-American populations carrying the greatest number of them.

Amazingly, Chakravarti says, the researchers found that among rare variants, the healthy people in their study possessed as many as 130 to 400 protein-altering variants; 10 to 20 variants that destroy the function of the proteins they encode; two to five variants that damage protein function; and one or two variants associated with cancer. The implication is that all healthy people everywhere carry similar numbers of rare, deleterious variants.

Several factors allow people to survive with so many errors in our genome, Chakravarti explains. One factor is that genes occur in pairs, yet our bodies often only require one normal copy to work. Another is that a "redundant" gene elsewhere in the genome can sometimes compensate for a specific deficiency. In addition, some deleterious genes are only turned on in response to certain environmental cues that a particular individual may never encounter.

1000 Genomes Project

The first phase of the 1000 Genomes Project, led by Chakravarti, Peter Donnelly at Oxford and David Altshuler at the Broad Institute of MIT and Harvard, was completed in 2008. It was a preliminary probe into the genomes of a subset of the individuals sequenced for this second phase and proved to be illuminating in searching for genetic markers of disease. The final phase of the project will involve sequencing the genomes of 1,500 more individuals from 11 more populations.

The following communities generously donated samples: Yoruba in Ibadan, Nigeria; Han Chinese in Beijing, China; Japanese, in Tokyo, Japan; a Mormon community in Utah, United States; Luhya, in Webuye, Kenya; people with African ancestry in the Southwestern United States; Tuscany in Italy; people with Mexican ancestry in Los Angeles, Ca., United States; Southern Han Chinese in China; British in England and Scotland; Finnish in Finland; Iberian populations in Spain; Colombians in Medellin, Colombia; and Puerto Ricans in Puerto Rico.

> The first human genome to be sequenced, published in 2003, made clear that as much as 98.5% of human genetic material does not encode proteins, as had been thought. Scientists now know the role of some of the non-protein-coding regions and, although much of the genome remains a mystery, there is reason to suspect that at least some of it plays a part in the variability seen in disease susceptibility and prevalence.

Disclosure: Chakravarti is on the scientific advisory board for Affymetrix and Biogen Idec.

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on the WEB 1000 Genomes Project
www.1000genomes.org/about

Trends in the management of bio-hazardous medical waste

By **Rodney W. Forsman**
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Laboratory Medicine and Pathology
College of Medicine, Mayo Clinic

The ethical and economical disposal of medical and bio-hazardous waste is a growing world-wide challenge that presents serious environmental and public health concerns for health-care employees, patients and the surrounding community.

According to Calvin Georgescu, UN Special Rapporteur on Human Rights and Toxic Waste, in a September 14, 2011, article released by the United Nations News Centre: "Some 20-25% of the total waste generated by healthcare establishments is regarded as hazardous and may create a variety of health and environmental risks if not managed and disposed of in an appropriate manner."

These hazardous materials can include infectious waste, anatomical and pathological waste, chemical products, pharmaceuticals, and medical devices and instruments, including sharps, where "needle-stick" injuries can expose the population to blood-borne pathogens such as hepatitis B, hepatitis C and HIV.

This problem is increasing, particularly in developing countries, where the amount of medical waste generated is rising as healthcare services are expanded and the technological tools and financial resources required to ensure that the waste is managed responsibly may not exist.

Until the late 1980's and early 1990's, the most practical way to dispose of medical and bio-hazardous waste was by on-site incineration or, if volume was small, by burial or encapsulation. More recently, however, the use of on-site incineration has decreased, particularly in the United States and other industrialized countries, for a number of reasons:

- Multi-chamber incinerators are expensive to operate and require highly trained staff for operation and maintenance.
- Regulations on the use of incineration have become more stringent and compliance has become more expensive.

According to Georgescu: "In health-care establishments where hazardous medical waste is incinerated, open burning and widespread deficiencies in the operation and management of small-scale waste incinerators result in incomplete waste destruction, inappropriate ash disposal and dioxin emissions, which can be even 40,000 times higher than emission limits set forth in international conventions."

On-site incineration has been replaced, in large part, by third-party services that collect and transport waste off-site for incineration or autoclave processing prior to disposal in a landfill. Today, approximately 80% of medical and bio-hazardous waste in the United States is processed using these "haul-out" services. This approach, however, can create significant risk and potential liability for the health-care facility generating the waste related to spills, accidents, mishandling during transport, or when waste is not processed in compliance with local, regional or national regulations. It should be noted that incineration has the potential for air pollution. The most common infectious component of medical waste is disposable syringes, many of which are made of polyvinyl chloride. When incinerated, dioxins, carcinogens and other pollutants, including heavy metals, can be released into the atmosphere if combustion is incomplete.

The remaining 20% of medical waste is processed on-site with the advantage that short-term and long-term risks are mitigated. On-site processing minimizes liabilities associated with storage, and, since waste is guaranteed safe before it leaves the premises, the potential for mishandling untreated waste during transport is eliminated.

Autoclave, microwave and chemical treatment are popular on-site options, but all have negative traits including noise, odour and incomplete sterilization. However, several new technologies for on-site processing, introduced in the past few years, are promising. These include steam and ozone.

Both technologies are cost-effective, environmentally friendly, safe to operate and can guarantee sterilization. Waste volumes are reduced by as much as 90%. Waste materials are ground into particles and then treated with pressurized steam or ozone until complete sterilization is achieved. After sterilization, sterilized liquids can be discharged into a sanitary sewer and solids can be recycled or disposed of as ordinary municipal trash.

Confidential patient information stored on paper, CD's, microfilm and other media is no longer recognizable or readable and full compliance with confidentiality regulations is assured. There are no negative air emissions and no hazardous by-products are created. In addition, because of their small size, units can be installed and operated on-site in a hospital or in a central area near the point of waste generation.

With technologies now available, it is possible to economically process medical and bio-hazardous waste in a way that is safe and environmentally friendly. However, health-care facilities generating the waste must develop and implement procedures for waste collection, separation of waste into infectious and non-infectious components, and safe handling and processing of infectious or confidential materials on-site or at a central location off-site in a manner that renders these materials safe, sterile and unrecognizable. MEH

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Epilepsy: Getting to targeted treatment

Epilepsy affects 1% of the world's population, yet existing treatments address only its symptoms, not its root causes. Those causes are many and are just starting to be understood. At Boston Children's Hospital, ranked #1 by *U.S. News & World Report* for Neurology and Neurosurgery, the Epilepsy Program is studying epilepsy patients from all over the world with advanced techniques. Its researchers are finding genetic causes of epilepsy that could lead to targeted, disease-modifying treatments.

At the same time, the program's 12 epileptologists are finding that targeting the *timing* of treatment can have excellent results, especially for children whose learning and development can be undone by abnormal brain electrical activity at night.

Dangers in the night

When a young child begins losing language, walking skills and fine motor abilities, or is slow to achieve them, physicians should consider what's happening at night, suggests landmark research from the Boston Children's Epilepsy Program.

That was critical for a young boy named Ian, who at the age of 3 had begun having up to 40 seizures a day. These were stopped with medications, but Ian began losing cognitive skills and language, and was unable to learn anything new.

Tobias Loddenkemper, MD, at Boston Children's, who saw Ian at age 5, suspected Ian might have electrical status epilepticus during sleep (ESES). This abnormal nighttime brain activity, which shows up on EEGs as pronounced spikes, can disrupt the circuits in the brain that form new memories.

A few months later, Ian was admitted to the Long-Term Epilepsy Monitoring Unit for sleep EEG studies. Loddenkemper diagnosed ESES the very first night: Ian was having as many as 10 or 11 abnormal EEG spikes every 10 seconds – disrupting his sleep and literally wiping out what he'd learned that day.

"It's like backing up your computer," Loddenkemper explains. "If you don't save your data, it's gone the next morning."

This problem is not uncommon. In a recent study, Loddenkemper and his colleagues reviewed overnight EEG recordings from 147 patients who were referred for evaluation over a 14-year period. They found that 100 of the 147 had prominent spikes in their EEGs, reflecting sleep-potentiated epileptiform activity (*Neurology*, May 29, 2012). About one in five of these children had no known epilepsy.

Of the children with EEG spikes, 48% had lesions on MRI – most commonly from early strokes, and primarily in the thalamus – versus just 19% of children without spikes.

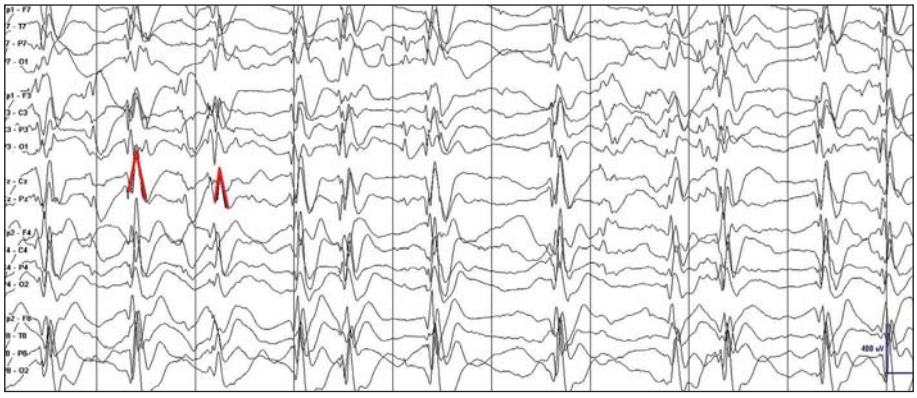
The good news, from another recent study at Boston Children's Hospital, is that nighttime epileptiform activity is treatable: Loddenkemper and his colleagues have found that high doses of Valium before sleep reduce nighttime spiking. In Ian's case, a reduced Valium dose plus prednisone, combined with his usual daytime medications, has eliminated the spikes almost completely.

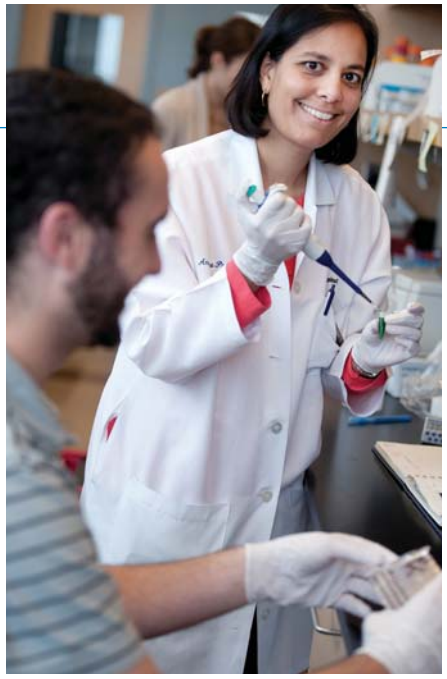
It has also led to an explosion of learning, language and self-confidence. "Ian is 8 years old, and it's almost like I'm meeting him for the first time," says his mother. "They gave me my son back."

Probing epilepsy's genetic causes

Brain tissue from epilepsy surgery is opening up new avenues to understanding epilepsy's

Dr Loddenkemper and an EEG recording





Poduri Annapurna

origins. Having the largest pediatric Neurology and Neurosurgery programs in the world, Boston Children's Hospital has a wealth of material to draw on. Recently, epileptologist Annapurna Poduri, MD, MPH, completed a study of the brains of eight children who had undergone a hemispherectomy for hemimegalencephaly, an enlargement and malformation of an entire brain hemisphere.

The genetic cause of their severe epilepsy turned out to be a mutation affecting just a third of the brain's cells. The mutation disrupts a gene that regulates the brain's growth, causing malformations in tissues – and possibly tipping the brain toward seizures. The gene may also activate other seizure-triggering pathways yet to be discovered, so it may point the way to targeted epilepsy treatments.

Poduri's Epilepsy Genetics Program has also found a tiny chromosome deletion in an infant with malignant migrating partial seizures in infancy (MMPEI), and is now investigating Ohtahara syndrome, another rare epilepsy that begins shortly after birth. Already, genomic sequencing has identified a cause in affected twin boys: a defective ion channel that may make brain cells hyperexcitable.

These genetic investigations, combining Boston Children's expertise in rare disease with cutting-edge bioinformatics and genomics, may do more than solve a mystery for each family. They could lead to practical treatments – not just for rare types of epilepsy, but common ones as well.

Comfort and collaboration

Boston Children's Hospital neurologists and neurosurgeons partner with physicians around the world, sharing expertise and working collaboratively to improve health care for infants, children and adolescents.

To make the process of coming to the United States easier for international patients, Boston Children's Hospital connects each patient with our International Health Center, which guides them through the process and makes travel and housing arrangements. Interpreter Services representatives (who, altogether, speak 63 languages) can help set up all medical arrangements so that patients and families fully understand their time at the hospital and can feel connected to their culture when they're far from home. MEH

Mubarak's journey to heart transplantation

When Mubarak Al-Kaabi was born in Doha, Qatar, everything seemed normal. But at age 3 ½, he was diagnosed with dilated cardiomyopathy – an enlargement or thickening of the heart muscle – and his doctor advised his parents, Aisha and Abdullah, to take their son to a heart transplant specialist for an evaluation. Because that type of specialty paediatric care is not available in the Middle East, the Qatari Government sponsored Mubarak and his family, sending them to medical centres first in Great Britain and then in Germany, but neither accepted his case right away.

After a long delay, Aisha's doctor, who had trained in the United States, suggested taking Mubarak to the United States for care. The family essentially began the process again from scratch, and the Qatari Government then sent his information to the medical attaché at their embassy in Washington, DC, to find an American hospital that might consider Mubarak's case. The information was forwarded to the Heart Institute at Children's Hospital of Pittsburgh of UPMC, where it was reviewed, and Mubarak's case was accepted.

Managing heart failure and recovery

The family first visited with cardiologists and cardiothoracic surgeons at the Heart Institute at Children's Hospital in February 2010. Mubarak was found to be in acute heart failure and his condition was worsening, so he was placed on a ventricular-assist device (VAD) to support both the right and left ventricles of his heart, known as a Bi-VAD, and moved to the cardiac intensive care unit (CICU). Very ill, Mubarak was then listed for a heart transplant.

For the next eight weeks, Mubarak's parents and older sister, Roudh, lived at the Ronald McDonald House apartments on the hospital campus while he was in the CICU. On April 28, a suitable donor heart became available and the next day Mubarak, then age 5, received a heart transplant performed by Peter Wearden, MD, PhD, surgical director of Children's Heart and Lung Transplant Program.

Two days later, while Mubarak was still in the hospital, Aisha gave birth to the couple's third child, a daughter, at Magee-Womens Hospital, part of the UPMC Health System, and a little more than two weeks later, Mubarak was discharged from the hospital.

The family, wanting some quiet space and privacy so that Mubarak could heal, then moved to a private apartment, where they lived for the next six months while Mubarak received check-ups regularly every one to three weeks. Eventually, his visits tapered to every three months, and Mubarak was able to return with his family to his home country. Mubarak became the first child from the Middle East to receive a heart transplant at Children's.

Now, every six months, Mubarak must return to Children's for a heart biopsy and evaluation by Pediatric Cardiologist Brian Feingold, MD, MS, FAAP, to ensure that he does not show any signs of rejecting his new heart. Once he hits five years post-transplant, his visits will be cut back to once a year. But, other than periodic visits to Pittsburgh, Mubarak is pursuing the typical activities of a 7-year-old boy: learning to swim and ride a bike, playing computer games, and attending first grade.

Family Concierge Service

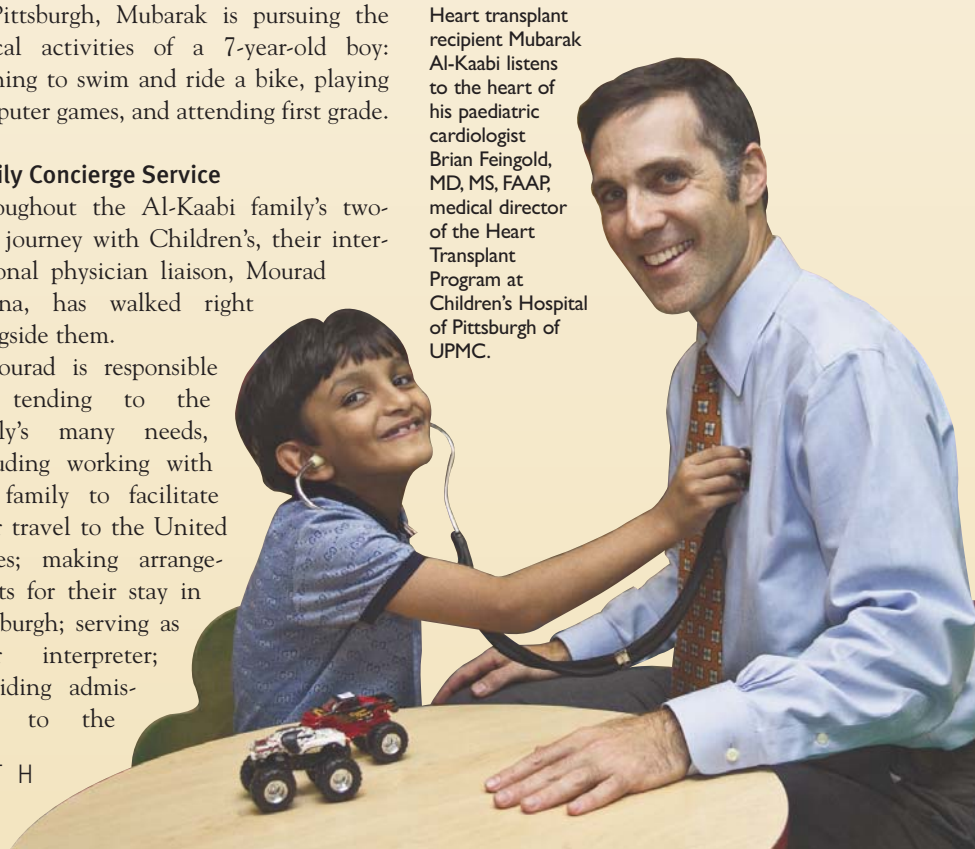
Throughout the Al-Kaabi family's two-year journey with Children's, their international physician liaison, Mourad Hanna, has walked right alongside them.

Mourad is responsible for tending to the family's many needs, including working with the family to facilitate their travel to the United States; making arrangements for their stay in Pittsburgh; serving as their interpreter; providing admission to the hospital; taking care of the paperwork – not only for the hospital and health insurance, but for the family's US entry permits and visas, as well.

On the medical side of all that planning is Alice Maksin, RN, BSN, a certified transplant coordinator at Children's, who works in constant collaboration with Children's physicians, Mubarak's physicians in Qatar, and Mourad, to schedule testing and treatment. Additionally, a team of physicians including Dr Feingold will be travelling to Qatar to explore a telemedicine partnership for consultation, follow-up visits, and training.

International liaisons are available to help families from all over the world receive medical care in Children's culturally sensitive environment.

● For more information, to refer a patient, or request a consultation, contact the International Liaison team at Children's Hospital of Pittsburgh of UPMC at +1-412-692-3000 or *international@chp.edu*. Visit *www.chp.edu*. MEH



Heart transplant recipient Mubarak Al-Kaabi listens to the heart of his paediatric cardiologist Brian Feingold, MD, MS, FAAP, medical director of the Heart Transplant Program at Children's Hospital of Pittsburgh of UPMC.

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Young adults with leukaemia – Why it's better to treat them like kids

Jenn Georges recently completed her master's degree and started a new job. She is busy planning her upcoming wedding. With her adult life on track, the 24-year-old doesn't mind that when it came to fighting leukaemia, she was treated – in one way – like a child.

In 2009, shortly after graduating from the University of Illinois, Georges came down with what she thought might be the swine flu. After three days of tests and transfusions in a downstate hospital, doctors there told her: "It's leukaemia." They recommended she go to an academic medical centre for the best possible treatment.

The Lombard native returned home to get her care at the University of Chicago Medicine. In her initial meeting with haematologist/oncologist Wendy Stock, MD, Georges learned that a clinical trial testing a paediatric protocol for young adults battling acute lymphoblastic leukaemia could give her the best chance at survival. She told Stock to "sign me up".

Georges is part of a distinct group of patients referred to as AYAs: adolescents and young adults with cancer. Until recently, most young adults with leukaemia were treated on adult protocols. But a 2008 retrospective study conducted by Stock and her colleagues observed that AYAs treated on paediatric regimens had better outcomes. "The results showed 63% disease-free survival for individuals on paediatric trials versus 39% for those on adult trials," said Stock, an expert on leukaemia and lead author of the study published in *Blood*.

This important observation led to the clinical trial that enrolled Georges and more than 300 other patients, ages 16 to 39 across the country. Designed and led by three national adult oncology groups, the on-going cooperative study is assessing toxicity, tolerance and compliance.

"While the adult and paediatric chemotherapy drugs are the same, the doses and schedules are different," Stock explained. "The intensity of the paediatric therapy gets harder to tolerate as patients age."

Shortly after she graduated from college, Jenn Georges, left, was diagnosed with leukaemia. She came to the University of Chicago Medicine and enrolled in a unique clinical trial, which was based on research conducted by her oncologist, Wendy Stock, MD.

Stock and the other researchers are also seeking to establish why five-year survival rates for AYA patients (currently 70%) have not kept pace with the increased rates of survival seen in younger children with leukaemia (almost 80%). "In addition to evaluating treatments, we are looking at the personal challenges faced by AYA patients," she said, "By examining characteristics such as demographics, economics and social support, we hope to identify any significant barriers faced by this population."

Georges, pictured here with Kate Breitenbach, MSN, APN, NP-BC, was the first patient seen in the new AYA clinic.

New program brings comprehensive care to AYAs

In August 2012, the University of Chicago Medicine began a new Adolescent and Young Adult Oncology Program to offer diagnostic, treatment and support services for individuals, ages 15 to 30, with leukaemia or lymphoma. The clinic's multidisciplinary medical team includes adult and paediatric haematologists/oncologists, advanced practice nurses and social workers as well as specialists in survivorship, psychology, fertility and genetics. In addition to facilitating coordinated care, the focused setting will provide more opportunities for innovative clinical research on therapeutic trials, quality of life, survivorship, medical economics and psychosocial issues.

Stock considers the AYA program a unique opportunity to assist more patients like Georges as they navigate the medical system and deal with the challenges of fighting cancer. "Jenn took an active role in her care and didn't let the diagnosis limit her life during treatment," Stock said. "We want to help more young adults have the optimism and independence she had when battling cancer." MEH

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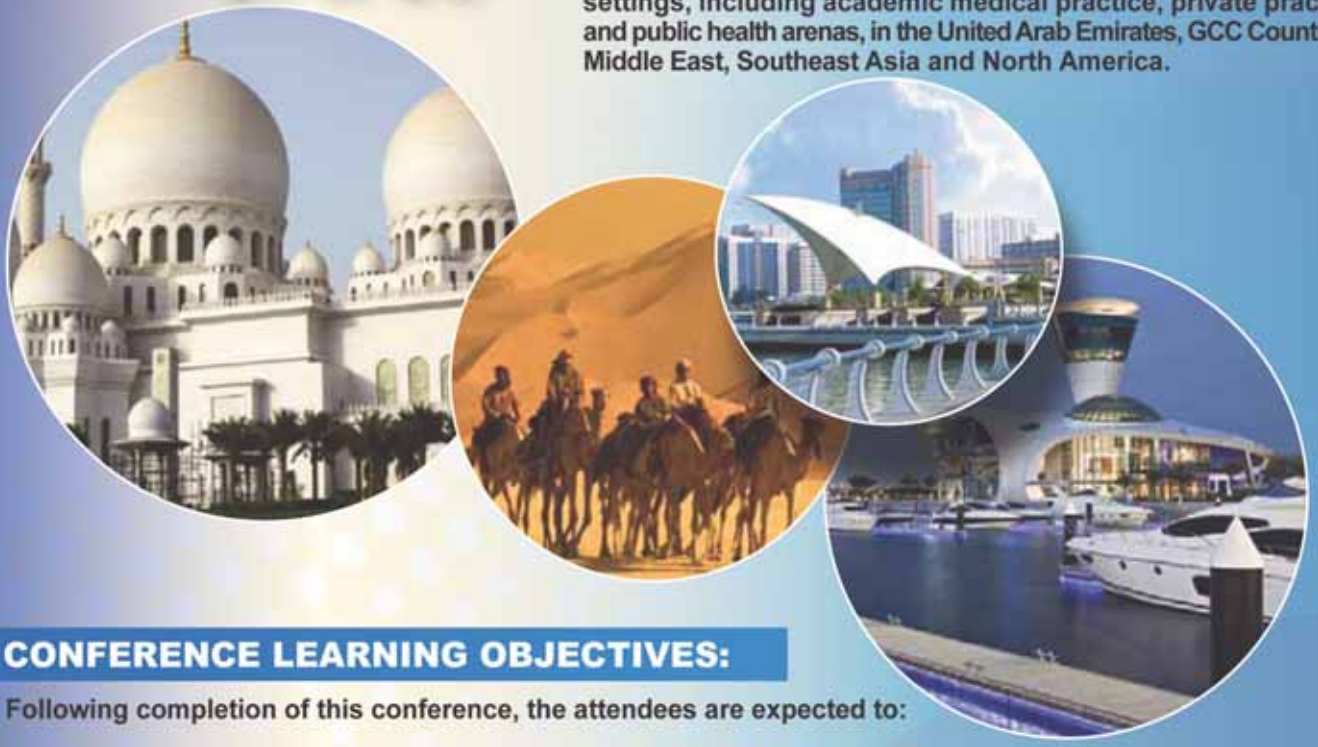

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Located in Toronto, Canada's most multicultural city, SickKids brings together a diversity of knowledge and experience. Highly trained and skilled healthcare professionals from around the world join SickKids because of its fine reputation and visionary strategic planning for children's health.

Global impact

SickKids International collaborates with global partners to improve the health of children through the advancement of child health education, research and clinical initiatives. We work with healthcare organizations around the world, helping to build sustainable, integrated programs dedicated to children's health.

Drawing on the experience and expertise of the SickKids community, SickKids International provides collaborative and consultative services to regulatory bodies, government organizations and institutions engaged in healthcare delivery. SickKids' expertise focuses on paediatric clinical services planning and patient care, global research priorities, and education and training.

We position our partners for success, striving to help them achieve desired outcomes and measurable progress in the rapidly evolving environment of children's health.

Reputable advisory services

Through SickKids International, we formally share our experience, knowledge and expertise in providing advisory services and needs assessments to our global partners.

A current advisory project is with Hamad Medical Corporation (HMC), begun in 2008, whereby SickKids will advise on the development and operation of a new, state-of-the-art children's hospital in Doha, Qatar. SickKids is providing expert counsel in such areas as paediatric medicine, surgical services, interprofessional practice and education, family-centred care and research.

Innovative education and learning

At SickKids, education is how we share knowledge with the world around us. Our learning programs bring in health-care professionals from around the world, including almost 100 per year from the Middle East, to learn SickKids' best-of-class techniques right at the bedside. SickKids is home to the largest, most comprehensive paediatric medical and surgical training program in Canada.

SickKids International offers international education programming customized to partners' specific needs. Our key programs are the *International Learner Program (ILP)* and *Continuing Education* services. Through our ILP, healthcare professionals have the opportunity to take part in observation (knowledge acquisition) or practice experiences (including "hands on" training related to specific areas of practice). The program is unique in North America by providing its practice stream participants with the chance to engage in supervised patient care. SickKids International also works with international partners to develop, implement and evaluate collaborative Continuing Education curricula tailored to their specific needs and delivered through in-person sessions at SickKids, or in the partner's home country.

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More than 275,000 patients come through SickKids' doors each year. We strive to ensure that each experience is positive, respectful and effective. We aim to be a world leader in family-centred care, and believe the best health outcomes are achieved when healthcare professionals work together with patients and their families. SickKids is committed to developing the ability of our staff in working with different cultures through cultural competency training.

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The SickKids Research Institute is the largest child health research institute in Canada, and is a centre for excellence that places SickKids on the world stage of healthcare expertise. Researchers from around the world are drawn to SickKids to help understand and prevent disease, find cures and transform children's health.

SickKids clinicians and scientists have been pioneers since the hospital was founded in 1875. It is the home of innovative thinkers, resulting in inventions such as the high frequency oscillator, and discoveries including the gene that causes cystic fibrosis. MEH

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- Faleh El Faleh
- Mohamed Al Sebayel

Kuwait
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Oman
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Qatar
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Russia
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- Raphael Esteban

Sweden
- Ola Weiland

UAE
- Adnan Abu Hammour
- Aly El Sayed
- Asad Dajani
- Azzam Kayasseh
- Huda Qatta
- Mazin Aljabiri
- Mazin Taha
- Mohammed El Nounou
- Mohammed Zaabi
- Mustafa Sabri
- Nigel Omar beejay
- Saeed El Sheikh
- Sameh Fakhri
- Salem Awad
- Zaher Koutoubi

USA
- Nizar El Zain

Program Highlights

Day 1
- Recent Advances in HBV
- HCV Challenges and Future Perspectives
- Hepatocellular Carcinoma Diagnosis and Current Management
- Debate: HCC and Viral Hepatitis
- MSD Lunch Symposium

CME Applied with DHA

Day 2
- Liver Transplant –Setting the Program and Beyond
- NAFLD Today and Tomorrow
- Update on Liver Fibrosis, Cirrhosis and Portal Hypertension
- janssen Lunch Symposium

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Registration fees	Early Bird till 25/12/2012	Late Registration from 26/12/2012	Onsite Registration
Physicians	**USD 200**	**USD 300**	**USD 400**
Non-Physicians	**USD 150**	**USD 225**	**USD 300**
Students	**USD 100**	**USD 175**	**USD 250**

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St Luke's Episcopal Hospital and Texas Heart Institute

First in Houston to treat Peripheral Artery Disease with drug-eluting balloon

St Luke's Episcopal Hospital (St Luke's), home of Texas Heart Institute (THI), is the first hospital in Houston to treat a patient for peripheral artery disease (PAD) in a clinical trial of a new drug-eluting balloon.

According to the World Health Organization, cardiovascular diseases including peripheral artery disease are the number one cause of death globally. PAD is a form of cardiovascular disease that involves the lower-extremity blood vessels. Claudication, which presents as leg pain caused by too little blood flow during exercise, is secondary to PAD. If severe blockage of the arteries in the lower extremities is left untreated, it can lead to leg sores, wounds and even amputations.

Interventional cardiologist Neil E. Strickman, MD, is the principal investigator at St Luke's and THI for the FDA-approved trial to evaluate the safety and effectiveness of the drug-eluting balloon in the treatment of PAD in the Medtronic IN.PACT SFA II trial.

"The drug-eluting balloon is a new technology for opening the main artery in the thigh, known as the superficial femoral artery (SFA), which supplies blood to the foot," Dr Strickman said.

"The balloon is coated with a special medication that is slowly released over a number of weeks and has special properties to keep it in the blood vessel wall to prevent re-narrowing of the artery – a process known as re-stenosis.

"Many products – including freezers, scrapers, and degreasers – have been used to open this artery, but no technology has been proven any better than another," he said.

Traditionally, after unblocking an artery with a balloon, cardiologists use a stent to keep the artery open. The main drawbacks of using a stent in this area of the leg are re-narrowing of the artery, fracturing (crunching) of the stent, and clotting. In some cases, a patient may have to be re-treated.

"The drug-eluting balloon has a chance to open the artery and heal the patient without the use of a stent," Dr Strickman added. "Ultimately, we want to prevent people from having to come back to have the procedure again."

This new device has been tested in 150 patients in Europe during the first phase of the trial. THI at St Luke's is one of the first sites selected and opened for the second phase of the trial that will enroll as many as 450 subjects in the US and Europe combined.

In the randomized study, patients will be treated using either the drug-eluting balloon or standard balloon angioplasty. Risk factors for PAD are the same as for coronary artery disease: diabetes, hypertension, high cholesterol, overweight and a sedentary lifestyle. Symptoms present with pain in the calf when walking, non-healing leg wounds and a feeling of cold in the legs or feet.

About St Luke's Episcopal Health System

St Luke's Episcopal Health System (*StLukesTexas.com*) includes St Luke's Episcopal Hospital in the Texas Medical Center, founded in 1954 by the Episcopal Diocese of Texas; St Luke's The Woodlands Hospital; St Luke's Sugar Land Hospital; St Luke's Lakeside Hospital; St Luke's Patients Medical Center; St Luke's Hospital at The Vintage; and St Luke's Episcopal Health Charities, a charity devoted to assessing and enhancing community health, especially among the underserved. St Luke's Episcopal Hospital is home to the Texas Heart® Institute, which was founded in 1962 by Denton A. Cooley, MD, and is consistently ranked among the top 10 cardiology and heart surgery centers in the country by *U.S. News & World Report*. Affiliated with several nursing schools and three medical schools, St Luke's Episcopal Hospital was the first hospital in Texas named a Magnet hospital for nursing excellence, receiving the award three times.

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The advantages of Apps

By **Leslie Morgan**
Managing Director Durbin PLC.
Leslie Morgan is a member of the Royal Pharmaceutical Society of Great Britain

The rise of mobile phone and tablet applications, or 'apps', has grown significantly over the last couple of years, and more of us are using these in our daily lives, whether they be for checking traffic updates, catching up with the latest sports news or social media.

I noticed recently that this magazine has started to review healthcare apps for medical professionals. After doing some research, I found that health and well-being applications are estimated to make up around 40% of all new applications being developed. This is a huge market that will get even bigger as the benefits become further apparent and the technology becomes more widespread.

As new apps are developed, patients can also take advantage. The last couple of years has already seen the rise of the so-called 'e-patient' – a patient who has the latest information about their condition and possible treatments after researching on the World Wide Web. These patients are also creating online communities and forums with those who have the same conditions or illnesses.

The UN recently launched 'm-Health' to use mobile technology such as text messages and apps to help target non-communicable diseases (NCDs) such as cancer, diabetes, cardiovascular and chronic respiratory diseases. It is hoped that this initiative will encourage governments worldwide to implement m-Health and prevent and treat NCDs and their common risk factors – unhealthy diet, smoking, lack of exercise and alcohol consumption.

NCDs contribute to an estimated 36 million deaths every year, and the UN hopes that the use of the m-Health technology will help to save lives, reduce illness and disability, and significantly reduce healthcare costs.

In England, patients now have access to a vast range of accredited online health information, including NHS Choices and digital information from specific healthcare charities, to NHS trusts that circulate information via Twitter.

GPs and hospital doctors are being asked by the Department of Health to actively encourage patients to use apps on their smartphones or tablets that can monitor their conditions.

The technology has become so advanced that a colleague of mine is able to use an app which allows him to track his asthma conditions, and I am also aware of another that allows patients to keep track of their immunisations.

In the north west of England some pregnant women with high blood pressure are being asked to use apps to take their own readings rather than having a home visit from a midwife.

Ministers believe that patients who keep a close eye on their condition are less likely to suddenly deteriorate and need urgent treatment in hospital, therefore avoiding expensive healthcare bills to the taxpayer.

Although the advantages of such technology are obvious, I do believe that there are some groups who this will not benefit, particularly elderly patients who may struggle with the technology. In addition, doctor's surgeries could be inundated with people texting in their readings therefore diverting doctors from seeing sick patients.

While downloading apps and talking about your condition with other sufferers via the internet is helpful, can it really change unhealthy habits or guarantee compliance with medicine?

Doctors need to know who their patient is, what their concerns and expectations are, and what the patient is able to do. Meaningful patient engagement that leads to long-term health behaviour change begins with patient-centered, interpersonal relationships between doctors and their patients. MEH

Durbin PLC is a British company based in South Harrow, London. Established in 1963, the company specialises in supplying quality assured pharmaceuticals, medical equipment and consumable supplies to healthcare professionals and aid agencies in over 180 countries. As well as reacting rapidly to emergency situations, Durbin PLC responds to healthcare supply needs from local project level to national scale programmes.
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Get fit, healthy and raise money for charity

Middle East Health spoke to three doctors who have taken part in the Gulf for Good charitable adventure challenge to find out why they did it and how it can benefit others, from a health perspective.

The Gulf for Good (G4G) fund-raising adventure challenges participants to do something unusual and push their limits of endurance and physical strength – like cycling in Vietnam, hiking an alternative Inca trail or trekking in the Himalayas. Participants raise funds, which are then donated to handpicked charities in the region where the challenge is held.

Gulf for Good – a UAE-based charity – was established in March 2001 and operates under the patronage of His Highness Sheikh Ahmed bin Saeed al Maktoum. The idea for this unique charity was sparked by the organisation's chairman – and publisher of this magazine – Brian Wilkie.

The sedentary lifestyle is an increasing cause of health problems all over the world and is particularly serious in this part of it. Gulf for Good can be a perfect solution for those finding it difficult to motivate themselves to do a bit of exercise and get healthy again. As the challenges test your physical stamina, it naturally serves as a brilliant exercise in achieving and maintaining good health while partaking in an exciting, fun, inspiring and stimulating adventure in some beautiful, far flung corner of the world. It is the perfect combination of adventure travel, physical endurance, teamwork and charity.

on the WEB Gulf for Good
www.gulf4good.org

What the doctors had to say

Dr Anne Marie

Why did you do a G4G challenge?

The first one was to support a charity I was already involved in – the Raey school in Addis Ababa, Ethiopia. I had the chance to visit the project earlier on and was looking at ways to help, besides going every now and then to provide medical care to the children in need and their guardians.

So, my decision was probably the other way around compared to most challengers who usually register then get to know the project afterwards.

One of my colleagues, Dr Carolyn Roesler, was investing a lot of time and effort in the charity and I thought I could be of some help.

It was also an opportunity to set a target of fitness to test and stretch my physical limits and start a training programme towards achieving the challenge in the best possible condition.

Which challenge did you do?

Well, in fact, I did two. The first one was the trek in the Simian Mountains in Ethiopia in March 2011. I had spoken to a friend of mine, from Belgium, who decided to join our group. She was very interested in the concept and decided to check if G4G would be interested in her own project, Mekong plus, based in Vietnam and Cambodia. G4G was interested, so in February, I joined a group of Belgians to do a cycling challenge between Ho Chi Minh City in Vietnam and Siem Reap in Cambodia.

Both challenges were fantastic, from a mental, physical and human perspective.

How did it help from a health perspective?

Well, it is a challenge, so you need to invest time and effort as this does not go well without good preparation. It does stretch your limits, but also gives you a goal to build up strength in a gradual manner. It is a good way to remain motivated to exercise regularly and build friendship with others with the same interest. This contributes greatly to relieve stress and put your daily worries into perspective when you think about the people who will benefit from your effort.

In a country like the UAE where we are blessed with a good lifestyle and fabulous weather eight months a year, it is difficult to find excuses not to keep in good shape! And you do not need expensive equipment as G4G helps you to train by organising regular fun sessions on the beach or climbing stairs in one of the big towers around town. There are also more and more cycling paths – another great way to stay in shape.

I am lucky not to have any weight issues despite my daily chocolate (Remember, I am Belgian!) but it is often a challenge to exercise regularly due to a heavy workload so it was a great way to introduce a routine and prove to myself that I could do it!

Why should healthcare professionals advise their patients to participate?

Leading an active lifestyle is known to be good, both physically and mentally. As I said, it helps to have a goal that we value, to remain motivated to exercise regularly and keep the muscles in shape.

Dr Carolyn Roesler

Why did you decide to do the challenge?

Every single day as a doctor I am problem solving, facing diagnostics challenges, and battle time pressure, as well as juggling the demands of five children.

I believe that mental stamina is only possible by being physically fit and I maintain a very strict exercise programme. I also believe that goal setting and challenges are important for mental stimulation and maintaining motivation and enthusiasm in all we do.

I wanted to challenge myself and give myself the opportunity to work with a team. Teamwork being another very important asset that is often ignored, but when working in a large corporate body such as Emirates – which I did at the time – teamwork is critical.

Which challenge did you do? When?
I did the Ethiopian Challenge in 2010.

How did it help from a health perspective – physically and mentally?
It was a great way to undertake an activity out of my comfort zone, creating a very significant challenge mentally – especially when altitude sickness made me feel very weak and nauseated. I had to really pull it together as on the day of the peak challenge I could easily have laid in a tent and covered my head to wipe out the headaches.

I think it made me appreciate what others with chronic pain and disability go through on a daily basis to cope with regular day-to-day activities.

I also learnt that team support is probably the most powerful way to really excel yourself and in testing environments of sleet and snow the support of others was incredible and inspiring.

What would you advise doctors say to their patients as a recommendation or reason why they should consider participating in a G4G challenge?
I think that it's an incredible way get to know yourself, gain confidence and discover how you can rise to a challenge and this can only benefit you in future life events. It can assist patients with gaining self-awareness determination, ability to work in a team, gain the fighting spirit and has enormous benefits for global aerobic, anaerobic fitness and endurance.

I must emphasise how important a team is to gaining individual success in such a G4G challenge.

How do you think it can help people as a "preventive" medicine?
I am sure success in achieving a G4G challenge is contagious and makes us want to do another and rise to future challenges. I think it makes us much more willing to step out of our comfort zone and gain a good level of fitness and mental wellbeing that can only positively affect health and prevent illness

"Know your limitations and rise above them." – This is my favourite quote that sums this up.

Dr Tanweer Husein

Why did you decide to do the challenge?
I was looking for something to push my limits. The challenge sounded perfect in that while I would be pushing my limits, I would also be doing a good cause.

Which challenge did you do? When?
I did the cycling challenge from Vietnam to Cambodia in 2009.

How did it help you from a health perspective – physically and mentally?
Physically it rang the alarm bells – it told me exactly where I stood on the 'physically fit' scale. Mentally, it was a clear sign that where there is a will there is definitely a way!

> Know your limitations and rise above them.

What would you advise doctors say to their patients as a recommendation why they should consider participating in a G4G challenge?
The G4G is the most truthful guide on one's physical condition. It is not just the sport that decides that, but the fact that we rough it out in different ways – food, weather, people. Every minute is a learning experience.

How do you think it can help people as a "preventive" medicine?
Many diseases are silent killers. Such activities give a deep insight into a person's health status. The medical tests you can do during the training can be an eye opener. MEH

KIMES – the future of medical technology

Korea International Medical & Hospital Show
21-24 March 2013
COEX, Seoul, South Korea

The 29th Korea International Medical & Hospital Show (KIMES) will take place at COEX in Seoul from 21-24 March 2013. This is Asia's premier medical event and has been growing as a hub for all those involved in the medical and healthcare industries.

With excessive demands from the Korean consumers, the development of the medical industry in Korea is remarkably fast-growing. In these circumstances, KIMES fills the important role of providing a platform where manufacturers, buyers and consumers can meet.

In Korea, medical research teams have a keen interest in new medical technology such as robotic surgery and the U-health care system based on perfect IT infrastructure.

The Korean Governmental supports these initiatives through investment Against this background, global companies are also making investments and setting up Research and Development centres in Korea.

The Korean medical industry is now enjoying the limelight as the one of the key national driving forces for new economic growth in the country which in turn will provide much new growth potential for the medical industry and keep it evolving.

Global medical market

KIMES, which has been growing along with the local medical equipment industry, is now in a position to raise itself onto the world stage as one of the world's premier medical exhibitions.

A the KIMES 2012 exhibition, 458 domestic companies and also 978 companies from 30 countries including America, Germany, England, Japan, Italy, Taiwan, and China participated at the event. They introduced and showcased some 30,000 products, such as advanced medical equipment, hospital equipment and medical information systems.

The organisers expect that up to 60,000 visitors will come to KIMES 2013 where 1,200 or so companies from 35 companies will be exhibiting.

KIMES is approved by the Global Association of the Exhibition Industry (UFI).

Network

In order to stimulate the domestic and overseas medical industry and maximize the effect of the exhibition, KIMES has been building a global network with America, Europe, Southeast Asia, North and South Asia, and the Middle East with overseas associations, related organizations, or KIMES' overseas agents. Through this initiative KIMES provides a vast amount of information about the Korean market to numerous delegations.

KIMES conferences

KIMES' diverse educational conferences and international forums for medical professionals, run simultaneously with the show.

At KIMES, the commitment to education demands offering a wide range of opportunities for the medical professional. A large bonus for KIMES participants is that the comprehensive conferences draw a huge audience.

Specifically, that translates into more customers, more business and better results for KIMES exhibitors and visitors.

The range of exhibits at KIMES includes consultation, diagnosis central supply, clinical examination, hospital accommodation, emergency equipment, radiology, medical information system, surgical apparatus, oriental medicine, cure apparatus, pharmaceutical, physiotherapy apparatus, obesity cure, healthcare, ophthalmic apparatus, medical device component, medical service, dental apparatus, disposable apparatus and others.

- For more information visit: *www.kimes.kr*

Doctors from GCC attend Dubai convention to tackle diabetes

More than a 150 doctors from across the GCC working in the diabetes field convened in Dubai last November for a programme designed to update their scientific knowledge in diabetes management and find a common platform to address the worsening problem in diabetes.

The course was the first to stem from a three-year partnership focused on continued medical education for next generation diabetologists – general practitioners and young specialists in diabetes – from the region, developed by the European Association for the Study of Diabetes (EASD) and the Gulf Group for the Study of Diabetes (GGSD), funded by Lilly and featuring 30 regional and international speakers.

According to data published by the International Diabetes Federation (IDF), six out of the world's top ten countries for highest prevalence of diabetes are in the Middle East and include five of the six GCC nations – Kuwait, Qatar, Saudi Arabia, Bahrain and the United Arab Emirates. In total, the Middle East has the highest comparative prevalence of diabetes (11.0%), with 32.6 million people known to have diabetes in 2011. This number is set to balloon to 59.7 million by 2030.

Speaking at the time of the event, Professor Leszek Czupryniak, secretary of the EASD Postgraduate Education Committee and chair of EASD Extra-European Education, said: "Diabetes needs to be addressed effectively and the first step is in empowering healthcare practitioners with the latest scientific information. We are pleased to present, as part of the EASD-GGSD-Lilly partnership on continued medical education, the first post-graduate course in clinical diabetes for EASD in the Gulf region, which includes the highest diabetes prevalence in the world. The customised training will tackle the most important current challenges in treating diabetes faced by the medical community in Europe but also in the Gulf region."

In late 2011, EASD, GGSD and Lilly announced a three-year partnership agreement aimed at providing post-graduate continued education for next generation diabetologists across the GCC. Under this partnership agreement, EASD is working in collaboration with GGSD to develop post-graduate training courses for doctors specialised in diabetes. Lilly provides funding for the programme as part of its on-going commitment to diabetes education. MEH

MedHealth Cairo will look at 'guiding your hospital towards 2020'

Delegates attend MedHealth Cairo 2012

MedHealth Cairo 2013
13-14 March 2013
Cairo Marriott Hotel

'Guiding your Hospitals Towards 2020' is the new theme of MedHealth Cairo 2013. Held for the 12th consecutive year, MedHealth Cairo will take place on 13-14 March 2013 at the Cairo Marriott Hotel, Cairo, Egypt. It will run simultaneously with the Arab Health Ministers Council. The event's main sponsor is Qatar's Hamad Medical Corporation and the co-sponsor is Al Jeel.

The scientific programme is designed in partnership and in collaboration with the Arab Hospitals Federation, The Executive Office for the Health Ministers for Cooperation Council States, ARADO and Imperial College London.

It will feature interesting and informative plenary lectures and workshops delivered by regional and international speakers and cover issues related to leadership, quality and safety, Arab hospitals accreditation and, risk and crisis management, among other topics.

In addition to the plenary lecture, a panel discussion by the Arab ministers of health will focus on: The sustainability of the adolescent health and the future of healthcare.

Parallel to the conference, a specialised exhibition will be held where pharmaceutical, medical equipment and IT companies will showcase their products. Also in attendance will be accrediting bodies and other specialised companies.

- For more information, visit *www.ahfonline.net*

UK Healthcare to launch major initiative at Arab Health

The UK Government is using its high profile presence at Arab Health to launch a strategic initiative, offering a gateway into UK healthcare expertise that spans both the public and private sectors.

Named 'Healthcare UK', the new initiative will be launched by some of the most senior representatives from the UK healthcare sector. The high-level event will be attended by healthcare leaders from across the Middle East, Africa and Asia.

Healthcare UK is a major drive to give healthcare system providers across the world access to the UK healthcare industry and expertise from the UK National Health Service (NHS). It will provide a single portal into the UK's rich range of private sector healthcare providers and NHS organisations who are keen to build international partnerships and export their expertise.

The UK is a world leader in healthcare, with unrivalled experience and expertise in meeting the complex health demands of a dynamic population.

Healthcare UK is looking to share insights gained over 60 years delivering one of the world's most successful and cost effective healthcare systems. Healthcare UK will allow nations across the world to take on board UK knowhow and technological advances with the potential to achieve a step change in healthcare delivery and patient outcomes.

The launch of Healthcare UK will include a special focus on the development of Primary Care to address the challenges of non-communicable diseases (NCDs).

Many countries are seeking to improve the healthcare outcomes of their populations and prepare for the anticipated upsurge of NCDs, which are becoming a significant cause of mortality and morbidity in both developed economies and countries with low to middle incomes.

Professor the Lord Darzi of Denham (KBE), former Minister for Health for the United Kingdom, tours the UK Pavilion at Arab Health 2012

UK Pavilion at Arab Health

UK Trade & Investment (UKTI) is delivering Arab Health's UK Pavilion, the third largest Pavilion outside the United Arab Emirates with over 120 UK exhibitors.

UKTI's market specialists will introduce UK firms to senior decision makers representing the North Africa, Middle East and Asia Pacific markets. At Arab Health 2012, UKTI facilitated 560 meetings between over 100 UK companies and international buyers.

Alongside helping UK-based companies succeed in the global economy, UKTI helps overseas companies bring their high quality investment to the UK's dynamic economy – acknowledged as Europe's best place from which to succeed in global business. Overseas organisations that are keen to tap into the expertise of UK products and services will find UKTI a valued partner in making this happen.

UK Healthcare Profile

The UK is a world leader in Life Sciences, offering cutting edge healthcare solutions, renowned training, innovative R&D and a commitment to building an environment which promotes commercial success.

The National Health Service (NHS) is one of the world's most cost-effective healthcare systems; it works in collaboration with commercial healthcare companies and academia to develop innovative, integrated, high quality and efficient systems of care. Innovation is central in the UK – with UK companies leading Europe in having the greatest number of medical devices undergoing clinical development for registration in the USA.

Uniquely, the UK's commercial healthcare sector has in-depth experience of working in partnership with the NHS in planning and delivering facilities, clinical services and deploying new technologies. With world renowned design, build and operating companies, the UK is well versed in producing unique and culturally appropriate medical services and facilities. MEH

US Department of Commerce to offer Matchmaking Programs at Arab Health 2013

During Arab Health 2013, the US Commercial Service of the US Department of Commerce will be assisting Middle East health buyers interested in sourcing the latest healthcare technologies from the United States.

During the show, Kallman Worldwide will once again host the USA Pavilion with more than 170 US exhibitors looking to expand their business in the Middle East. Commercial Specialists from US Embassies and Consulates around the region will be onsite to facilitate meetings between US suppliers exhibiting at the USA Pavilion and Middle East healthcare buyers looking to acquire US technologies and products.

Middle East health care providers looking for new technologies can benefit from doing business with U.S. companies. US medical equipment firms are among the world's most innovative and cost-competitive, and offer excellent after-the-sale service and training. In addition, US medical technologies quality standards are widely accepted in the marketplace.

At the show, the US Commercial Service is also offering a business-to-business matchmaking program which arranges scheduled meetings between US companies and Middle East buyers and distributors.

- To pre-register for an appointment, visit: *https://IBP.expoplanner.com/ah2013.*
- Commercial Specialists from the US Commercial Service offices present at Arab Health will be available to meet with Middle East buyers.

U.S. COMMERCIAL SERVICE
United States of America
Department of Commerce

The US Commercial Service helps US companies establish international business relationships. The agency's global network includes locations in more than 100 U.S. cities and in American consulates and embassies in more than 70 countries.

- For more information on the US Commercial Service, please visit *www.export.gov.*

Radiation dose continues to be hot topic at RSNA

Compiled by **Jay Franco**

'Low dose, high image quality' were the buzz words at RSNA 2012. Siemens calls it: 'Right dose technology, right dose treatment, right dose management'. Philips calls it DoseWise. Whatever name it is given, idea of reducing radiation dose and maintaining image quality in the x-ray environment continues to be a hot topic.

The 98th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA), the world's premier annual radiology show, was held from 25-30 November 2012 in Chicago, USA.

The 2012 RSNA president, Dr George Bisset III, addressed the radiologists in his opening speech: "In an increasingly consumer-driven healthcare environment of the moment, we have the unique capacity to add new value to the patient experience, simply by demonstrating better that we put patients first in all that we do, and that we understand their needs."

There was much news to come out of the event, some of the highlights included:

- Imaging shows some brains compensate after traumatic Injury
- Researchers discover gender-based differences in Alzheimer's disease
- Scatter radiation from mammography presents no cancer risk
- Breast cancer risk estimates increased with repeated prior CT and nuclear imaging
- Researchers identify physiological evidence of 'Chemo Brain'
- CT depicts racial differences in coronary artery diseases
- Men with belly fat at risk for getting osteoporosis
- High altitude climbers at risk from brain bleeds

Alongside the conferences was the technical exhibition which featured over 600 exhibitors who presented their best innovations to 59,000 visitors from all over the world. Here are a few highlights of the exhibits:

Siemens

The first mammography system, MAMMOMAT Inspiration Prime Edition, was launched by Siemens. It is intended to lower dose by replacing the standard scatter radiation grid with a new algorithm for progressive image reconstruction. This new algorithm helps identify scatter-causing structures and calculates a corrected image, enabling complete use of primary radiation so physicians can achieve high-quality images using less dose.

Also showcased was the world's first wireless ultrasound system – the ACUSON Freestyle, which featured a wireless transducer, thus eliminating cables in ultrasound imaging. Jeffrey Bundy, CEO

Siemens-freestyle

of the Siemens Ultrasound business unit said: "This system facilitates the use of advanced ultrasound technology in clinical fields requiring a sterile environment, such as interventional radiology, anesthesiology, critical care, cath lab, or emergency care."

This system employs advanced synthetic aperture imaging technology, an integration of hardware and software specifically developed for wireless signal transmission of full-resolution digital image data at very high data rates. Three wireless transducers are available and the user can operate the transducers up to three metres away from the system.

Philips

With a new mission this year -- "Transforming Care Together" -- Philips unveiled 15 new products and features that reflect the principles of Imaging 2.0 by offering patient-adaptive systems for patient comfort and image quality, and showing new ways to integrate and share information.

iPatient: This is an advanced platform for its family of CT and PET/CT scanners to facilitate patient-centred imaging now and in the future. It puts patients in control of personalised workflow built to simplify the use of iterative reconstruction techniques, and new methods that facilitate patient-specific dose management. With its SyncRight feature, iPatient allows for easy and efficient communication between the CT system and the injector in order to deliver appropriate contrast dose and consistent image quality.

MicroDose Mammography with Single Shot Spectral Imaging (SI)±: a non-invasive, full-field digital mammography system that uses direct, digital photon-counting technology to provide high-quality images at 18-50% less dose than comparable systems. The new SI± application provides objective spectral breast density measurements for refined risk assessments that can be obtained in the same examination as a standard low-dose mammogram.

Philips also offered a dStream broadband technology that will enable their current Ingenia 1.5T and 3.0T Magnetic Resonance (MR) users to switch to digital broadband MRI for the majority of their analogue MR systems. The technology builds on the existing MR magnet and is a cost-effective way to provide digital broadband MRI. Compared with system replacement, dStream upgrade technology saves on magnet and reconstruction costs and means fewer disturbances for the facility during installation. Users can expect significant savings in cost when upgrading an existing MRI compared to purchasing a new digital system. With this technology routine exams for brain, spine, knee, ankle and liver can now be performed in less than eight minutes.

Philips SmartPath to dStream

GE Healthcare

GE launched four technologies to transform healthcare delivery and improve patient-care.

Silent Scan MR is one of the major breakthroughs in the MR industry, and is specifically designed to address one of the most significant impediments to patient comfort – excessive acoustic noises generated by conventional MR scanners in excess of 110 decibels. The Silent Scan aims to reduce MR scanner noise to near ambient (background) sound levels and thus help improve a patient's MR exam exposure.

Universal Viewer helps put clinical insight within reach to help radiologists and referring physicians deliver patient results efficiently. It brings together advanced visualisation, intelligent productivity tools, and multimodality workflow for oncology and breast imaging all within one intuitive workspace that can be accessed anywhere, anytime. It works with Centricity PACS, Centricity PACS-IW, and Centricity Clinical Archive.

Breast Ultrasound: The somo•v Automated Breast Ultrasound (ABUS) is the first and only ultrasound system approved for breast cancer screening in the US. With this new technology GE Healthcare has the opportunity to integrate 3D automated whole breast ultrasound screening in clinical practice as an adjunct to mammography – a powerful tool which helps physicians find previously undetectable cancers.

InSightec ExAblate: This system is exclusively compatible with GE Healthcare's normal and wide bore systems, including Signa HDxt 1.5T, Signa HDxt 3.0T, Optima MR450 & 450w, and Discovery MR750 & 750w. It combines therapeutic acoustic ultrasound waves with continuous guidance and treatment monitoring by MRI. This unique combination of technologies is called Magnetic Resonance guided Focused Ultrasound Therapy (MRgFUS). Physicians use the MRI to plan and guide the therapy and monitor treatment outcome. The focused ultrasound acoustic energy destroys the nerves causing the pain from bone metastases, resulting in rapid reduction in pain.

Agfa Healthcare

Agfa announced its DX-D 400, a floor

mounted X-ray suite and the newest member of the company's imaging portfolio. It is both compact and versatile and can be configured to meet specific workflow needs or budget constraints. Combined with either the latest computed radiography (CR) technology or with a cassette-sized DX-D detector and the renowned NX workstation, the DX-D 400 offers state-of-the-art imaging technology at an affordable cost – without compromising functionality, performance or image quality. The DX-D 400 is ideal for imaging centers, private practices as well as hospitals that are interested in replacing or adding digital X-ray technology. It is a scalable solution and produces clear and sharp images with multi-scale contrast detail enhancement provided by MUSICA² – their image processing software.

Carestream

A smaller-format 25 cm x 30 cm DRX 2530C Detector was demonstrated as a work in progress. The new cesium iodide detector is designed to offer high efficiency for dose sensitive pediatric, orthopedic and general radiology exams. It is designed to fit into pediatric incubator trays and offer higher DQE (detective quantum efficiency) which can lead to lower dose requirements than CR cassettes or gadolinium scintillator detectors. This detector is intended to be used with their DRX-Revolution or DRX-Mobile Retrofit Kits for mobile imaging of neonatal or pediatric patients.

Also showcased was their new table top DRYVIEW 5950 Laser Imaging System that produces 508 pixels-per-inch output for general radiology and mammography images. This imager can support efficient printing and time-saving film cartridges that can benefit healthcare providers of all sizes across the globe, and delivers an enhanced quality control system for mammography images. It offers DICOM connectivity and can be used to output images from a PACS network or from any DICOM modality. It offers two film cartridges on-line and supports five film sizes: 35 x 43 cm, 35 x 35 cm, 28 x 35 cm, 25 x 30 cm and 20 x 25 cm.

Toshiba

Hospitals will now be able to diagnose diseases faster and safer with Toshiba's latest and advanced CT system, AQUILION ONE VISION Edition, which offers a low dose exam with the largest bore, widest coverage and thinnest slices. It is equipped with a gantry rotation of 0.275 seconds, a 100 kw generator and 320 detector rows (640 unique slices) covering 16 cm in a single rotation, with the industry's thinnest slices, 500 microns (0.5 mm). The system can accommodate more patients with its 78 cm bore and fast rotation, including bariatric and patients with high heart rates. It also includes their third-generation iterative dose reconstruction software, AIDR 3D, which incorporates significant system enhancements by reducing radiation dose compared with conventional scanning.

Agfa DX-D 400

Also displayed was Toshiba's scalable Vantage Titan 1.5 MR series, which includes 8-, 16- and 32-channel MR systems. Vantage Titan 8-channel is an ideal MR for the majority of clinical applications, offering patient-friendly features including a 71 cm bore, their Pianissimo noise-reduction technology, advanced non-contrast imaging, integrated coils with Octave SPEEDER technology and an intuitive M-Power user interface.

For customers who require enhanced cardiac imaging, the Vantage Titan line is easily upgradeable to a 32-channel system, enabling higher spatial and temporal resolution for better images of moving anatomy. The line is also enhanced with a modern, sleek exterior, including new covers and soft, patient-soothing lighting around the bore.

Fujifilm Medical Systems

Fujifilm showcased their FDR portfolio and other features that focus on improving dose and image quality performance. It includes a complete line of wireless Cesium and Gadolinium flat panel detectors, FDR AcSelerate Suite and standard FDR D-EVO Suite II room replacement suites, as well as one of the most comprehensive lines of digital portables, including the latest FDR Go (work in progress) and FDR-flex.

FDR D-EVO Suite II room replacement suites bring to the DR room advancements such as Irradiated Side Sampling (ISS) Detector and Dynamic Visualisation (DV), touch screen tube head controls, tube tracking, SpeedLink, increased table weight capacity and a low table-to-floor height ratio.

FDR Go is an all-new Fujifilm integrated DR portable with a sleek, small chassis designed for light, easy manoeuvrability, the full sized power of a 32kW generator system, and an integrated FDX Console for use with any FDR D-EVO detector.

The FDR-flex is a wireless hand carryable DR solution that instantly upgrades almost any analog portable or x-ray room to the image quality, speed and dose efficiency of DR. The user drops the mini briefcase style communication box into the portable cassette drawer, snaps the laptop into its mount and is ready to go, with endless DR possibilities.

FDR AcSelerate Suite – their X-ray room suite which now has a new release of AcSelerate-flex which includes a table with removable FDR D-EVO detector capability, offering expanded usability of the table's detector for cross table, table top and wheelchair exams.

■ The next annual RSNA meeting will take place from 1-6 December, 2013. For more info visit *www.rsna.org*

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Medica: The biggest medical trade show on Earth

Compiled by **Jay Franco**

The world's premier healthcare forum for medicine, Medica 2012, was held in Düsseldorf, Germany, from 14-16 November 2012. Over 4,550 "MedTech" producers from 60 countries showcased their new products and technologies for the healthcare industry.

The focal segments of Medica were arranged according to halls: Electromedical Equipment/Medical Technology, Laboratory Technology/Diagnostics, Physiotherapy/ Orthopaedic Technology, Medical Products (Commodities and Consumables), Information and Communication Technology, Medical Furniture as well as special Room Furnishing and Building Technology for Clinics and Surgeries.

The Medica Congress, which has regularly welcomed over 5,000 visitors in recent years, and featured some 200 seminars and courses, is the largest interdisciplinary advanced training forum in the field of medicine in Germany, with lectures focusing on key issues such as oncology, cardiology and age-related diseases.

Middle East Health's stand in Hall 16 drew the attention of visitors from Europe, Americas and the Middle East who expressed their interest in magazine and the Middle East market. While at the event we took the opportunity to visit a number of country pavilions and other booths in an effort to find out about product innovation and the various spheres..

Brazil

The Brazilian delegation accounted for over 50 companies that were organised by ABIMO (the Brazilian Medical Devices Manufacturers' Association). Brazil's health equipment is exported to more than 180 countries, among which the main buyers can be found in the US, Argentina, Venezuela, Belgium and Germany.

Fanem, a leader in neonatal products, presented its new BabyPuff Reanimator Infantil 1020 which comes in four different versions – traditional, table use, portable and wall-mounted.

FAMI exhibited their range of sanitary products made from stainless steel, aluminum and plastic. Their samples included items used for transportation, storing, and sterilising instruments and prosthetics, as well as those for use in surgical theatres, headboards, veterinary laboratories and for podological and aesthetic use.

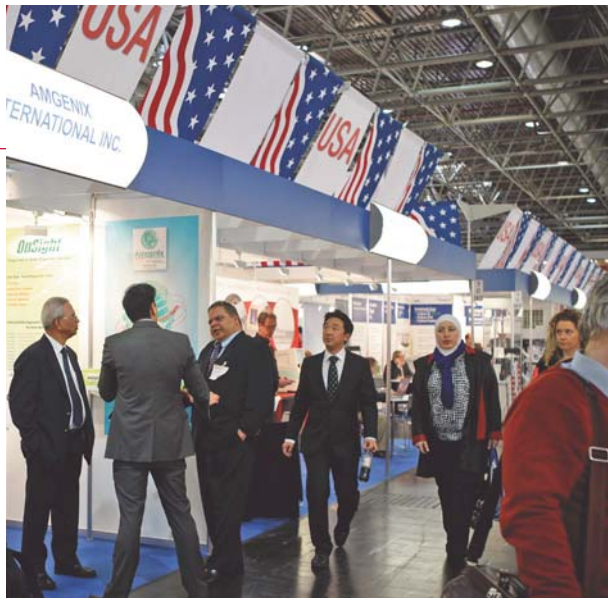
WEM's all-new SS-601 MCA electro-surgical unit featured connections and interfaces with the other operating theatre equipment. This technology allows the device to be used during robotic surgery, which can be undertaken on location or remotely.

The Welsh Pavilion

Over 60 Welsh delegates attended Medica and were supported by the Welsh Government, who considers life sciences as a priority area. MediWales, their life sciences network, has been working with the Welsh Government to reach out to the international community and develop this sector.

DTR Medical showcased their range of new sterile single-use surgical instruments for specialities including ENT, neuro-surgery, vascular and general surgery, gynaecological procedures and orthopaedic surgery.

Huntleigh, a member of the Getinge group, displayed their world renowned brands such as Sonicaid (OB/Gyn) , Dopplex (vascular assessment) and Smartsigns



(patient monitoring). They are the largest manufacturer of foetal monitors in the UK.

Korea

A number of Korean companies displayed their cutting-edge technologies at the show.

MEKICS, leaders in intensive care, showed their entire array of respiratory care products. Their patient monitor, MP 1300, featured a 12.1" touch screen, 10 waveform display, ECG, RESP, Sp02, NIBP, with multi gas and cardiac output. Their ICU Ventilator MV200 SU:M Series offered advanced autovent mode, hemo-dynamic with Sp02 and EtC02 and a smart tool for system management.

Dong Kang Medical Systems announced their new generation digital X-ray system, Innovision-CS, which is powered by Samsung Flat Panel Detector to capture high quality definite images. It features rapid image acquisition, AMP (Auto-Mover to Position) tube and detector stand, synchronised tube and detector stand, data sharing for easy setting and easy image management with DICOM connectivity. Overall it covers the complete spectrum of clinical requirements and optimizing workflow.

Leaders in medical electronics, Votem, presented their VP-1200 multi parameter patient monitors for humans and veterinarians. It comes with a 12.1" high resolution display and maximum 10 waveforms, with standard configurations: ECG, Sp02, NIBP, 2 Temp, 2IBP, and is capable of high-end functions such as drug dose calculation, ECG recall, mini trend, colour change, NIBP STAT, patient monitoring, and more.

United States

Around 500 American companies were spread out across several halls according to the nature of business, which included clinical diagnostics and laboratory equipment, rehabilitation and physiotherapy, and medical devices.

At the US pavilion, which was organised by Messe Dusseldorf North America (MDNA), were several individual States with their unique identities, such as Choose Washington, Pure Michigan, Enterprise Florida, State of North Carolina, MassMedic (Massachusetts Medical Device Industry Council), Greater Akron Chamber (Ohio), State of Utah, Bio Maryland, Maine International Trade Center, and the State of Vermont.

Avery Dennison Medical Solutions offered users a new level of confidence and comfort with their InteliShield Barrier Film for ostomy applications. Each layer of the film is designed to fulfil a critical purpose, while the oxygen barrier helps control odour, additional layers provide enhanced strength and secure bonding. In addition to being as quiet, soft and discreet as current products, the film provides another important benefit: it's PVC, PVdC and plasticizer free.

Pointe Scientific introduced a new generic chemistry reagent line, packaged in a barcoded bottle which allows easy application to the Beckman Coulter AU 400/640/800 chemistry analyzers. This line has the potential to offer significant cost savings over the instrument manufacturer's branded reagents. The reagents are liquid stable and have been shown to be accurate and precise. Available products include reagents necessary for a basic metabolic panel, a lipid panel, and liver function panels. Calibrators and controls are also available.

■ Medica 2013 will take place from 20-23 November 2013. Visit *www.medica.de*

Interview

Paolo Fraccaro, Executive President of ABIMO, Brazil, speaks to Jay Franco in an exclusive interview for *Middle East Health*

JF: What are the key challenges that Brazilian healthcare product manufacturers face in the Middle East?

PF: Brazilian medical device manufacturers face local restrictions when approving new products, because our regulatory agency (ANVISA – the National Health Surveillance Agency) takes a long time to inspect documents and approve products for export. Brazilian manufacturers are doing their best to produce innovative devices so that approvals may be obtained quickly in order to compete with the international markets. Certain products and production sites may even take up to 5 years for approval.

JF: What steps have been taken to accelerate this approval process?

PF: ANVISA is working towards establishing a contra agreement with certification companies in major importing/exporting countries like Canada, USA, Australia, France and the UK to reduce the procedures involved in approving the imports and/or exports of medical products.

JF: What is the Brazilian Government or ABIMO doing to boost research and development (R & D) standards in exporting companies?

PF: Brazilian companies seeking to be a part of ABIMO will need to have a CE mark for their products and ANVISA approval for their manufacturing process. ABIMO is working with the government to train the companies in order to create awareness for a strong R & D, which will ultimately result in innovation and quality. Companies with good sales revenue can afford to have a strong R & D department, which brings about confidence to compete with other quality products on an international platform.

JF: How do you view the future of Brazilian healthcare exports in the Middle East market?

PF: We see a huge opportunity in the Middle East. All the Brazilian companies present here at Medica are seeking to reach out their products to the international healthcare community, and are looking for dealers and distributors in your region. In view of this every effort is made to ensure that these companies attend key trade shows like Medica and Arab Health.

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About Mindray

Mindray is a leading developer, manufacturer and marketer of medical devices. Established in 1991, Mindray offers a broad range of products across three primary business segments: patient monitoring & life support products, in-vitro diagnostic products and medical imaging systems. Mindray is globally headquartered in Shenzhen, China. R&D centers in Shenzhen, Beijing, Nanjing, Shanghai, Chengdu, Xi' an, Seattle, New Jersey and Stockholm collaborate together as an effective global R&D system.

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The Imperial College London Diabetes Centre, Abu Dhabi

A Multi-Disciplinary Care Approach to Health

John Sanderson, director, Hicom, discusses how multi-disciplinary care is a collaborative approach to treatment planning and on-going care throughout the treatment pathway. He looks at how this can be achieved and how this is already being done within the UAE region.

Wait-time management

Hospital information systems can be beneficial in providing both healthcare professionals and patients with vital information upon arrival and through the initial stages of their care. As an example, Moorfields Eye Hospital and Rashid Centre for Diabetes and Research use a patient queuing system to provide valuable information on patient whereabouts to the healthcare team and can be used within communal waiting areas to inform patients of the next appointment and approximate waiting times, with information displayed in both English and Arabic.

Patient smartcard tracking

At The Imperial College London Diabetes Centres (ICLDC) in Al Ain and Abu Dhabi, the clinics utilise a hospital information system incorporating a patient smartcard tracking system. This allows the automatic capture of patient data relating to arrival and departure time in each ward or department. The system works via a smartcard or barcoded patient wrist bands that gives healthcare providers valuable information on when the patient has been seen, by whom and the next step required for their care.

Resource management

A hospital information system that incorporates a resource management module to allow the tracking of hospital resources and assets and informs healthcare professionals of a patient's status, can provide visibility to the appropriate staff on availability of doctors, beds, theatres and modalities such as x-ray and MRI. It can also give visibility to maintenance staff in terms of cleaning and infection control throughout the healthcare setting.

Electronic claims management

Electronic claims management (eClaims) has been a requirement of the Abu Dhabi Health Authority for some time and it will soon be mandatory in Dubai as well. With an eClaims module fully integrated into the hospital information system, the claims process can be managed effectively and efficiently.

This form of eClaims integration is used by Imperial College London Diabetes Centre Al Ain and Abu Dhabi and Moorfields Eye Hospital and enables insurance claims to be submitted, payment and denial remittance information to be imported from the respective insurer and the preparation and generation of resubmission claims. As the requirement of the Health Authorities develop in the future, the integrated eClaims solution will also support pre-authorisation and real-time electronic prescription verification.

Pathology laboratory management

The Imperial College London Diabetes Centres and the Rashid Centre for Diabetes and Research benefit from a hospital information system that incorporates a comprehensive pathology laboratory management module. The pathology management module enables requests to be prioritised, turnaround times to be monitored, results to be verified before release and quality control data to be reviewed for audit purposes.

e-Prescribing

Moorfields Eye Hospital and Imperial College London Diabetes Centre use a hospital information system that incorporates an e-prescribing module to ensure accuracy of patient prescriptions. The module is designed to support automated prescribing and has the additional benefit of accessing a patient's medication history and alerting healthcare professionals to any allergies a patient may suffer from. Furthermore, with the Health Authorities soon to be introducing electronic prescription verification for insurance billing purposes, an e-prescribing module is vital in ensuring the correct prescription is issued to the patient and the correct price is charged.

Associated to e-prescribing is the automated dispensing of accurate prescriptions. The pharmacy module that is fully integrated into Moorfields Eye Hospital's and ICLDC's hospital information systems enables pharmacists to prepare and dispense drugs without the risks associated with manually selecting and preparing drugs from a paper prescription. Pharmacists can further benefit from alerts to drug expiration dates, real-time stock control and recommendations of alternative medicine if needed. Furthermore, the technology allows for generation of accurate dispensing labels containing both English and Arabic instructions, aligned with the Health Authorities' regulations.

Conclusion

The above study is a representative sample of just some of the many different elements that are needed to help achieve effective multi-disciplinary care through the use of a hospital information system. Getting a patient into the care setting and embracing technology to aid in the delivery of patient care effectively and efficiently throughout the entire care pathway is achievable and is already being carried out with high levels of success throughout the UAE region. MEH

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A positive β-Glucan result is now included as a mycological criterion in the current EORTC-MSG revised definitions of Invasive Fungal Disease.

Warnings, Precautions and Limitations (see instructions for use for details):

i. *Cryptococcus, Zygomycetes* (such as *Absidia, Mucor* and *Rhizopus*) and *Blastomyces dermatitidis* are known to have little or no (1→3)-β-D-glucan and thus, glucan is not detected during infection with these organisms.
ii. The tissue locations of fungal infection and encapsulation may affect the serum concentration of this analyte.
iii. Some individuals have elevated levels of (1→3)-β-D-Glucan that fall into the indeterminate zone of 60 – 79 pg/mL. In such cases, additional testing is recommended.
iv. Test levels were established in adult subjects. Infant and pediatric normal levels approach those of adults. Data for neonates and infants less than six months, are lacking.
v. Off-color or turbid samples such as those that are grossly hemolyzed, lipemic, or contain excessive bilirubin may cause interference.
vi. Samples obtained by heel or finger stick methods are unacceptable as the alcohol-based gauze used to prepare the site and/or skin surface pooling of blood may contaminate the specimens.
vii. Surgical gauzes and sponges can leach high levels of (1→3)-β-D-Glucan and may contribute to a transient positive result for the Fungitell assay.
viii. The serum of hemodialysis patients may contain high levels of (1→3)-β-D-Glucan when certain cellulose dialysis membranes are used.
ix. In performing the test, great care must be taken to avoid contamination.

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CE

An RCT to determine the effect of a heel elevation device in pressure ulcer prevention post-hip fracture

J. Donnelly, PhD, BSc(Hons) Health Studies, MCGI, RGN, ONC; J. Winder, PhD, CSci, MIPEM; W. G. Kernohan, PhD, BSc, CPhys, MInstP; M. Stevenson, Senior Lecturer in Medical Statistics

Introduction

The heel is a common site for pressure ulceration in patients with a fractured hip. Patients with fractured hips exemplify those at high risk of pressure ulceration. Practitioners use a range of measures, including dressings, splints and pressure-redistributing mattresses, to prevent heel ulceration.

No dressing studies have been able to substantiate claims that they prevent pressure ulceration. Trials demonstrating that heels subjected to complete offloading did not develop pressure damage, and mattress trials showing that heel ulcers developed on a wide range of support surfaces, led us to conclude that devices that remove pressure from the heel may be more effective in reducing the incidence of heel PUs than devices that partially redistribute pressure, such as static and dynamic mattresses. However, existing literature could not support this theory.

A randomized controlled trial set out to determine whether there are differences between complete offloading and standard care in terms of the number of new pressure ulcers (PUs) developing on the heels of older patients with fractured hips and the number or severity of new PUs on other areas of their bodies.

Methodology

All patients were nursed on pressure redistributing support surfaces. Mattress type was determined by ward nurses according to perceived need.

Patients aged over 65 years in a fracture trauma unit with fractured hips were randomly allocated to receive heel elevation (Heelift Suspension Boot, DM Systems) plus pressure-redistributing support surface (intervention group) or standard care (pressure-redistributing support surface alone)(control group).

Exclusion criteria included existing heel damage. Patients were assessed on pre- and postoperative days for the occurrence of new pressure damage.

Patients completed a satisfaction questionnaire at discharge.

Pressure points were inspected daily for signs of tissue discolouration/ ulceration.

Complications and treatment details were also recorded. An experienced tissue viability nurse who was blinded to history, skin assessments, and patient group, viewed photographs of suspected pressure damage and was asked to categorize images using the NPUAP scale.

Results

119 patients were recruited into the control group and 120 into the intervention group. Independent t-tests and chi-squared analysis showed both groups were comparable at baseline.

Thirty-one subjects (26%) in the control group developed PU s compared with eight in the intervention group (7%, $p < 0.001$). No subjects in the intervention group developed a PU on their ankles, feet or heels, whereas 29 subjects in the control group did ($p < 0.001$). Kaplan-Meier survival curves indicated that subjects in the control group were more likely than those in the intervention group to suffer pressure damage at all time points ($p = 0.001$).

Conclusion

The findings suggest that offloading reduces the incidence of heel ulcers.

Download the entire RCT, as published, at: *bit.ly/heelift*

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Transfer to practice

Older, acutely ill, immobile patients should have their heels elevated off support surfaces from the moment of hospital admission until they are independently and effectively able to reposition their lower limbs in response to pressure related discomfort. Heel pressure relief must be viewed as part of a wider strategy, which aims to prevent all PUs. This strategy must include pressure-redistributing support surfaces, as patients who were nursed in this way consistently developed less pressure damage than those who were not.

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Ibis World Trade Centre is centrally located just off Sheikh Zayed Road. The hotel features 210 rooms, including 140 non-smoking rooms on dedicated floors, and 3 special needs rooms. Our rooms are modern and practical with a choice of double or twin beds. All rooms have flat screen TV's with over 50 international channels and WIFI. The hotel offers a choice of restaurants specializing in breakfast options, Italian cuisine and a range of bars with live entertainment. Scheduled complimentary shuttles to all major malls and Jumeirah Beach are provided, and with the convenience of the World Trade Centre Metro Station on our doorstep, allows even the budget conscious traveler easy access to explore everything that Dubai has to offer. Ibis World Trade Centre is only 5 minutes away from Dubai Mall and Burj Khalifa, and 20 minutes away from Dubai International Airport Terminals 1&3, making your stay at Ibis the perfect location for business or leisure whilst in Dubai.

BMJ Learning – diabetes course

The Diabetes Qualifications and Courses series is delivered by BMJ Learning in partnership with the University of Leicester. Our programme of courses are based on the International Diabetes Federation's (IDF) curriculum and have been designed to address the learning needs of doctors and healthcare professionals from around the world. All courses are delivered online and can be studied flexibly.

The courses are designed to build on your personal experience giving you the skills to evaluate your own practice in the global context of scientific evidence, research and experience in diabetes care.

The course will challenge you to evaluate this evidence and apply it in practice to improve patient outcomes. You will gain the knowledge and skills necessary to tackle the challenges of the prevention and management of diabetes that many healthcare systems currently face.

- We have four study options available; individual 10 week courses, a Postgraduate Certificate, a Postgraduate Diploma and bespoke training for organisations. Applications for the May 2013 intake close on 10 March 2013.

For further information and to apply online, visit *http://qualificationsandcourses.bmj.com*

- Alternatively, please email us on *response.diabetesdiploma@bmjgroup.com*

EHL Management Services becomes Mediclinic Middle East

Name change for all Mediclinic Middle East hospitals and clinics

In October 2012, majority shareholder Mediclinic International acquired all remaining interests in EHL Management Services from Varkey Group and GE, becoming 100% owners. The company is now known as Mediclinic Middle East to reflect its position as part of one the world's leading healthcare providers.

As part of the rebranding exercise, all hospitals and clinics in the group have come together under a single Mediclinic name. These include:

- Mediclinic City Hospital
- Mediclinic Welcare Hospital
- Mediclinic Dubai Mall
- Mediclinic Arabian Ranches
- Mediclinic Meadows
- Mediclinic Al Qusais
- Mediclinic Mirdif
- Mediclinic Al Sufouh
- Mediclinic Ibn Battuta
- Mediclinic Beach Road

Mediclinic International is one of the 10 largest listed private hospital groups in the world with 52 healthcare facilities in Southern Africa, 14 in Switzerland and 10 in the UAE. That such a well-respected name in the global healthcare industry has invested so heavily in the region is great news for the UAE. The international standard of healthcare that UAE residents expect is now so visibly on their doorstep.

Further exciting developments within Mediclinic Middle East include the opening of Mediclinic Beach Road, a brand new 20,000 square feet primary healthcare facility in the Sheikh Hamdan Complex in Jumeirah 1.

With its global expertise in a local setting, Mediclinic Middle East is an exceptional referral resource for community-based doctors or other health professionals who feel their patients require skills, care or expertise beyond that which they or their clinic can supply. Referring a patient to any Mediclinic Middle East facility is easy, convenient and can help ensure the best possible outcome.

- Mediclinic – Expertise you can trust. *www.mediclinic.ae*

Royal Brompton's weaning programme expands

London's renowned Royal Brompton Hospital has recently expanded its capacity for patients who require weaning from invasive ventilation. This complex service has drawn patients to the hospital from across the globe due to the expertise of the staff and the excellent facilities.

Observational studies have shown that the prolonged mechanical ventilation of critically ill patients is associated with clinically adverse outcomes and the need for subsequent rehabilitation. Judging the point where patients have sufficient respiratory reserve to make the transition to non-invasive ventilation requires considerable expertise and experience.

The process is a very complex and timely one that begins once a patient is deemed ready to wean. There are several options for decreasing support and a plan is developed based on factors including chronic conditions, previous level of function, as well as age. Occupational, physical and speech therapists will also be key support figures in the successful weaning process.

Royal Brompton Hospitals' team of consultants, intensivists, therapists, specialist nurses and support staff provide the very best integrated care programme for patients who require this highly complex treatment.

- For more information visit: *www.rbht.nhs.uk/private-patients*
- Informal medical enquiries may be directed to:

– Professor Michael Polkey *m.polkey@rbht.nhs.uk*

– Dr Jeremy Cordingley, Director of Intensive Care *j.cordingley@rbht.nhs.uk*

Professor Michael Polkey

Carestream launches new tabletop laser imager for general radiology, mammography imaging applications

The new Carestream Dryview 5950 Laser Imaging System produces 508 pixels-per-inch output for general radiology and mammography images.

The new imager can support efficient printing and time-saving film cartridges that can benefit healthcare providers of all sizes across the globe. The Dryview 5950 laser imager also can deliver an enhanced quality control system for mammography images.

This innovative internal quality control system that includes a built-in densitometer will produce test prints and display data needed to support mammography quality control charting – which can eliminate the need for an external densitometer and can greatly reduce the time required for mammography quality control.

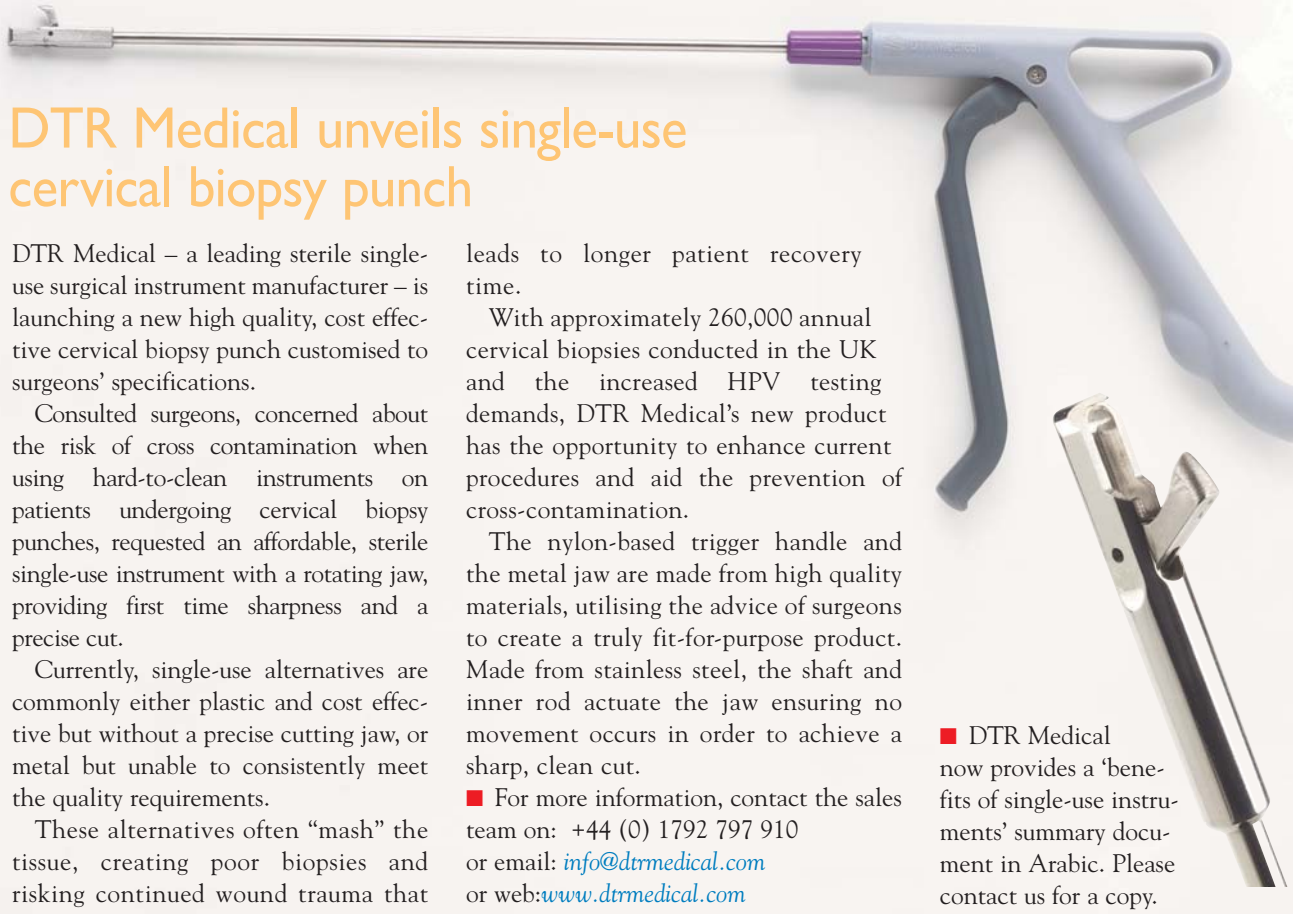
Carestream's imager offers DICOM connectivity and can be used to output images from a PACS network or from any DICOM modality. Carestream's Smart Link remote technology solutions can remotely provide software updates and enables real-time response and analysis of service issues from a remote location.

The Dryview 5950 laser imager will offer two film cartridges on-line and will support five film sizes: 14 x 17 inch (35 x 43 cm), 14 x 14 inch (35 x 35 cm), 11 x 14 inch (28 x 35 cm), 10 x 12 inch (25 x 30 cm) and 8 x 10 inch (20 x 25 cm). Daylight-loading film cartridges make changing sizes fast and easy, and the imager can output up to 110 films per hour for 8 x 10 inch images.

This new imager complements Carestream's family of printers which currently includes: DRYVIEW 6850 Laser Imaging System, Dryview 5850 Laser Imaging System, Dryview 5700 Laser Imaging System and Dryview Chroma Imaging System.

■ For more information, visit: *www.carestream.com*

DTR Medical unveils single-use cervical biopsy punch



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

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

Currently, single-use alternatives are commonly either plastic and cost effective but without a precise cutting jaw, or metal but unable to consistently meet the quality requirements.

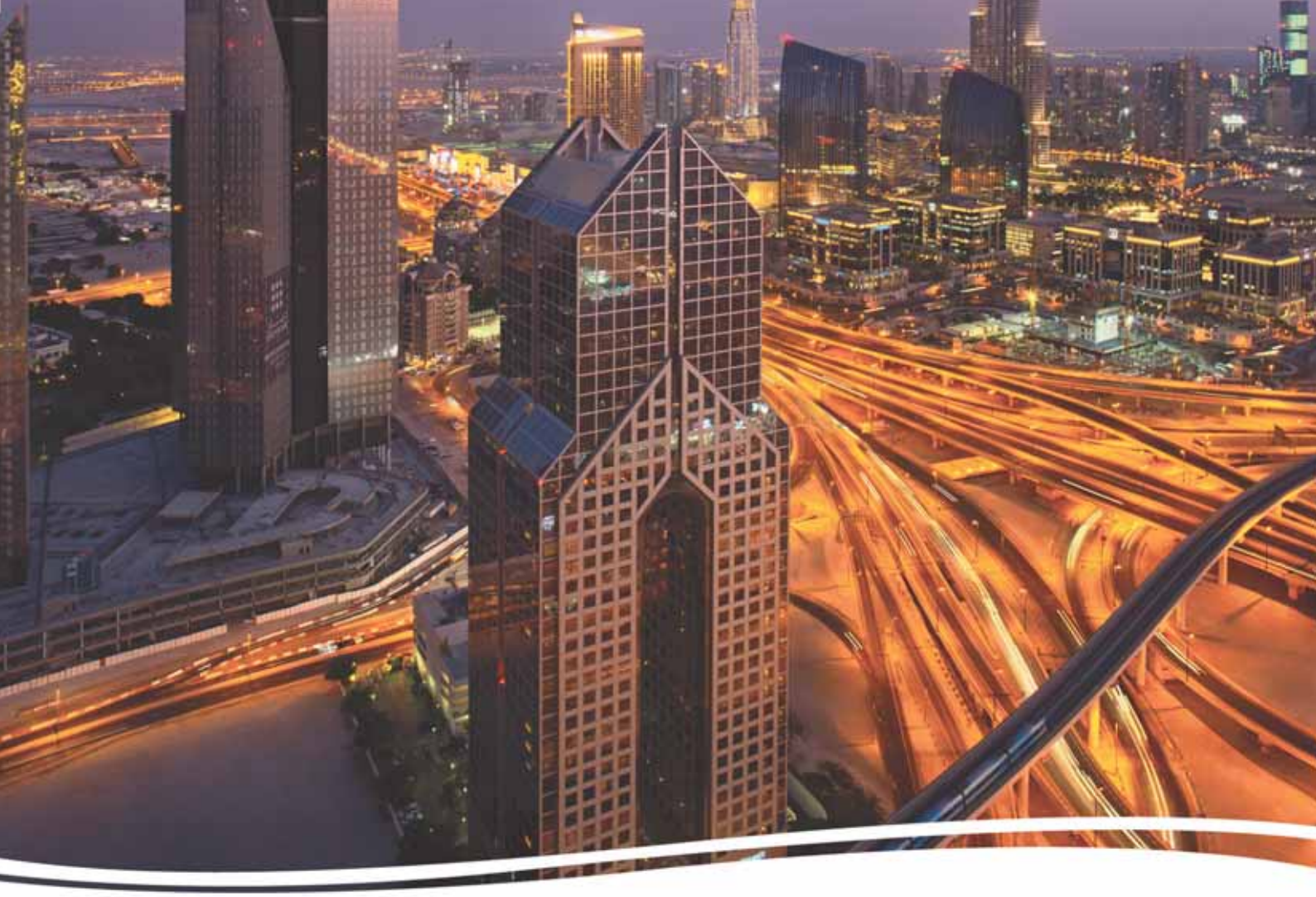
These alternatives often "mash" the tissue, creating poor biopsies and risking continued wound trauma that leads to longer patient recovery time.

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

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

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

■ DTR Medical now provides a 'benefits of single-use instruments' summary document in Arabic. Please contact us for a copy.



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Dusit Thani
DUBAI

On the pulse

Harloff offers low-cost medical carts

Harloff is now offering a low-cost, economically priced line of medical carts: the new V-Series.

V for Value: Value priced medical carts designed for facilities under budget constraints.

A cart for any application (Emergency, Infection Control, Treatment), these carts are competitively priced with the same Harloff quality.

- Tall or short cabinet heights available
- Extended wheel base with projected front casters to prevent tipping
- Seamless painted steel top work surface
- Carts available with break-away lock bar or key lock
- Integrated drawer pull handles
- Full-extension ball-bearing drawer slides
- Five inch full swivel casters, two with brake
- Ships with wheels installed and ready to use
- Twelve year manufacturer's warranty
- Latex free
- Durable, hard-baked powder coat finish

Harloff is a quality manufacturer well known in the medical industry for our storage solutions. We back our products with a 12 year warranty, and we are FDA Certified. Everything is manufactured in the USA, with sales and production under one roof at our facility in beautiful Colorado Springs, CO.

The Harloff brand of products provides secure storage solutions for every department in the hospital, including the ER, OR/Surgery Centers, Infection Control, Pharmacy, Sterile/Central Supply, Orthopedics, Radiology, and patient care.

Harloff has the broadest line of Medical Carts and Cabinets available, and we offer the ability to customize and adapt our carts to meet your needs.

■ For more information visit:
www.harloff.com

Red Bag introduces new tech for on-site processing of bio-hazardous waste

Steam is recognised worldwide as an accepted standard for sterilizing bio-hazardous medical waste. More recently, ozone, a powerful oxidant capable of destroying bacteria and viruses, has been introduced and accepted as a technology capable of sterilizing a broader range of bio-hazardous waste with less energy and water consumption than other technologies, including steam.

Red Bag Solutions (RBS), a manufacturing and waste management services company based in Baltimore, Maryland, USA, offers both steam (SSM) and ozone (OSM) technologies for the on-site processing of medical waste.

SSM and OSM are designed for safe and cost-effective processing of a broad variety of medical waste, including:

- Biological agents and infectious materials,
- Needles, syringes, and disposable surgical instruments,
- Sharps containers and needle boxes,
- Confidential media and proprietary materials,
- Blood products and body fluids,
- Pathogens: bacterial, viral, fungi and other infectious agents,
- Contaminated animal carcasses and animal bedding, and
- Some pharmaceuticals.

With SSM, waste is macerated and particles are simultaneously surrounded by superheated water and steam until sterilization is achieved. With OSM, waste is macerated while particles are surrounded by ozone and ozone-infused water until sterilization is achieved.

After processing, waste is sterile, safe and no longer recognizable as medical waste. Liquids can be discharged into the sanitary sewer. Solids are converted into a confetti-like by-product that can be recycled or disposed of as ordinary municipal trash. Confidential material such as paper, CD's, microfilm and other media is completely destroyed and is no longer recognizable or readable.

Processing is odor-free and no negative air emissions are released. In addition, both systems are more environmentally friendly and less costly to operate than other on-site medical waste processing alternatives.

Both SSM and OSM are easy to install and cost-effective and safe to operate. Units have a smaller footprint than other on-site medical waste processing technologies. Waste volume is reduced by as much as 90%.

Red Bag Solutions offers customizable options to support the acquisition and operation of SSM and OSM equipment.

- For more information visit: *www.redbag.com*
- Contact Red Bag Solutions at: +1-443-524-4245.
- European inquiries: +31(0)88 - 008 03 00

On the pulse

Inditherm launches new neonatal accessory range

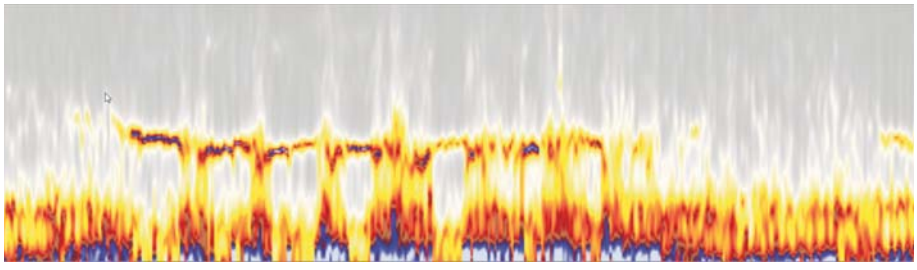
Inditherm Medical, who specialise in patient warming, have launched a range of neonatal accessories to complement their highly successful CosyTherm systems. Designed and constructed to the highest quality the products are effective, fully withstand hospital washing standards and have a cheerful appearance to help create a feeling of normality for parents.

The range includes CosyNest to recreate the boundaries that the newborn has experienced in the womb, constructed to completely encircle the baby, providing a comfortable boundary at head, feet and sides. CosyHood fits to cribs to protect the baby from excess light whilst also reducing exposure to draughts and noise. CosyCover is available to fit a variety of incubators, giving infants protection from light and noise, whilst allowing all-round observation of the patient and access without compromising aseptic techniques, without removal of the cover.

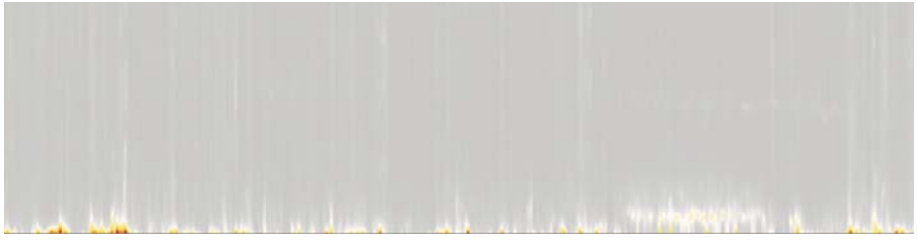
All the accessories come in a range of shapes and sizes.

■ For more information contact Inditherm on: +44 (0)1709 761000
or email: *info@indithermplc.com*

Schiller medilog holter systems – where burnout detection is going to happen



Perfect sleep



Severe autonomic dysfunction

Burnout has become a buzzword. There are a number of self-tests and other methods available to analyse it. But how reliable is this? The criteria are often unclear and the patient's perception differs for the same symptoms.

Therefore Schiller has developed a revolutionary new way of measuring the "Fire of Life".

The time interval between two heartbeats varies from a healthy person from beat to beat. These temporal differences, Heart Rate Variability (HRV), provide information about the exercise and recovery phases of the body and shows how well the person reacts to it. The heart rate itself is continuously adjusted by the autonomic nervous system, the controlling network of the human body.

With Schiller's medilog ECG recorders and the "Fire of Life" software the HRV is analysed and displayed in a new way to help judge the function of the autonomic nervous system. Viewing the "Fire of Life" it can show if therapeutic actions or lifestyle changes are successful in reducing stress and improving recovery. This opens up new diagnostic possibilities.

Perfect sleep Severe autonomic dysfunction

Schiller's HRV (Darwin) provides the best beat to beat measurement available noninvasively and is an ideal tool for screening for autonomic failure, syncope, neuropathy and detailed research into HRV and its associated conditions. It is part of the range of Schiller medilog products which have been used for recording ECG and diagnosing arrhythmias for over 30 years. The latest range of ECG and HRV recorders and software now puts a reliable, affordable and non-invasive screening device and research tool in your hands. So now you can make a difference in treatment and cost.

■ For more information, visit:
www.schiller.ch

ITS BEEN A LONG DAY...DINNER?

LUIGI'S

Chef Luigi always has the freshest Italian dishes your taste buds can desire. If you're looking for something a bit tangier, visit Luigi's for some tasty Pizza and Pasta with an A La Carte menu for dinner.





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Relax and unwind. Our 360 degree view from the 43rd floor is sure to take your breath away. Enjoy a chilly drink on a hot day. Try a refreshing juice to rejuvenate after a long hard work out. Hungry after a swim? We've got that too. We want to make your visit as hassle-free as possible. Isn't that what relaxation is all about?


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Kugel medical provides safety cabinets for the lab

Kugel medical products have the ideal solution to insure laboratories are a safe working environment, especially with the handling and the storage of flammable liquids, solvent and other chemicals.

With the new transportable safety storage cabinets for maximum flexibility and safety Kugel can achieve individual storage requirements of acid and base. Among other innovations are the construction with integrated, transportable base as well as the 2-colour-concept with a choice of 7-door-colours (at no extra cost).

All safety cabinets correspond to the international standards of fire and environment protection.

Kugel also produces laboratory furniture, preparation cabinets, exhaust units as well as several down-draft grossing tables.

- Arab Health booth ZN19.
- For more information visit: *www.kugel-medical.de*

Sysmex innovates automation of urinalysis

Sysmex's UX-2000 answers a longstanding customer wish for greater convenience and automation in urinalysis. Now, a single device incorporates the two most common testing methods in urinalysis. At a single push of a button, this bench-top analyser takes on the complete urine screening process using criteria that you define in line with your needs – to the highest regulatory standards and with high clinical utility and some of the most comprehensive parameters available.

In the UX-2000, Sysmex believes they have addressed all the major challenges in urinalysis: cost, speed, quality, networking and standardisation.

To date, lab staff has always had to run two separate tests: test strips and particle analysis. No longer. Now the UX-2000 offers both test strip analysis for three types of test strip, and particle analysis using Sysmex's world famous fluorescence flow cytometry plus hydrodynamic focusing, now applied in urinalysis.

You can free up significant time for your lab staff to concentrate on other matters. Choose which type of tests you wish to apply. Test for a large number of parameters and eliminate errors associated with the manual testing process. You can also offer the high-quality standardised testing called for by today's extensive legislation.

- For more information, visit: *www.sysmex-mea.com*

Static Systems sustain success with VoIP Nurse Call

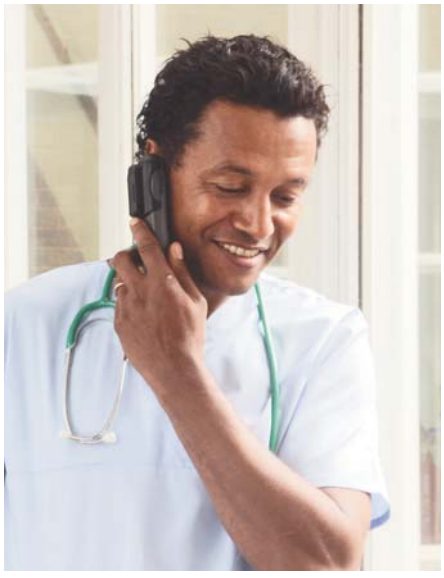
Since introducing VoIP integration into its nurse call systems some five years ago, Static Systems Group (SSG) has established itself as a proven supplier of this technology, including involvement with a number of projects in the Middle East where speech communication has been recognised as an effective means of improving staff efficiency and providing quality patient care.

The platform independent technology underpinning SSG's Fusion-IP system can work with a range of propriety IP telephone systems to network busy medical and surgical wards.

Using industry standard SIP and RTP protocols to achieve speech clarity, the nurse call system is routed to wireless handsets. Medical staff can respond immediately to calls from patients via their personal handsets and either, deal with patients straight away, or grade the call's importance to assess whether the need is less urgent. In effect, the staff handsets become mobile nurse station indicators.

Every nurse call/VoIP installation is tailored to suit each hospital's specific nursing management practices and procedures – an important consideration where nursing and care resources are stretched.

Further, the platform independent nature of Fusion-IP allows many technologies to work seamlessly as one integrated system. Advanced facilities (apps) available include: intelligent, real-time location of staff and patients, remote access to server based information using smartphones and tablets, and patient control of their immediate environment for improved wellbeing.



- Videos demonstrating the Fusion-IP apps are available at: *http://youtube.com/user/staticsystems*
- For more information visit: *www.staticsystems.co.uk*

Novotel World Trade Centre

in the heart of Dubai

Novotel World Trade Centre is centrally located just off Sheikh Zayed Road. The hotel features 412 rooms, including 13 suite rooms, 37 executive rooms, 297 non-smoking rooms on dedicated floors, and 6 special needs rooms. Novotel rooms are modern and comfortable and offer a choice of double or twin beds with a sofa bed, flat screen TV's with over 50 international channels, laptop safe, WIFI and complimentary tea & coffee facilities. Free internet access in the Lobby is offered with the "MAC Corner". Choose from 8 modern meeting rooms all with natural daylight and with maximum seating capacity of 150 people. Novotel has the largest swimming pool in the area, a fully equipped fitness center, massage and treatment rooms, beauty salon and free valet parking. Enjoy the choice of restaurants and bars including international buffet, live Jazz bar, coffee shop and pool side bar. Scheduled complimentary shuttles to all major malls and Jumeirah Beach are provided, and with the convenience of the World Trade Centre Metro Station on our doorstep, allows easy access to explore everything that Dubai has to offer. Novotel World Trade Centre is only 5 minutes away from Dubai Mall and Burj Khalifa, and 20 minutes away from Dubai International Airport Terminals 1&3, making your stay at Novotel the perfect location for business or leisure whilst in Dubai.

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Designed for natural living

Brownmed showcases new arthritis products

Cooler weather often brings along with it an increase in aches and pains in the joints and muscles. For those with arthritis, this is not just an inconvenience, but truly debilitating.

A manufacturer in the United States, already specialising in quality ergonomic and pain relief soft goods, is proud to introduce several new products to help these patients remain compliant and to ease their pain

In 2012 Brownmed introduced Active Gloves, Arthritis Socks, Finger Sleeve and Arm Sling. Active Gloves feature the outstanding comfort of the traditional IMAK Arthritis Gloves, but with unique gripper dots to help those with arthritis grip objects much easier.

Active Gloves have earned the Ease of Use Commendation from the Arthritis Foundation. The Arthritis Foundation programme recognises consumer products designed to be comfortable and effective, as well as easy to use by patients with arthritis. Products earning the commendation undergo rigorous testing at a research facility, including evaluation by a panel of individuals with varying degrees of arthritis. The research process includes both a quantitative and qualitative review that encompasses both the product and the packaging.

"We're pleased to partner with such a respected authority on arthritis," said Ivan E. Brown, CEO of the company. "We believe the collaboration with the Arthritis Foundation will allow us to expose more patients to our products. Improving life is our passion, and this alliance strengthens our ability to realize that mission."

Another new offering, Arthritis Socks, allow the moisture wicking comfort of cotton and spandex – similar to the Arthritis Gloves – for the feet. It allows each toe its own separate warm covering . . . like a pair of gloves for the feet.

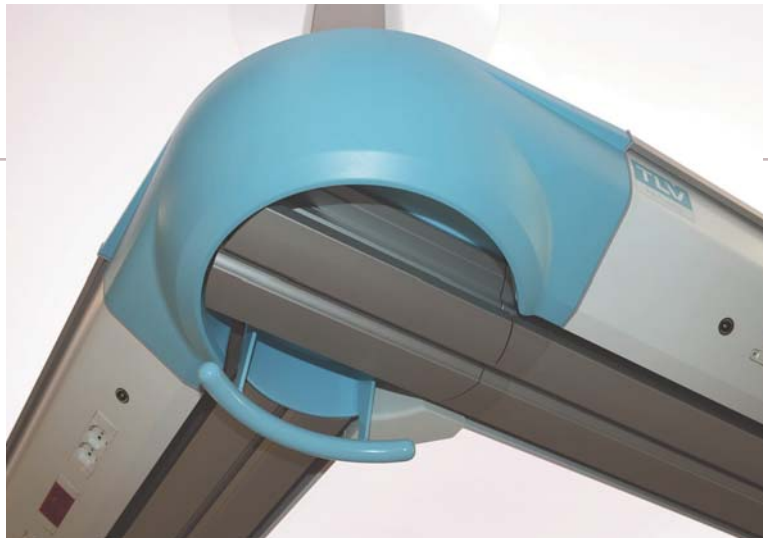
Finger Sleeve can cover a finger joint for warmth, compression and comfort. It features a gel insert which can be chilled for cold therapy, to help reduce swelling.

And the new Arm Sling offers a therapeutic hand exerciser and neck/shoulder comfort pad filled with massaging ergoBeads for gentle, effective therapy.

Brownmed manufactures and markets medical devices worldwide, with production in the United States as well as Asia. It is an ISO 9001:2008-certified facility with offices in Spirit Lake, Iowa, Kansas City, Missouri and Hamburg, Germany.

- For more information, visit: *www.brownmed.com* Or email: *paul.katzfey@brownmed.com*
- The Arthritis Foundation Ease of Use Program *www.arthritis.org*

TLV Healthcare introduces HI-CARE – a new light in the operating room



Many studies have proved that proper lighting influences people's mood. For a few years now working staff in hospitals have been using RGB (red-green-blue) lighting to improve comfort and performance at their work place. With sustainable development, LED has shown the way to low energy consumption when used over long periods, with low maintenance and cost saving factors.

As a worldwide, long term indirect lighting specialist, TLV Healthcare has integrated both these cutting edge technologies in its brand new HI-CARE media bridge to ensure comfort and safety to operating theatre (OT) staff.

For the first time ever, RGB dimmable LEDs, or green LEDs lighting provide efficient vision to anaesthetists, surgeons and their staff to perform their tasks even during minimal invasive surgery or endoscopic procedures.

This is a new concept in patient care - consider better X-ray analysis and a top MIS procedure performed under perfectly tuned green light, or an improved patient preparation to anaesthesia under a cooling red light, or a quicker recovery using a tonic blue and white light between different surgeries… which now is fully integrated all-in-one unit!

HI-CARE is 100% studied and tailor-made in France according to customer specifications, this OT supply system combines indirect lighting, power supplies, communication technology; data transfers interfaces, medical gases and all needed accessories within reach.

Monitoring equipment and biomedical accessories contribute to the highly flexible ergonomics of HI-CARE – its swivelling corners and external and internal rails, and is totally flexible and can be configured in different angles to fit all surgeries.

In order to fight airborne contamination, this unit has been cautiously designed to limit laminar flow supply and air ceiling turbulences thus improving air quality in the working environment. For optimum hygiene, the smooth surfaces and recessed sockets facilitate cleaning and decontamination of the unit.

■ For more information, visit: *www.tlv.fr*

Proviasette frozen biospecimen container comes to the Middle East

Provia Laboratories has expanded the distribution for its unique Proviasette frozen biospecimen container. Under an agreement with ProScan Middle East FZE, the Proviasette will be marketed to hospitals, laboratories, research universities, tissue banking companies and pharmaceutical companies throughout the Gulf Region and elsewhere in the Middle East.

Provia Labs introduced the Proviasette, the next-generation biospecimen storage container, in 2011. The Proviasette improves upon a design used by leading academic and commercial laboratories around the world to efficiently store hundreds of thousands of snap frozen and OCT-embedded biospecimens in -80 degree C or vapour-phase liquid nitrogen (LN2) freezers.

In hundreds of labs worldwide, tissue samples sometimes valued in the thousands of dollars are stored in glass, foil or other makeshift containers. These containers are subject to failure at low temperature, are difficult to label and track, and take up far too much freezer space.

Well-designed and GMP-manufactured, the dual polymer construction of the Proviasette prevents the cap and base from seizing at low temperatures. It is virtually indestructible in a lab setting, and is certified 95kPa compliant. Highly space efficient, the Proviasette enables up to 8,400 samples to fit conveniently into a standard -80 degree C freezer.

■ For more information visit: *www.proviasette.com*

Berchtold's Chromophare F Generation – functional and aesthetic

The new F Generation combines proven reflector technology with the newest LED technology. In specifics: In contrast to other technologies, the light beams are mixed within the light head. Hence they produce light with exceptional spectral qualities. This mixing is achieved using a very flat free-form polygon reflector and total reflection. In doing so, the beam from the LED light source is targeted with help from the reflector in the light head. Up to 420 facets generate more than 650 overlapping beam paths for a homogeneous light beam and glare-free light field. Colour-cast shadows in the surgical field are reduced to a minimum.

Chromophare lights meet the highest demands for design and functionality. A screwless housing with minimal seal ring area, closed shapes with smooth, seamless surfaces and soft, edgeless contours make the lights simple and efficient to clean. The materials of the light head comply with the high hygiene requirements in the operating room.

Another highlight of the F Generation is the interactive multicolour touch panel. All light functions are clearly displayed and visually arranged on the touch screen. It can be fastened to the wall or the light suspension.

■ For more information, visit: *www.berchtold.biz*

CIM med brings carrier arm to Middle East

Hygiene and state-of-the-art design are two critical areas when it comes to furnishing hospitals in the Arab world. And it is why the high quality standards of German manufacturers are much appreciated in the region. So CIM med, the German specialist for carrier arm systems, will again be presenting its solutions at this year's Arab Health trade fair. The event will also be an opportunity to expand and deepen the company's existing relations with local partners.

Mobile and stationary mounts for monitors, keyboards and other medical technology contribute a great deal towards optimizing processes in hospitals. Mounting systems featuring CIM med integrated data and power lines enhance hygiene in operating theaters and protect cables from damage. The mounts are ergonomically designed to facilitate the work of caregivers, allowing them to focus completely on the patients and further avoiding incidents. They are made of eloxized and powder-coated aluminum and are resistant to strong disinfectants and cleaning products. Plus, they fit well in the esthetic conception of a modern hospital.

Speaking to Middle East Heath, Manuela Loibl, General Manager of Germany-based CIM med, said: "The need for medical technology is continuously rising in the Middle East. Demand there is for exceptional materials and quality in terms of both function and design. CIM med, the German specialist for mobile and stationary carrier arm systems, is meeting this demand and thereby steadily expanding its sales in the Arabic region. We were able to double our sales in the Middle East in the last year. In the meantime, the region accounts for 15% of our total turnover.

Khalid Scientific, an important partner of CIM med in the UAE, provided support for our largest project in 2012 in the Arab-speaking region. Khalid Scientific installed monitors at the Hamad Medical Corp hospital in Qatar. To do so they resorted to our high-quality carrier arms with integrated cable management. Other key clients are for example Gulf Drug and Dodhy's in the UAE and Gulf Medical in Saudi Arabia.

"Our growth last year was particularly noticeable in the United Arab Emirates, Saudi Arabia and Qatar. In 2013, we would like to increase our focus on Kuwait, Jordan and Oman."

- Arab Health booth ZM 19.
- For more information, visit: *www.cim-med.com*

Hospira Plum A+ with Hospira MedNet brings innovative IV therapy to the Middle East

With more than 325,000 pumps installed worldwide, the Plum A+ general purpose infusion system remains the proven choice for caregivers and clinicians alike. In the Middle East, demand for the latest IV therapy technologies has made the Plum A+ a perfect fit. The unique, innovative PlumSet cassette technology and time-saving features simplify medication delivery and help to enhance safety for patients, clinicians and caregivers.

The scalable platform can be initially deployed, and later upgraded to include Hospira MedNet safety software to meet your evolving patient care needs. Hospira MedNet safety software wirelessly manages infusion information from each infusion device and facilitates best practices to help reduce medication errors, improve quality of care and deliver cost savings.

Hospira MedNet safety software wirelessly delivers easy to interpret and information-rich reports to help with your complex decisions and support your continuous quality improvement (CQI) efforts. Hospitals in the region that installed the Hospira MedNet platform have quickly seen the benefits.

To help eliminate medication errors, Hospira's IV clinical integration solution connects the pharmacy validated medication order with the IV pump, the patient and the patient's electronic medical record (EMR) to help streamline workflow and improve patient safety while providing measurable financial benefits.

- Arab Health booth: 4G20
- For more information, visit: *www.hospira.com*

The Swingle Tier

What do you get when you have the benefits of the height-adjustable single tier desk combined with the adjustable flexibility of a swing lift platform? You get the 'Swingle Tier', AFC Industries' newest addition to its ergonomic height-adjustable workstations.

The importance of the ergonomic desk has risen in direct correlation to the technological advances occurring today. If you find yourself at a computer terminal for more than four hours per day, you are not only at risk of developing Repetitive Stress Injuries (RSI), but also of shortening your life expectancy.

At AFC Industries, we firmly believe that the ergonomic desk must be designed to allow for the personalisation of user-adjustable heights, tilt and back and arm support. AFC Industries has manufactured the Swingle Tier to address these issues and offer the ultimate in user flexibility and comfort.

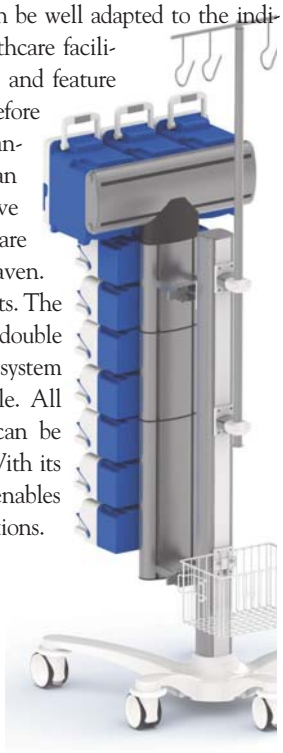
You will appreciate the desks electronic height adjustment settings of 28 to 47 inches (71 – 119cm) from the floor for comfortable sit-to-stand settings; its articulating monitor arms for the ultimate in focal length positioning; and the swing lift keyboard platform with its single hand height and tilt adjustments that makes this unit equally at home in Radiology Reading Rooms, Laboratories, Security and IT installations. Just another way that AFC Industries creates solutions for working environments.

The Swingle Tier name is a trademark owned by AFC Industries.

■ For more information, visit: *www.afcindustries.com*

The CIM Cart series

CIM has met the growing demand for easily adaptable solutions with a series of roll stands. The mobile mounts can be well adapted to the individual needs of clinical personnel and healthcare facilities. They are made of eloxized aluminium and feature integrated cable management. They therefore offer a great deal of flexibility and high standards of hygiene. The devices are easy to clean and resistant to disinfectants. Germs have cannot proliferate anywhere because there are no tangled cables offering them safe haven. Models are available for light or heavy weights. The two models are equipped with high-quality double rollers and are easy to maneuver. A carrier system with component grounding is also available. All CIM med carrier arms and components can be slipped onto the C-profile of the column. With its expanded range of applications, CIM med enables quick and efficient configuration of workstations.



■ Arab Health booth ZM 19.

■ For more information, visit: *www.cim-med.com*

Medical Apps

Compiled by **Jay Franco**

US company invents smartphone thermometer

This is not yet a smartphone App, but the technology is so brilliant we figured we must mention it here. We will soon be able to take our temperatures by using our smartphones. This great innovation follows the recent invention of a non-contact infrared (IR) sensor which can be built into a smartphone or tablet that will accurately measure a patient's temperature in less than one second with no contact with the human body. The California-based company Fraden Corp has recently received a patent for their Fraden Smartphone Sensing Technology and the product is now available for licensing to smartphone manufacturers.

Ideally suited for parents with small children, nurses, doctors, caregivers or anyone that has ever had trouble taking a temperature, the sensor accurately detects infrared signals that naturally emanate from any surface. Just aim the smartphone at the face and it automatically takes the internal body temperature.

A small IR lens is positioned near the camera lens, with no protruding parts, making the device appear identical to existing smartphones. The sensor's wide range, from -30 degrees C (-22 F) to 204 degrees C (400 F), offers broad applications in taking temperatures of not only humans, but also of inanimate objects in the home environment, such as kitchen (cooking and refrigeration), bathroom (baby bath water temperature), school (science class), and industry (automotive and production machinery, chemical processes, energy management, and construction).

- For more details visit *www.fraden.com*

iExaminer captures images from Welch Allyn PanOptic ophthalmoscope

The Welch Allyn iExaminer consists of a hardware adapter and associated software that allows healthcare providers to capture, store, send and retrieve images from the Welch Allyn PanOptic ophthalmoscope using the iPhone 4 or 4S. The PanOptic features patented optical technology that creates a viewing area of the fundus and retinal nerve in an undilated pupil that is 5 times larger than that of a traditional ophthalmoscope and increases magnification by 26% to more easily see retinal details. The iExaminer rapidly captures and transmits the retinal images created by the PanOptic for easy, cost-effective eyeground image documentation.

The iExaminer is available on iTunes App store and is currently pending 510(k) clearance from the US FDA.

The iExaminer mount and PanOptic Ophthalmoscope is available from an authorised Welch Allyn distributor.

- For more information, visit: *www.welchallyn.com/iexaminer*
- Price: US$29.99

View DICOM images on your iPad

The iPaxera is an easy to use PACS application specifically designed for viewing and navigating DICOM studies with an iPad, iPhone or iPod.

iPaxera is the only application that permits the radiologists to retrieve their studies from local folders, PACS or the PaxeraView workstation and do the diagnosis remotely and then dictate or write the report via the embedded reporting tool and send it by email or save it with the study.

Some of the key features include Query /Retrieve DICOM studies with any PACS system; a reporting tool to write or dictate reports and send via email; display and navigate through images by interactive slider, zoom, pan, rotation and distance measurement through two-fingers drag and pinch; change window width / window level through single finger drag; and reset to default image through double tapping.

- For more information, visit: *www.paxeramed.com/ipaxera*
- Price: US$9.99

Mayo apps enable access to clinical lab expertise

Mayo Medical Laboratories recently introduced two comprehensive mobile applications for iPhones and iPads, allowing physicians and pathologists unparalleled access to clinical laboratory expertise from Mayo Clinic.

The Lab Catalog app provides guidance on test selection and result interpretation, enabling physicians to search for tests by disease, test name or test ID. In addition to test information, the app provides direct access to educational resources such as videos, articles and testing algorithms.

The Lab Reference app provides users with quick access to reference values, uses, method names, cautions, testing algorithms, and clinical and interpretive information for each test.

The applications are optimised for each device's screen size. The applications also will work offline and automatically update once a mobile connection becomes available.

- For more information, visit: *www.mayomedicallaboratories.com/apps*
- Price: Free

iOS Apps are available for download from the App Store. Android Apps are available for download from the Android Market

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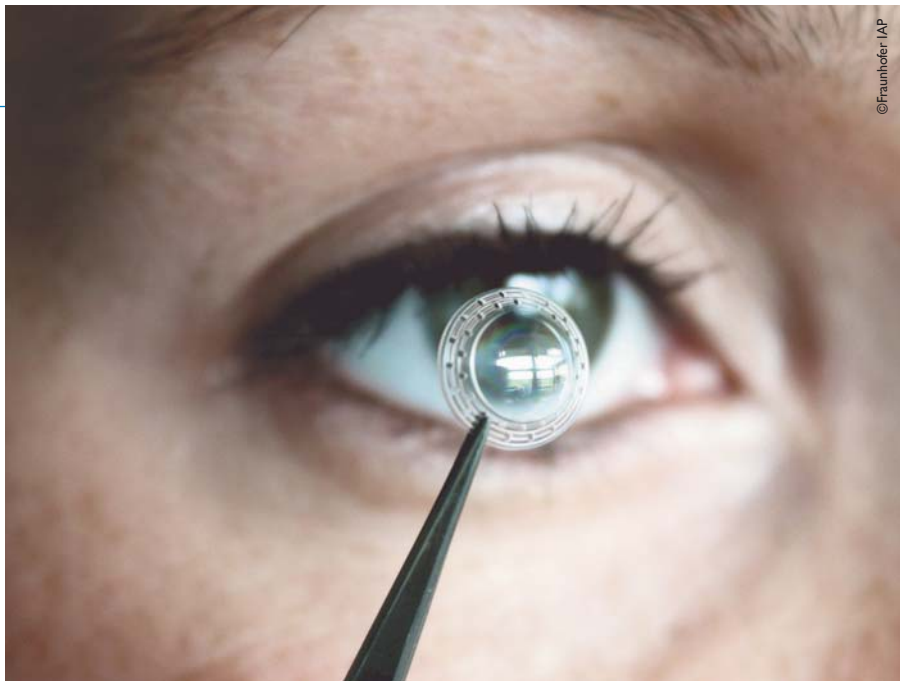
Artificial cornea implant



ArtCornea is easy to implant. This artificial cornea does not trigger any immune reactions.

Blindness is often caused by corneal diseases. The established treatment is a corneal transplant, but in many cases this is not possible and donor corneas are often hard to come by. Reseachers in Germany have developed an artificial cornea which has proved effective in initial tests and could in future make up for this deficiency and save the vision of those affected. *Middle East Health* reports.

Our eyes are our window to the world. Thousands of people have lost their eyesight due to damages to the cornea, such as trauma, absent limbal stem cells or diseases. Transplantation of a donor cornea is the therapy of choice for a great number of those patients. Let alone the issue of scarce donor material, a sub-group of patients do not tolerate transplanted corneas, necessitating the employment of an alternative means of restoring eye sight. In Germany alone, around 7,000 patients are waiting to be treated. In close cooperation with the Aachen Centre of Technology Transfer, Germany, Dr Joachim Storsberg and his team from the Fraunhofer Institute for Applied Polymer research IAP in Potsdam, Germany, are attempting to improve the situation by developing an artificial cornea.

"We are in the process of developing two different types of artificial corneas. One of them can be used as an alternative to a donor cornea in cases where the patient would not tolerate a donor cornea, let alone the issue of donor material shortage," says IAP project manager Dr Storsberg.

The scientist has considerable expertise in developing and testing of next-generation biomaterials. Between 2005 and 2009 he collaborated with interdisciplinary teams and private companies to successfully develop an artificial cornea specifically for patients whose cornea had become clouded – a condition that is extremely difficult to treat. Such patients are unable to accept a donor cornea either due to their illness or because they have already been through several unsuccessful transplantation attempts. Dr Storsberg was awarded the Josef-von-Fraunhofer Prize 2010 for this achievement.

"A great many patients suffering from a range of conditions will be able to benefit from our new implant, which we've named 'ArtCornea'," says Storsberg, adding: "We have already registered ArtCornea as a trademark."

Patients regain vision

ArtCornea is based on a polymer with high water-absorbent properties. Dr Storsberg and his team have added a new surface coating to ensure anchorage in host tissue and functionality of the optic. The haptic edge was chemically altered to encourage local cell growth. These cells graft to the surrounding human tissue, which is essential for anchorage of the device in the host tissue. The researchers aimed to enlarge the optical surface area of the implant in order to improve light penetration beyond what had previously been possible – a tall order.

"Once ArtCornea is in place, it is hardly visible, except perhaps for a few stitches. It's also easy to implant and doesn't provoke any immune response," says Storsberg.

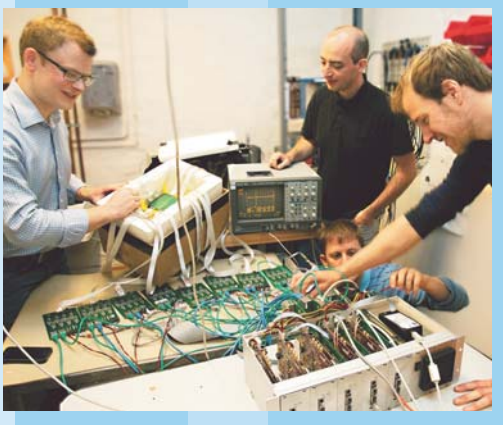
The scientists have also managed to make a chemically and biologically inert base material biologically compatible for the second artificial cornea, ACTO-TexKpro. Dr Storsberg achieved this by selectively altering the base material, polyvinylidene difluoride, by coating the fluoride synthetic tissue with a reactive molecule. This allows the patient's cornea to bond together naturally with the edge of the implant, while the implant's inner optics, made of silicon, remain free of cells and clear. The ACTO-TexKpro is particularly suitable as a preliminary treatment, for instance if the cornea has been destroyed as a consequence of chronic inflammation, a serious accident, corrosion or burns.

The experiments were carried out in collaboration with Dr Norbert Nass and Dr Saadettin Sel, senior consultant ophthalmologist at Martin-Luther-University Halle-Wittenberg. How well TexKpro and ArtCornea are accepted by clinicians as an additional tool at their disposal was first tested by the doctors in the laboratory and thereafter in vivo in several rabbits. After a six month healing process, the implanted prostheses were accepted by the rabbits without irritation, clearly and securely anchored within the eye. Tests carried out following the operation showed that the animals tolerated the artificial cornea well. Prof Dr Norbert Schrage will take charge of clinical trials that will soon commence at the Eye Clinic Cologne-Merheim. MEH

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date	Contact
FEBRUARY 2013		
UAE International Dental Conference & Arab Dental Exhibition	5 – 7 February, 2013 Dubai, UAE	Index Conferences www.aeedc.com
Emirates Surgical Pathology Conference 2013	7 – 9 February, 2013 Abu Dhabi, UAE	www.espc2013.com/index
International Conference on Drug Discovery & Therapy	18 – 21 February, 2013 Dubai, UAE	Eureka Science Limited www.icddt.com
8th International Breast Cancer Congress	20 – 22 February, 2013 Iran, Tehran	www.crc.ir
2nd American Society for Nutrition Middle East Congress (ASNME 2013)	20 – 22 February, 2013 Dubai, UAE	www.asnme.org
MARCH 2013		
6th Dubai Anaesthesia 2013	7 – 9 March, 2013 Dubai, UAE	www.dubaianaesthesia.com
Arab Lab – The Expo	10 – 13 March, 2013 Dubai, UAE	www.arablab.com
Dubai Pharmaceuticals & Technologies Exhibition (DUPHAT)	19 – 21 March, 2013	www.duphat.ae Dubai, UAE
OBS-GYNE Exhibition & Congress	31 March – 2 April, 2013 Dubai, UAE	IIR Middle East www.iirme.com
Altitude Training & Team Sports	24 – 25 March, 2013 Doha, Qatar	Dayanah Cheikh www.aspetar.com/Events.aspx



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date	Contact
APRIL 2013		
MEDEXPO Saudi Arabia 2013	6 – 8 April, 2013 Jeddah, KSA	medexpo@dmgeventsme.com www.medexposaudi.com
Cardio Arab 2013	11 – 13 April, 2013 Dubai, UAE	info@egyicc.com www.ahc2013.com
MEDiCONEX Cairo Health 2013	13 – 15 April, 2013 Cairo, Egypt	info@mediconex.com www.mediconex.com
Dubai Derma	16 – 18 April, 2013 Dubai, UAE	www.index.ae/events.aspx
5th International Congress of the Jordanian Society of Fertility & Genetics	24 – 26 April, 2013	www.fertigen.com.jo Amman, Jordan
MAY 2013		
EgyMedica 2013	9 – 11 May, 2013 Cairo, Egypt	marketing@egymedica.com www.egymedica.com
EgyHospital Build	9 – 11 May, 2013 Cairo, Egypt	marketing@egymedica.com www.egymedica.com
SaudiHealth 2013	12 – 14 May, 2013 Riyadh, KSA	info@saudihealthexhibition.com www.saudihealthexhibition.com
JUNE 2013		
M+Health	3 – 5 June, 2013 Dubai, UAE	www.mplushealth.com
Hospital Health Middle East	3 – 5 June, 2013 Dubai, UAE	www.hospitalbuild-me.com

List your conference:

If you have upcoming conference/exhibition details which you would like to list in the agenda, please email the details to the editor: *editor@MiddleEastHealthMag.com*

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