

Middle East HEALTH

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January–February 2017

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Can LVADs regenerate heart muscle?

Researchers start trials to find out

MENA Heart Failure Alliance

Regional experts set out priorities to tackle CVD

German healthcare

Hamburg – a leading destination for complex medical treatment

Hope for paraplegics

Neural prosthetic used to restore walking in paralyzed primate

In the News:

- First HIV vaccine efficacy study
- Doctors' burnout an organisation-wide problem
- Platypus venom could hold key to diabetes treatment
- Initiative launched to track progress on health and climate change



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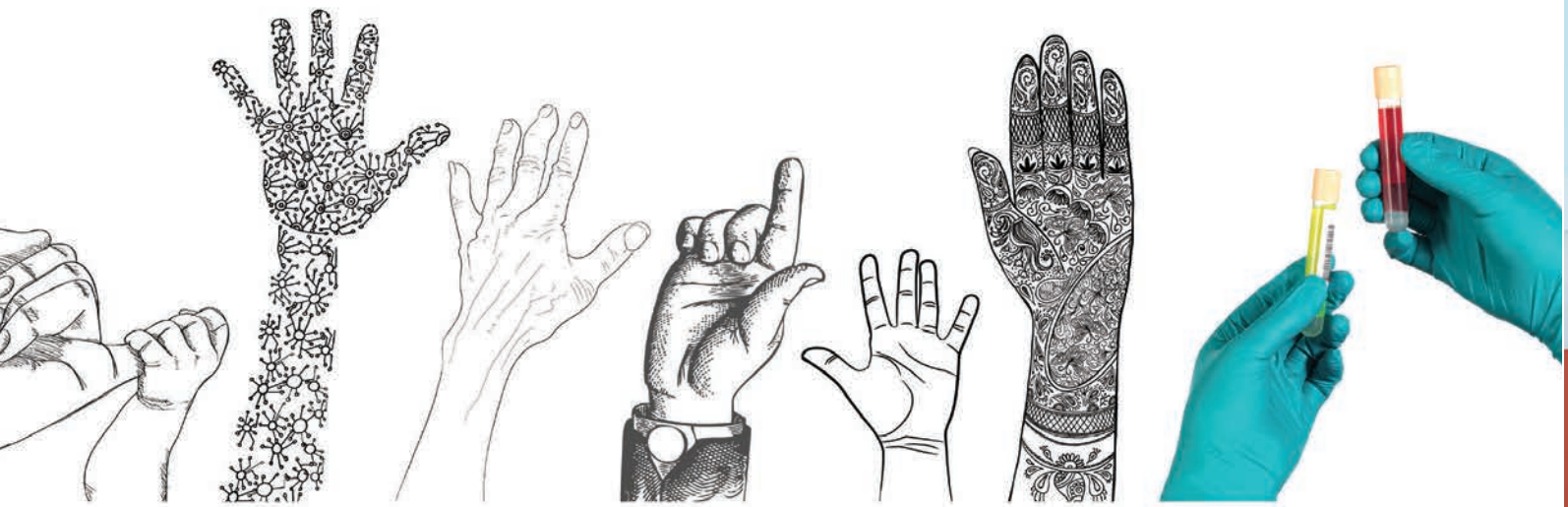
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Prognosis

German expertise

Patients from the Middle East have been travelling to Germany for decades to receive treatment for complex medical problems. To find out why these patients travel to Germany for treatment, *Middle East Health* visited this powerhouse of Europe. We toured leading hospitals in Hamburg and Berlin, hospitals that cater to so-called 'International Patients', particularly those from the Arab world. We were shown advanced robotic exoskeletons used in ambulatory rehabilitation, cutting-edge cath labs, innovative hospital design and luxury patient rooms. We spoke to doctors and professors, all leaders in their fields of cardiology, oncology, endocrinology and obstetrics and gynaecology, among others. The world-leading reputation of German healthcare is undeniable, but meeting the doctors and seeing the advanced technology and ultra-modern facilities first-hand leaves a clear impression of why this country is so attractive to international patients. Read part one of our report in this issue.

Regional experts and policy makers met recently to set out priorities to tackle heart disease, one of biggest causes of mortality and morbidity. We report on the establishment of the MENA Heart Failure Alliance, which aims to raise public, patient and professional awareness and develop comprehensive national strategies to better understand, prevent and treat the disease in the region.

At the time of going to press, the evacuation of Aleppo was underway which will finally provide some relief for the many thousands of people and the few remaining doctors who have been trapped in the eastern part of city. The experiences of the survivors have been grim, to say the least. The doctors have been truly heroic. We publish a harrowing first-hand account from a doctor working in Aleppo during the bombing campaign.

In healthcare news, there have been several interesting developments. A new HIV vaccine has started efficacy trials and raises the promise of a potential preventive measure against this devastating disease. New research shows that the Zika virus replicates and persists in foetal brains and placentas, which can cause devastating birth defects, while the pregnant mother experiences only minor illness. In a world first that provides some hope for a viable treatment for paraplegia, scientists have used a neural prosthesis to enable a pair paralyzed rhesus monkeys to walk again.

From the team at *Middle East Health* – we wish you a prosperous and healthy 2017.

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Middle East Health is published by Hurst Publishing FZE,
Creative City Fujairah, Licence Number: 3910/2013 FBCC.

UAE National Media Council - Approval Number: 2207

Middle East Health website

www.MiddleEastHealthMag.com



Middle East Health is printed by Atlas Printing Press.
www.atlasgroupme.com



56

NEWS

- 12 Middle East Monitor
- 18 Worldwide Monitor
- 24 The Laboratory

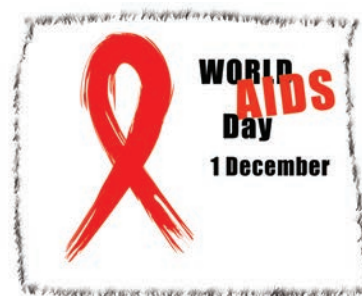
NEWS FEATURES

- 30 HIV-AIDS Update
- 32 Zika Virus Update
- 36 Yemen Update
- 38 Syria Update
- 64 Health Security
- 66 Big data can be used to predict disease outbreaks
- 68 Internet of 'healthcare' Things
- 90 Neural prosthesis used to restore walking in paralysed primate

FOCUS

- 42 **Cardiology:** MENA Heart Alliance
- 46 **Cardiology:** Can mechanical pump regenerate heart muscle
- 56 **German healthcare:** Hamburg – a leading destination for complex treatment
- 98 **Imaging – CT:** New scanners from Philips, GE and Carestream

30



36



38



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42

INTERVIEWS

- 70 Cathy Easter – On knowledge sharing
- 74 Dr Mothaffar Fahed Rimawi – On breast cancer

COLUMNS

- 94 Durbin
- 96 Beyond Borders
- 97 Roche

BACK PAGES

- 104 On the Pulse
- 110 The Back Page
- 111 Agenda



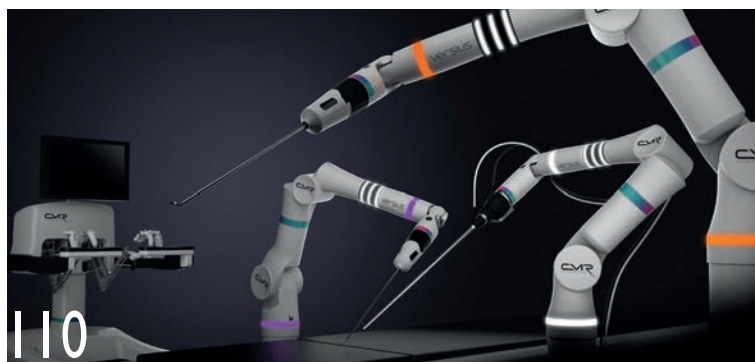
46



96



102



110



88



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When an international academic center approached the University of Chicago Medicine (UCM) for guidance, we sent a multidisciplinary team of experts to advise the hospital on how to improve its health care service delivery, operations and training programs. Katherine Pakieser-Reed, PhD, RN, executive director of the Center for Nursing Professional Practice and Research, reviewed the institution's nursing practices and provided a set of recommendations that included operational improvements as well as customized training programs in areas such as preventing pressure ulcers. Gary Lennon, UCM's director of Supply Chain Performance and Analytics, brought to the project his business savvy on how to contain costs and improve efficiency in the management of materials and supplies. And Dr. Aasim Padela, an Emergency Medicine faculty member, reviewed the hospital's Emergency Department operations and educational programs and suggested improvements in clinical care processes and residency and fellowship training.

These are just three of the many experts from the University of Chicago Medicine who are now supporting new and existing hospitals around the globe. They are the same men and woman who work every day in our "hospital of the future," the Center for Care and Discovery, a new 10-story facility at the heart of the University of Chicago medical campus. An architectural and technological tour de force, our new hospital provides a home for complex specialty care with a focus on cancer, gastrointestinal disease, neuroscience, advanced surgery and high-technology medical imaging.

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middle east monitor

Update from around the region



This NASA image from space taken 9 November 2016 shows Tehran shrouded in smog – the grey colour over the city indicated in the photo.

Air pollution kills more than 400 in Tehran in November

Although smog is a common occurrence in Tehran in November, this year it reached record levels resulting in the deaths of more than 400 people.

Habib Kashani, a member of Tehran’s municipal council, was quoted by the state news agency, Irna on 15 November as saying that air pollution in Tehran had led to the death of 412 citizens in 23 days. City authorities closed all schools mid-November because of the heavy air pollution.

Fine airborne particles climbed to concentrations of more than 150 micrograms per cubic metre; concentrations between 101 and 150 are considered unhealthy for sensitive groups, including the elderly and children.

The main sources of air pollution in the city are from fumes produced by cars, trucks, and motorcycles.

Tehran is particularly prone to smog at this time of year because in the winter, temperature inversions exacerbate Tehran’s smog. A layer of warmer air traps the colder, denser, smog-laden air beneath it, while mountains around the city prevent smog from leaving the valley.

Middle East Arthritis Foundation launches first UAE Support Group

The Middle East Arthritis Foundation launched its first support group for those

suffering from Ankylosing Spondylitis in the UAE on 17 December. The meeting at the JW Marriott, Marquis, Business Bay, Dubai, aimed to help affected patients and their families cope with the disease, and to create awareness to aid early diagnosis.

Headed by Specialist Rheumatologist, Dr Ghita Harifi, the group will provide a platform for support, medical advice and treatments, and education of various elements associated

with Ankylosing Spondylitis. The disease is the most common form of Spondyloarthropathy – an umbrella term for inflammatory diseases that involve mainly the spine. It often has some particularities that make it difficult to diagnose, making it trickier to manage effectively.

“Back pain is a very common complaint amongst the general population, but many don’t think much more of it than that,” says Dr Harifi. “When it starts before the age of 40, or when it lasts for more than three months, and is associated with morning stiffness or relieved by movement, it may be related to Ankylosing Spondylitis. We don’t know exactly the prevalence of this disease in the Middle East, but it is probably under diagnosed.”

A blood test for the HLA-B27 gene can be done to help confirm a suspected diagnosis of the disease, although this is not an accurate finding as some people who have the gene may never develop arthritis. A consultation with a rheumatologist can help to accurately diagnose patients.

Although statistics specific to the Middle East are lacking, the prevalence of the disease in the United States is 1% of adults, or an estimated 2.7 million people male-to-female ratio is 4-1.

“We launched this support group because there is currently a vast lack of understanding about Spondyloarthropathy, coupled with the fact that it is tricky to diagnose. We hope that this event will create awareness about the disease, not only among the

public, but also among GPs, orthopedic doctors, and other medical professionals. This will help in ensuring that it can be diagnosed as early as possible, and affected patients can be put on the right course of treatment from the onset,” adds Dr Harifi.

Burjeel Hospital Abu Dhabi opens Pediatric Clinic in Emergency Department

Burjeel Hospital, one of Abu Dhabi’s leading tertiary care facilities, opened a new Pediatric Clinic in its Emergency Department on 1 December. This initiative reflects the hospital’s commitment to providing quality family-centred healthcare and prioritizing the healthcare needs of children. The clinic and medical staff on call will ensure young patients coming into the Emergency Department receive treatment immediately.

Dr Nabil Debouni, Medical Director, Burjeel Hospital Abu Dhabi, said: “At Burjeel Hospital we are dedicated to serving every member of the community, including our ‘little guests’. Children are at the foundation of a healthy society and caring for them is not just our priority it’s our steadfast commitment. This clinic will go a long way in helping families cope with attending to the healthcare concerns of their children without any delay. Burjeel Hospital’s team of skilled and experienced doctors is well trained to respond to any health emergencies that children may encounter. We constantly strive to provide the best medical care to individuals and families in the UAE and surrounding regions, while providing our signature ‘art of healing’.”

Cleveland Clinic Abu Dhabi achieves top HIMSS benchmark for EMR

Cleveland Clinic Abu Dhabi has achieved the HIMSS Analytics Electronic Medical Record Adoption ModelSM (EMRAMSM) Stage 7, an international benchmark for the use of advanced IT to improve patient care.

Cleveland Clinic Abu Dhabi is the first UAE healthcare facility, and only the second in the GCC, to achieve EMRAMSM Stage 7.

HIMSS Analytics developed the EMRAMSM in 2005 as a methodology for

evaluating the progress and impact of electronic medical record systems for hospitals in the HIMSS Analytics Database. There are eight stages (0 – 7) that measure a hospital's implementation and utilization of information technology applications. The final stage, Stage 7, represents the most advanced patient record environment. Only 4.5% of hospitals in the US, and just ten hospitals outside the US, have reached HIMSS Stage 7 designation.

The validation process to confirm a hospital has reached Stage 7 includes twelve months of data collection and a site visit by an executive from HIMSS Analytics and independent former or current chief information officers from Stage 7 hospitals to ensure an unbiased evaluation. HIMSS Stage 7 environments demonstrate the adoption of technology and analytics to ensure enhanced patient safety, reduced medical errors, superior clinical outcomes, improved reimbursements and informed decision making.

Dr Tomislav Mihaljevic, Chief Executive Officer, Cleveland Clinic Abu Dhabi, said: "We are honored to be the first hospital in the UAE to achieve HIMSS Stage 7 designation. In doing so, we are helping to raise the standard for innovative care in Abu Dhabi and the Gulf region. Achieving HIMSS Stage 7 not only allows us to use the latest IT solutions to enhance the patient experience today, but also establish a data-driven culture that allows us to continuously improve and better serve our patients and the community in the years to come."

Cleveland Clinic Abu Dhabi set out with the vision to support the delivery of world-class healthcare by establishing integrated hospital IT operations. They referenced US-based Cleveland Clinic's best practices for clinical content and clinical outcomes, and developed an electronic medical record system that is highly integrated with ancillary clinical systems to enable:

- Capability to share data with external registries to track international quality and patient safety measures
- Tracking of core patient safety measures such as AMI (Acute Myocardial Infarction), Heart failure and VTE (Venous Thromboembolism Prophylaxis)

- Seamless Computerized Physician Order Entry (CPOE) across multiple systems
- Real-time connectivity with US-based Cleveland Clinic for 24/7 monitoring of conditions such as epilepsy and sleep disorders

3 US scientists top list of winners for Hamdan Medical Award

Three American scientists topped the list of winners of International Awards given by the Sheikh Hamdan bin Rashid al Maktoum Award for Medical Sciences in December with a total value of AED450,000.

HH Sheikh Hamdan bin Rashid al Maktoum, Deputy Ruler of Dubai, the UAE Minister of Finance and the Patron of the Award, honoured the three winners in a prestigious ceremony in Dubai, the UAE on 14 December, alongside 12 personalities and organizations from the UK, France, Australia, United Arab Emirates, Saudi Arabia, and Morocco.

Prof Harvey J Alter, NIH Distinguished Investigator, Transfusion Medicine Department, NIH Clinical Center, USA, won the Grand Hamdan International Award for the topic of Gastroenterology. Professor Alter's outstanding achievements and discoveries were recognized worldwide and have contributed to curing and saving the lives of many patients throughout the world. He was the principal investigator of studies that identified non-A, non-B hepatitis, now called hepatitis C. His fundamental discoveries with his colleagues have resulted in major medical advances through ongoing molecular biological and immunological studies aiming to uncover the determinants of viral clearance, persistence and disease pathogenesis. These results shaped the understanding of hepatitis C and was the starting point to find new therapies and vaccines.

Prof Alter also co-discovered the Australia antigen, which is key to detecting hepatitis B virus. His work was instrumental in providing the scientific basis for instituting blood donor screening programs. Currently, he continues to study the infectious risks of blood transfusion, but now focuses on agents other than hepatitis viruses.



Professor David Tuveson



Professor Harvey J Alter



Professor Sanford Markowitz

Prof Sanford Markowitz, Case Western Reserve University, School of Medicine, Cleveland, Ohio, USA was announced the winner of the Hamdan International Award for Medical Research Excellence for the topic of Colon Disorders.

Prof Markowitz is the holder of Mar-



kowitz-Ingalls Professorship of Cancer Genetics at the Case Western Reserve University School of Medicine, and a medical oncologist and colon cancer researcher who is internationally recognized for his discovery of two key colon cancer tumour suppressor genes, TGF-beta RII and 15-PGDH. His work explained why individuals with Lynch syndrome develop familial colon cancer—they are born with a molecular defect that leads to rapid inactivation of a certain tumour suppressor gene. Additionally, he uncovered the reason as to why aspirin prevents colon cancers in some individuals but not others.

Prof David Tuveson, Deputy Director of the Cold Spring Harbor, Laboratory Cancer Centre, New York, USA, won the Hamdan International Award for Medical Research Excellence, for the topic of Pancreatic Diseases.

Prof Tuveson unravelled a number of signalling pathways that play a major role in developing pancreatic cancer. These pathways, and their components, are considered excellent therapeutic targets. Importantly, his work resulted in the discovery of numerous cellular proteins that are linked to this type of cancer, and that these proteins can be used as biomarkers for early detection. His laboratory at Cambridge established a preclinical therapeutic initiative to evaluate potential chemoprevention and intervention strategies for pancreatic cancer.

Prof Tuveson is currently working on designing new model systems for pancreatic cancer and inventing new therapeutic and diagnostic platforms for rapid evaluation in preclinical and clinical settings. His approach is based on the tenants of individualized medicine, as he tests the drugs on specific model organisms for pancreatic and malignant tissues in order to evaluate therapeutic responses in patients.

UAE's first specialist unit set up to help those with eating disorders

Eating disorders have become a growing concern in the Middle-Eastern community. Though the exact cause is unknown, it is generally believed that a variety of factors including genetics, environmental, cultural and psychosocial aspects contrib-

ute to the development of this illness.

Anorexia nervosa, bulimia, and overeating disorders can have numerous symptoms such as adherence to increasingly strict diets, regardless of weight; secretly bingeing on large quantities of food; increase in consumption of laxatives or diet pills and exercising extensively, often several hours per day

Committed to educating, preventing and assisting those in need, the American Center for Psychiatry and Neurology has launched the first specialized comprehensive evidence-based eating disorders outpatient service in the country. Available in both Abu Dhabi and Dubai branches, this is the first facility to offer an effective solution for patients living in the Middle East that wish to receive treatment without having to leave their environment.

Carine El Khazen Hadati, Clinical Psychologist, Eating Disorders Practitioner and the Director of Eating Disorder Program at American Center for Psychiatry and Neurology, said: "With our regular and intensive outpatient programme offering medical, nutritional, psychological and psychiatric care, we will be able to treat any type of eating disorders whether mild or severe. The introduction of this programme offers patients an affordable and effective treatment option to those who are unable to travel. It also dismisses sufferers from having to travel abroad to attend in-patient specialized care while having to deal with separation from loved ones, adaptation to a new environment, stigma and financial cost – that will have detrimental repercussions on the overall prognosis."

Jordanian innovator dedicates Stars of Science victory to cancer victims

The winner of Qatar Foundation's (QF) *Stars of Science* (SOS) TV show dedicated his victory in season eight of the programme to all the lives that have been lost to cancer and to those currently in treatment.

Medical researcher Sadeem Qdaisat was named the Arab world's top innovator in the finale of *Stars of Science* on MBC4 on 19 November. Sadeem said he is hugely grateful for the level of support he received



Stars of Science Season 8 winner Sadeem Qdaisat of Jordan (second from right) reacts as the final result is revealed.

from QF throughout the programme, and in particular from specialists at Sidra Medical and Research Center (Sidra) and Hamad Medical Corporation (HMC).

Sadeem's winning innovation, 'GenomiQ', which aims to eliminate human error and significantly cut down on the time needed to test genetic samples through an automated process, earned him a winning score of 36.8% in a combined jury and public vote, and a prize of \$300,000 in seed funding.

"This means we're ready to help cancer patients; to ease their pain and to provide them with better results," said the 28-year-old PhD candidate from Jordan. "I'm dedicating this win to all the lives that have been lost to cancer, and I promise to continue to fight for everyone still in treatment and with diagnoses."

Since 2009, *Stars of Science* has served as a platform for young people across the Arab region and beyond to solve regional problems, supported by the resources of QF's Qatar Science & Technology Park (QTSP) and many other prominent institutions within Qatar.

Sadeem, who first presented his automated genetic testing idea in SOS season six, said: "Qatar came up time and again as a go-to destination for innovation support when I began looking for mentoring and backing." The young scientist said he has been hugely impressed by the "can-do" at-



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titude at QF, and said he feels particularly grateful to Her Excellency Sheikha Hind bint Hamad Al Thani, Vice Chairperson and CEO, QF, whom he met with other SOS finalists and alumni in the run-up to the show's finale.

"You can tell, from the very senior figures at QF right through the organisation, that their sole purpose is to help communities, and that they're prepared to go that extra mile to ensure they achieve this. You just don't see that anywhere else."

The young entrepreneur said he had always wanted 'GenomiQ' to be an Arab invention, supported by companies and institutions in the Middle East. "My ambition now is to build five devices and get them into hospitals in the Middle East, Europe and the US. I've been approached by a lot of companies, and the affiliation with Qatar Foundation has opened many doors for me. Developing a prototype like this is about connecting with people who believe in the idea, and QF has helped enormously in this area."

Following his win, Sadeem sent a message of encouragement to all young people watching: "You are the future of our region and our world. Have confidence in your abilities, don't be afraid to take the road less travelled, believe in the power of education and seize any opportunity you have to make your dream a reality."

National Reference Laboratory gets CAP accreditation

The National Reference Laboratory (NRL) in Abu Dhabi, in November announced that with a total of six CAP-accredited laboratories in its network, it is now the largest, referral CAP-accredited laboratory network in the Middle East.

Clinical laboratory testing is an essential part in the delivery of quality healthcare with 70-80% of medical decisions made based on tests ordered to diagnose, treat, manage, and monitor a patient's condition. This latest recognition of NRL's services ensures that the region has even wider access to the highest quality testing, tailored to the specific healthcare needs of the region.

NRL was created in 2010 by Mubadala in partnership with and managed by Labo-

ratory Corporation of America Holdings (LabCorp), the world's leading healthcare diagnostics company and operator of one of the world's largest and most experienced clinical laboratory networks. Together with the significant resources of LabCorp, NRL offers a comprehensive menu of more than 4,700 tests, providing a complete solution for all clinical testing needs. LabCorp's support has allowed NRL to quickly become a UAE and regional leader, and to establish a strong reputation as a quality-driven and patient-centered laboratory.

The latest sites in NRL's network to receive the prestigious CAP-accreditation, following an onsite inspection of their policies and procedures, are the laboratories of Imperial College London Diabetes Centre, in Abu Dhabi and Al Ain. These laboratories allow the patients of the Centre to get diagnosed within an hour, as well as receive personalized treatment and management plans that significantly contribute to the effectiveness and attractiveness of the Centre as a diabetes hub for the region.

The CAP Laboratory Accreditation programme is a worldwide leader in laboratory quality assurance, serving as the gold standard in laboratory accreditation for more than 50 years. "Achieving CAP accreditation is a critical part of the commitment to provide the highest quality laboratory services for patients," said Bharati Jhaveri, MD, FCAP, Chair of the College of American Pathologists' (CAP) Council on Accreditation.

"The laboratories of NRL at Imperial College London Diabetes Centre Abu Dhabi and Al Ain, met all of the requirements for CAP accreditation, demonstrating the rigorous application of the highest standards in laboratory medicine. We congratulate NRL on its commitment and the efforts to pursue the CAP accreditation for all laboratories in their network," said Abdul Hamid Oubeisi, CEO of National Reference Laboratory.

HMC's Communicable Disease Center part of large expansion phase

The official opening of Hamad Medical Corporation's (HMC) Communicable Disease Center (CDC) in November

marked the start of the largest expansion phase in HMC's history.

The addition of this latest facility to HMC's portfolio brings the total number of hospitals to nine at present, with three more hospitals set to open in the first half of this year.

"We have begun the largest expansion program in HMC's history," said Ali Abdulla Al Khater, Chief Communications Officer at HMC. "Four new hospitals – the Communicable Disease Center, Qatar Rehabilitation Institute, Ambulatory Care Center and Women's Wellness and Research Center – will significantly increase capacity across our system and provide state-of-the-art environments in which our expert teams can provide care for their patients," he explained.

HMC was established by Emiri decree in 1979. However, its oldest facility, Rumailah Hospital, has been caring for patients since 1957.

"As Qatar has grown and developed over the past 50 plus years, so too has HMC. This long history of caring for the residents of Qatar ensures HMC is uniquely positioned to understand the specific cultural and healthcare needs of the population and provide the best possible care," said Al Khater.

The scale of the current expansion phase underway at HMC is vast. When all services have relocated to the new hospitals, between 9,000 and 10,000 patients per week will use the services and the total floor space across HMC will increase by 65% following the full opening of the new hospitals.

"Our patients are already benefitting from the advanced facilities and care they receive at the CDC and the upcoming opening of the three additional hospitals will again strengthen our range of specialist healthcare services and increase our capacity," said Hamad Al Khalifa, HMC's Chief of Facilities Development.

The upcoming plans build on the capacity increase that has already taken place across HMC over the past year. The Neonatal Intensive Care Unit at Women's Hospital, Pediatric Emergency Center Al Sadd and Bone and Joint Center have all been expanded, while the Enaya Continuing Care Center and a new surgical services facility have opened. **MEH**



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Update from around the globe



Global leaders to promote health to achieve Sustainable Development Goals

At a meeting of 9th Global conference on health promotion on 21 November last year, the leaders from governments and United Nations organizations, city chiefs and health experts from around the world made two landmark commitments to promote public health and eradicate poverty.

The conference, co-organized by the World Health Organization (WHO) and the National Health and Family Planning Commission of the People's Republic of China in Shanghai, agreed:

- **The Shanghai Declaration on Health Promotion**, which commits to make bold political choices for health, stressing the links between health and wellbeing and the United Nations 2030 Agenda for Sustainable Development and its Sustainable Development Goals.

- **The Shanghai Healthy Cities Mayors' Consensus**, which contains a commitment by more than 100 mayors to advance health through improved management of urban environments.

WHO Director-General Dr Margaret Chan says underpinning these commit-

ments is the need for government action that protects people from health risks, provides access to healthy choices and spreads awareness of how to be and stay healthy.

Dr Chan adds: "Legislative and fiscal measures are among the most effective interventions that governments – national and city – can take to promote the health of their citizens, from tobacco control and taxing sugary drinks to ensuring people can breathe clean air, bike home safely and walk to school or work without fear of violence."

The Declaration: The Declaration highlights the need for people to be able to control their own health – to be in a position to make healthy lifestyle choices. Noting the need for political action across many different sectors and regions, it highlights the role of good governance and health literacy in improving health, as well as the critical role played by city authorities and communities.

Governance-related commitments include protecting health through public policies, strengthening legislation, regulation and taxation of unhealthy commodities and implementing fiscal policies to enable new investments in health and wellbeing. The Declaration also stresses the importance of

universal health coverage, and the need to better address cross-border health issues.

Health literacy pledges include the development of national and local strategies to improve citizens' awareness of how to live healthy lives, and increasing citizens' ability to control their own health and its determinants by harnessing the power of digital technology. The Declaration also commits to ensure that environments support healthy consumer choices, for example through pricing policies, transparent information and clear labelling.

The Declaration emphasizes the need for healthy urban policies that promote social inclusion, issues that are further strengthened in the Mayors' Consensus.

Mayors' Consensus: Cities are already home to over 50% of the world's population, and this is expected to increase to two-thirds by 2030, making them a particularly important focus. The Mayors' Consensus listed 10 action areas that municipal leaders attending the Conference will integrate into their cities' plans to implement the United Nations 2030 Agenda for Sustainable Development. Key areas include addressing pollution, gender-based violence, child de-

velopment and making cities smoke-free.

The mayors agreed to integrate health as a core consideration in all city policies; to promote community engagement through multiple platforms, including schools, workplaces and modern technology, to advance health; and reorient municipal health and social services towards equity and universal health coverage.

Around 6 million children die each year despite progress in reducing child deaths

Estimates for 2015 suggest that 5.9 million children worldwide died before reaching the age of five, including 2.7 million newborns. Globally, four million (4.02 million) fewer child deaths occurred in 2015 than in 2000, mainly thanks to reductions in deaths from pneumonia, diarrhoea, death during birth, malaria and measles. However, progress on reducing newborn deaths (in the first 28 days) has been slower meaning that as a whole the world failed to reach the Millennium Development Goal (MDG) target of reducing child deaths by two-thirds between 1990 and 2015.

The study, published in *The Lancet*, provides the most up-to-date figures for deaths of children under five years old and includes data for all 194 countries that are World Health Organisation states. The 2015 figures highlight the inequality in child deaths around the world with the national rates of child death ranging from 1.9 to 155.1 deaths per 1000 births, and 60.4% (3.6 million) of all deaths occurring in 10 countries.

Progress since 2000 has largely been due to reductions in the rates of deaths from pneumonia, diarrhoea, malaria, measles and deaths during birth – each reduced by more than 30% worldwide between 2000 and 2015. However, some of these still remain leading causes of deaths. Globally in 2015, the leading causes of death for children under five years old were complications due to premature birth (17.8%, 1.1 million deaths), pneumonia (15.5%, 0.9 million deaths) and death during birth (11.6%, 0.7 million deaths).

Countries with the highest rates of child death (100 or more deaths per 1000 births)

include Angola, Central African Republic, Chad, Mali, Nigeria, Sierra Leone and Somalia. In these countries pneumonia, malaria and diarrhoea were the leading causes of death, so to improve survival in these regions the researchers recommended improving the uptake of breastfeeding, providing vaccines for pneumonia, malaria and diarrhoea, and improving water and sanitation.

In comparison, for countries with the lowest rate of child death (less than 10 deaths per 1000 births) which include the Russian Federation and the United States of America, the leading causes of death include congenital abnormalities, complications due to premature birth and injuries. Improved detection and surgery for congenital abnormalities, better medical care during pregnancy and childbirth, and more research on effectiveness of injury interventions could help improve survival in these countries.

Although the number of newborn deaths was reduced from 3.9 million in 2000 to 2.7 million in 2015, progress has been slower than the improvements in survival for one month to five year olds. This resulted in the proportion of newborn deaths increasing from 39.3% in 2000 to 45.1% in 2015. If newborn deaths had reduced at the same rate as that of children aged between one month and five years old the MDG target to reduce child deaths by two-thirds between 1990 to 2015 might have been reached.

“Child survival has improved substantially since the Millennium Development Goals were set even though the target to reduce child deaths by two-thirds was not achieved,” says Dr Li Liu, lead author, Johns Hopkins Bloomberg School of Public Health, USA. “The problem is that this progress is uneven across all countries, meaning a high child death rate persists in many countries. Substantial progress is needed for countries in sub-Saharan Africa and Southern Asia to achieve the child survival target of the Sustainable Development Goals.”

Writing in a linked Comment, Professor Peter Byass, Umeå Centre for Global Health Research says “Undoubtedly child mortality is falling, and the world should be proud of this progress,” but he adds “... Of the estimated six million un-

der-5 child deaths in 2015, only a small proportion were adequately documented at the individual level, with particularly low proportions evident in low-income and middle-income countries, where most childhood deaths occur... That six million under-5 children continue to die every year in our 21st century world is unacceptable, but even worse is that we seem collectively unable to count, and hence be accountable for, most of those individual deaths.”

Study finds number of people with high BP up in poor countries, down in rich countries

In the past 40 years, there has been a large increase in the number of people living with high blood pressure worldwide because of population growth and ageing – rising from 594 million in 1975 to over 1.1 billion in 2015.

The largest rise in the prevalence of adults with high blood pressure has been in low- and middle-income countries (LMICs) in south Asia (eg. Bangladesh and Nepal) and sub-Saharan Africa (eg. Ethiopia and Malawi). But high-income countries (eg. Australia, Canada, Germany, Sweden, and Japan) have made impressive reductions in the prevalence of adults with high blood pressure, according to the most comprehensive analysis of worldwide trends in blood pressure to date, published in *The Lancet*.

The study shows mean blood pressure also decreased in women in central and eastern Europe, Latin America and the Caribbean, and, more recently, central Asia, Middle East, and north Africa, but the estimated trends in these regions had larger uncertainty than in high-income regions.

The study also found that men had higher blood pressure than women in most world regions in 2015.

Both elevated systolic (higher than 140 mmHg) and diastolic (higher than 90mmHg) blood pressure can be used to make a diagnosis of high blood pressure. Recent research suggests that the risk of death from ischemic heart disease and stroke doubles with every 20 mmHg systolic or 10 mmHg diastolic increase in middle and older ages.



Over the past four decades, the highest average blood pressure levels have shifted from high-income western countries (eg. Norway, Germany, Belgium, France) and Asia-Pacific countries (eg. Japan) to LMICs in sub-Saharan Africa, South Asia, and some Pacific island countries. High blood pressure remains a serious health problem in central and eastern Europe (eg. Slovenia, Lithuania).

“High blood pressure is the leading risk factor for stroke and heart disease, and kills around 7.5 million people worldwide every year. Most of these deaths are experienced in the developing world,” explains lead author Professor Majid Ezzati from Imperial College London.

“Taken globally, high blood pressure is no longer a problem of the Western world or wealthy countries. It is a problem of the world’s poorest countries and people. Our results show that substantial reductions in blood pressure and prevalence are possible, as seen in high-income countries over the past 40 years. They also reveal that WHO’s target of reducing the prevalence of high blood pressure by 25% by 2025 is unlikely to be achieved without effective policies that allow the poorest countries and people to have healthier diets – particularly reducing salt intake and making fruit and vegetables affordable – as well as improving detection and treatment with blood pressure lowering drugs.”

The findings come from a comprehensive new analysis of global, regional, and national trends in adult blood pressure between 1975 and 2015. This includes trends in average systolic (the maximum pressure the heart exerts while beating) and diastolic blood pressure (amount of pressure in the arteries between beats), as well as prevalence of high blood pressure. The Non-Communicable Disease (NCD) Risk Factor Collaboration pooled data from 1479 population-based studies totalling 19.1 million men and women aged 18 years or older from 200 countries (covering more than 97% of the world’s adult population in 2015).

● doi: 10.1016/S0140-6736(16)31919-5

Malaria vaccine funding ensures roll out of pilot vaccination project

The world’s first malaria vaccine will be rolled out in pilot projects in sub-Saharan Africa in 2018 after funding was secured for the initial phase of the programme and vaccinations, WHO confirmed.

The vaccine, known as RTS,S, acts against *P. falciparum*, the most deadly malaria parasite globally, and the most prevalent in Africa. Advanced clinical trials have shown RTS,S to provide partial protection against malaria in young children.

“The pilot deployment of this first-generation vaccine marks a milestone in the fight against malaria,” said Dr Pedro Alonso, Director of the WHO Global Malaria Programme. “These pilot projects will provide the evidence we need from real-life settings to make informed decisions on whether to deploy the vaccine on a wide scale.”

The Global Fund to Fight AIDS, Tuberculosis and Malaria in November approved US\$15 million for the malaria vaccine pilots, assuring full funding for the first phase of the programme. Earlier this year, Gavi, the Vaccine Alliance and UNITAID announced commitments of up to \$27.5 million and \$9.6 million, respectively, for the first four years of the vaccine programme.

RTS,S was developed through a partnership between GlaxoSmithKline and the PATH Malaria Vaccine Initiative (MVI), with support from the Bill & Melinda Gates Foundation and from a network of African research centres.

“These pilots are critical to determine whether this vaccine can be rolled out more broadly, adding an important new tool to the proven interventions we already have in the fight against malaria. The Global Fund’s commitment marks the beginning of a historic partnership between Gavi, the Global Fund and UNITAID, bringing together three

of the world’s biggest health financing institutions to tackle one of the leading killers of children,” Dr Seth Berkley, CEO of Gavi, the Vaccine Alliance.

RTS,S is the first malaria vaccine to successfully complete pivotal Phase 3 testing. The Phase 3 trial enrolled more than 15,000 infants and young children in 7 countries in sub-Saharan Africa. Countries that participated in the Phase 3 clinical trials will be prioritized for inclusion in the WHO pilot programme.

Initiative launched to track progress on health and climate change

The Lancet Countdown: Tracking Progress on Health and Climate Change was launched in November at the COP22 climate talks taking place in Morocco. An international, multi-disciplinary research initiative, it brings together leading experts to track and analyse the impacts of climate change on public health.

The Lancet Countdown will report annually in *The Lancet*. With input from 48 leading experts from across the world, some 16 institutions are academic partners of the initiative, including University College London, Tsinghua University and the Centre for Climate & Security among others. The Lancet Countdown is engaged in a special collaboration with the World Health Organization (WHO) and the World Meteorological Organisation (WMO) to promote synergies, collaborate on data sources, and ensure strong engagement with Ministries of Health.

With the aim of ensuring the case for action on health and climate change is more widely evidenced and understood, the Lancet Countdown will inform decision-making and drive an accelerated policy response to climate change. It will complement other initiatives, such as the Intergovern-



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Giving Shape to Ideas



mental Panel on Climate Change and its achievements for climate science.

Patricia Espinosa, Executive Secretary, UN Framework Convention on Climate Change, said: “The health impacts of climate change are already being felt and effecting some of the most vulnerable on our planet. No one is immune or out of reach. Climate action, spearheaded by governments and supported by business, cities, investors and citizens – including health care professionals – goes hand-in-hand with delivering a better quality of life in its own right and as a key pillar of the Sustainable Development Goals.”

The interrelation of climate change and public health is becoming increasingly clear. The Lancet Countdown builds on the findings of the 2015 Lancet Commission on Health and Climate Change, which concluded that climate change posed both a “potentially catastrophic risk to human health”, while conversely being “the greatest global health opportunity of the 21st century” if the right steps are taken.

Dr Richard Horton, Editor-in-Chief of *The Lancet* said: “One challenge of the ongoing global climate crisis is to convey the urgency of our collective predicament and the need for decisive action. The Lancet Countdown on Health and Climate Change is being launched to amass the evidence needed to hold policy makers accountable for their promises and commitments. The research community can make an important contribution to heightening political awareness and accelerating progress to a healthier, low-carbon world. These are the goals of our Countdown on Health and Climate Change.”

A broader evidence base on interrelated health and climate change trends will notably help demonstrate clear co-benefits of action. An estimated 18,000 people die every day due to air pollution exposure, making it the world’s largest single environmental health risk. The World Bank in turn estimates it costs the global economy US\$225 billion a year in related lost labour income. CO2 and other greenhouse gasses from road transport and fossil fuel energy generation responsible for the bulk of air pollution in the first place, are also a leading cause of

climate change. Health and economic co-benefits from addressing climate change – be it mitigation or adaptation – only add to the impetus for action, given that changes to climate take longer to be felt.

The Lancet Countdown comes at a crucial time for international cooperation and national action on climate change, following ratification of the Paris Agreement and the announcement of the 2030 global Sustainable Development Goals (SDGs). As part of this transition, healthcare professionals, governments and countries will have to shift from an understanding of climate change solely as a threat, to one which embraces the response to climate change as an opportunity for human health and wellbeing. The Lancet Countdown is aligned with the SGD process in working to ensure the health challenge posed by climate change is resolved by 2030.

First living-donor uterine transplants performed in US

Baylor University Medical Center at Dallas has performed the first four living-donor uterine transplants ever done in the US.

The medical centre issued a statement saying: After two years of preparation, careful review of all 16 previous uterine transplants performed in the world, and thoughtful discussion of the ethical and resource considerations – we entered a new space. Under IRB (Institutional Review Board) approval, we performed the first four living-donor uterine transplants ever done in the U.S. Alongside our team during all four surgeries in Dallas was a Swedish surgical team, widely considered the world’s experts in uterine transplant as five births have resulted from transplants they have performed. We performed the surgeries between September 14 and 22, making modifications along the way to discover potential improvements to the protocols.

“During the past three weeks since the first surgery, we performed routine follow-up testing as part of the trial protocol on all four patients. In three patients, we determined after several tests the transplanted organs were not receiving viable blood flow and the uteri were removed. Those patients are now



Surgeons at Baylor University Medical Center at Dallas carefully remove a donor’s uterus to perform a living donor uterine transplant on September 14, 2016. (left to right) Dr Greg McKenna, Dr Giuliano Testa, Dr E. Colin Koon, Dr Liza Johannesson

doing well and will soon be back to normal activity.

“The fourth patient’s follow-up tests currently indicate a much different result. Her tests are showing good blood flow to the uterus. There are also no signs of rejection or infection at this time. We are cautiously optimistic that she could ultimately become the first uterine transplant recipient in the U.S. to make it to the milestone of uterine functionality.”

Both the Baylor University Medical Center surgical team and the Swedish surgical team reviewed the three cases that resulted in explantation, and they believe the valuable learnings from the cases will result in recommendations to change the current protocols in operative and post-operative management of uterine transplant patients with specific attention to the thickness of the uterine veins.

“We are committed to sharing all of our learnings in this research with the scientific community and the world, as it is the best way to honor our patients – donors and recipients – and our colleagues’ work in helping find a solution to uterine-factor infertility,” the medical center said. **MEH**

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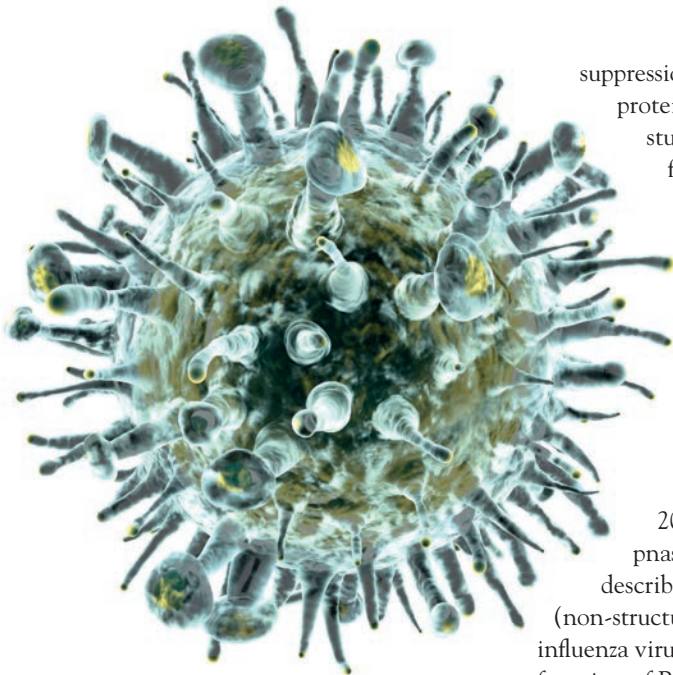
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Medical research news from around the world



Researchers find new mechanism to control human viral infections

A team of researchers, co-led by a University of California, Riverside professor, has found a long-sought-after mechanism in human cells that creates immunity to influenza A virus, which causes annual seasonal epidemics and occasional pandemics.

The research, outlined in a paper published online 5 December 2016 in the journal *Nature Microbiology*, could have broad implications on the immunological understanding of human diseases caused by RNA viruses including influenza, Ebola, West Nile, and Zika viruses.

"This opens up a new way to understand how humans respond to viral infections and develop new methods to control viral infections," said Shou-Wei Ding, a professor of plant pathology and microbiology at UC Riverside, who is the co-corresponding author of the paper.

The findings build on more than 20 years of research by Ding on antiviral RNA interference (RNAi), which involves an organism producing small interfering RNAs (siRNAs) to clear a virus.

His initial research showed that RNAi is a common antiviral defense in plants, insects and nematodes and that viral infections in these organisms require active

suppression of RNAi by specific viral proteins. That work led him to study RNAi as an antiviral defense in mammals.

In a 2013 paper in the journal *Science* he outlined findings that show mice use RNAi to destroy viruses. But, it remained an open debate as to whether the same was true in humans.

That open debate led Ding back to a key 2004 paper (doi: 10.1073/pnas.0308308100) in which he described a new activity of a protein (non-structural protein 1, or NS1) in the influenza virus that can block the antiviral function of RNAi in fruit flies, a common model system used by scientists.

In the current *Nature Microbiology* paper, the researchers demonstrated that human cells produce abundant siRNAs to target the influenza A virus when the viral NS1 is not active.

They showed that the creation of viral siRNAs in infected human cells is mediated by an enzyme known as Dicer and is potently suppressed by both the NS1 protein of influenza A virus and a protein (viral protein 35, or VP35) found in Ebola and Marburg viruses.

The researchers in the lab of the co-corresponding author, Kate L. Jeffrey, an investigator in the Massachusetts General Hospital gastrointestinal unit and an assistant professor of medicine at Harvard Medical School, further demonstrated that the infections of mature mammal cells by influenza A virus and other RNA viruses are inhibited naturally by RNAi, using mice cells specifically defective in RNAi.

"Our studies show that the antiviral function of RNAi is conserved in mammals against distinct RNA viruses, suggesting an immediate need to assess the role of antiviral RNAi in human infectious diseases caused by RNA viruses, including Ebola, West Nile, and Zika viruses," Jeffrey said.

● doi: 10.1038/nmicrobiol.2016.250

Doctors' burnout an organisation-wide problem

Current approaches to dealing with burnouts in doctors on an individual case-by-case basis is not effective and the issue should instead be tackled with organisation-wide initiatives, according to researchers at The University of Manchester and the University of Southampton.

A meta-analysis study, which brought together the results of previously conducted research, was carried out to explore the effectiveness of interventions in reducing burnout in doctors. It explored the comparison between doctor-directed interventions that target the individual and organisation-directed interventions that target the working environment. The strength of the doctor's experience and the particular healthcare setting they worked in was also assessed.

The research concluded that while doctor-focused tactics such as mindfulness and cognitive behaviour are important, the greatest success at preventing and reducing burnout in doctors can be achieved through the adoption of organisation-directed approaches such as improved working environment and organisational culture.

Burnout is a major problem in the healthcare industry and is often driven by excessive workload, imbalance between job demands and skills, a lack of job control and prolonged stress. It is a syndrome consisting of emotional exhaustion, depersonalisation, and a diminished sense of personal accomplishment. Importantly, burnout can result in an increase in medical errors, reduced quality of patient care, and lower patient satisfaction.

It was found that organisations that combined several elements such as structural changes, fostering communications between members of the health care team, and cultivating a sense of teamwork and job control tended to be the most effective in reducing burnout. However, such intense organisation-directed interventions were rare and had not been evaluated sufficiently.

What's more, the evidence indicated



that young doctors starting out in their career, are at higher risk of burnout compared to those with more experience, and interventions focused on enhancing teamwork, mentoring, and leadership skills might be suitable for this group.

“Our findings clearly show that we need more effective intervention models to prevent burnout in doctors. Such models could be organization-directed interventions which promote healthy individual-organization relationships and view burnout as a problem of the whole healthcare system,” said Dr Maria Panagioti, Research fellow in Primary Care at the University of Manchester who led this study.

With reference to doctors in the United Kingdom, George Lewith, Professor of Health Research at the University of Southampton who supervised the research, said: “This work suggests that if we want to retain safe and professionally competent NHS clinicians working in very demanding front line jobs we need to support their mental and physical health and create appropriate and enabling working environments for them. Efforts need to be focused on finding appropriate ways of reaching doctors who work in stressful environments to ensure their wellbeing is taken care of. If we don't patient safety could be at risk.”

● doi: 10.1001/jamainternmed.2016.7674

Gene therapy trial for haemophilia shows promising results

Researchers are reporting the highest and most sustained levels to date of an essential blood-clotting factor IX in patients with the inherited bleeding disorder haemophilia B.

After receiving a single dose of an experimental gene therapy in a clinical trial, patients with haemophilia produced near-normal levels of clotting factor IX, allowing them to stop clotting factor infusions and to pursue normal activities of daily life without disabling bleeding episodes.

Lindsey A. George, MD, a haematologist at Children's Hospital of Philadelphia (CHOP) is the lead investigator of the phase 1/2 clinical trial sponsored by Spark

Therapeutics, and Pfizer. The American Society of Hematology (ASH) recently highlighted updated findings from that trial during its annual meeting in San Diego.

Katherine High, MD, a senior author of the study and Spark Therapeutics's president and chief scientific officer, described the updated interim trial data. The clinical trial of nine adult haemophilia B patients, aged 18 to 52 years, used a single dose of a gene therapy product engineered to enter patients' liver cells and direct the production of the blood clotting factor that they lack.

George notes: “Our goal in this trial was to evaluate the safety of the gene therapy product and secondarily, to determine if we could achieve levels of factor IX that could decrease bleeding events in patients.”

She added: “These patients have a severe or moderate level of haemophilia, with baseline clotting factor level less than or equal to 2% of levels in healthy people. In current treatment, patients with haemophilia give themselves intravenous doses of factor IX up to a couple times a week. While generally effective, factor levels fluctuate, and patients may suffer painful, disabling joint bleeds when their clotting factor levels drop. Such a regimen requires significant planning of daily activities.”

In the current trial, said George, the patients maintained factor levels of approximately 30%, enough to lift them out of the severe category. “At these new levels, haemophilia patients do not typically need to self-treat with factor to avoid bleeding events,” she said, adding, “This represents a potential dramatic improvement in their quality of life and a shift in the way we think about treating haemophilia.”

A factor level of 30% is near-normal, she added, and patients would be expected to experience bleeding only in the event of major trauma or surgery.

One subject self-infused two days after receiving the gene therapy vector. Beyond this, no patients had any bleeding events or required factor for any reason. With significant reduction in bleeding events and factor use, six of the first seven patients reported increased physical activity and all

reported improved quality of life.

Previous haemophilia gene therapy trials have been frustrated by an immune response to the gene therapy product that limited the success of the therapy. In the current trial, two patients experienced an immune response to the gene therapy that did not result in safety concerns, and were treated with steroids. The patients are still undergoing treatment but have maintained factor IX activity without bleeding.

George reported that she is cautiously optimistic, acknowledging that this trial is a small study, with a short follow-up period. However, as the researchers continue to monitor patients in the current trial, next steps will be to discuss with the US Food and Drug Administration the outlines of a larger, phase 3 clinical trial. No gene therapies for any genetic diseases have yet been approved for clinical use in the US.

Formerly a research leader at CHOP, High pursued ground-breaking preclinical investigations in haemophilia B gene therapy and provided scientific expertise to previous gene therapy trials in haemophilia and other genetic disorders at CHOP before moving to Spark Therapeutics, which was spun off from CHOP in 2013. CHOP maintains a financial interest in the company.

New genetic cause of autism spectrum disorder identified

Autism spectrum disorders affect around one percent of the world's population and are characterized by a range of difficulties in social interaction and communication. In a new study published in *Cell* (1 December 2016), a team of researchers led by Gaia Novarino, Professor at IST Austria, has identified a new genetic cause of ASD.

Novarino explains why this finding is significant: “There are many different genetic mutations causing autism, and they are all very rare. This heterogeneity makes it difficult to develop effective treatments. Our analysis not only revealed a new autism-linked gene, but

also identified the mechanism by which its mutation causes autism. Excitingly, mutations in other genes share the same autism-causing mechanism, indicating that we may have underscored a subgroup of ASDs.”

Dr. Caglayan, Chairman of the Department of Medical Genetics in the School of Medicine at Istanbul Bilim University in Turkey and co-author of the study, points out: “The identification of novel genes, especially in heterogeneous diseases such as autism, is difficult. However, as result of a collaborative effort, we were able to identify mutations in a gene called SLC7A5 in several patients born to consanguineous marriages and diagnosed with syndromic autism.”

SLC7A5 transports a certain type of amino acids, the so-called branched-chain amino acids (BCAA), into the brain. To understand how mutations of SLC7A5 lead to autism, the researchers studied mice in which SLC7A5 is removed at the barrier between the blood and the brain. This reduces the levels of BCAAs in their brain, and interferes with protein synthesis in neurons. Consequently, the mice show reduced social interaction and other changes in their behaviour, which are also observed in other autism mouse models.

In a previous study, Novarino and colleagues identified a mutation in a gene that is involved in the breakdown of these same amino acids in several patients with ASD, intellectual disability and epilepsy. “Of course, not all genes causing autism affect amino acid levels, and these forms of autism are unarguably very rare, but it is possible that even more autism-causing genes fall in this group.” explains Novarino.

Notably, the researchers could treat some of the neurological abnormalities in the adult mice missing SLC7A5 at the blood-brain barrier. After delivering BCAAs straight into the mice’s brains for three weeks, the authors observed an improvement in behavioural symptoms.

The researchers’ results contrast with the idea that ASDs are always irreversible conditions.

● doi: 10.1016/j.cell.2016.11.013



Platypus venom could hold key to diabetes treatment

Australian researchers have discovered remarkable evolutionary changes to insulin regulation in two of the nation’s most iconic native animal species – the platypus and the echidna – which could pave the way for new treatments for type 2 diabetes in humans.

The findings, now published in the *Nature* journal *Scientific Reports*, reveal that the same hormone produced in the gut of the platypus to regulate blood glucose is also surprisingly produced in their venom.

The research is led by Professor Frank Grutzner at the University of Adelaide and Associate Professor Briony Forbes at Flinders University.

The hormone, known as glucagon-like peptide-1 (GLP-1), is normally secreted in the gut of both humans and animals, stimulating the release of insulin to lower blood glucose.

But GLP-1 typically degrades within minutes.

In people with type 2 diabetes, the short stimulus triggered by GLP-1 isn’t sufficient to maintain a proper blood sugar balance. As a result, medication that includes a longer lasting form of the hormone is needed

to help provide an extended release of insulin.

“Our research team has discovered that monotremes – our iconic platypus and echidna – have evolved changes in the hormone GLP-1 that make it resistant to the rapid degradation normally seen in humans,” says co-lead author Professor Frank Grutzner, from the University of Adelaide’s School of Biological Sciences and the Robinson Research Institute.

“We’ve found that GLP-1 is degraded in monotremes by a completely different mechanism. Further analysis of the genetics of monotremes reveals that there seems to be a kind of molecular warfare going on between the function of GLP-1, which is produced in the gut but surprisingly

also in their venom,” he says.

The platypus produces a powerful venom during breeding season, which is used in competition among males for females.

“We’ve discovered conflicting functions of GLP-1 in the platypus: in the gut as a regulator of blood glucose, and in venom to fend off other platypus males during breeding season. This tug of war between the different functions has resulted in dramatic changes in the GLP-1 system,” says co-lead author Associate Professor Briony Forbes, from Flinders University’s School of Medicine.

“The function in venom has most likely triggered the evolution of a stable form of GLP-1 in monotremes. Excitingly, stable GLP-1 molecules are highly desirable as potential type 2 diabetes treatments,” she says.

Professor Grutzner says: “This is an amazing example of how millions of years of evolution can shape molecules and optimise their function.

“These findings have the potential to inform diabetes treatment, one of our greatest health challenges, although exactly how we can convert this finding into a treatment will need to be the subject of future research.”

● doi: 10.1038/srep37744



Researchers identify cellular switch for asthma

Working with human immune cells in the laboratory, Johns Hopkins researchers report they have identified a critical cellular “off” switch for the inflammatory immune response that contributes to lung-constricting asthma attacks. The switch, they say, is composed of regulatory proteins that control an immune signalling pathway in cells.

“Asthma patients are constantly firing through this pathway because those proteins are stuck in the ‘on’ position, without proper control by other proteins that shut down this reaction,” says Nicola Heller, Ph.D., assistant professor of anaesthesiology and critical care medicine at the Johns Hopkins University School of Medicine.

Asthma has been correlated with an overabundance of one type of immune cell called M2 macrophages in the lungs. In a nonasthmatic person, the M2 macrophages activate to clean up inhaled allergens and foreign particles, and then deactivate when the irritant is broken down.

However, in people with asthma, the M2 cells and the chemical signals they emit linger and call in other cells that cause inflammation that can trigger an asthma attack with the classic symptoms of difficulty breathing, wheezing and shortness of breath. Over time, the lung is changed by secretions from the M2 cells, which cause the lung tissue to remodel itself, contributing to irreversible obstruction and poor lung function.

“If you prevent these cells from becoming the M2 type, you can potentially stop the continued inflammation and long-term structural changes,” says Heller.

The new research, reported 25 November 2016 in the *Journal of Biological Chemistry*, investigated the role of two proteins, GRB10 and p70S6K, in the control of the signalling pathway that activates M2 cells.

In their previous work, also published in the *Journal of Biological Chemistry* 23 September 2016, Heller’s group found that the inflammatory pathway involving the two proteins begins with interleukin 4 (IL-4), an immune system chemical that passes through a protein named IRS-2 before activating the M2 cells. They found that other proteins that stop the action of IRS-2 were not present in human M2 cells from people with allergies compared to healthy people. This made IRS-2 more active and increased the formation of M2 cells in people with allergies.

In the new study, Heller’s lab delved deeper into the IRS-2 pathway. By analysing chemical changes of the IRS-2 protein in immortalized cultures of human white blood cells, it determined that IRS-2 appeared in two different forms — “on”, which allows the signal to pass through, and “off”, which stops the signal from activating the cells into M2 macrophages. They began by observing which proteins became active in the presence of IL-4 in human white blood cells and add “stop” signals to IRS-2. The activity of two regulatory proteins, GRB10 and p70S6K, increased after IL-4 exposure compared

to the same cells that were not exposed to IL-4.

In further experiments, the researchers treated the immortalized white blood cells with both chemical and genetic blockers, called small interfering RNA (siRNA), designed to render either p70S6K or GRB10 nonfunctional. The researchers saw that decreased GRB10 and p70S6K activity resulted in more of the “on” form of IRS-2, meaning these proteins are responsible for turning off IRS-2 and thereby downstream M2 production.

“This confirmed for us that without properly functioning GRB10 and p70S6K, the cells could not turn off IRS-2 signalling and M2 production,” says Heller.

The research team, Heller says, has already begun experiments to further explore the implications of these results, which include looking at differences in this pathway between cells taken from allergic and healthy individuals, and testing the efficacy of an inhalable drug that mimics the function of GRB1 and p70S6K to shut off the development of M2 macrophages in the lungs of mice.

“One of the advantages of working with lung macrophages is that they are one of the first cells that see anything that gets put

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in an inhaler,” says Heller. “So we hope to modulate their activity in this way.”

These findings also have implications for treatment of cancer and other disorders, such as obesity, in which M2 macrophage cells play a regulatory role in tumour growth and fat deposition.

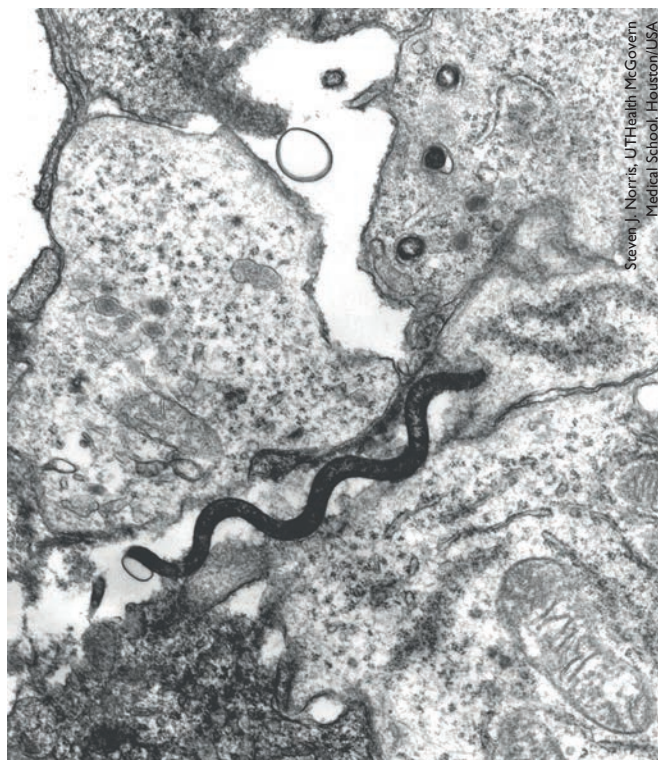
● doi: 10.1074/jbc.M116.756791

Re-emergence of Syphilis traced to pandemic strain cluster

Over the last few decades, an age-old infectious disease has been re-emerging globally: Syphilis. Using techniques to analyse low levels of DNA, an international research team headed by the University of Zurich has now shown that all syphilis strains from modern patient samples share a common ancestor from the 1700s. Furthermore, their research demonstrates that strains dominating infections today originate from a pandemic cluster that emerged after 1950, and these strains share a worrying trait: Resistance to the second-line antibiotic azithromycin.

Syphilis has plagued humankind for over 500 years. After the first reported outbreaks struck Europe in 1495, the disease spread rapidly to other continents and swelled to a global pandemic. When treatment with the antibiotic penicillin became available in the mid-twentieth century, infection rates started to decrease dramatically. Strikingly, however, infection with the bacteria *Treponema pallidum* subsp. *pallidum* (TPA) has been re-emerging globally in the last few decades; more than 10 million cases are reported annually. Yet the reason for the resurgence of this sexually transmitted infection remains poorly understood.

According to the authors of the paper, little is known about the patterns of genetic diversity in current infections or the evolutionary origins of the disease. Because clinical samples from syphilis patients only contain low quantities of treponemal DNA and the pathogen is difficult to culture in the laboratory, researchers from the University of Zurich decided in 2013 to apply DNA capture and whole-genome sequencing tech-



Electron micrograph of a *Treponema* bacterium between two host cells.

niques, as used by colleagues at the University of Tübingen, to ancient DNA samples. The team collected 70 clinical and laboratory samples of syphilis, yaws, and bejel infections from 13 countries spread across the globe. Like syphilis bacteria, the closely related subspecies *Treponema pallidum* subsp. *pertenue* (TPE) and *Treponema pallidum* subsp. *endemicum* (TEN), which cause yaws and bejel, are transmitted through skin contact and show similar clinical manifestations.

By using genome-wide data, the researchers could reconstruct a phylogenetic tree showing a clear separation between the TPA lineage and the TPE/TEN lineage.

“There have been many questions regarding the origin of syphilis since its appearance on the world stage 500 years ago. By combining an evolutionary and an epidemiological approach, we could decipher the genetic relation between strains infecting individuals today, and trace the emergence of a pandemic cluster with high frequency of antibiotic resistance,” says Homayoun C.

Bagheri, former professor at the UZH Institute for Evolutionary Biology and Environmental Studies.

The genomic analyses show the emergence of a pandemic cluster named SS14-Ω, which is present in contemporary infections around the globe and distinct from the cluster comprising the well-studied Nichols reference strain.

“Our findings highlight the need to study more extensively the predominant strain

type in the contemporary epidemic,” says Natasha Arora, researcher at the Zurich Institute of Forensic Medicine and first author of the study published in *Nature Microbiology*.

An evolutionary finding of epidemiological relevance is that the SS14-Ω cluster originated from a strain ancestor in the mid-20th century – after the discovery of antibiotics. The worrying aspect of this pandemic cluster is its high resistance to azithromycin, a second-line drug that is widely used to treat sexually transmitted infections.

Natasha Arora adds: “The good news is that, so far, no *Treponema* strains have been detected that are resistant to penicillin, the first-line antibiotic for syphilis treatment.”

Co-author Philipp Bosshard from the University Hospital Zurich is continuing to collect Swiss patient samples to further study the clinical aspects of the work. The researchers are convinced that this type of analysis will open new opportunities to develop a comprehensive understanding of the epidemiology of syphilis.

● doi: 10.1038/nmicrobiol.2016.245



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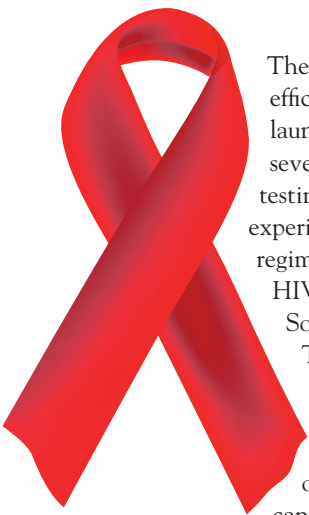
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HIV vaccine efficacy study begins



The first HIV vaccine efficacy study to launch anywhere in seven years is now testing whether an experimental vaccine regimen safely prevents HIV infection among South African adults.

The study, called HVTN 702, involves a new version of the only HIV vaccine candidate ever shown

to provide some protection against the virus. HVTN 702 aims to enrol 5,400 men and women, making it the largest and most advanced HIV vaccine clinical trial to take place in South Africa, where more than 1,000 people become infected with HIV every day.

“If deployed alongside our current armoury of proven HIV prevention tools, a safe and effective vaccine could be the final nail in the coffin for HIV,” said Anthony S. Fauci, M.D., director of the US National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health and a co-funder of the trial. “Even a moderately effective vaccine would significantly decrease the burden of HIV disease over time in countries and populations with high rates of HIV infection, such as South Africa.”

The experimental vaccine regimen being tested in HVTN 702 is based on the one

investigated in the RV144 clinical trial in Thailand led by the U.S. Military HIV Research Program and the Thai Ministry of Health. The Thai trial delivered landmark results in 2009 when it found for the first time that a vaccine could prevent HIV infection, albeit modestly. The new regimen aims to provide greater and more sustained protection than the RV144 regimen and has been adapted to the HIV subtype that predominates in southern Africa.

“The people of South Africa are making history by conducting and participating in the first HIV vaccine efficacy study to build on the results of the Thai trial,” said HVTN 702 Protocol Chair Glenda Gray, M.B.B.C.H., F.C.Paed. (SA). “HIV has taken a devastating toll in South Africa, but now we begin a scientific exploration that could hold great promise for our country. If an HIV vaccine were found to work in South Africa, it could dramatically alter the course of the pandemic.” Dr Gray is president and chief executive officer of the South African Medical Research Council; research professor of paediatrics at the University of the Witwatersrand, Johannesburg; and a founding director of the Perinatal HIV Research Unit at Chris Hani Baragwanath Hospital in Soweto, South Africa.

The experimental vaccine regimen tested in the Thai trial was found to be 31.2% effective at preventing HIV infection over the 3.5-year follow-up after vaccination. In the HVTN 702 study, the design, schedule and components of

the RV144 vaccine regimen have been modified in an attempt to increase the magnitude and duration of vaccine-elicited protective immune responses.

As the regulatory sponsor of HVTN 702, NIAID is responsible for all operational aspects of this pivotal Phase 2b/3 trial, which is enrolling HIV-uninfected, sexually active men and women aged 18 to 35 years. The NIAID-funded HIV Vaccine Trials Network (HVTN) is conducting the trial at 15 sites across South Africa. Results are expected in late 2020.

HVTN 702 begins just months after interim results were reported for HVTN 100, its predecessor clinical trial, which found that the new vaccine regimen was safe for the 252 study participants and induced comparable immune responses to those reported in RV144.

HVTN 100 and HVTN 702 are part of a larger HIV vaccine research endeavour led by the Pox-Protein Public-Private Partnership, or P5 – a diverse group of public and private organizations committed to building on the success of the RV144 trial. The P5 aims to produce an HIV vaccine that could have a significant public health benefit in southern Africa and to advance scientists’ understanding of the immune responses associated with preventing HIV infection. P5 members include NIAID, the Bill & Melinda Gates Foundation, the South African Medical Research Council, HVTN, Sanofi Pasteur, GSK and the U.S. Military HIV Research Program.

World AIDS Day 2016: “Dignity above all”

“Dignity above all” is the regional slogan of this year’s World AIDS Day, celebrated every year on 1 December. This year’s campaign in the Eastern Mediterranean Region calls on all stakeholders to work together to end stigma and discrimination against people living with HIV in health care settings.

The campaign is soliciting high-level political commitment and advocating active measures to end stigma and discrimination against people living with HIV

in health care settings in which it is their right to receive adequate care and quality treatment.

In his message on World AIDS Day, Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, said: “It is unacceptable that, over 35 years into the epidemic, stigma and discrimination against people living with HIV is still widespread among health care workers of all disciplines. Stigma and discrimination in health care settings seriously constrain our ability to end the HIV epidemic.”

He added, “Contrary to medical ethics, people living with HIV often endure rejection and denial of health care for general conditions that are related or unrelated to their HIV infection. Such negative experiences deter those in need from seeking care and eventually their health deteriorates.”

Globally, already 15 million people are accessing life-saving HIV treatment. New HIV infections have been reduced



by 35% since 2000 and AIDS-related deaths have been reduced by 42% since the peak in 2004. However, in the Region, at the end of 2015, less than 20% of people living with HIV in the Region knew their HIV status and only 14% of them were receiving treatment.

While the world embarks on the “Fast-Track to End AIDS” strategy, ending the AIDS epidemic by 2030 as part of the Sustainable Development Goals will require greater investment, commitment and innovation.

The lack of policies and regulations to protect the rights of people living with HIV and to provide guidance and best practices in health care facilities worsen the situation. A generic policy for protecting people living with HIV in the Region from stigma and discrimination has been developed as a model by the WHO Regional Office. The policy identifies the forms of discrimination faced by people in health care settings. They include denial of access to services,

the disease and judgmental attitudes towards behavioural practices of people living with HIV.

counselling and testing, exclusion and isolation in specific wards and rooms, disclosure of HIV status without a patient’s consent, verbal abuse and lack of respect and extra unjustified infection control; measures that can mark a person as HIV-positive.

The policy also identifies reasons behind stigma and discrimination in health care settings among which are the lack of knowledge about modes of HIV transmission, fears around the incurability of the disease and judgmental attitudes towards behavioural practices of people living with HIV.

It clearly articulates the right of people living with HIV to health care and the ethical duties of health care providers both within and outside health care settings to provide adequate and equal care.

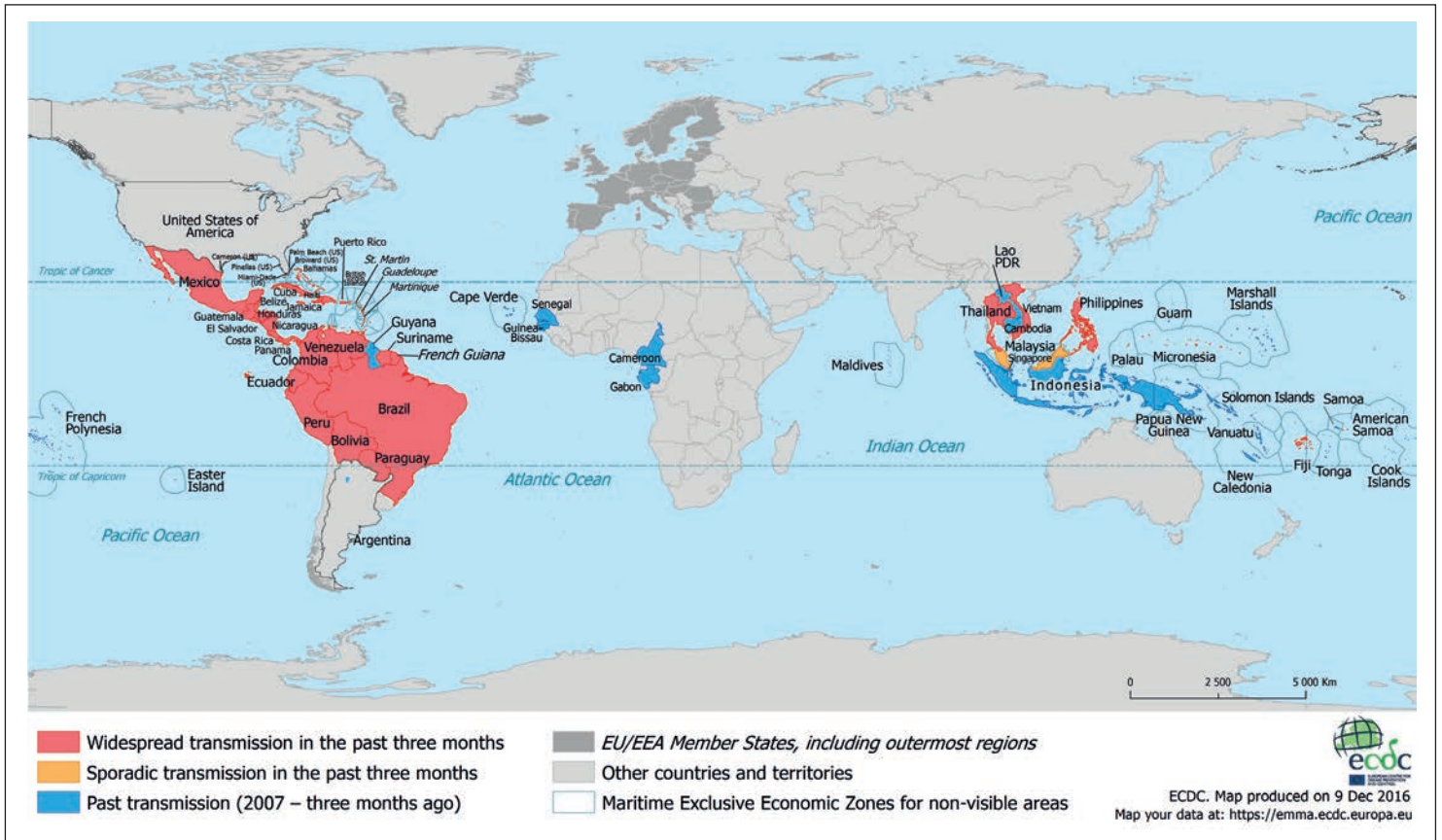
The generic policy inspired country actions. Through close work with national AIDS programmes in Member States, 14 countries will denounce stigma and discrimination against people living with HIV in health care settings and will announce national policies to protect them against those breaches of medical ethics.

On the occasion of World AIDS Day, the WHO Regional Office is calling upon governments, civil society and patient groups to engage actively in ending HIV stigma and discrimination in health care settings and to put dignity above all.

The HVTN 702 vaccine regimen consists of two experimental vaccines: a canarypox vector-based vaccine called ALVAC-HIV and a two-component gp120 protein subunit vaccine with an adjuvant to enhance the body’s immune response to the vaccine. The vaccines do not contain HIV and therefore do

not pose any danger of HIV infection to study participants. Both ALVAC-HIV (supplied by Sanofi Pasteur) and the protein vaccine (supplied by GSK) have been modified from the versions used in RV144 to be specific to HIV subtype C, the predominant HIV subtype in southern Africa. Additionally, the protein subunit

vaccine in HVTN 702 is combined with MF59 (also supplied by GSK), a different adjuvant than the one used in RV144, in the hope of generating a more robust immune response. Finally, the HVTN 702 vaccine regimen includes booster shots at the one-year mark to prolong the early protective effect observed in RV144. MEH



Countries and territories with reported confirmed Zika virus transmission in 3 months to 9 December 2016

Study finds Zika virus replicates and persists in foetal brains and placentas

Zika virus can make thousands of copies of itself in foetuses' brains and in the placentas of pregnant women, which may help explain how the virus causes devastating birth defects and pregnancy losses even if a woman had only a minor illness. A new study by the United States Centers for Disease Control and Prevention (CDC) is the first to show Zika virus RNA replicating in brain tissues of infants with microcephaly who later died and in placentas of women who suffered pregnancy losses.

CDC scientists found Zika virus RNA persisted in foetal brains and in placentas for more than seven months after the mothers contracted Zika. The researchers also found evidence of the virus replicating in an infant with microcephaly who died two months after birth. The RNA levels were about 1,000 times higher in the infants' brains than in the women's placentas, according to the study published 13 December 2016 in CDC's *Emerging Infectious Diseases* journal.

"Our findings show that Zika virus can continue to replicate in infants' brains even after birth, and that the virus can persist in placentas for months – much longer than we expected," said Julu Bhatnagar, PhD, lead of the molecular pathology team at CDC's Infectious Diseases Pathology Branch and the study's lead author. "We don't know how long the virus can persist, but its persistence could have implications for babies born with microcephaly and for apparently healthy infants whose mothers had Zika during their pregnancies. More studies are needed to fully understand how the virus can affect babies."

The study sheds light on how the virus can cross the placenta and infect the foetus's brain. The researchers found Zika virus infects and proliferates in Hofbauer cells, a type of migratory immune cell in the placenta. Because the Hofbauer cells can move freely throughout the placenta, they may help transfer the virus to the foetus's

brain. Once there, the virus can infect various types of brain cells.

The researchers tested tissues from 52 patients with suspected Zika virus infection, including brain tissues (tested postmortem) from eight infants who had microcephaly and later died. They also tested placental tissues from 44 women: 22 who had adverse pregnancy or birth outcomes (miscarriage, elective termination, stillbirth or babies born with microcephaly) and 22 who had babies who appeared healthy. Most of the women were US residents who had travelled to countries with Zika outbreaks during their pregnancies. The eight infants with microcephaly who died were from Brazil and Colombia.

Zika most dangerous in early pregnancy

Brain tissues from all eight infants were positive for Zika virus, and Zika virus was detected in placentas of nearly three-quarters (16/22) of women who had an

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adverse pregnancy or birth outcome. Mothers of all the infants with fatal microcephaly and all of the women with positive test results contracted Zika virus during their first trimester of pregnancy. Zika virus RNA was also detected in the placentas of more than one-third (8/22) of the women who had apparently healthy infants. All of these women had Zika infection during their third trimester of pregnancy, but the babies who were tested for Zika after birth tested negative. These findings further confirm that Zika virus infection during the first trimester of pregnancy poses more danger for pregnancy and foetal development than infection contracted during the third trimester.

As part of the Zika response, CDC's Infectious Disease Pathology Branch developed a variety of tests to detect Zika virus in human tissue samples. The molecular tests used in this study can show

evidence of Zika virus in tissues long after the virus would be undetectable by blood tests, which typically can only be used during the 12 weeks following infection.

"Our molecular tests for tissues extend the timeframe to detect Zika virus," Bhatnagar said. "For women who contracted Zika virus during early pregnancy but were never diagnosed, these tests could help determine whether Zika virus may have caused their miscarriage, pregnancy loss, or adverse birth outcome."

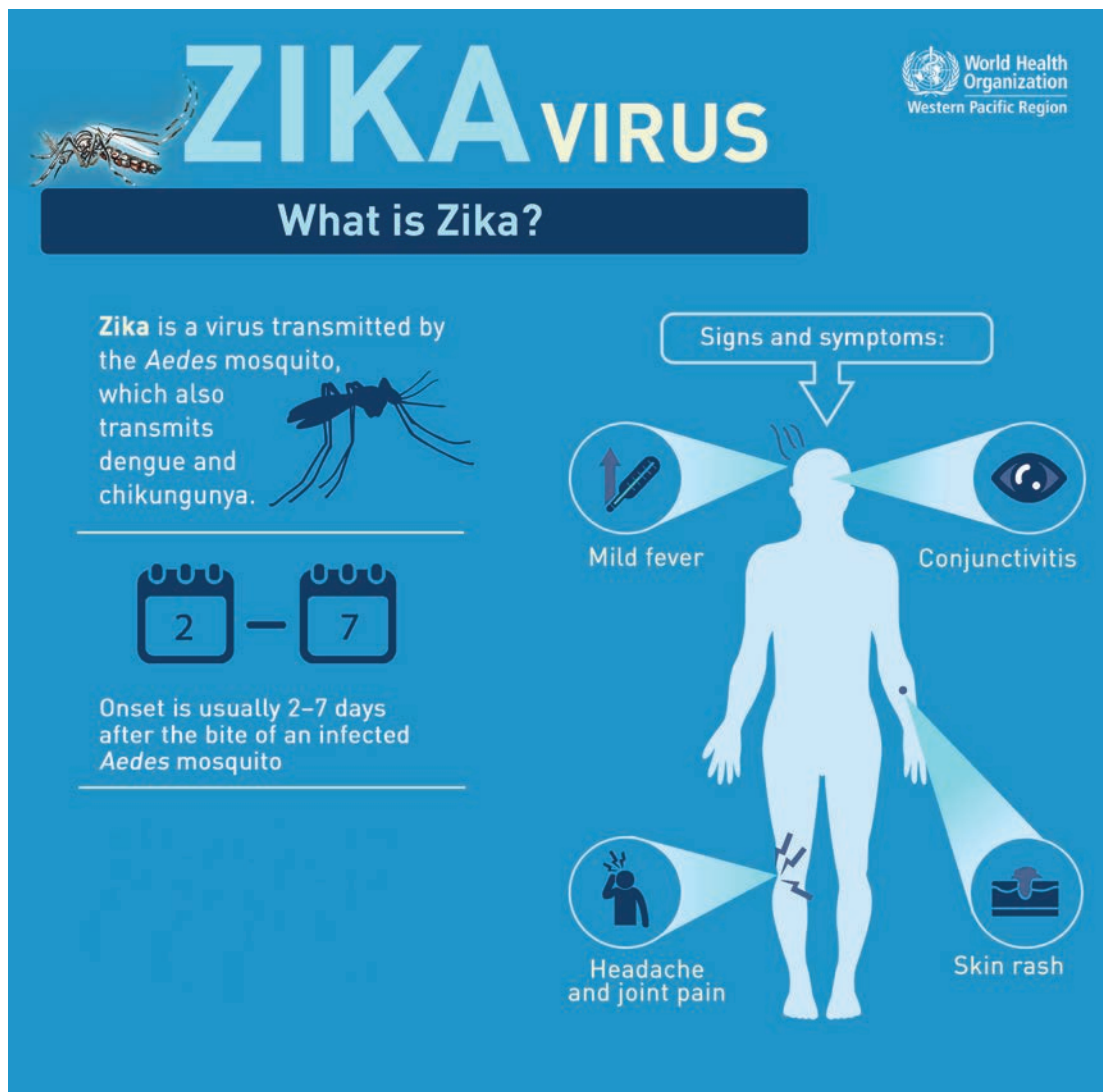
CDC recommends monitoring babies born to mothers who had Zika virus infection during their pregnancy. CDC established the US Zika Pregnancy Registry (USZPR) to monitor the effects of Zika virus infection during pregnancy on foetal and infant outcomes. The data collected through the USZPR is used to update recommendations <www.cdc.gov/zika/hc-providers/pregnant-woman.html> for clinical care, to plan for

These findings further confirm that Zika virus infection during the first trimester of pregnancy poses more danger for pregnancy and foetal development than infection contracted during the third trimester.

services and support for pregnant women and families affected by Zika virus, and to improve prevention of Zika virus infection during pregnancy.

As of 12 December 2016, Zika virus outbreaks have been reported in 50 countries and territories, according to the CDC.

● doi: 10.3201/eid2303.161499.





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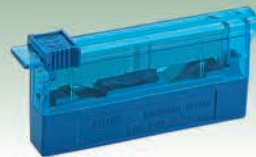
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Millions go hungry as country on brink of collapse

After a 2016 that was disastrous for civilians, war ravaged Yemen will see an additional 2.5 million people go without enough to eat in 2017 if the current downward spiral is allowed to continue, the Norwegian Refugee Council warned.

By Jessica Moussan El Zarif,
Norwegian Refugee Council

The past year has seen widespread destruction and overall deterioration of conditions, with more than 14 million Yemenis going to bed hungry at night. The price of staple food is now 20% higher than before the conflict started last year. Projections for 2017 indicate that, if the situation does not change, an extra 2.5 million people will be left without enough to eat. That will mean that a staggering 60% of the entire population will struggle to put food on the table.

People currently receiving NRC food vouchers say they have had to survive on bread and water alone. Many people have also had to flee from their houses due to airstrikes and fighting on the ground.

“Unless the conflict ends and the deep economic crisis is reversed, the new year will see an entire nation slide further into a black hole of despair,” said NRC Secretary General Jan Egeland. “The figures for 2016 are shocking, and there is a risk that further deterioration of the situation in 2017 will result in famine across Yemen. We must put an end to this man-made disaster that shames us all.”

NRC has reached over 1 million Yemenis in need across the country in 2016, but the scale of the current crisis is well beyond the reach of the few remaining humanitarian agencies on the ground. One million people represent just a small percentage of the total 18.8 million people in need of humanitarian assistance or protection. Despite the challenges of accessing certain areas, NRC is operating in hard-to-reach areas throughout Yemen.

“In 2016, all sides to the conflict have impeded our ability to reach people who were in most need of humanitarian assistance,” Egeland said. “Going into

2017, it is essential that all restrictions on aid are lifted and that humanitarians are able to deliver life-saving services throughout Yemen.”

Displacement in Yemen has risen massively since the start of the conflict. An estimated 4.5 million people in Yemen currently require shelter support. By the end of 2016, almost 2.2 million people remain displaced across the country; more than 90% of them have been displaced for more than 10 months. Many of the Yemenis who have been displaced by the conflict are living in public buildings or makeshift camps, many without access to basic facilities such as toilets or washrooms.

Economic collapse in Yemen is imminent if nothing is done to bolster the failing banking system. This will mean that civil servants continue not to be paid and imports that had previously been guaranteed by the Central Bank of Yemen – such as rice and wheat – grind to a halt. Restrictions on imports mean that Yemenis are not getting the commercial goods that they need at prices they can afford.

“The 2016 Yemen humanitarian response has only received half the funding it needed,” Egeland said. “If we see the same trend in 2017, then it will be an impossible job to reach all the Yemenis in need. Humanitarians have shown that, despite challenges on the ground, we can respond rapidly to need on the ground; but the financial commitments haven’t matched the response.”

As of October 2016, 11,332 civilian casualties had been reported by community-level human rights monitors since the escalation of the conflict, including 4,125 deaths and 7,207 injuries. An estimated 11.3 million people require protection, gender-based violence and child protection assistance. **MEH**



Yemen 2016:

- The total Yemeni population stands at 27.4 million people
- 14.1 million people are food insecure, and 7 million people are severely food insecure
- The minimum food basket costs 20% more than it did before the crisis
- Less than half of health facilities in 16 governorates are fully functional
- 2 million children are out of school, with 1,600 school unfit for use due to the conflict
- Since October, over 100 cases of cholera have been confirmed and thousands more suspected
- 2.2 million people remain displaced in Yemen. One out of every five is living in abandoned buildings or out in the open
- The Central Bank of Yemen’s foreign currency reserves stand at less than \$1 billion USD.
- 1.2 million civil servants have received less than 1/5 of their salaries in the past 3 months.
- Yemeni GDP has dropped by 35% compared to pre-conflict rate
- Only 58% of the Yemen Humanitarian Response Plan has been funded to date.



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Brave doctors risk it all to save lives

The situation on the ground in Syria changes on a daily basis as the war continues, making it difficult to report current events in a bimonthly magazine such as *Middle East Health*. However, the life and experience of doctors working in this war zone deserves reporting no matter that some detail may be outdated or overtaken by new events. Their brave deeds to save lives in the face of such terror must be told. – *Editor*.

The air strikes came just minutes apart that morning, shattering a large, Doctors Without Borders-supported hospital in Syria's Idlib province. Twenty-five people were killed, including five children. Among the adult fatalities were a doctor, a chief nurse, five nurses and a lab technician. The raids were carried out by forces loyal to the Syrian Government.

"Some of the victims were patients lying in their hospital beds, others were visiting their relatives," recalled Dr Mazen, the 55-year-old orthopedic surgeon who worked at the hospital until it was crushed by a string of consecutive strikes – known as "double tap" in army-speak – on February 15, 2016.

"Our hospital was reduced to rubble, and so was my heart," Dr Mazen said of the MSF-supported facility.

To this day, he thinks back to the attack every day.

"The only reason I have survived was because I was 15 minutes late to work," he said.

"I should have been there at 9:00 am. The first strike came at 9:02 am. Rescue teams started to move in to try to pull survivors out from under the rubble. But the next strike came at 9:05 am. And then again at 9:45 am and 9:50 am."

As all hell broke loose, the surgeon rushed along with volunteer rescuers to evacuate the survivors they could find to the nearest medical facility — the Central Hospital in the northwest Syrian town of Maaret al-Numan.

But the nightmare was not over.

"The Syrian air force then fired two missiles at the Central Hospital, one at

11:00 am, the other at 11:05 am," the surgeon recalled.

The most dangerous place

Scores of hospitals and medical facilities have been damaged or destroyed since the outbreak of war in 2011, notably by air strikes, leaving hundreds of thousands of people without access to adequate healthcare.

In addition, hundreds of doctors and other medical professionals have been killed, with many others detained and tortured for daring to provide care to people in "enemy" territory.

Thousands of health workers have joined the human tide of refugees fleeing Syria in recent years, knowing that they might otherwise become the next targets.

Some, however, have stayed behind; fearing that if they left too, injured or sick civilians still trapped in the country would have no chance at life.

But because of the staff shortages, doctors still working in Syria face an enormous workload.

"There are days when we have to treat more than 100 people at once, we see patients lying on the floor screaming in pain, but we just can't get to everyone fast enough," said Dr Ahmad, another surgeon who works at an MSF-supported hospital near the town of Jisr al-Shughour, not far from the Turkish border.

"We have faced incredibly difficult days," he recalled, as he described artillery attacks and air strikes on his facility.

"It is as though Syrian air force and its allies are seeking to maximize the number

of civilian casualties; this is clear when markets, bakeries, town squares and hospitals are hit," he said.

"In Syria, the most dangerous places to be are a hospital or an ambulance."

Under international humanitarian law, hospitals and ambulances enjoy a special protected status. In Syria, however, health workers have had to go to great lengths in order to conceal their ambulances and medical facilities — because they know that they are prime targets for attack should they be clearly marked.

"We hide our hospitals and cover our ambulances with mud in order to disguise them," said Dr Ahmed, who is a general surgeon, trained in Aleppo University.

Hospitals and medical centers are often concealed as their staff seeks to evade attack.

"The building housing this hospital used to be a cheese factory, but we turned it into a fully functioning hospital. Working conditions are not ideal but we are trying our best," Dr Ahmed said.

Others have set up medical facilities in abandoned poultry farms or empty school buildings.

"We doctors have learned that we cannot work in clearly marked, normal hospital buildings in Syria any more. It's just too dangerous. Any building that looks like a hospital will be targeted," he said. "Of course, this means that our patients aren't getting the quality care they need, because these buildings were not designed to be hospitals. We also lack a lot of essential equipment."

Still, many of Dr Ahmad's patients would simply not survive if they had to

wait to wait to be transported across the frontier to Turkey. The border is mainly closed, and for some – particularly those with war injuries – the journey would just be too long.

Despite the grim working conditions he and his colleagues face, Dr Ahmad believes he must remain in Syria.

“We will never leave,” he says.

Moving hospitals, panic rooms

Dr Abdallah, a laboratory physician, explained that while he has continued to work in Syria, his wife, young daughter and two sons were now living in the Turkish border city of Gaziantep, where they can be safe.

“But because they worry about me, they live in constant fear and anxiety. They know that being a medic in Syria is near-suicidal,” he said, adding that it hasn’t always been easy to explain to his family why it is important for him to remain — particularly because their concerns are by no means unwarranted.

Dr Abdallah, who ran an MSF-supported hospital named after the Iraqi capital Baghdad, has also had a very close brush with death.

“Our hospital was bombed on November 3,” he said.

“Our logistician, named Emad Zeitoun, was killed when he went out of the panic room,” he said, describing a makeshift 15 square-metre shelter set up in the basement of the hospital that medical staff and patients hid in during attacks.

The raid came at 11:00 pm, Dr Abdallah said, the same day as two other hospitals in Aleppo countryside were hit. “It was a black day for healthcare in Aleppo,” he said.

The facility had a huge workload when it was hit, mainly caring for bombing victims who needed amputations or other treatment for critical injuries.

In fact, staff had so much to do that they were regularly forced to refer non-emergency cases to centres nearer the Turkish border.

As a safety procedure, staff had covered the building housing the hospital with a two-metre-high dirt barrier. They also ensured no one ever filmed the facility, so that its exact location could not be discovered.

Nonetheless, it too came under attack. First one strike, and minutes later, another.

These photos were taken in east Aleppo by Karam Almasri for Médecins Sans Frontières on 23 November 2016. They show the aftermath of an airstrike attack on one of the key surgical hospitals in east Aleppo on 17 November 2016. The damage was so extensive that the hospital was forced to go out of service immediately. The hospital had an emergency room, an intensive care unit and a number of operating theatres providing orthopaedic and general surgery.



The main entrance of the hospital after it was bombed



The hospital's main reception area was shattered by the bombing.



A room on the second floor of the hospital.



The airstrikes shattered everything in the surrounding area, including ambulances and cars parked in the front of the hospital.

“Those who could walk were sent away straight after the first raid; we knew another strike was imminent. The others were packed into the panic room. There were 50 of us in there when the second rocket hit 10 minutes later. Three floors were immediately crushed, one on top of the other, like a layered pastry cake. The strikes also left a hole in the ceiling of our shelter; everyone climbed out through there,” Dr Abdallah said.

Even after surviving his hospital’s destruction, the doctor is now looking for a new location to start working again.

“We will not stop fulfilling our humanitarian duty. We as Syrian doctors cannot give up on our people. I don’t blame anyone who left, either to work on the Turkish border or in Europe. But if we all went away, who would help those left behind, and who have no one to turn to?”

Near-daily attacks

Syria’s war has killed hundreds of thousands

of people. Numerous UN resolutions have been issued condemning attacks on hospitals in Syria — yet attacks on medical facilities have either been denied outright or at best branded as mistakes.

For medical staff on the ground, all difficulties pale in comparison to the constant danger posed by air strikes and other violence.

Medical staff in MSF-supported hospitals in Idlib province reported 54 attacks on health care staff and facilities between July and December last year.

Dr Abd, a surgeon who now heads the opposition’s health directorate in Idlib province, agreed with his colleagues in that staff and equipment shortages make work very hard.

Safety from air strikes and other attacks, however, is what Syrian doctors need the most.

“If we need insulin we can get it from NGOs like MSF,” said Dr Abd. “But who can protect us?” **MEH**

Cerebral palsy – the most common physical disability in children

Cerebral palsy (CP) is the name for a series of neurological disorders caused by abnormalities in parts of the brain that control muscle movement. It is the most common form of physical disability in childhood, being present in two of every 1,000 children. Symptoms can range from mild to severe both in physical and mental capacities. In mild cases a single limb may be affected. In more severe cases, all four limbs and almost all functional aspects of the child are affected. CP is usually caused by brain damage that occurs before or during a child's birth, or during the first 3 to 5 years of a child's life. The brain damage that leads to cerebral palsy can also lead to other health issues, including vision, hearing and speech problems and learning disabilities.

Cerebral palsy affects muscle control and coordination, so even simple movements – or standing still – are difficult. Other vital functions that also involve motor skills, such as breathing, bladder and bowel control, eating, and learning, also may be affected when a child has CP. Cerebral palsy does not get worse over time.

The causes of most cases of CP are unknown, but many are the result of problems during pregnancy. This can be due to infections, maternal health problems, a genetic disorder, or something that interfered with normal brain development. Problems during labour and delivery can cause CP, but this is the exception.

Premature babies – particularly those who weigh less than 3.3 pounds (1,510 grams) – have a higher risk of CP than babies that are carried full-term, as are other low-birth-weight babies and multiple births (twins, triplets, etc.). Brain damage in infancy or early childhood can also lead to CP. A baby or toddler might suffer damage because of lead poisoning, bacterial meningitis, malnutrition, being shaken as an infant, or being in a car accident while not properly restrained.



Associated medical problems

Children with CP have varying degrees of physical disability. Some have only mild impairment, while others are severely affected. The brain damage that causes CP can also affect other brain functions, and can lead to further medical issues. Associated medical problems may include visual impairment or blindness, hearing loss, food aspiration, gastroesophageal reflux, speech problems, drooling, tooth decay, sleep disorders, osteoporosis and behaviour problems.

Seizures, speech and communication problems, and mental retardation are more common among kids with the most severe forms of CP. Many have problems that may require ongoing therapy and devices such as braces or wheelchairs.

Collaborative approach

Currently there's no cure for cerebral palsy, but a variety of resources and therapies can provide help and improve the quality of life for kids with CP. Children with neuromuscular disabilities require the collaborative approach of a multidisciplinary team. Because cerebral palsy symptoms can vary

from child to child, children with cerebral palsy need specialized care tailored to their own individual needs.

As soon as CP is diagnosed, patients should begin therapy for movement, learning, speech, hearing, and social and emotional development. Paediatric cerebral palsy treatment also may include medication, surgery or braces to help improve muscle function. Different kinds of therapy can help them achieve maximum potential in growth and development.

Orthopaedic surgery can help address deformities of hips, knees, feet and scoliosis (curvature of the spine), which are common problems associated with CP. Severe muscle spasticity can sometimes be helped with medication taken by mouth or administered via a pump implanted under the skin.

A variety of medical specialists might be needed to treat the different medical conditions. If several medical specialists are needed, it's important to have a primary care doctor or a CP specialist help you coordinate the care. **MEH**

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Participants at the 'Closing the Gaps in Heart Failure across MENA' workshop and members of the newly formed MENA Heart Alliance (left to right):

- Dr Kamal Alghalayini, Consultant Cardiologist and Director of the Heart Failure Program and Non-invasive Cardiology Lab at King Abdulaziz University, Jeddah – Saudi Arabia
- Prof. Feras Bader, Cardiologist, Cleveland Clinic, Abu Dhabi - UAE
- Ed Harding: Managing Director Health Policy Partnership (HPP) Consultancy – UK
- Dr Waleed Al-Habeeb, Secretary General of the Saudi Heart Association and President of the Saudi Heart Failure Group – Saudi Arabia
- Dr Bassem Sobhi, Consultant Cardiologist and Head of the Heart Failure Clinics - National Heart Institute, Cairo – Egypt
- Angela Massouh, a Heart Failure Nurse Specialist, American University of Beirut Medical Center
- Hend Soliman, Heart Failure Patient and member of the Egyptian Association for Care of Heart Failure Patients, Cairo – Egypt

MENA Heart Failure Alliance launched

Regional experts, policy makers set out priorities to tackle heart disease

The MENA Heart Failure Alliance, the region's first dedicated group for heart failure management, was launched at a cardiology workshop in Abu Dhabi in November. The 'Closing the Gaps in Heart Failure across MENA' workshop brought together regional healthcare leaders, policy makers and heart failure experts to discuss the findings from *The MENA Heart Failure Roadmap Report* – an in-depth study conducted by The Health Policy Partnership. The report

assessed the unmet needs, barriers, and opportunities for policy change that may reduce the morbidity and mortality for MENA (Middle East North Africa) heart failure patients.

The MENA Heart Failure Alliance will be dedicated to combat heart failure, establish a clear roadmap of priority actions, and develop locally applicable interventions and policies following the key focus areas identified through the Roadmap Report findings, according to a

statement issued by the Alliance.

The workshop enabled the Alliance to identify priority areas for heart failure management in the MENA region, which included; raising public, patient and professional awareness and understanding; developing comprehensive and unique national strategies; establishing better measurement and data, and; working on continuous care pathways and guidelines.

The Alliance is formed by experts in cardiology and includes:

Heart Failure Facts

Middle East and North Africa

What is Heart Failure?¹

Heart Failure is a **serious chronic condition**, which occurs when the heart is unable to pump enough blood to meet the needs of the body

Heart Failure impacts more than **60 million** people worldwide⁴

1 in 5

people over the age of 40 will develop heart failure in their lifetime⁵



Risk Factors²

- ♥ high blood pressure
- ♥ diabetes
- ♥ hyperlipidaemia
- ♥ cigarette smoking
- ♥ drug abuse
- ♥ khat chewing
- ♥ obesity
- ♥ coronary artery disease

Think Heart Failure if...³

- ☹ extreme tiredness
- ⚖ weight gain
- ♥ rapid heartbeat
- 🫁 breathlessness
- 🦵 swelling - legs, ankles, abdomen
- 🤢 nausea

People in MENA develop heart failure

10 years younger

than their Western counterparts⁶



1/2 of people hospitalised for heart failure die within 5 years⁷

People are generally **more afraid** of stroke (41%), advanced cancer (43%) or heart attacks (12%) than heart failure (4%), even though heart failure is more deadly⁸

In the UAE, only

50%

of all potential heart failure cases are diagnosed⁹

MENA Heart Failure Roadmap ... why?

Despite the future burden of Heart Failure, few countries have adequate Heart Failure and Cardiovascular Disease prevention and management policies.

It is important to raise the status of Heart Failure as a key strategic policy area

What needs to be done?

- ✓ Lead national strategies
- ✓ Prevention
- ✓ Timely and accurate diagnosis
- ✓ Better measurement and data
- ✓ Raise awareness
- ✓ Guideline based care in hospital
- ✓ Monitoring heart failure outside hospital
- ✓ Self-management tools
- ✓ Preparing the healthcare system

NOVARTIS

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● Professor Feras Bader, Cardiologist, Cleveland Clinic Abu Dhabi (UAE);

● Dr Bassem Sobhi, Consultant Cardiologist and Head of the Heart Failure Clinic - National Heart Institute, Cairo (Egypt);

● Dr Waleed Al-Habeeb, Secretary General of the Saudi Heart Association and President of Saudi Heart Failure Group (KSA);

● Dr Kamal Alghalayini, Cardiology Consultant and Director of the Heart Failure program and non-invasive Cardiology Lab at King Abdulaziz University (KSA);

● HEND Soliman, Heart Failure

Patient and member of the Egyptian Association for Care of Heart Failure Patients (Egypt); and

● Angela Massouh, a Heart Failure Nurse Specialist, American University of Beirut Medical Center (Lebanon).

Referring to two studies – Hospitalized heart failure patients with preserved vs. reduced ejection fraction in Dubai, United Arab Emirates: a prospective study, *European Journal of Heart Failure* (2014) and Gulf CARE: Heart failure in the Middle East, *Global Cardiology Science & Practice* 2015 – Dr Prof Bader, speaking at the heart failure event, said: “The MENA region has one of the youngest

populations of heart failure patients across the globe, with the population in MENA developing heart failure 10 years younger than their western counterparts. Furthermore, despite striking improvement in the prognosis and survival in patients with coronary artery disease (CAD), hypertension, and congenital heart disease, the prevalence of heart failure still continues to grow.”

A study conducted by TNS UK in 2014 found that people are generally more afraid of stroke (41%), advanced cancer (43%) or heart attacks (12%) than heart failure (4%), even though heart failure is more deadly¹¹.

“Awareness of heart failure is low amongst the general public, healthcare professionals and policymakers, which can affect all aspects of heart failure care and there are often limited educational materials and appropriate support to help patients and caregivers understand the condition. This may result in late presentation, inadequate self-care, or limit the patients’ ability to make care or treatment decisions.

“One of the key focus areas for the MENA Heart Failure Alliance, is to work with a cross section of specialist physicians and healthcare providers to increase awareness of the disease and ensure patients and healthcare professionals can make informed decisions,” said Prof Bader.

Heart failure often occurs when the heart muscle has suddenly become weak following a heart attack or other illnesses affecting the heart, or by damage sustained more gradually due to diabetes, high blood pressure or coronary artery disease. Common risk factors of heart failure include, high blood pressure, diabetes mellitus, hyperlipidaemia leading to CAD, cigarette smoking and obesity, many of which are associated with a more Western-type lifestyle and has a high prevalence in the Middle-East population.

Dr Wael Al Mahmeed, Cardiologist at Cleveland Clinic Abu Dhabi and member of the MENA Heart Failure Alliance said: “While there are comprehensive healthcare strategies in the region when it comes to cardiovascular disease and non-communicable disease, we need to work with our governments to ensure heart failure is integrated within those frameworks and the region. The UAE is prepared for this expected burden.”

Heart Failure Roadmap report

The Heart Failure Roadmap report found that the MENA region has unique challenges in heart failure that require unique responses. Studies suggest that re-hospitalisation rates are much higher in MENA than in other countries. These may be driven, in part, by inadequate awareness and understanding of heart failure at all levels of the health system and inconsistent patient follow up. These high re-admission rates are costly and often avoidable.



Professor Feras Bader, Cardiologist, Cleveland Clinic, Abu Dhabi

“Accurate and comprehensive data collection on the burden of heart failure in this region will be a top priority for the MENA Heart Failure Alliance as it’s the primary reason why little attention is given to the diagnosis, management and prevention of the disease,” Dr Wael said

“Heart failure is the number one reason for hospitalisation for people over 65 across the globe, placing a huge social and economic burden on patients and their families. The pressures of heart failure are set to grow across MENA, driven by the high prevalence of risk factors for non-communicable diseases in the region which are often left unchecked and unchallenged.

“Understanding the sociocultural aspects affecting the disease will help develop locally applicable interventions and policies. Governments must urgently develop responses that are specific to the needs and circumstances of the region and each individual country,” Dr Wael said.

Workshop participants also discussed how to build continuous care pathways and guidelines for heart failure patients, including; recognising the importance of prevention; achieving timely and accurate diagnosis; ensuring patients receive guideline based care whilst in hospital recognizing the importance of monitoring and maintenance of heart failure outside of hospital and; giving patients adequate tools and support for self-monitoring and self-management.

The MENA Heart Failure Alliance plan to establish comprehensive heart failure management programmes across the region to help patients access adequate and more equitable care with the commitment and consensus of clinicians and policymakers.

References:

1. TNS UK Limited, March 2014. Survey of 11,000 members of the public aged 50+ years old in Europe, funded by Novartis Pharmaceuticals. **MEH**

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Can mechanical pump regenerate heart muscle?

Could heart muscle that's been damaged by a heart attack be prompted to repair itself?

Researchers with University of Texas (UT) Southwestern Medical Center's Hamon Center for Regenerative Science and Medicine are launching clinical trials to find out. The trials will look at whether a type of mechanical pump – a ventricular assist device – can create an environment that results in regeneration of heart cells.

“Research at UT Southwestern over the past five years was the first to show that the heart muscle in mammals can actually regrow in the early days of life. This ability stops, in part because of the work load that the heart has to do, and we believe that taking away that load by using ventricular assist devices will reactivate this regenerative ability of the heart,” said Dr Hesham Sadek. Dr Sadek, who attended medical school at Ain Shams University in Cairo, Egypt, is Associate Professor of Internal Medicine with the Hamon Center for Regenerative Science and Medicine.

Heart disease is one of the leading cause of death worldwide. In the United States, an estimated 5.7 million people have heart failure, which is the inability of the heart to pump enough blood to keep up with the demands of the body, but does not mean the heart has stopped working. There are no current treatments to regenerate heart muscle.

“We are looking at a specific and accessible strategy to reawaken the regenerative ability of the adult heart,” said Dr Sadek, who holds the J. Fred Schoellkopf, Jr. Chair in Cardiology.

A ventricular assist device (VAD) is a mechanical pump used to support heart function and blood flow in people who have weakened hearts. The device takes blood from a lower chamber of the heart and helps



Dr Mark Drazner, head of UT Southwestern's LVAD program, displays one of the VAD mechanical heart pumps, with Dr Hesham Sadek, Associate Professor of Internal Medicine with the Hamon Center for Regenerative Science and Medicine.

pump it to the body and vital organs, just as a healthy heart would. A small tube carries blood out of the heart into a pump, while another tube carries blood from the pump to the blood vessels, which deliver the blood to the body.

UT Southwestern is establishing a Ventricular Assist Device Program through which the clinical trials will be conducted. The first series of clinical trials will be conducted with patients who currently have or will be getting VADs implanted to treat heart failure. Each trial will use a different measure to assess heart regeneration. The initial trial will use a nuclear imaging modality to assess heart mass. Eventually, the researchers expect to complete six or seven trials that assess

the ability of VADs to promote heart regeneration and to discover biomarkers of the process in VAD patients.

The clinical trials build on previous research in Dr Sadek's lab that found that heart muscle in newborn mammals is capable of regeneration, much like skin and bone are capable of regeneration throughout an animal's life. But cardiomyocytes, or heart muscle cells, lose that ability in the days following birth due to the high-oxygen environment of the beating heart.

“Dr Sadek has brought an exciting new perspective to the clinical problem of heart disease. He has obtained evidence indicating that placing a heart on a VAD can active a regenerative response and

VAD/Heart regeneration timeline

■ **1998-2001:** UT Southwestern is one of 20 medical centres in the REMATCH trial comparing ventricular assist devices (VADs) to standard care for heart failure patients. Patients with VADs do significantly better.

■ **Feb. 2011:** Work by Dr Hesham Sadek, Dr Eric Olson and others showing the ability of the neonatal mouse heart to regenerate is published in *Science*.

■ **April 2014:** *Cell* publishes research by the Dr Sadek and others showing that oxygen metabolism causes damage to DNA in heart cells, which shuts down their ability to regenerate.

■ **May 2014:** UT Southwestern announces the formation of the Hamon Center for Regenerative Science and Medicine thanks to a \$10 million gift from the Hamon Charitable Foundation to focus on tissue and organ regeneration research.

■ **Jan. 2015:** A small study by Dr Sadek, Dr Pradeep Mammen and others showing that long-term VAD use leads to heart muscle regeneration is published in the *Journal of the American College of Cardiology*.

■ **Sept. 2016:** The first patient is enrolled in a series of clinical trials at UTSW studying the ability of VADs to lead to heart regeneration.

A diagrammatic representation of a Left Ventricle Assist Device (LVAD)

create new cardiac muscle cells,” said Dr Eric Olson, Director of the Hamon Center for Regenerative Science and Medicine and Chairman of Molecular Biology.

“The opportunity to bring cutting-edge advances in science to our patients with advanced heart failure who require LVAD support is truly exciting and we hope will lead to major advances in the care of such patients in the future,” said Dr Mark Drazner, Medical Director of the Heart Failure, LVAD, and Cardiac Transplant program.

UT Southwestern has played an integral role throughout the relatively short history of VAD therapy and in the devices’ rapidly evolving technology. UT Southwestern participated in the landmark clinical trial (REMATCH) that led to USFDA approval of the first left ventricular assist device for destination therapy. UT Southwestern also participated in the HeartWare Bridge-to-Transplant trial, which was completed

in 2012 and led to FDA approval of the device.

In 2015, Dr Sadek, Dr Pradeep Mammen, Associate Professor of Internal Medicine and Integrative Biology, and others found that long-term use of ventricular assist devices induces regeneration of heart muscle by preventing oxidative damage to cardiomyocytes.

“This work suggests that by reducing the load on the heart, a pathway for myocyte cell division that has been silenced by high demand can be turned back on. These trials are the clinical translation of that finding in the lab,” said Dr Olson, who holds the Pogue Distinguished Chair in Research on Cardiac Birth Defects, the Robert A. Welch Distinguished Chair in Science, and the Annie and Willie Nelson Professorship in Stem Cell Research.

UT Southwestern established the Hamon Center for Regenerative Science and Medicine in 2014 with a US\$10 million endowment gift from the Hamon Charitable Foundation to further research

into the relatively new field of regenerative medicine. The Center’s goal is to understand the basic mechanisms for tissue and organ formation, and then to use that knowledge to regenerate, repair and replace tissues damaged by ageing and injury. The Center for Regenerative Science and Medicine is providing the funding for the VAD heart regeneration studies.

UT Southwestern collaborators include Dr Mark Drazner, Professor of Internal Medicine and Medical Director of the Heart Failure, LVAD, and Cardiac Transplantation Program, and Clinical Chief of Cardiology, who holds the James M. Wooten Chair in Cardiology; Dr Mammen, who is with the Hamon Center for Regenerative Science and Medicine; and Dr Matthias Peltz, Associate Professor of Cardiovascular and Thoracic Surgery. Additionally, the UT Southwestern researchers will be working with Washington University and the University of Utah, two of the largest VAD programs in the country, to recruit patients for the clinical trials. **MEH**

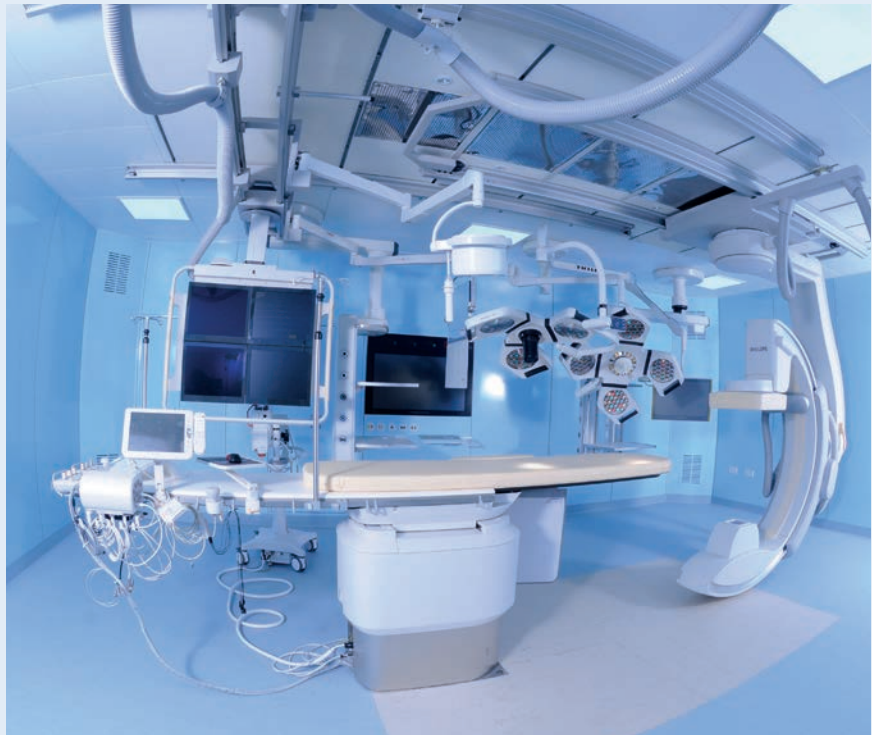
Thumbay Hospital's Cardiology Dept set to introduce advanced facilities and treatments

Affiliated to the Gulf Medical University, the Thumbay network of academic hospitals are widely-regarded as the champions of 'quality healthcare at affordable costs' and the pioneers of medical tourism in the region. The hospitals are located in Dubai, Ajman, Sharjah, Fujairah & Hyderabad (India) with 700-plus beds, and provides the most comprehensive range of care for cardiovascular problems in the region.

Led by expert doctors with extensive experience, the cardiology department uses the most modern technologies to provide a plethora of world-class services ranging from just a check-up to handling the most critical cases. The hospitals offer emergency cardiac services round-the-clock.

In 2016, the Thumbay Hospital in Ajman made headlines when it successfully carried out the first Balloon Mitral Valvuloplasty in the Emirate, at its brand-new, most-modern Cath Lab. Balloon Mitral Valvuloplasty is a very demanding procedure, and requires special training to perform the dilatation of the mitral valve. However, it is beneficial for the patient, who otherwise would have to undergo an open-heart surgery to rectify the condition. An important advantage of this procedure vis-à-vis the surgical option is that the patient can resume his/her normal routine just one day after the procedure, with no need for prolonged rest, and not more than a day of hospital admittance.

The hospital also excels in device-based therapy, and is fully prepared to perform different device implantations. Two pacemaker implants were successfully performed at the hospital recently. The Cath Lab is also well-equipped to implant life-saving devices like ICDs (Implantable Cardioverter Defibrillator)



and CRTDs (Cardiac Resynchronization Therapy Devices) for heart failure cases. These are performed by doctors with successful track records spanning more than eight years.

Insertion of BVS bio-absorbable stents is another area of expertise of Thumbay Hospital. An increasing number of patients nowadays are choosing to have the bio-absorbable stents inserted, as these become part of the body after 6 months of insertion, ruling out the need to follow long-term medication.

The hospital also offers pediatric cardiology services, caring for children with congenital heart disease.

Upcoming facilities & treatments

The Cardiology Department of Thumbay Hospital is all set to see several major developments in the near future. The

hospital will soon introduce cardiothoracic surgery, bringing in world-class expertise to tackle serious heart and lung conditions requiring surgical intervention.

The Cardiology Department will also update its non-invasive facilities through measures like optimizing the use of CT coronary angiography to identify narrowing of the coronary artery. Plans are also afoot to emphasize and optimize the use of 3D echo for real-time imaging of cardiac structure and function.

In the long-term, the hospital has plans to set-up an electrophysiology study (EPS) lab, which would not only check for abnormalities in heartbeat, but also enable doctors to perform cardiac ablation procedures to correct heart rhythm arrhythmias. The EPS lab will also enable easy insertion of cardiac resynchronization devices. **MEH**

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Study shows effects of long-term exposure to air pollution and traffic noise on blood pressure

Long-term exposure to air pollution is linked to a greater incidence of high blood pressure, according to the largest study to investigate the effects of both air pollution and traffic noise by following over 41,000 people in five different countries for five to nine years.

The study, which is published 23 October 2016 in the *European Heart Journal*, found that among adults, up to one extra person per 100 people of the same age group living in the most polluted areas of cities would develop high blood pressure (hypertension) compared to those living in the less polluted areas. This risk is similar to the effect of being overweight with a body mass index (BMI) between 25-30 compared to people with normal weight (BMI 18.5-25).

High blood pressure is the most important risk factor for premature illness and death.

This study is one of the first to investigate both air pollution and traffic noise simultaneously and it found that traffic noise is associated with an increase in cases of hypertension as well. The way the study was conducted enabled the researchers to estimate the risk

that was linked to air pollution and the risk linked to noise separately. The association of air pollution with hypertension remained even when exposure to traffic noise was considered in the analysis. The researchers say this is an important finding because there are differing ways of reducing air pollution and noise.

A total of 41,072 people living in Norway, Sweden, Denmark, Germany and Spain participated in the study, which was part of the “European Study of Cohorts for Air Pollution Effects” (ESCAPE) project that is investigating long-term effects of exposure to air pollution on human health in Europe. Information on blood pressure was gathered when the participants joined the study and during a follow-up examination in later years.

None had hypertension when they joined the study, but during the follow-up period 6,207 people (15%) reported that they developed hypertension or started to take blood pressure-lowering medications.

Between 2008 and 2011, the researchers measured air pollution during three separate two-week periods (to allow for seasonal effects). They used filters to capture information on concentrations of polluting particles known as “particulate matter” (PM) of different sizes: PM10



(particles less than or equal to 10 microns in diameter), PM2.5 (less than or equal to 2.5 microns), PMcoarse (PM10 minus PM2.5) and PM2.5 absorbance (a measurement of soot particles). These measurements were taken at 20 sites in each of the areas being studied, and measurements of nitrogen oxides were measured at 40 different sites in each area. Traffic density was assessed outside the homes of the participants and traffic noise was modelled according to the EU Directive on environmental noise.

The researchers found that for every five micrograms per cubic metre (5 µg/m³) of PM2.5, the risk of hypertension increased by a fifth (22%) in people living in the most polluted areas compared to those in the least polluted areas. Higher soot concentrations also increased the risk.

Chronic traffic noise

For exposure to chronic traffic noise, the researchers found that people living in noisy streets, where there were average night time noise levels of 50 decibels, had a six percent increased risk of developing hypertension compared to those living on quieter streets where average noise levels were 40 decibels during the night.

Professor Barbara Hoffmann, Professor of Environmental Epidemiology at the Centre for Health and Society at Heinrich-

Heine-University of Düsseldorf, Germany, who led the analysis, said: “Our findings show that long-term exposure to particulate air pollution is associated with a higher incidence of self-reported hypertension and with intake of anti-hypertensive medication. As virtually everybody is exposed to air pollution for all of their lives, this leads to a high number of hypertension cases, posing a great burden on the individual and on society.

“Exposure to traffic noise shares many of the same sources with air pollution and so has the potential to confound the estimates of the adverse effects of pollution on human health.

However, this study controlled for traffic noise exposure and found that the associations of air pollution with hypertension did not vanish. This is important because preventive measures for air pollution and noise differ.

One very important aspect is that these associations can be seen in people living well below current European air pollution standards. This means, the current legislation does not protect the European population adequately from adverse effects of air pollution. Given the ubiquitous presence of air pollution and the importance of hypertension as the most important risk factor for cardiovascular disease, these results have important public health consequences and call for more stringent air quality regulations.

● doi: 10.1093/eurheartj/ehw413

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لقد كانت مهمتنا دوماً إيجاد سُبُل جديدة ومبتكرة لمشاركة أحدث الاكتشافات في مجال العلوم، وتطوير النقاش بين المجتمع العلمي العالمي. وتعدّ دورية Nature الطبعة العربية سواء النسخة الورقية المطبوعة، أو الإلكترونية، أو تطبيق الهواتف الذكية بمنزلة مُنتَداك الخاص لقراءة الأبحاث الرئيسية، ومشاهدتها، والاستماع إليها، والمشاركة فيها.





Superhero Eric DelaTorre

Saving a Superhero

This is a story of a real-life superhero, Eric DelaTorre, who was born with life-threatening heart defects. Today, the 5-year-old boy has the powers he needs to live a healthy and energetic life.

At the time of Eric's birth in October 2011, an echocardiogram showed a serious heart condition. Cardiologists at two hospitals had differing opinions about which side of the heart had the more critical problem. That's when Eric's family turned to the University of Chicago Medicine Comer Children's Hospital, where a comprehensive echocardiogram showed the infant had complex congenital heart disease significantly affecting both sides of his heart.

"For the first time, we felt like more than just a number," said Eric's mother Alma. "We loved the hospital's boutique feel and personal touches, like the echo technician stroking Eric's head and the cardiologist playing classical music during the test."

When Eric was just three months old, Gerhard Ziemer, MD, PhD, performed open-heart surgery on the left side of his heart. Due to the severity of the condition, the little boy's chest needed to be left open for three days with a life support machine at his bedside.

"Our world came crashing down when we were told Eric might not pull through," Alma said. "Our PICU nurses assured us everything was going to be okay and never left his side. Child Life specialists also comforted and helped us."

Eric recovered and grew stronger. And he was able to go home from the hospital seven weeks later.

But when the pulmonary arteries on the right side of his heart failed to grow as expected, another open-heart surgery followed just over a year after the first one. The main pulmonary artery was widened and the entire pulmonary artery between his right and left lungs was replaced with artificial tubes.

"We were included in rounds and Dr Ziemer spent hours answering our questions," Alma said. "Everyone – from the valets and receptionists to the cleaning people – was so nice and warm to us."



Alma DelaTorre, left, pediatric interventional cardiologist Daniel Gruenstein, MD, and Rachel Simon, RN, BSN, CPN, comfort Eric DelaTorre in the Hybrid Cardiac Catheterization Lab at the University of Chicago Medicine Comer Children's Hospital.

The power of X-ray vision

Reconstructing the heart of a growing superhero is no easy feat, and the cardiac team continued to follow Eric closely to ensure he didn't miss a beat.

In December 2015, Comer Children's interventional cardiologist, Daniel H. Gruenstein, MD, used Eric's love of superheroes to ease his patient's fears. When Eric avoided making eye contact with his new doctor, the nurses suggested wearing superhero lead aprons and matching surgical caps during a procedure. As soon as Gruenstein donned his Superman gear, "Eric and I were best friends," he said, adding: "We also played superhero cartoons on a monitor to make him more comfortable."

Eric's procedures took place in Comer

Children's Hybrid Cardiac Catheterization Lab, a state-of-the-art facility for treating children and adults with heart conditions. The cardiovascular X-ray system in the lab gives the physicians real-time feedback on radiation dosage so they can make adjustments while doing procedures. The only one of its kind in Chicago, the system also enables the interventional cardiologist to focus the radiation on a small region of the patient's body, further reducing the exposure for patients like Eric who may require several catheterizations throughout their lifetime.

"Superheroes use X-ray vision to save people, and we use it to help keep the hearts of little superheroes pumping," Gruenstein said. "At the same time, we are protecting their bodies from excess radiation over the long term."

Recently, Gruenstein became one of the first cardiologists in the US to receive a new board certification in adult congenital heart disease. This means he is now certified to care for Eric and other pediatric and congenital heart disease patients through adulthood.

Today, Eric is an energetic and outgoing little boy. His family spends a lot of time outdoors, where Eric loves to roll in the dirt, hunt fossils and observe nature. He also loves playing with robots and building things.

"Eric wants to participate in everything," Alma said. "None of this would be possible without the staff at Comer Children's Hospital, who gave our family all the attention and love we needed. It was the right decision to come to Comer Children's."

■ For more information, please visit <http://international.uchospitals.edu> MEH

New clinical practice guidelines recommend more use of surgical ablation for treating Afib

New clinical practice guidelines have been issued by The Society of Thoracic Surgeons (STS) that include major recommendations for the use of surgical ablation when treating atrial fibrillation (Afib), the most common type of irregular heartbeat. The guidelines were posted online 19 December 2016 in *The Annals of Thoracic Surgery*.

“These guidelines represent nearly 2 years of effort by some of the United States’ leading experts in the surgical treatment of atrial fibrillation,” said guidelines co-author Vinay Badhwar, MD, Gordon F. Murray Professor and Chair of the West Virginia University Heart & Vascular Institute. “This important document highlights the increasing global evidence on the safety and efficacy of surgical ablation for the treatment of Afib.”

STS believes that the practice of summarizing current scientific evidence into clinical practice guidelines and recommendations may contribute importantly to improving surgical outcomes, as well as the quality of patient care. In this case, the literature revealed that surgical ablation as a treatment option for Afib has experienced continued development over the last 30 years, with its frequency and success steadily increasing. The guideline writing committee merged these findings into a singular consensus paper to shape practice, concluding that surgical ablation is effective in reducing Afib and improving quality of life, and so deserves a more prominent role in adult cardiac surgery.

In patients with Afib, rapid, disorganized electrical signals cause the atria to quiver. The quivering upsets the normal rhythm between the atria and the ventricles. As a result, the ventricles may beat fast and without a regular rhythm.

Afib can lead to blood clots, strokes, heart failure, and other heart-related complications. According to the American Heart Association (AHA), untreated Afib

doubles the risk of heart-related deaths and is associated with a significantly increased risk for stroke.

“It is recognized that surgical ablation impacts long-term outcomes with improvements in normal heart rhythm, quality of life, and stroke reduction,” said Dr Badhwar. “Current evidence reveals that surgical ablation can be performed without significant impact to major complications or death.”

One option for Afib treatment – as the new clinical guidelines recommend – is surgical ablation, also known as the maze procedure. When performing surgical ablation, the surgeon makes very specific and defined lesions in the heart. Scar tissue forms, blocking the abnormal electrical signals while also creating a controlled path for electricity in the heart to follow. The heartbeat should eventually normalize.

Surgical ablation can be done as a standalone procedure or in combination with another heart surgery. In developing these new guidelines, the authors assessed the safety of performing surgical ablation for three surgical approaches: primary open atrial operations where the left atrium is already being opened, such as mitral valve repair or replacement and/or tricuspid valve repair; primary closed atrial operations when the left atrium would not otherwise be open, such as coronary artery bypass grafting (CABG) and/or aortic valve replacement (AVR) operations; and standalone operations when the only goal is to perform surgical ablation to treat Afib.

The new clinical practice guidelines offer evidence-based recommendations that include:

- Surgical ablation for Afib at the time of concomitant mitral operations to restore cardiac rhythm;
- Surgical ablation for Afib at the time of concomitant isolated AVR, isolated CABG, and AVR+CABG operations to restore cardiac rhythm; and

These guidelines may help guide surgeons when faced with a challenging decision on the management of Afib. The guidelines represent an assimilation of the world's literature; they do not supersede the final medical decision of the surgeon. It is important to remember that the ultimate choice of any therapy remains between the patient and their doctor.

- Surgical ablation as a primary standalone procedure to restore cardiac rhythm for symptomatic Afib that is resistant to medication or catheter ablation.

The authors also recommend a multidisciplinary heart team assessment, treatment planning, and long-term follow-up in order to optimize patient outcomes in the treatment of Afib.

“These guidelines may help guide surgeons when faced with a challenging decision on the management of Afib,” said Dr Badhwar. “The guidelines represent an assimilation of the world’s literature; they do not supersede the final medical decision of the surgeon. It is important to remember that the ultimate choice of any therapy remains between the patient and their doctor.”

doi: 10.1016/j.athoracsur.2016.10.076

SKMC Cardiac Sciences Institute is renowned for its expertise and ability to handle complex cases

The Cardiac Sciences Institute at Sheikh Khalifa Medical City in Abu Dhabi, one of Abu Dhabi Health Services Company's entities, is a comprehensive and cutting-edge facility that provides complete invasive and non-invasive care for both adult and pediatric patients. From diagnosis to rehabilitation, the institute provides a full-service solution. The Institute is renowned for its expertise, its integration of disciplines, its state-of-the-art equipment and facilities as well as for its highly trained and qualified personnel.

Adult Cardiology

The division of Adult Cardiology is one of the largest divisions of cardiology in the UAE. It encompasses many subspecialties. It has an inpatient service that covers both a coronary care unit as well as a regularly monitored cardiology ward.

The non-invasive laboratory includes all forms of echocardiography i.e. transthoracic echocardiograms, transoesophageal echocardiograms, exercise echocardiograms, dobutamine echocardiograms and contrast echocardiograms; in addition to other forms of non-invasive testing i.e. exercise treadmill testing, Holter monitoring, blood pressure monitoring, event recording and Tilt Table Testing.

It has a very well established electrophysiology service with regular device implantations, both regular pacemakers and high voltage devices, as well as simple and complex ablations. This includes very busy electrophysiology and pacemaker clinics.

It has a very active interventional cardiology service with 24/7 primary Percutaneous Coronary Intervention (PCI) service covering a large catchment area. It also has a multidisciplinary heart failure clinic, which includes a heart failure specialist, a clinical pharmacist, a cardiac rehabilitation physiotherapist and a dietitian.

The division is a recognized American College of Cardiology International Centre of Excellence (ICOE). It is



involved in many international registries and is accredited as a Chest Pain PCI Centre by the Cardiovascular Society of Chest Pain.

Its Echocardiography laboratory is the first to be accredited by the European Association of Cardiovascular Imaging outside Europe. The division is the first to be accredited as an Arab Board center for conducting a Cardiology Fellowship Program. It accommodates the many internal medicine residents as part of their residency program.

Adult Cardiac Surgery

The division of Adult Cardiac Surgery is the largest cardiac surgery provider for Abu Dhabi and the rest of the UAE. It has some of the best cardiac surgeons in the country. It not only performs cardiac bypass grafting surgery, but also all types of cardiac valve repairs and replacements. This includes low, intermediate and high risk patients. It also includes emergency surgeries such as patients with cardiogenic shock and severe left main coronary stenosis. They provide a 24/7 service.

It is capable of performing Extra-Corporeal Membrane Oxygenation (ECMO) and Ventricular Assist Device (VAD) implantations.

Pediatric Cardiology

The division of Pediatric Cardiology provides

24/7 coverage for pediatric cardiology patients from the whole of the UAE.

Patients with congenital heart disease who require surgical intervention are evaluated and managed prior to and after the surgical intervention by the pediatric cardiology team.

Our services include non-invasive imaging like echocardiography, electrocardiography, Holter monitoring, blood pressure monitoring and CT angiography in addition to diagnostic and interventional cardiac catheterizations for a wide range of anomalies from the very simple to extremely complex lesions.

The pediatric cardiology team provides teaching and mentoring to the pediatric residents and neonatal fellows and actively participates in local and international meetings. It is active in research and publications in peer-reviewed journals.

Pediatric Cardiac Surgery

The division of Pediatric Cardiac Surgery is the only provider of congenital heart disease corrective surgery for both pediatric and adult patients in the UAE. It performs both simple and complex cardiac surgeries. It has performed more than 2000 congenital heart disease corrective surgeries with a very good track record for having low morbidity and mortality. The division has high complexity index compared to other centres in the world. MEH



A bird's eye view of historic Hamburg

Hamburg – a prime destination for complex medical treatment

Middle East Health travelled to Germany in September last year to visit a few select hospitals and speak to leading doctors in the country. In essence, we wanted to find out why German health care is so attractive to Arab patients. The article is run in two parts: Part one, Hamburg in this issue and Part two, Berlin in the next issue.

Many patients from the Arab world travel to Germany for healthcare and have been doing so for decades. Simply, they trust German medical expertise to resolve their health problems, particularly when they are too complex for treatment at home. They trust German healthcare, for good reason – the country plays a leading role in medical care, research and innovation in the world and is one of the best places in the world for the successful treatment of complex cases.

The country has many outstanding hospitals and clinics spread across the country, staffed by some of the most well

recognised doctors and specialists in the world. There were too many for us to visit them all, so we focussed on Hamburg and Berlin as these cities have a concentration of leading hospitals and clinics that cater to international patients in general and Arab patients specifically.

In this article, we speak to doctors in Hamburg. In Part 2 of this article – to be published in the March-April 2017 issue of *Middle East Health*, we will focus on Berlin.

We thank Hamburg Tourism and Visit Berlin for assisting us with our itinerary and accommodation. Without their generous help and efficient organisation, it would

have been very difficult to successfully complete our full agenda.

They do fantastic work promoting their respective cities and if you are thinking of visiting these wonderful, vibrant and culturally rich destinations – for healthcare or tourism – the best place to start your research is on their websites.

■ For Hamburg, go to: www.hamburg.com – and their dedicated website for international patients seeking healthcare in the city is: www.healthcare-hamburg.com

■ For Berlin go to: www.visitBerlin.com – and their dedicated website for international patients seeking healthcare

in the city is: health.visitBerlin.com

All the hospitals and clinics we visited have international patient offices – set up specifically to provide comprehensive services for travelling patients and their accompanying relatives. This includes initial consultation, estimated cost of procedure, visa assistance, airport pick-up, accommodation for accompanying relatives, translation services, etc. They are there to make this process as smooth as possible and should be the first point of call for any patient considering treatment in one of these hospitals or clinics.

Hamburg

Hamburg is one of Europe’s leading centres for medicine. The city has more than 50 hospitals and 30,000 medical professionals offering the highest standards of medicine. The services offered by the city’s hospitals and around 5,000 doctors in practice encompass all conceivable medical spheres – from diagnosis and treatment to therapy and rehabilitation. Combine this with the city’s historical and cultural attractions and you have one of the most attractive health tourism destinations in the world.

Hamburg Tourism notes that because of continued growth in the healthcare sector, the government is assisting this dynamic industry by “promoting sustainable business models and innovations through



Hamburg – with the newly opened Elbphilharmonie building in the background

collaboration between research and teaching, business and politics, associations and interest groups, with a view to ensuring an exemplary healthcare system”.

They are also focussing on the internationalisation of their services and note that “existing cooperation

agreements with the countries of the Arab world will allow a bilateral transfer of knowledge. Close personal ties between researchers and doctors with their world-wide counterparts benefit both sides, not least international patients in Hamburg”.

Wish for a child

Kinderwunsch – Fertility Clinic Valentinshof is a private fertility clinic in Hamburg. Kinderwunsch literally means “child wish” – and for couples wishing to have a child, but are struggling with infertility problems, this is the place to go. When you enter this clinic – the only private fertility clinic in Hamburg – you are struck by the German sophistication, precision, and the cleanliness and purity of the place. However, it is when you speak to the doctors that you understand fully why this clinic is so successful in fulfilling the dreams and wishes of apparently infertile couples to have a

child. Beyond their expertise, there is empathy, compassion and ambiance of calm in their presence.

Dr Anja Dawson, gynaecologist and obstetrician, with specialisation in gynaecological endocrinology and reproductive medicine, leaves a lasting impression for her compassion, understanding and professionalism. She is one of a team of four highly skilled doctors and biologists. They include Dr Ulrich Knuth, gynaecologist, obstetrician and a leading andrology (male reproductive health) specialist; as well as Dr Andreas Schepers, reproductive biologist and



Dr Anja Dawson



senior clinical embryologist and Dr Elke Leuschner, reproductive biologist, who run the laboratory.

Fertility Clinic Valentinshof has an exceptional success rate in producing pregnancies in couples who have virtually given up hope of having a child. They put this down to several factors, including the expertise of the doctors, technicians and embryologists, the advanced technology they use and the quality of their laboratory – as well as the somewhat less tangible, but equally important, empathy they offer, which enables the couple to feel at ease in this ‘oasis of calm’, as they refer to their clinic and which is immediately apparent when you visit it.

Their practice offers a complete range of fertility treatments – from optimising the body’s natural cycles to assisted or in-vitro fertilisation (IVF).

“We take the time to try all reasonable means of conceiving naturally wherever possible,” Dr Dawson explained.

They have a holistic approach designed to make the treatment all about the couple themselves. “In our

fertility clinic, the male partner is directly involved in the therapy. From discussions with our patients, we know that couples appreciate and feel better about their treatment when both parties are involved,” she said.

“We draw information on the latest in fertility treatments from international congresses and publications. Any significant developments that we find worthy are integrated directly into our treatments.

“We work with the most modern equipment and we use our own IVF laboratory. In constructing our practice, we paid special attention to using clean, low-pollutant materials throughout, particularly in the IVF lab,” Dr Dawson told *Middle East Health*.

She said they guarantee couples the greatest possible discretion. “We keep the waiting times as short as possible, and we offer individual rooms in our surgery area as a matter of course.”

As well as providing a full range of diagnostics and treatment for women, the clinic also offers diagnostics for men. This is andrology specialist Dr Knuth’s responsibility. He is one of Europe’s leading

andrologists and has knowledge of the latest advances in this specialist field of male reproductive health.

“We provide hope for men who have been told their sperm are no good for fertilisation. We can check tissue in the testes and extract a few healthy sperm, which can be used for IVF,” Dr Knuth explained.

Dr Dawson is also an experienced prenatal doctor and has many years of experience with the monitoring and care of high-risk pregnancies, such as with multiple pregnancies, gestational diabetes and preeclampsia.

The clinic also offers hormone consultation in which they diagnose and treat hormonal irregularities, such as Polycystic Ovary Syndrome, irregular menstrual cycles, thyroid disorders in women, and early menopause.

The doctors work with a range of partners in associated disciplines, such as nutrition, osteopathy, psychology, genetics and urology.



Kinderwunsch – Fertility Clinic Valentinshof

kinderwunsch-valentinshof.de

Helios Endo Clinic, Hamburg

The Helios Endo Clinic in Hamburg is a specialised private clinic for bone, joint and spine surgery. The clinic is well known in the GCC and is highly regarded worldwide for its 'outstanding competence in the treatment of the support and locomotor system'.

In total the clinic sees more than 7000 patients a year, mostly for knee and hip replacements, but also for elbow, ankle, shoulder and spine surgery. Surgeons at the endo-clinic have implanted more than 130,000 joint replacements since the clinic opened in 1976.

The clinic was founded by Professor Buchholz, who is world-renown for starting hip replacement surgery, explained Dr Alaa Aljawabra, an orthopaedic specialist and trauma surgeon, at Helios Endo Clinic. It was the biggest centre for hip replacement at the time and is now considered the largest arthroplasty centre in the world.

The clinic is also specialised in treating infected joints.

Dr Aljawabra, speaking to *Middle East Health*, explained that Prof Buchholz was a pioneer in mixing antibiotics with the cement used in joint replacement to prevent infection, which has now become common practice.

The clinic sees around 150 to 200 international patients a year, mainly from Russia and the GCC countries, he said.

"Some of our surgeons do operations in the Arabic countries and so the name of

Endo Clinic has become well known in the GCC," he said.

"Most of our international patients pay out of pocket and our rates are considerably cheaper than the US and even some hospitals in the UAE. In fact, international patients will pay the same rate as the local German patients," he said.

International patients interested in being treated at the Helios Endo Clinic should get hold of the International Patient Office.

The clinic provides a full concierge service for international patients. Private rooms in the clinic are like hotel suites to ensure patients are comfortable.

Dr Aljawabra said that generally inpatient treatment takes about 8-10 days depending on the patient and the treatment required. Rehabilitation can take around three weeks, during which most patients will continue staying at the clinic, he added.

The clinic can accommodate 250 patients. And in the private section it can accommodate 33 patients. There are single, double and, for German health insurance purposes, a few triple rooms. The clinic also has two suites with a room for the patient and connecting room for accompanying relatives.

"We see about 70% of our international patients from April to September. They prefer to plan the operations during the summer months," Dr Aljawabra said.

"Following treatment and rehabilitation, we stay in contact with our international

Helios Endo-Clinic specialties

- Highly specialised joint surgery for hip, knee, shoulder, ankle or elbow joints – arthroscopy, endoprosthesis and surface replacement, corrections and reconstitutions
- Joint surgery for septic cases / infections – revision interventions
- Spinal surgery – intervertebral prolapses, stenosis or degenerative changes of the spine – corrections, stabilisations, fusions, decompressions
- Neurosurgery – interventions of the spinal cord, tumour operations of the osseous spine as well spinal membranes, spinal nerves and the spinal cord.

patients to keep a check on how well the implant is performing."

He noted that they do face some challenges with international patients. In many cases they are badly prepared for the treatment. "They do not know much about their problem and they often lack documentation, unlike the German patients. In many cases, they come to us to correct a procedure which has been poorly done in their home country – so we often see these difficult cases. They see us as gods and think we can do magic and fix anything," Dr Aljawabra said with a smile.



Helios Endo-Clinic, Hamburg
www.endo-international.com

University Medical Center – Hamburg Eppendorf

University Medical Center – Hamburg Eppendorf (UKE) was established in 1889 and provides a combination of research, teaching and clinical practice. UKE underwent a major redesign with construction of a new medical clinic in 2009 and is now regarded as one of the most modern medical facilities in Europe with a total of 80 departments, clinics, polyclinics and research institutes.

The modern building has the appearance of a hotel, rather than a hospital and does not have the antiseptic smell often associated with medical facilities.

The center has approximately 1600 beds, all in single or double rooms.

Interestingly, the new medical center has what they call a 'patient boulevard' – a wide corridor with shops, restaurants, post office,

bank, prayer room for Islamic patients and seating areas where patients and the families can relax.

Nearby are a series of consultation rooms where patients can meet with the doctors for the initial consultation.

International patients have been travelling to UKE for many years to seek treatment from their many renowned doctors and professors,

which has led the center to establish a comprehensive and well developed International Office. The Office provides an extensive range of services for international patients to support some of the unique issues faced by patients travelling from abroad, such as assistance with enquires about treatment, organising appointments, obtaining visas, arranging interpreters, preparing medical reports in different languages and so on.

“For international patients, we organize everything. We are in charge from the first request to discharge and we also handle the billing process in our office,” explained Jelena Bagnjuk who handles case management and marketing at the International Office.

“Before the patient arrives we plan all the treatment, so they don’t have to spend time waiting here while this is done. What is important is that we receive all the necessary documentation and medical reports from previous procedures,” she said.

Middle East Health spoke to Prof Dr Carsten Bokemeyer, Spokesperson of the Hubertus Wald Tumor Center and the University Cancer Center Hamburg (UCCH) about the cancer center and international patients coming from the Gulf region.

“We have two very large departments for haematology – Leukaemia and Stem Cell Transplants,” Prof Bokemeyer said. “Our department for allogenic transplants under the leadership of Prof Dr Nicolaus Kröger is the largest in Germany. We also have a large center for head and neck cancer, and we have a large department for GI (gastrointestinal) cancer treatment, among others.”

He added that UCCH has an advanced radio-oncology center which has been “really well equipped over the past few years and we have all that is required for chemotherapy”.

“Our Martini Klinik for prostate cancer is the largest in the world, measured by the number of operations,” he also added.

Martini Klinik

The Martini Klinik is a highly specialized private clinic for the treatment of patients suffering from prostate cancer. The clinic offers a complete service portfolio for the diagnosis and therapy of prostate cancer and, together with UKE, it cares for about 5,000 outpatients every year at the Prostate Carcinoma Center. With around 2,200 prostate cancer surgeries annually, the clinic performs the highest number of complete



University Medical Center - Hamburg-Eppendorf

(radical) surgical removals of the prostate worldwide, offering open as well as Da Vinci robot assisted procedures

Prof Dr Carsten Bokemeyer, Medical Director of the Oncology Clinic, pointed out that the biggest advantage of the UCCH for patients is that they don’t have to be transferred between clinics during their course of treatment or have to explain everything repeatedly.

He emphasized the importance of their multidisciplinary teams as being one of the most important factors in their high rate of success in treating complex cancer cases. “The specialist and nursing teams work using an interdisciplinary process where the teams cooperate extremely closely to organize and discuss all cases together,” he said. Cancer treatments have improved exponentially over the course of the last 20 years. “New discoveries from the fields of molecular biology and genome research have made their way into everyday clinical treatment. Now, many more patients can receive a course of treatment tailored to their specific condition and greatly improve the chances of fully recovering.

“Intensive research is required to achieve such progress,” he said, adding that the

research at the UCCH focuses on making new discoveries available to the patient as quickly as possible as well as focusing on the fields of prevention and early detection.

A cure for leukaemia

Prof Bokemeyer explained that in the haematology field, apart from acute leukaemia, they perform a relatively large number of multiple myeloma treatments.

“In addition to the 200 allogenic transplantations a year we are also doing around 80-100 autologous blood stem cell transplantations with high dose chemotherapy, particularly for lymphoma, multiple myeloma and patients with germ cell tumours,” he said, adding: “This is also one of the reference centers for young patients with germ cell tumours in Germany.

“Of course, in oncology there is a lot of innovation with new treatments and we offer some of these treatments within clinical trials,” he said.

Discussing stem cell transplant for leukaemia patients, Prof Dr Bokemeyer, explained that for the advanced procedure they perform, the patient is required to stay as an inpatient for around four weeks. “Following inpatient treatment, it is



Prof Dr Nicolaus Martin Kröger, Medical Director, Department of Stem Cell Transplantation

Prof Dr Carsten Bokemeyer, Director, Department of Oncology, Hematology, Bone Marrow Transplantation with section Pneumology



important for these patients to stay in the area as an outpatient – and we have various accommodations for this – for about three to four months. During this time, they will visit our outpatient department once a week and this is when we will start modulating the new immune system [from the stem cell graft] to avoid a relapse and to cure the disease.”

New cancer therapies

He said that some new therapies under development include “the immunological care of patients with cancer, where in the past for a number of patients there has been no cure available for their cancer, we are finding now that around 30-40% of these patients can be cured with immunological treatments.

“We are developing specific tests to check early on whether these patients respond to these drugs, because they are very expensive,” he said.

“Another new approach in cancer care is that of personalized oncology, where we take

additional biopsies from the tumour and do a specific molecular genomic profile and look for specific mutations in the tumour that can be treated with drugs that target that specific mutation.

“If the patient, the tumour, the mutation and the drug meet – it can be the best treatment for the patient.

“We are working with pharmaceutical companies on a clinical and pre-clinical basis

with regards these drugs and biopsy profiling,” he added.

UKE provides a wide range of medical treatments with some of the most advanced technology available, with reference to the latest research and with many world-renowned doctors and professors.

● For a comprehensive list of treatments available at UKE and to get in touch with the International Office, visit: www.uke-io.de

UKE Pediatric Clinic

The new UKE Pediatric Clinic is expected to open later this year, while the current clinic continues to provide first-class medical treatment. Since 1990, the UKE Pediatric Clinic – in cooperation with the Interdisciplinary Clinic for Stem Cell Transplantation – has overseen more than 500 boys and girls receive either a bone marrow or stem cell transplant. The UKE Pediatric Oncology and Hematology Center is one of the largest of its kind in Germany.

For children suffering from cancer, a blood stem cell or bone marrow transplant (BMT) can be a lifeline. Both are invaluable methods of treating leukemia, congenital blood disorders and severe immune defects. A so-called HLA-identical donor is needed for such transplants. The donor may be a sibling or an unrelated person. If no suitable donor is found, then an HLA-haploidentical stem cell transplant from the patient’s mother or father is also a possibility. Twelve percent of all bone marrow and stem cell donors are patient’s parents.

A research team, led by Prof Dr Ingo Müller, head of the UKE Pediatric Stem Cell Transplantation Clinic, is currently investigating why one parent may be a more suitable donor than the other.

“Only a few years ago we thought that fathers were the more suitable donors; now we know that the opposite is more often the case,” he explained. “We have discovered evidence that the cells transferred from the child to the mother during pregnancy play a pivotal role. Approximately 50% of mothers carry their child’s cells after birth. These mothers are the most suitable donors in the groups that we have investigated.”

This was especially relevant in the treatment of children suffering from leukemia. Their chance of survival was around 40% higher if the donating mother had a high level of the child’s cells.

Prof Müller explained: “The immunological mechanisms behind this finding will be investigated further with BMT Head of Research Prof Dr Boris Fehse, as part of a nationwide study. Over the course of the next two years a total of 10 major treatment centers in Germany will be taking part.”

Park Hyatt Hamburg

During our visit to Hamburg, we stayed at the Park Hyatt Hamburg. This 5-star luxury boutique hotel is the hotel of choice for Arab families accompanying a family member who has travelled to Hamburg for medical treatment.

Park Hyatt Hamburg is located on the Mönckebergstrasse in the historic Levantehaus. The hotel combines old-world charm and maritime tradition with state-of-the-art conveniences and 21st-century interior design.

Situated in the heart of the city centre, the hotel is just a short, scenic stroll from Alster Lake, the vibrant Mönckebergstrasse shopping district and the exclusive design stores of Neuer Wall.

Hamburg Airport is 17 kilometres from the hotel and Hauptbahnhof railway station only 200 metres away.

Levantehaus was built in 1911/1912 by local architects as a “Kontorhaus”. These “Kontohäuser” were designed and built from 1886 to about 1938 as special offices for trading companies. These Hanseatic merchant buildings are distinguished by their design-related room flexibility. During the Second World War, the historic building was destroyed by bombs but was rebuilt from 1948 to 1950, largely true to the original. In April 1998, the hotel was officially opened by the world-famous hotel chain Hyatt Hotels & Resorts.

The hotel features Hanseatic architecture and a sophisticated maritime elegance, typical of the city of Hamburg. It has 252 luxurious rooms, including 21 suites, and 31 residences for long-stay guests, some of which are duplex apartments with separate living and sleeping areas.

The residences can be used as office space and are equipped with the latest business facilities – internet, fax, answering machine, three phones and a large desk.

The design of the guestrooms resembles that of Hyatt hotels in Asia, especially those in Japan, being elegant and simple. In the bathroom, for example, instead of a regular wash



A residential suite at the Park Hyatt Hamburg



basin, there is a white bowl placed on a slab of black granite.

The Mendelssohn Suite features a piano and open fireplace in the living room as well as a fully equipped kitchen so guests can serve home-cooked meals on the dining table in front of the fireplace. The suite connects to a double room, to provide extra accommodation for families.

This luxury boutique hotel houses the Apples Restaurant, Apples Bar with smoker's lounge, and the Park Lounge where traditional afternoon tea is served at the open fireplace. The restaurant also has a private dining room for 24 guests and a

summer courtyard.

The hotel also houses the Club Olympus Spa & Fitness – an exclusive club featuring an indoor 20-metre swimming pool, large heated whirlpool, traditional Finnish wood sauna, low-temperature sanarium sauna, steam bath, cold plunge pool and novelty showers. An exercise studio, wellness area, massage treatments and a comprehensive range of state-of-the-art fitness and strength-training equipment are also available.

■ For more information, visit: www.hamburg.park.hyatt.com

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Cybercrime is increasing in the healthcare sector

Intel security warns that the market for stolen healthcare data and the business of cybercrime is growing in the healthcare sector. However, it adds that the value of stolen healthcare data has not yet eclipsed that of stolen financial data. *Middle East Health* reports.

Intel security has recently released a report which warns the healthcare industry to be aware of and take appropriate precautions against the growing threat of cybercrime.

The warning is made clear in their recently released McAfee Labs report – ‘Health Warning – Cyberattacks are targeting the health care industry’.

The report assesses the marketplace for stolen medical records; compares it with the marketplace for stolen financial services data; identifies healthcare focused cybercrime-as-a-service trends; and profiles cybercrime targeting intellectual property in the pharmaceutical and biotechnology industries.

“In an industry in which the personal is paramount, the loss of trust could be catastrophic to its progress and prospects for success,” said Raj Samani, Intel Security’s CTO for Europe, the Middle East, and Africa. “Given the growing threat to the industry, breach costs ought to be evaluated in the Second Economy terms of time, money, and trust – where lost trust can inflict as much damage upon individuals and organizations as lost funds.”

The value of stolen data

Intel Security found that the price per record for stolen patient medical records remains lower than financial account records and retail payment account information, despite the increasingly time-sensitive, or perishable, nature of data such as credit and debit card numbers.

In recent years, Intel Security has observed the cybercriminal community extend its data theft efforts beyond financial account data to medical records. Although credit and debit card numbers can be cancelled and replaced quickly, this is not the case for protected health information (PHI) that does not change. This “non-perishable” PHI could include family names, mothers’ maiden names, social security or pension numbers, payment card and insurance data, and patient address histories. But, though this dynamic has led to industry speculation that the price per medical record could soon rise to rival or even eclipse that of financial account or payment card data, Intel Security’s 2016 research did not illustrate such price-point movement.

The research found the average health record price point to be greater than that of basic personally identifiable information, but still less than that of personal financial account data. The per record value of financial account data ranged from US\$14.00 to \$25.00 per record, credit and debit cards drew around \$4.00 to \$5.00, but medical account data earned only from \$0.03 to \$2.42.

The findings suggest financial account data continues to be easier to monetize than personal medical data, which could require an investment that financial payment data does not require. Upon stealing a cache of medical records, it is



Raj Samani, Intel Security’s CTO for Europe, the Middle East, and Africa

likely cybercriminals must analyze the data, and perhaps cross-reference it with data from other sources before lucrative fraud, theft, extortion, or blackmail opportunities can be identified. Financial data, therefore, still presents a faster, more attractive return-on-investment (ROI) opportunity for cybercriminals.

“Liquidity trumps longevity in the race to monetize stolen data,” said Samani. “If I steal a million credit or debit card numbers, I can quickly sell this digital merchandise before banks and retailers discover the theft and cancel these numbers. Alternatively, a million medical records contain a rich cache of permanent PHI and personal histories, but such data requires a greater investment of time and resources to exploit and monetize it.”



Theft of Intellectual Property

Intel Security's research also investigated the targeting of biotechnology and pharmaceutical firms for their intellectual property and business confidential information. The researchers suggest that the economic value of such information is considerably higher than the cents-per-record data Intel Security's researchers identified within patients' health care accounts.

Intel Security researchers found evidence that formulas for next-generation drugs, drug trial results, and other business confidential information constitutes significant value. The stores of such data at biopharmaceutical companies, their partners, and even government regulators who are involved in bringing new drugs to market have become a premium target of cybercriminals.

"Corporate espionage has gone digital along with so many other things in our world," Samani said. "When you consider that research and development is a tremendous expense for these industries, it should be no surprise that cybercriminals are attracted to the ROI of this category of healthcare data theft."

Cybercrime-as-a-service

The research also identified cybercriminals leveraging the cybercrime-as-a-service market to execute their attacks on

healthcare organizations. Researchers found evidence of the purchase and rental of exploits and exploit kits to enable the system compromises behind healthcare data breaches. In one case, a relatively non-technically proficient cyber thief purchased tools to exploit a vulnerable organization, leveraged free technical support to orchestrate his attack, and then extracted more than 1,000 medical records that the service provider said could net him about \$15,000.

The researchers also observed brazen efforts by cybercriminals, through online ads and social media, to recruit into their ranks healthcare industry insiders with access to valuable information.

"When a well-developed community of cybercriminals targets a less prepared industry such as health care, organizations within that industry tend to play catch-up to protect against yesterday's threats, and not those of today or tomorrow," Samani said. "Gaining the upper hand in cybersecurity requires a rejection of conventional paradigms in favour of radical new thinking. Where healthcare organizations have relied on old playbooks, they must be newly unpredictable. Where they have hoarded information, industry players must become more collaborative. Where they have undervalued cyber defence overall, they must prioritize it. In the Second Economy, if you win the

If I steal a million credit or debit card numbers, I can quickly sell this digital merchandise before banks and retailers discover the theft and cancel these numbers. Alternatively, a million medical records contain a rich cache of permanent protected health information and personal histories, but such data requires a greater investment of time and resources to exploit and monetize it.

'time' contest with attackers, you are in a position to preserve money and trust."

The report concludes: "One troublesome issue with this topic is the lack of evidence pointing to the motivation behind the acquisition of stolen medical data. With payment card information, we have documented that stolen card numbers are used to conduct fraud against the victims. In the course of our investigations we have identified where specific data is sought to verify the addresses of the victims. At present, however, we have not identified specific uses for bulk data purchases of medical data. We will continue our research on this topic because it deserves significant attention, and will post updates as we find more data."



Health Warning – Cyberattacks are targeting the health care industry
<http://tinyurl.com/zfo2cp7>



Big Data can be used to predict disease outbreaks

Big data derived from electronic health records, social media, the internet and other digital sources have the potential to provide more timely and detailed information on infectious disease threats or outbreaks than traditional surveillance methods. *Middle East Health* reports.

A team of scientists led by the US National Institutes of Health reviewed the growing body of research on the subject of big data modelling for infectious disease threats and has published its analysis in a special issue of *The Journal of Infectious Diseases*, 1 December 2016.

Traditional infectious disease surveillance – typically based on laboratory tests and other data collected by public health institutions – is the gold standard. But, the authors note it can have time lags, is expensive to produce, and typically lacks the local resolution needed for accurate monitoring. Further, it can be cost-prohibitive in low-income countries. In contrast, big data streams from internet queries, for example, are available in real time and can track disease activity locally, but have their own biases. Hybrid tools that combine traditional surveillance and big data sets may provide a way forward, the scientists suggest, serving to complement, rather

than replace, existing methods.

“The ultimate goal is to be able to forecast the size, peak or trajectory of an outbreak weeks or months in advance in order to better respond to infectious disease threats. Integrating big data in surveillance is a first step toward this long-term goal,” says Cecile Viboud, Ph.D., co-editor of the supplement and a senior scientist at the NIH’s Fogarty International Center. “Now that we have demonstrated proof of concept by comparing data sets in high-income countries, we can examine these models in low-resource settings where traditional surveillance is sparse.”

Experts in epidemiology, computer science and modelling collaborated on the supplement’s 10 articles. They report on the opportunities and challenges associated with three types of data: medical encounter files, such as records from healthcare facilities and insurance claim forms; crowdsourced data collected

from volunteers who self-report symptoms in near real time; and data generated using social media, the internet and mobile phones, which may include self-reporting of health, behaviour and travel information to help elucidate disease transmission.

But big data’s potential must be tempered with caution, the authors say. Non-traditional data streams may lack key demographic identifiers such as age and sex, or provide information that underrepresents infants, children, the elderly and developing countries. Social media outlets may not be stable sources of data, as they can disappear if there is a loss of interest or financing. Most importantly, any novel data stream must be validated against established infectious disease surveillance data and systems, the authors said.

Each article features a promising example of the use of big data to monitor and model infectious diseases activity:

■ In the United States, researchers found what they describe as “excellent alignment” between medical insurance claim data for flu-like illnesses and proven influenza activity reported by the Centers for Disease Control and Prevention.

■ A European surveillance system that began collecting crowdsourced data on influenza as part of a research project is now considered an adjunct to existing surveillance activities. Influenzanet <www.influenzanet.eu> uses standardized online surveys to gather information from volunteers who self-report their symptoms on a weekly basis. A number of European Union member states are now using the tool and expanding it to include Zika, salmonella and other diseases.

■ An online platform, ResistanceOpen <www.healthmap.org/resistanceopen>, was developed by U.S. and Canadian scientists to monitor antibiotic resistance at the regional level. The site takes advantage of publicly available, online data from community healthcare institutions as well as regional, national and international bodies. An analysis showed online information compared favourably with traditional reporting systems in the two countries.

■ Multiple studies have looked at social media and internet health forums for information on drug use and to detect adverse drug reactions. While there are technical and ethical challenges, the authors suggest internet search logs and social media posts can provide information more quickly than traditional physician-based reporting systems.

■ In a comparison of the relatively new field of epidemic forecasting to the better-established one for weather forecasting, the authors note the former is much more difficult given that there is less observational data for disease, and because human behaviour has the potential to rapidly alter the course of an epidemic.

■ An examination of spatial data – including from insurance claims and social media posts – shows their potential for filling geographical information gaps but also presents technical, practical and

privacy challenges that must be addressed.

■ With appropriate safeguards to ensure anonymity, call data records from mobile phones may provide “an unprecedented opportunity” to determine how travel affects disease transmission. Studies of malaria and rubella in Kenya showed call data improved the understanding of the spatial transmission of those diseases.

■ Online news articles and health bulletins from public health agencies were manually extracted and modelled to elucidate transmission patterns for two recent outbreaks—the Ebola epidemic in West Africa and a Middle East Respiratory Syndrome outbreak in South Korea. Internet findings were in line with traditional data, providing a proof of concept that this approach can be generalized and automatized to a variety of online sources and generate information on disease transmission.

■ Researchers also describe the benefits of a novel, publicly available epidemic simulation data management system, called epiDMS, which provides storage and indexing services for large data simulation sets, as well as search functionality and data analysis to aid decision makers during healthcare emergencies.

Scarcity of reliable information

While the new hybrid models that combine traditional and digital disease surveillance methods show promise, the scientists agree there is still an overall scarcity of reliable surveillance information, especially compared to other fields such as climatology, where the data sets are huge.

“To be able to produce accurate forecasts, we need better observational data that we just don’t have in infectious diseases,” notes Professor Shweta Bansal of Georgetown University, a co-editor of the supplement. “There’s a magnitude of difference between what we need and what we have, so our hope is that big data will help us fill this gap.”

Multi-disciplinary initiatives such as the NIH-led Big Data to Knowledge program will be instrumental in expanding the use

The ultimate goal is to be able to forecast the size, peak or trajectory of an outbreak weeks or months in advance in order to better respond to infectious disease threats.

of big data in research, as noted in the supplement.

The publication’s authors include scientists affiliated with Fogarty’s Research and Policy for Infectious Diseases program (RAPIDD), grantees from NIH’s National Institute of General Medical Sciences, and researchers from nearly 20 universities throughout North America and Europe. The supplement was produced with support from Georgia State University, the Fogarty International Center, Northeastern University and Georgetown University.

Reference:

The Journal of Infectious Diseases, 1 December 2016. http://jid.oxfordjournals.org/content/214/suppl_4.toc

Prepare for the Internet of ‘Healthcare’ Things



By **Jean Turgeon**,
Vice President and Chief Technologist, Avaya

Hospitals in the region are increasingly looking to technology solutions to proactively advance patient care and improve outcomes. We can expect to see network-connected healthcare “aides” playing an ever-greater role in delivering healthcare. Just imagine, “smart beds” that automatically detect if they’re occupied – or if a patient has gone walkabout – and can track the quality of the patient’s sleep. Wearables and implants can measure a patient’s vital statistics, continuously log data and report, in real-time, any abnormalities to the appropriate clinical staff. Network-connected infusion pumps, imaging machines, blood-glucose sensors, and myriad of devices can automatically and collaboratively share valuable data with the patient’s electronic health record (EHR).

That time isn’t far off either – a report last year from IDC indicated that enterprise mobility will have penetrated over 80% of MEA healthcare organizations by 2017, with over a third of organizations having already deployed corporate smart devices. Perhaps unsurprisingly then, IT security was cited as the biggest concern by healthcare CIOs. While we are seeing major initiatives to leverage technology to improve healthcare delivery in the region, such as in the United Arab Emirates, which has included providing a world-

class healthcare system in its UAE Vision 2021 strategy, there is a need to understand the challenges and risks. Careful network planning is a must if adoption is going to be successful.

Of course, networked devices are prevalent in hospitals today – a growing number of nurses and doctors have already transitioned away from clipboards and paper to Wi-Fi-enabled communications devices and tablet computers. However, in the rush to introduce Internet-connected devices – the much-spoken of “Internet of Things” (IoT) – some hospitals are opening themselves up to additional risk. Left unsecured, these devices represent an additional point of exposure for the network.

Security

Hacks continue to dominate the headlines, as vulnerabilities are increasingly exposed in industries that have previously been, to an extent, cruising under the attacker’s radar. Healthcare providers, as the holders of highly sensitive – and highly marketable – information, have now become high-value targets.

As the use of connected devices in healthcare expands, so too does the risk of a “Medjack”. This attack vector sees hackers exploiting old and insecure operating systems as launch points to move laterally through the borderless internal network. Typically, these attacks target back-end EHR and financial systems, but there are some hackers with more nefarious motives. Hacks are known to have been attempted where critical systems such as drug infusion pumps and cardiac implants are manipulated due to security flaws in hospital equipment and medical devices. It’s one thing to hold to ransom patient data, but things are taken to a whole new level when actual lives can be threatened.

The network represents one of the largest avenues of attack, and every reasonable effort must be made to secure it. On some legacy networks, anyone can

connect devices without being prompted for authorization. In the most extreme cases, network administrators admit they have no idea exactly what devices are accessing their network at any given time. Going forward, hospitals must ensure that hackers can’t simply access an active Ethernet port, or surf the wireless network until they find a vulnerable node.

Attacks come in many forms and have evolved over time – from the so-called “Sneakernet” attacks using floppy disks and then USB keys, to infected devices brought in from home by oblivious patients or employees. Now, the major challenge is that Internet-connected devices and end-user applications are evolving faster than the legacy network. The traditional approach of securing the Internet gateway with a firewall is no longer enough. With conventional technologies, once a device is connected to the network with an IP address, all other devices on the same network segment are visible and exposed to a potential hacking attack.

Software-defined networking can deliver a crucial element of a multi-layered, defense-in-depth security strategy. In these environments, traffic dynamically flows across the network, leveraging the shortest path to its destination. The network can be easily segmented into areas – zones – that remain invisible to devices at the edge. One physical network can support numerous virtual networks on the fly. Network connectivity is extended as approved devices attach and are authenticated, and dynamically retracts as those devices disconnect.

Reducing the number of attack points, the size of the network attack profile, and obscuring network elements can provide important security benefits.

Secure segmentation

Traditionally, segmentation is done through virtual LANs, used in combination with routing and filtering, and data can then

be directed to flow from approved devices to pre-defined applications. While this methodology works, it lacks scalability – especially in the context of IoT, and can also be exploited using the IP Hopping attack vector.

Delving deeper into the healthcare scenario, surely the network that delivers MRI data to the patient EHR database should be isolated from the network that supports connectivity between the payment card system and the financial backend. Obviously, both need to be securely partitioned from the Guest Wi-Fi. The list of applications and services that should be securely separated from each other is potentially endless.

There is a solution that solves both the scalability and security issues: secure network segmentation. This approach leverages a natively secure technology to deliver massively scalable segmentation, automatically isolating flows and zones, and establishing the necessary control and enforcement points. No communication can occur between zones

without explicit configuration, and data flows are containerized end-to-end across the network to neutralize the risk of IP Hopping attacks.

This capability is known as “Stealth Networking,” and each unique combination of flows defines an individual service that can be treated independently, given special privileges or specific restrictions. Operating the network in Stealth mode provides the isolation needed to secure key healthcare applications and services. If it cannot be seen or accessed, then it cannot be hacked; sounds simple, yet Stealth Networking delivers a highly effective ability to reduce the threat of cyber attacks.

If segmentation was important in the relatively modest networking scenario of yesterday’s healthcare, just imagine what it means for an IoT-enabled tomorrow. As the number and diversity of network-connected devices exponentially grows, so too does the potential number of attack vectors. Scalable, secure segmentation, in combination with a centralized access policy and enforcement engine, will

come to characterize the software-defined network perimeter.

Enabling new innovations

The pace of advancement in medical device technology is at an all-time high, but unfortunately, so is the increase in security breaches, despite very conscious efforts on the part of the industry to close potential gaps. Unfortunately, the adverse publicity that naturally attaches to these incidents can act as an inhibitor of innovation. In some cases, a healthcare organization may hold back on leveraging the latest technology for fear of not being able to effectively secure it. Such hesitation would delay improvements in patient care and could adversely affect outcomes.

As the Internet of Healthcare Things takes hold, it is of paramount importance to find ways of enabling the rapid adoption of innovative solutions. It is equally important, obviously, to solve this challenge in such a way that network security is not compromised; indeed it can and should be enhanced. MEH

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Interview

Sharing knowledge and expertise

Cathy Easter, President & CEO of Houston Methodist Global Healthcare, was one of five women leaders across the globe who received a recognition award for their contribution to UAE's success by the Bilateral US-Arab Chambers at a VIP event in November in Abu Dhabi. *Middle East Health* spoke to her about the award and Houston Methodist.

Middle East Health: Part of your award is for the sharing of knowledge and technological expertise by Houston Methodist with the medical profession in the UAE. Can you give some detail about this?

■ **Cathy Easter:** We have had an office in the UAE since 2008 and that has been our hub for the EMEA region. We have had a number of engagements from building the master plan for a medical city to developing a plan to upskill nurses.

MEH: What has been shared?

■ **CE:** We focus primarily on knowledge transfer regarding development and

operations of high quality health care projects which can be either governmental or private. We also focus a great deal on education and training for health professionals in the region.

MEH: How was it shared?

■ **CE:** We have a few different models. We actually provide services where we can share our expertise in developing and managing an outpatient facility or multi-specialty hospital. We can look at the market and assist a client with market assessment or develop a business plan. We can also work with existing organizations

and their leadership to provide them with relevant experts from Houston Methodist to solve some of the challenges that are facing them in their specific organization, whatever those may be. We recognize that we must work to adapt proven methodologies to support the culture within the UAE and the region.

MEH: How do you think this has helped healthcare in the UAE?

■ **CE:** I think that we have made a good start with our current work with Meraas and the Valiant Clinic [in Dubai], which has enabled us to provide our expertise and



Cathy Easter - President & CEO of Houston Methodist Global Healthcare

management experience with an incredibly well respected brand and leadership team to provide world class healthcare services. We are also extremely encouraged to work in such an innovative environment with a partner that values innovation. Further integration of people's personal health information through wearables and similar platforms in a touch clinical environment will give us an opportunity to greatly assist individuals in taking a more active role in their own health.

MEH: How does this benefit Houston Methodist?

■ **CE:** We are a global health care provider as well as a global brand. As we have these opportunities to work with other prominent global organizations and physicians, it reinforces how we can assist organizations that are committed to improving the quality of healthcare around the globe.

MEH: It was noted that Houston Methodist was selected for this honour because of its 'cross-pollinating' of technologies from the oil industry and health industry. Can you explain this?

■ **CE:** This occurred through a partnership with Exxon Mobil and Houston Methodist around the concept of "Pumps and Pipes". The idea came from a prominent physician discussing the movement of blood flow with an oil and gas executive that is faced

with similar issues regarding the flow of oil & gas. The idea was sparked and now engineers from both industries as well as aerospace have had a number of successful conferences where they discuss innovation and technology that is being used in their respective fields and how they can learn from one another. This is just one example where the physicians of Houston Methodist really do think differently about problem solving as well as the globalization of health care.

MEH: To what extent is Houston Methodist involved in healthcare in the Middle East / GCC region? Who are they working with, in what countries?

■ **CE:** We have recently opened an office in Riyadh as we see a number of patients from the Kingdom, but we are also working on a number of projects to assist with the healthcare infrastructure development. Some of them are Greenfield projects and others are with well-established providers. We have also had projects in Kuwait, Qatar and Oman previously. We continue to see patients from the entire GCC.

MEH: Houston Methodist was recently ranked number 1 in the USA for its heart transplant program by CareChex – an independent research company. What sets Houston Methodist's heart transplant program apart from other such leading program's in the US?

■ **CE:** CareChex is an independent health care research company that offers comparisons of hospital services to consumers. The quality ratings come from a database of nearly 40 million patients treated in about 5,000 hospitals across the country. The company examines information on mortality, overall complications, inpatient quality and patient safety to determine the medical excellence ranking for our transplant program. Houston Methodist J.C. Walter Jr. Transplant Center stands apart as the largest and most comprehensive transplant center in the region and one of the largest heart-lung transplant programs in the world. For more than 50 years, Houston Methodist J.C. Walter Jr. Transplant Center has been in the vanguard of

the organ transplant field. Some of the world's first transplants were performed here by legendary surgeons Michael E. DeBakey, MD and George P. Noon, MD, in the 1960s, during the frontier days of transplant medicine. In 2015 the team performed its 5,000th transplant, with exponential growth taking place in the last decade. World-class clinical expertise, cutting-edge technology and an integrated, multidisciplinary approach to treatment provide Houston Methodist the ability and agility to respond to needs within the transplant environment quickly and to achieve the best clinical outcomes. An intense focus on research and innovation ensures endless advances in the therapies available to patients. One example of how Houston Methodist is leading heart services is that we are one of the first hospitals in the United States to adopt the CardioMEMS heart failure system to wirelessly monitor patients with compromised heart function. Use of the CardioMEMS monitor significantly reduces hospital admissions for patients with heart failure who continue to struggle with symptoms. In addition, research has documented a significant reduction in 30-day readmissions with the use of this device. In terms of volume, in 2015 Houston Methodist performed 38 heart transplants, and implanted 116 LVADs between 2014 and 2015.

MEH: What does the future hold for Houston Methodist in the GCC and wider Middle East region?

CE: Our plan is to keep working with leading organizations that are seeking to improve the care provided in the region through advisory services as well as working to further develop partnerships which focus on clinical development, including education and training of health providers. We are extremely committed to the region and want to focus on improvements to the infrastructure and systems that will enable these efforts to be more sustainable and not episodic. Lastly, we want to continue to provide excellent care and service to those patients that either choose to travel abroad or need to travel due to the nature of their illnesses. **MEH**

Partnerships that foster the exchange of healthcare professionals



Nizar Mamdani, Executive Director of the International Healthcare Services, University of Nebraska Medical Center

The University of Nebraska Medical Center/ Nebraska Medicine's International Healthcare Services ("UNMC") is a renowned leader in patient care excellence in the United States and is internationally recognized for its innovative programs. It has world-class experts in patient-care, research, education, training and management to

enhance patient-care delivery around the world. UNMC has established 124 collaborative partnerships in 44 countries. The diverse array of global partnerships touches patients around the world.

Nizar Mamdani, Executive Director of the International Healthcare Services, experienced first hand how extraordinary the healthcare delivery in cancer care and bone marrow transplantation is at UNMC. His wife, Nancy, was a Non-Hodgkin's patient at UNMC. "I recognized the importance for international patients to be the ultimate beneficiaries from UNMC's advanced treatment programs", says Mamdani. He started UNMC's International Healthcare department and the "No-Cost" healthcare training/observation programs for international healthcare professionals.

"No-Cost training programs work fairly simply. Healthcare professionals participate in a two-week, observership with UNMC's experts. They receive free housing, meals, local transportation, and priceless training. The rewards of such training programs

are returned many times over, because the patients, in their own countries, are the ultimate beneficiaries of our training programs," says Mamdani. Hundreds of healthcare professionals have participated in UNMC's No-Cost programs while 54 UNMC specialists visited 24 partner institutions for training.

Abdalla Bajawi, a trainee in Pathology from King Fahd Specialized Hospital, Dammam, Saudi Arabia said: "We are so impressed with the advanced technology and the state-of-the-art medical advancement here. I'm training in HBLC and will transfer the knowledge to my colleagues when I go back."

"The relationships Nizar describes are having a strong impact," according to Dr James Armitage, a world-renowned hematologist at UNMC. "Anytime you can interact with colleagues around the world to the betterment of patients is excellent."

■ For more information contact:
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www.unmc.edu/international

Medfind – German doctor recruiting expertise

Interview



Sascha Winter, Managing Director of Medfind

Middle East Health: Why did you setup Medfind in the Middle East?

■ **Sascha Winter:** Our corporate office is based in Germany and was founded by a doctor about 10 years ago. Throughout these years, the community we are working with, has risen to over 25,000 medical personnel. Some of these doctors are very interested to relocate to the Middle East and that's why we

have decided to setup our activities locally to better serve clinics based here.

It was also a logical measure to take, appreciating the fact that governments in the region are taking up steps to re-energize medical tourism and keep patients in their home countries, but at the same time benefitting from German board doctors located within the region with higher quality treatment, including specialty medicine.

MEH: Who is your clientele?

■ **SW:** We are very proud to be a recruitment partner with some very prestigious clinics in the region. We open doors to the German medical HR market for them and the fact, that we are even able to provide doctors which are hard to find because of specialty requirements, for example cardiovascular surgeons and Arab-speaking female dermatologists.

MEH: But isn't it very expensive to hire a German doctor?

■ **SW:** It really depends on how much value you place on quality medical care. On one hand the salary expectations of a German doctor is higher when compared

to other medical professionals from other parts of the world. However, that being said, the quality standard of medical education in Germany is unrivaled throughout the world and is highly recognized and coveted when looking at medical care in the Middle East.

MEH: How do you stand out amongst your competition?

■ **SW:** We are not a so called *One-Stop-Shop*. We are specialized in our field. Some of our staff are former doctors themselves, so this medical background and expertise of our team allows us to provide comprehensive solutions for employer's recruitment needs based on the type of vacancy or specialized service required. So, it is almost like doctors recruiting doctors and what better way to ensure quality professionals and a genuine understanding of the medial field than someone trained and certified in the profession itself.

● **Sascha Winter** is the Managing Director of Medfind – German Medical Recruiting

● For more information, visit:
www.medfind.net or call: +971 4 442 5377



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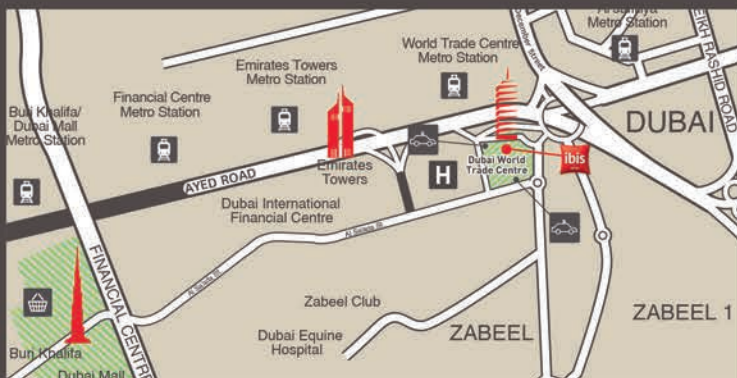
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Interview

There has been progress with breast cancer, but there's room for improvement in the region

Middle East Health spoke to Dr Mothaffar Fahed Rimawi of Baylor St Luke's Medical Centre, Texas, US, who was visiting the region recently. The board-certified medical oncologist, who specialises in breast cancer care and research, said he was heartened by what he had seen in the region in terms of the quality of health care.



Dr Mothaffar Fahed Rimawi, Medical Director, Lester and Smith Breast Cancer Center

Middle East Health: How many women get breast cancer in the GCC and Levant?

■ **Dr Mothaffar Fahed Rimawi:** I don't know what the number is. I don't think it exists for the region. It was actually one of the things we were talking about with several leading physicians and officials in Doha and the UAE – the need to have such national or even regional efforts to try and describe the prevalence and incidence of breast cancer. There are numbers of how many cases per health care sector and I think there are some national numbers, but in trying to characterise the actual prevalence, the lifetime risk that people have, what we do is extrapolate from Western numbers, use one in eight, one in ten women. The population here is different, there's a large expatriate population and that population by definition is younger, you may not see the older age cancers.

People told me about the large number of younger women with breast cancer – and

again is this because of the average age of the population or is it really more common? We don't know, but what we do know is the lifestyle is changing in the region. There's a lot of Western-style eating – for example, a diet richer in saturated fat, less fruit and vegetables – and also changes in reproductive decisions, delaying pregnancy increases risk and having multiple children reduces the risk. Lactation helps. If there's a message to women in the region it is to basically consider those decisions.

MEH: Is the incidence increasing?

■ **MFR:** In general, we know the incidence of breast cancer is increasing in the world and that again has to do with lifestyle, but an important factor is a lot of women used to die young, for example in childbirth, but as health care has improved in other aspects women are living longer to develop breast cancer.

MEH: Do you have any idea what the mortality rate from breast cancer – in the region and the world for comparison?

■ **MFR:** I don't think those numbers exist. What I can tell you is that from what I've seen at the medical centres I've been at, patients are receiving really top-notch care in terms of the drugs, multi-disciplinary care, and the expertise of physicians is very comparable to the West.

MEH: What are the most common types of breast cancer in the Middle East? Is this the same around the world or does this region have some unique features regarding breast cancer?

■ **MFR:** The majority is the hormone receptor-positive breast cancer, that's

generally no different in the Middle East than it is in Western countries, however it varies by age.

The things we check in breast cancer are the oestrogen receptors (ERs) and the progesterone receptors (PRs), these together are known as hormone receptors.

The third receptor we check is HER2-positive breast cancer, this accounts for about 20- 25% of breast cancer. It's unique because it has this protein called HER2 and the cancer needs it to grow and survive and so what we've been able to do very successfully is develop drugs that target this protein and turn it off and therefore turn the [cancer] cell machinery off.

I've done a lot of research starting from the laboratory and then taking it to patients, to a point where we're combining different treatments. There's a proportion of patients you can probably treat successfully with these drugs alone, without chemotherapy – for a type of breast cancer that's considered aggressive, this is fantastic. We've done a lot of work towards achieving this and I think we've made significant progress and probably in the next five to ten years there'll be a good proportion of women with this type of breast cancer who are treated without chemotherapy.

One of my research interests is a strategy called de-escalation, essentially to identify patients with whom we can omit parts of treatment or replace them with less toxic ones without compromising outcomes, we're working very actively on this and have made good progress.

MEH: Talking about your research I understand you have recently

completed some research to do with breast cancer screening. Obviously, this is an important preventative measure. How advanced is this in the region? And what can be done to improve it?

■ **MFR:** Every country in the region has national campaigns, I know these things exist in Jordan and Lebanon and the GCC area and there is a very strong national push towards that. What I hear from colleagues is the frequency is not high enough yet. For it to be effective it needs to happen in two-thirds of the population to make a difference, so we're not there yet but I think it's important for women to understand their own risk and discuss it with their doctor and come up with a screening programme that works for them. Some women may be at higher risk and require more careful screening.

MEH: Is there a reluctance among women to undergo?

■ **MFR:** There are several studies that shows even in the West women's level of anxiety goes up before a mammogram and then comes down to baseline. If a woman has an abnormal mammogram it never goes back to baseline anxiety – she's still more nervous about mammograms than before. Of course, the schedule needs to be discussed with the woman's primary care giver or gynaecologist to come up with a screening programme that works for them and also being aware of their breasts, performing self-examinations.

MEH: What advances have been made in the past 10 years with regards to diagnosis and treatment of breast cancer?

■ **MFR:** Breast care in the last 10 years has changed quite a bit. Equipment has improved tremendously – it's moved from analogue mammograms to digital to 3D-mammograms, which essentially provides a lot more images – almost like slicing through the breast like you slice through a loaf of bread. For very little or no extra radiation than the regular mammogram, they can detect smaller tumours and more tumours at an earlier stage. It can also work for women whose breasts are really dense. There's more use of MRI machines to screen high-risk women.

In terms of treatment there's been several drugs studied and approved in several countries in the last 10 years that have

improved outcomes, that have helped save lives, such as trastuzumab and pertuzumab, which are anti-HER2 agents.

There are drugs that help stop the cell cycle like palbociclib. There's been a number of targeted therapies that have been studied and approved in the last 10 years that have made a real difference for patients with breast cancer. Also in the last 10 years we have improved our strategies for anti-estrogen therapy, which has been a very effective strategy and also there are more medicines available for the prevention of breast cancer in women who are high risk. All in all, the past 10 years have been transformative and I predict the next 10 years will be even more transformative – where we enter the age of more tailored, more personalised treatment and where we are able to treat a proportion of women with less treatment and yet maintain their outcomes and develop drugs for women with more aggressive tumours that require more treatment.

MEH: Does Baylor St Luke's Breast Center provide specialist treatment that is not available elsewhere?

■ **MFR:** What we have that is unique is a true multidisciplinary approach, where medical oncologists, the surgeons, reconstructive surgeons, the genetic counsellors, dieticians, support staff, radiologists, are all in the same administrative structure and clinical structure. Everyone sees patients in the same space, it's an integrated centre, it's one space where women come in for all aspects of care, prevention, diagnosis and follow-up.

We also have a survivorship programme to help with the long-term side effects of the treatment. Since we are a medical school we have one of the world's leading programmes in breast cancer research. We are major co-sponsors of the San Antonio Breast Cancer Symposium – which is the largest breast cancer meeting in the world.

Our patients have plenty of opportunities for clinical trials, with new and experimental approaches, which are very promising. We have the number one genetics department in the US, with a very robust genetics and genomics programme, that's unique to us.

One of our philosophies is partnerships. Our patients can receive services they can't receive elsewhere, however, we do work with local communities, whether in

the US or worldwide, and if they can get a proportion of care closer to home then they should do that, where their social support is and where they're comfortable.

We have a strong tradition in education and training; we have a long tradition of training scientists and physicians to specialise in breast cancer care and research. We believe in training and education as a global message. We also believe in the impact of research, this is something the region is starting to pay attention to and I hope will build on, which is the importance of building research programmes from the laboratory to the clinic, that would study breast cancer and the challenges unique to every individual region and country in the region and develop solutions, scientific and operational, that actually fit the region.

Having been born and raised in Jordan I'm connected to the region and we are excited at the prospect of helping in these efforts. I see a lot of growth and attention to health in the GCC. I know, having grown up and being educated in Jordan, that Jordan gives a lot of attention to health care and Lebanon has a tradition of excellence in this area. Progress has been made but there's still room for improvement. Everybody recognises that there's more focus now on education and training programmes to train physicians locally and keep them in the region, but also be connected internationally to others to share progress. Generally, I'm optimistic and heartened by what I've seen here and in countries in the region. I'm hoping there'll be some regional collaboration and cooperation. I think paying attention to women's health, such as screening, is an important part of women's rights and empowering women, which I'm passionate about. **MEH**

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Digital innovation helps patients live healthier lives

Mundipharma, an international pharmaceutical leader, is harnessing the power of digital innovation to provide optimal patient care with the key aim of helping patients stay healthy.

The company is dedicated to providing patients with severe and debilitating diseases the benefit of new treatment options in fields such as pain, oncology, oncology supportive care, ophthalmology, respiratory disease and consumer healthcare.

Most recently, Mundipharma has developed a new Asthma Mobile Application which is designed to enhance communication between doctors and patients – and enable asthma sufferers to keep track of and improve their asthma care. It will improve patient inhaler technique and in turn enable better outcomes for asthma sufferers in the Middle East region. The App will be free to download on both iPhone and Android platforms.

There is a great need for this application as, according to the Global Asthma Report 2014, more than 334 million people worldwide suffer from asthma and almost half of them are not optimally controlled.¹

According to a study conducted in the UAE, 12-15% of adults across the country suffer from this chronic condition.

“One of the biggest issues is that the control of asthma remains sub-optimal. Despite advances, patients’ inhaler-use technique has not improved in 40 years. We seek to change that,” said Dr Mohamed Samir of Mundipharma.^{2&3}

“This is important as there are multiple inhalers requiring varying inhaling techniques and knowing how to properly use a specific inhaler will ensure the asthma inhaler is being used correctly so the asthma sufferer will get the full benefit of the medication,” Dr Samir added.



Commenting on the company’s innovation, Dr Ashraf Allam, Vice President of Mundipharma Middle East & Africa, said: “Mundipharma’s history and focus in innovation has made us one of the fastest growing pharmaceutical companies globally and keeps us committed to meeting the demand for patient-centric solutions. We have started to harness the power of digital innovation to bridge the gap to optimal patient care. Utilizing Oculus Rift [a virtual reality headset], we are the first company in the Middle East to use virtual reality to enhance the learning experience for physicians and patients.”

At a recent conference sponsored by Mundipharma in Dubai, doctors in the Middle East & Africa were invited to be the first in the world to view and test the application.

Dr Bassam Mahboub, Consultant & Head of Pulmonary Medicine at Rashid Hospital & Chief Innovation Officer at The Dubai Health Authority, commented: “Respiratory health in the region continues to improve, but we need to see more innovation.”

The App will help patients improve their asthma management in general, by capturing their symptoms, seeking advice from an expert, learning about their disease & getting tips on how to better manage their disease, as well as how to properly use their inhaler.

The App will also provide reminders and monitor frequency of medication-use and prescription renewals, as well as provide emergency contacts.

These kinds of applications are clever, digital innovations which are very simple in use. They are developed to help improve the positive outcome of the treatment and consequently make patients healthier and happier.

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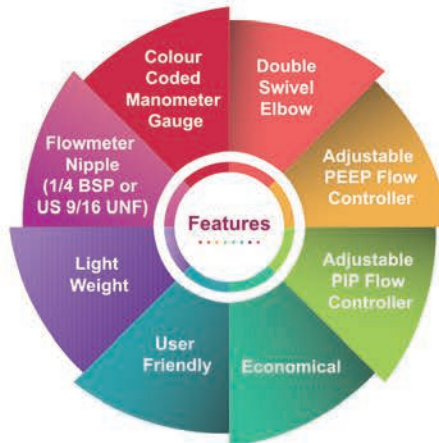
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Studies show significant number of adults at high risk of sleep apnea in UAE and KSA

Studies show that a significant number of adults in the UAE and Saudi Arabia are at high risk of Obstructive Sleep Apnea. Although obesity is a risk factor it is not the only cause of this sleep disorder which can have detrimental effects on an individual's general health and wellbeing.

What is Obstructive Sleep Apnea?

Obstructive Sleep Apnea (OSA) is the most common type of sleep apnea and is caused by complete or partial obstructions of the upper airway. It is characterized by repetitive episodes of shallow or paused breathing during sleep, despite the effort to breathe, and is usually associated with a reduction in blood oxygen saturation. These episodes of decreased or paused breathing, called "apneas" (apnea means 'without breath'), typically last 20 to 40 seconds. The most common cause of this is the partial or complete stoppage of the flow of air due to the relaxation of the muscles which surround the throat and tongue.

Individuals with OSA are rarely aware of difficulty breathing, even upon awakening. It is often recognized as a problem by others who observe the individual struggling to breathe while sleeping or is suspected because of its effects on the body. OSA is commonly accompanied with snoring.

OSA affects approximately 4% of the adult population. If OSA left untreated, it can contribute to the development of high blood pressure, diabetes, heart attacks, and strokes. According to the World Health Organization (WHO), it is estimated that approximately 100 million people worldwide suffer from the condition.

Symptoms

One of the most noticeable symptoms of OSA is unexplained daytime sleepiness. Other common symptoms include, restless sleep, and loud snoring (with periods of silence followed by gasps). Less common symptoms are morning headaches;

insomnia; trouble concentrating; mood changes such as irritability, anxiety and depression; forgetfulness; increased heart rate and/or blood pressure; decreased sex drive; unexplained weight gain; increased urination and/or nocturia; frequent heartburn or gastroesophageal reflux disease; and heavy night sweats.

Causes

One of the main causes of OSA is obesity, which can increase the soft tissue around the airway, leading to airway obstruction during sleep. However, obesity is not always present in individuals with OSA. Old age and individuals with decreased muscle tone can also suffer from airway collapse and sleep apnea.

Prevalence of OSA in KSA

According to the current evidence, sleep disorders are prevalent among the Saudi population.^(1, 2) Two previous studies used the Berlin questionnaire to assess the prevalence of obstructive sleep apnea (OSA) risk and symptoms among middle-aged Saudi men and women and found that 3 of every 10 Saudi men and 4 of every 10 Saudi women are at high risk for OSA.^(3, 4) A recent study that used polysomnography (PSG) to assess OSA in a random sample of Saudi school employees aged 30 to 60 years (n=346) revealed that the rates of OSA (an apnea-hypopnea index (AHI) of ≥ 5) were 11.2% and 4.0% in men and women, respectively, and the rates of obstructive sleep apnea syndrome (OSAS) (an AHI of ≥ 5 plus daytime sleepiness) were 2.8% (4.0% in men and 1.8% in women).⁽⁵⁾ In the Western countries, the prevalence of OSAS is 3% to 7% in men and 2%

to 5% in women.^(6, 7) Parent-reported snoring has been described in 17.9% of elementary school children.⁽⁸⁾ A meta-analysis that included studies from all continents estimated the prevalence of parent-reported snoring in children to be 7.45% (95% confidence interval, 5.75–9.61).⁽⁹⁾ The estimated prevalence of narcolepsy with cataplexy in Saudis is 40/100,000 people,^(10, 11) which is within the range reported in other studies that showed the prevalence of narcolepsy with cataplexy to fall between 25 and 50 per 100,000 people.⁽¹²⁾ A national study reported the prevalence of restless leg syndrome as 5.2%.⁽¹³⁾

Prevalence of OSA in the UAE

A study in the United Arab Emirates (doi: 10.2147/IJGM.S40001) published in the *International Journal of General Medicine* in 2013 showed that in a primary health care setting, the prevalence of symptoms of OSA among adult UAE citizens is very high. The authors note that UAE patients are at risk for OSA and may benefit from proper evaluation for OSA.

Based on the responses and measurement of the Berlin Questionnaire of 1214 subjects studied, 58% of the respondents were female and 42% were male. Two-hundred-fifty-four respondents met the criteria for high-risk scoring. This gives a prevalence of 20.9% (out of which 22.9% of the male respondents were high risk for OSA, while 19.5% of the females were high risk for OSA), while the remainder of the participants were classified as low risk. The highest prevalence was observed between age 51 to 60 in both genders. Seventy percent of the high-risk group were obese with a



Philips Healthcare's DreamStation positive airway pressure (PAP) sleep therapy devices are designed to make sleeping comfortable and easy.

body mass index (BMI) ≥ 30 kg/m² and nearly 75% of the low risk group had a BMI < 30 kg/m².

The authors of the study note that community-based studies from Western countries have reported OSA is more common in males compared with females, and in Jordan, the high risk of obstructive sleep apnea was present in 19.1% of men and in 14.7% of women.

The authors also pointed out that a population-based study in the United States revealed that obesity was a strong predictor of OSA risk. Among obese subjects (BMI ≥ 30 kg/m²), 59% of subjects were at high risk of OSA. They add that their study shows a close association between high BMI and the risk of OSA in the population of Dubai.

Speaking about the disorder at a medical conference in Dubai, Professor Ahmed BaHammam, Consultant of Pulmonary and Sleep Medicine and Director of Sleep Disorders Center at King Saud University in Riyadh, said: "Considering the high prevalence and the serious consequences of OSA, efforts are needed to build up and advance this specialty in the Middle East. It is very important for physicians in the primary healthcare sector to be fully educated and trained on the diagnosis and treatment of OSA to help improve the detection and make sure they are tackled and detected earlier. This will definitely help in preventing complications for patients."

Treatment

Continuous positive airway pressure (CPAP) is the gold standard treatment for OSA specially for moderate and severe cases. Other treatment options are considered for milder cases such as (but not limited to); Avoiding alcohol and smoking, avoiding medications that

relax the central nervous system, such as muscle relaxants and weightloss in those who are overweight. Surgical procedures and oral appliances are being considered for some cases as well.

As a global leader in the management of sleep disorders, Philips Respironics has developed an extensive range of products and solutions, from diagnostics tools through patient-centred sleep therapy devices, to help enhance the quality of sleep and improve peoples' health. Philips is a pioneer in science-based sleep solutions, which forms a strategic element of the company's commitment to provide innovative solutions for the home.

Philips latest innovation was the introduction of *Dream Family Sleep Therapy Platform* in 2016.

The Dream Family offers innovative, comprehensive sleep therapy technology with sleek, patient-driven design, and personalized tools to keep patients engaged and compliant to therapy.

DreamStation positive airway pressure (PAP) sleep therapy devices are designed to be as comfortable and easy to experience as sleep is intended to be. Connecting patients and care teams, DreamStation devices empower users to embrace their care with confidence, and enable care teams to practice efficient and effective patient management. MEH

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SleepApnea.com

Philips Respironics hosts and operates an online resource for sleep apnea patients and healthcare professionals – SleepApnea.com. With Philips' understanding of the challenges faced by sleep apnea patients, this site is a comprehensive online resource designed to provide sleep apnea patients and healthcare professionals with the information they need to recognise, diagnose and treat the disorder.

Ultraviolet air steriliser reduces sepsis and mortality in cardiac surgery patients

An ultraviolet air steriliser reduces sepsis and mortality in cardiac surgery patients, according to research presented 12 October 2016 at Acute Cardiovascular Care 2016, in Lisbon, Portugal.

“Hospital-acquired infections are the most common postoperative complication in the intensive care unit (ICU) and are associated with longer hospital stay, higher mortality rates, and increased healthcare costs,” said lead author Dr Juan Bustamante Munguira, a physician at the University Hospital La Princesa in Madrid, Spain.

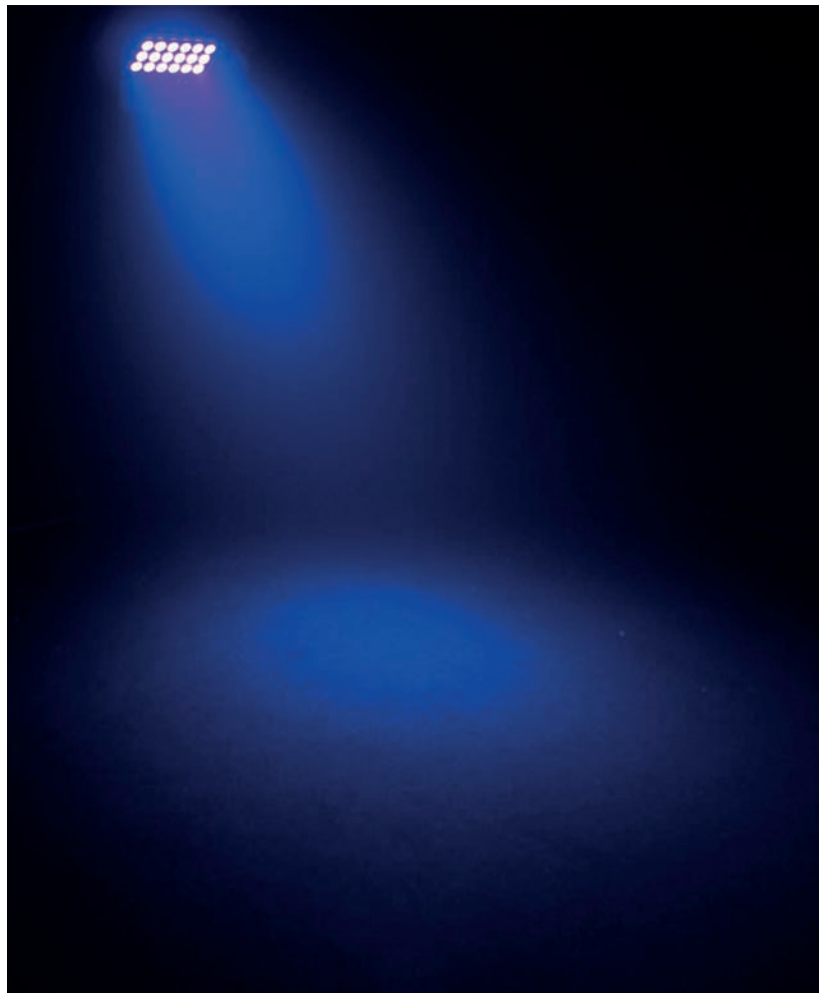
He said: “Pathogens are transmitted through the air, and by touching skin, clothes, and medical instruments and devices. Several studies have shown that standard cleaning methods are not effective for killing pathogens. Novel disinfection technologies, such as hydrogen peroxide vapour, ozone mists, or ultra microfibre cloths, have emerged to solve this situation.”

This prospective, randomised and non-interventional clinical trial evaluated the impact of an ultraviolet air steriliser on clinical outcomes of patients in ICU who had undergone cardiac surgery. The study included 1097 patients, who were randomised to an ICU with (522 patients) or without (575 patients) the steriliser.

Patients were 68 years of age on average and 67% were men. EuroSCORE2 before surgery was similar between groups (6.90 in patients with the steriliser and 7.02 in those without), which indicates that they had the same risk of dying during or shortly after heart surgery.

The investigators found that sepsis occurred in 3.4% of patients using the steriliser compared to 6.7% patients not using the steriliser ($p = 0.02$). The 30 day in-hospital mortality rate was significantly lower in patients using the ultraviolet air steriliser (3.8%) compared to the group without it (6.4%).

Dr Munguira said: “Sepsis, also



called blood poisoning, can be caused by an infection and is potentially life-threatening. We found lower rates of sepsis and mortality in patients who recovered from cardiac surgery in an ICU fitted with an ultraviolet air steriliser.”

The incidence of ventilator-associated pneumonia was lower in the ultraviolet group but the difference between groups was not statistically significant. The length of stay in ICU and the hospital was similar in both groups.

A logistic regression model showed that age, emergency (unscheduled) surgery, and the absence of the ultraviolet air steriliser were each independently associated with

30 day in-hospital mortality.

“Our research shows that the ultraviolet air steriliser was independently associated with lower 30 day in-hospital mortality. The ultraviolet radiation is harmless to humans but kills microorganisms including bacteria, viruses and spores by inactivating their RNA or DNA,” Dr Munguira said.

“Our research indicates that this technology may help reduce hospital infections and deaths, and larger studies may find a statistically significant benefit on pneumonia. This is a relatively new area of research and a cost effectiveness study in more patients is needed,” he concluded. **MEH**



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Mr Andrew Goldberg OBE, consultant orthopaedic foot and ankle surgeon (right).

3D print technology improves ankle replacement with hi-tech ankle joint

Arthritis in the ankle is extremely painful and can affect someone's quality of life as much as end-stage heart failure. Even getting up to make a cup of coffee can be difficult.

The commonest cause of ankle arthritis is a break of the ankle or leg or recurrent severe sprains, but it can take anything up to 20 years to develop because the cartilage wears away gradually and with it does the shock absorbing capacity of the joint lining. Eventually bones rub against bones which cause a limp, stiffness and pain.

Physiotherapy and losing weight can help in some cases – otherwise, surgery may have to be considered.

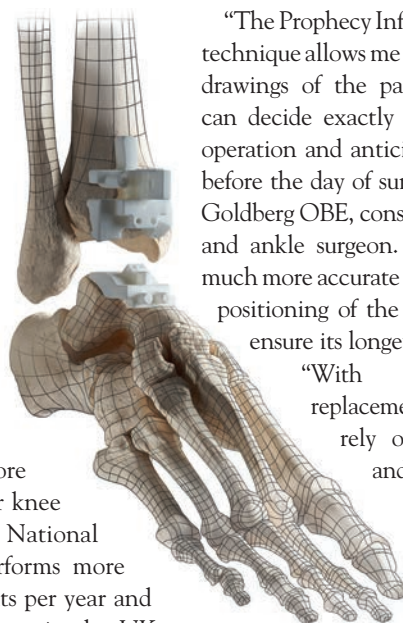
Every year, 29,000 patients in the UK seek help from an orthopaedic surgeon for ankle arthritis. The main treatment to date has been ankle fusion – where the bones are joined together with screws to stop movement. The disadvantage of this is that because the joint can no longer move, stresses happens at other joints around the ankle and foot or even the knee or spine, putting them at risk of wear and tear arthritis.

Ankle Replacement is a newer technology which, just like a hip or a knee replacement, allows movement in the joint to be retained and hopefully less stresses to be placed on the other joints.

The joint replacement is made of metal with a plastic lining to allow the bones to glide and move more normally.

In the UK about 900 ankle replacements take place each year and long term outcomes are improving, however nearly 2% of ankle replacement procedures fail each year – the equivalent of 20% after ten years, which is more than double that of hip or knee replacements. The Royal National Orthopaedic Hospital performs more than 50 ankle replacements per year and is one of the leading centres in the UK. There is evidence that centres that carry out a higher volume of these procedures have better patient outcomes.

The Royal National Orthopaedic in Stanmore, England have pioneered a new technology that uses a scan of the patient to 3D print a replica of the patient's bones and then plan a specific replacement designed for the actual patient. This new technique is known as patient specific instrumentation.



“The Prophecy Infinity ankle replacement technique allows me to see detailed architect drawings of the patient's anatomy and I can decide exactly how I plan to do the operation and anticipate any surprises well before the day of surgery,” said Mr Andrew Goldberg OBE, consultant orthopaedic foot and ankle surgeon. “I find the technique much more accurate and believe that precise positioning of the prosthesis is crucial to ensure its longevity.”

“With other conventional replacements, the surgeon must rely on cumbersome frames and rods to align the implant correctly and it is in some cases more of an art than a skill,” said Mr Goldberg.

“Before I began using this approach, my patients would take up to a year to walk pain-free. Now most are pain-free by six weeks and without a limp by three months.”

● The Royal National Orthopaedic Hospital is involved in a clinical study on ankle replacement surgery.

See: www.anklearthritis.co.uk

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Mother donates part of her liver to save son's life in living-donor transplant procedure

A 7,000-mile journey to Children's Hospital of Pittsburgh of UPMC enabled 8-year-old Saleh Al-Sada from the Persian Gulf country of Qatar to receive the vital organ transplant needed to save his life. Yet the curative solution was always as near to him as his mother.

Young Saleh was suffering from heart failure, a consequence of a rare inherited metabolic disorder. The transplant that would restore his cardiac health involved not the heart, but the liver, and his mother Manal, a viable candidate, stepped forward to provide a portion of her own organ for her son.

Mrs. Al-Sada's gift has enabled Saleh's heart to heal and his metabolic condition to improve, and her own liver function is now fully restored. It is an example of how a living-donor liver transplant can provide a life-saving alternative for young children with serious metabolic conditions.

Metabolic disorder

Saleh and his fraternal twin, Mohammed, who does not have the condition, were born in 2007 in Doha, Qatar. Doctors quickly diagnosed Saleh's condition, known as propionic acidemia (PA), a potentially life-threatening disorder that presents quickly in stricken infants through poor feeding, lack of appetite, vomiting, lethargy and weak muscle tone.

As a recessive genetic disorder, PA occurs when a specific faulty gene is inherited from both parents. In people with the condition, the body is unable to break down certain amino acids and fats, which can lead to a buildup of harmful organic acids and toxins in the blood.

Through the age of 4, Saleh's health and nutrition issues required frequent hospital visits. By the time he was 5 years old, Saleh stabilized, started to eat, gained weight, and attended school. Until at the age of 7 he had an inexplicable episode of rapid deep breathing that required medical attention. Doctors said his lungs were good, but found he had developed

cardiomyopathy caused by his metabolic condition.

"One of the complex complications of propionic acidemia is cardiac disease, which has been reported to get better with liver transplantation," said Children's Hospital's Director of Pediatric Transplantation, George Mazariegos, MD, FACS, an expert in the field of liver transplantation as a cure for metabolic disease, whose team ultimately performed Saleh's liver transplant.

Doctors advised the family that a liver transplant might benefit Saleh. Aware of Children's reputation in liver transplantation for metabolic disease, Saleh's doctors consulted with Dr. Mazariegos and then recommended that the Al-Sadas bring their son to Pittsburgh.

Concerned about her son's frail condition, Mrs. Al-Sada asked if she could serve as the donor to expedite transplantation. Although Mrs. Al-Sada, like her husband Badr, is a carrier of the defective gene that resulted in her son's PA, she does not have the condition, and her own liver functions normally.

Transport for transplant

In 2015 the family arrived in Pittsburgh. Saleh and his mother were evaluated, and preparation for the transplant procedure began. A portion of the left lobe of Mrs. Al-Sada's liver was removed and rushed to Dr. Mazariegos and the team at Children's. Saleh's surgery was more complex, and recovery took longer, requiring temporary use of a ventilator to assist his weak lungs while his heart got stronger. However, signs of cardiac improvement were already evident after the first week. After two months, Saleh's recovery had progressed to the point where physical and occupational therapy were started to help him regain strength.

The path home

Six months after surgery, his cardiac condition and breathing were significantly

The mother's left lobe of her liver that she donated will completely regenerate over time and the portion transplanted into her son will grow and develop as if it was his original liver.

improved, and his liver function was normal. As PA is a systemic disease, liver transplant does not cure the patient of the condition. "However, the pathways of the organic acids are present to a large degree in the liver, so treatment of it significantly improves with liver transplantation," Dr. Mazariegos explains, adding that Saleh's metabolic control in terms of his dietary restrictions has improved with the transplant, and he is being weaned from his medications.

Mrs. Al-Sada's left lobe will completely regenerate over time, and the portion transplanted into Saleh will grow and develop as if it was his original liver.

Liver transplantation as a treatment for pediatric metabolic diseases is increasingly proving to be a viable option – one where Children's Hospital has a proven record of success. With related living-donor transplantation, parents and family members can often be the donors, resulting in more positive outcomes due to shortened wait times and better genetic matching from healthy living donors.

According to Dr. Mazariegos, Saleh's case was innovative from the standpoint of using the liver of a donor who was also the carrier of a gene that caused the metabolic disorder, even though the mother did not have the condition.

Today, Mrs. Al-Sada's hope for her son is that he may grow up to become a doctor – like the many who were so instrumental in saving his life. **MEH**



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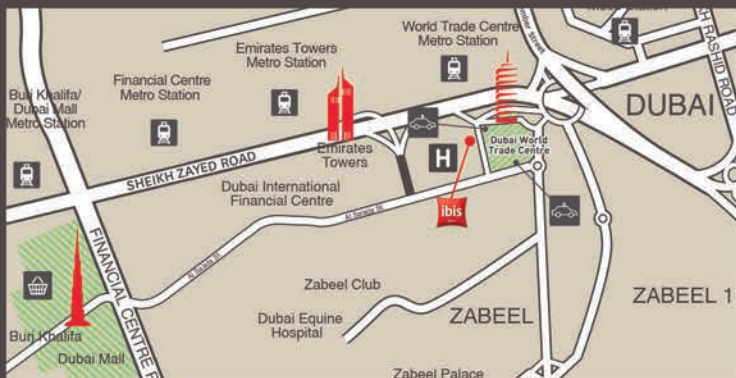
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Shirley Ryan AbilityLab set to open in March

New research hospital will revolutionize rehabilitation



The Rehabilitation Institute of Chicago, the world leader in rehabilitation, advances patient care with a mighty new ally: real, valid science. In March 2017, we will open a new hospital – The Shirley Ryan AbilityLab – and it’s more than just a new building – it’s a new kind of research hospital, one that is revolutionizing the future of rehabilitation and creating a new category of medicine.

It is designed explicitly for the practice of “translational medicine” – a new model for medical care in which research is applied directly (translated) during patient care. It is the world’s first and only center of its kind on the planet.

AbilityLab’s novel and striking design embeds clinical and research teams among patients, 24/7. Our physicians lead AbilityLab translational care teams and design personalized treatment plans to meet your goals. In this setting, research will not just coexist with patient care, it will be integrated full time into the clinical environment, engaging patients in the process. This will allow for a patient’s best chance at a faster more complete recovery.

AbilityLab has the largest rehabilitation research enterprise in the world, with an unparalleled research distinction including a record eight, multi-year, multi-million-dollar federal research designations. At any given time, there are more than 350 clinical studies underway dedicated to improving treatments and creating better outcomes for patients.

AbilityLab sets the standard of care in the post-acute market through our innovative applied research and discovery programs, particularly in the areas of neuroscience,

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Located along the beautiful shoreline of Lake Michigan in downtown Chicago, Illinois, AbilityLab provides fundamentally different care than any other hospital, serving the largest number of the most complex patients and treating a wide range of conditions from stroke, traumatic brain injury and spinal cord to cerebral palsy, cancer related conditions and other neurological disorders. Each year treating over 50,000 patients from more than 70 countries throughout the world.

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One of the largest Inherited Cardiac Conditions centres in the UK delivers leading diagnostic and management services

Due to the complex nature of Inherited Cardiac Conditions (ICC), the clinical experience with these diseases is limited to a few centres around the world. Royal Brompton & Harefield Hospitals (RB&HH) is one of the largest centres for the diagnosis and management of patients with ICC in the UK. Our multi-disciplinary team includes the leading specialists in this field.

ICC are a group of genetic disorders that affect the heart and major vessels, in particular the heart muscle (Cardiomyopathies), the heart rhythm (Inherited Arrhythmia Syndromes) and the aorta (Aortopathy).

Additional inherited conditions include Pulmonary Hypertension and lipid disorders such as Familial Hypercholesterolaemia (Lipidopathy).

The frequency of all ICC combined is approximately 1:100 worldwide and in many cases lead to sudden death at a young age. Although the prediction of sudden death can be challenging, the current knowledge and experience on these diseases allow us to identify most patients at risk and prevent further complications.

Diagnosis of these conditions can be difficult and for many of these diseases is based on a combination of markers from different diagnostic areas. The most common diagnostic tests include ECG, echocardiogram, exercise test, angiogram, MRI scan and genetic testing, where appropriate. For those patients attending our clinic, we can provide all diagnostic tests in a one-day assessment to ensure the best possible service for patients.

The management of patients with ICC depends on their clinical expression and risk profile. It ranges from monitoring, to medical and interventional treatment. Certain details of the patients' history and the results of the investigation can be helpful for the specialist Cardiologist to choose the appropriate patient management pathway.

In particular, our recently ISO15189-accredited Clinical Genetics and Genomics laboratory offers diagnostic testing for families and individuals at risk of inherited diseases, including Cardiomyopathy, Familial Aortopathies and Arrhythmias. The molecular genetic analysis of ICCs using a comprehensive repertoire of next-generation sequencing-based tests is essential for a complete clinical diagnosis. This informs the further care of ICC patients and enables the testing of their relatives, a service international referrers can benefit from too.

Fortunately, interventions and appropriate management have substantially improved the outcome for patients with ICC.

■ Prospective patients can be referred by their consultant or general practitioner to the ICC specialists by phoning 00 44 (0) 2031 315 749 or emailing privatepatients@rbht.nhs.uk

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Korea Medical Tourism Convention aims to attract more Middle East patients to world class medical facilities in South Korea

Reports show South Korea hosted 296,889 medical tourists from over 190 countries in 2015

Korea National Tourism Organization, the state-run tourism organization, in cooperation with the *Financial News*, a leading South Korean newspaper company, organized the Korea Medical Tourism Convention in November in Abu Dhabi. The medical tourism convention aimed to attract Middle East patients to Korea for advanced treatment.

The opening ceremony was attended by H.H Sheikh Mohammad Bin Khalifa Bin Sultan Al Nahyan, H.E Abdullah Al Nueimi, the ambassador of UAE to South Korea, H.E Park Kang Ho, the ambassador of South Korea to UAE, and a number of important officials from the two countries. The event gathered 28 Korean health establishments,

government departments and medical agencies. The exhibitors promoted attractive medical and travel combination packages for patients wishing to seek medical treatment in world-class healthcare facilities in South Korea. The slogan for the event was 'Care by Heart, Visit Medical Korea!'

The convention proved to be timely and strategic as more patients from the Middle East region have expressed a preference in seeking medical treatments in South Korea. In fact, the Korea Health Industry Development Institute (KHIDI) Annual Report 2015 reveals that a total of 6,101 patients from the region visited South Korea in 2015, which reflects an 11.2% increase from the previous year. Of the 6,101 patients,

2,946 came from the UAE, 1,215 from Saudi Arabia and 411 from Egypt. The strong relationship between the UAE and South Korea is attributed to the signing of previous Memorandums of Understanding (MoU) to further cooperative ties, especially in the field of health care.

"The event played a significant role in raising more awareness on the many benefits and advantages to be gained by patients wanting to visit South Korea for medical purposes," said Kyoo Sang Kang, the regional director of Korea National Tourism Organization Dubai office. "The convention served as a strategic vehicle that helped in giving a better understanding of Korean oriental medicine, treatments and

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our diverse range of medical facilities – giving them enough information before they decide on coming to visit South Korea.”

According to the Korea National Tourism Organization, South Korea hosted 296,889 medical tourists from over 190 countries in 2015, reflecting an increase of 11.4% from the 266,501 patients in 2014 and the 211,218 patients in 2013. The growth complements the plan of receiving one million international patients by the end of 2020.

Korea offers a blend of high-quality care with high-tech procedures at prices far less than its counterparts in Europe, Japan and the United States. The country has become one of the leaders in organ transplants and cancer treatments throughout the world due to its superior procedures in curing severe conditions such as brain disease, cardiac disorders and cancer. Korea is also ranked the highest for five-year survival rates of cancer treatment patients over Canada, Japan and the US. The health industry in Korea also surpasses the US in terms of successful liver transplants – achieving a 92% success rate compared to 85% in the US.

At the convention leading medical professionals from the UAE and South Korea discussed topics related to the field of medicine and tourism. Five Korean medical experts representing leading hospitals in Korea gave presentations on



common diseases and case studies from their Middle East patients.

The convention offered free consultations, business meetings and key medical seminars from participating hospitals. Some of the leading Korean

establishments that participated at the event include Samsung Medical Center, Asan Medical Center, Wooidul Spine Hospital, Seoul National University Hospital and Jaseng Hospital of Korean Traditional Medicine. **MEH**

World first: Neural prosthetic used to restore walking movement in paralyzed primate

An international team of scientists has used a wireless “brain-spinal interface” to bypass spinal cord injuries in a pair of rhesus macaques, restoring intentional walking movement to a temporarily paralyzed leg. The researchers, who describe their work in the journal *Nature*, say this is the first time a neural prosthetic has been used to restore walking movement directly to the legs of nonhuman primates.

The study was performed by scientists and neuroengineers in a collaboration led by Ecole Polytechnique Federale Lausanne (EPFL) in Switzerland, together with Brown University, Medtronic and Fraunhofer ICT-IMM in Germany. The work builds upon neural technologies developed at Brown and partner institutions, and was tested in collaboration with the University of Bordeaux, Motac Neuroscience and the Lausanne University Hospital.

“The system we have developed uses signals recorded from the motor cortex of the brain to trigger coordinated electrical stimulation of nerves in the spine that are responsible for locomotion,” said David Borton, assistant professor of engineering at Brown and one of the study’s co-lead authors. “With the system turned on, the animals in our study had nearly normal locomotion.”

The work could help in developing a similar system designed for humans who have had spinal cord injuries.

“There is evidence to suggest that a brain-controlled spinal stimulation system may enhance rehabilitation after a spinal cord injury,” Borton said. “This is a step toward further testing that possibility.”

Grégoire Courtine, a professor at EPFL who led the collaboration, has started clinical trials in Switzerland to test the spine-part of the interface. He cautions: “There are many challenges ahead and it may take several years before all the components of this intervention can be tested in people.”

Re-establishing communication

Walking is made possible by a complex interplay among neurons in the brain and spinal cord. Electrical signals originating in the brain’s motor cortex travel down to the



The brain-spine interface uses a brain implant like this one to detect spiking activity in the brain’s motor cortex. Seen here, a microelectrode array and a silicon model of a primate’s brain, as well as a pulse generator used to stimulate electrodes implanted on the spinal cord.

lumbar region in the lower spinal cord, where they activate motor neurons that coordinate the movement of muscles responsible for extending and flexing the leg.

Injury to the upper spine can cut off communication between the brain and lower spinal cord. Both the motor cortex and the spinal neurons may be fully functional, but they are unable to coordinate their activity. The goal of the study was to re-establish some of that communication.

The brain-spinal interface used a pill-sized electrode array implanted in the brain to record signals from the motor cortex. The sensor technology was developed in part for investigational use in humans by the BrainGate collaboration, a research team that includes Brown, Case Western Reserve University, Massachusetts General Hospital, the Providence VA Medical Center, and Stanford University. The technology is being used in ongoing pilot clinical trials, and was used previously in a study led by Brown neuroengineer Leigh Hochberg in which people with tetraplegia were able to operate a robotic arm simply by thinking about the movement of their own hand.

Wireless neurosensor

A wireless neurosensor, developed in the neuroengineering lab of Brown professor Arto Nurmikko by a team that included Borton, sends the signals gathered by the

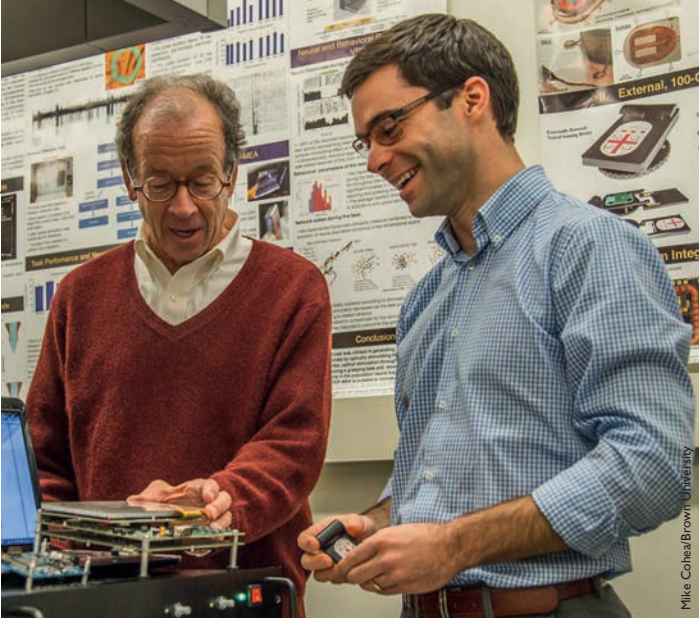
brain chip wirelessly to a computer that decodes them and sends them wirelessly back to an electrical spinal stimulator implanted in the lumbar spine, below the area of injury. That electrical stimulation, delivered in patterns coordinated by the decoded brain, signals to the spinal nerves that control locomotion.

To calibrate the decoding of brain signals, the researchers implanted the brain sensor and wireless transmitter in healthy macaques. The signals relayed by the sensor could then be mapped onto the animals’ leg movements. They showed that the decoder was able to accurately predict the brain states associated with extension and flexion of leg muscles.

The ability to transmit brain signals wirelessly was critical to this work, Borton said. Wired brain-sensing systems limit freedom of movement, which in turn limits the information researchers are able to gather about locomotion.

“Doing this wirelessly enables us to map the neural activity in normal contexts and during natural behavior,” Borton said. “If we truly aim for neuroprosthetics that can someday be deployed to help human patients during activities of daily life, such as untethered recording technologies will be critical.”

The researchers combined their understanding of how brain signals influence locomotion with spinal maps, developed by



Mike Cohen/Brown University

The brain-spine interface uses a brain implant like this one to detect spiking activity in the brain's motor cortex. Seen here, a microelectrode array and a silicon model of a primate's brain, as well as a pulse generator used to stimulate electrodes implanted on the spinal cord.

Courtine's lab at EPFL, which identified the neural hotspots in the spine responsible for locomotor control. That enabled the team to identify the neural circuits that should be stimulated by the spinal implant.

With these pieces in place, the researchers then tested the entire system on two macaques with lesions that spanned half the spinal cord in their thoracic spine. Macaques with this type of injury generally regain functional control of the affected

leg over a period of a month or so, the researchers said. The team tested their system in the weeks following the injury, when there was still no volitional control over the affected leg.

Limitations and future work

The study showed that with the system turned on, the animals began spontaneously moving their legs while walking on a treadmill. Kinematic comparisons with healthy controls showed that the lesioned macaques, with the aid of brain-controlled stimulation, were able to produce nearly normal locomotor patterns. While demonstrating that the system works in a nonhuman primate is an important step, the researchers stressed that much more work must be done to begin testing the system in humans. They also pointed out several limitations in the study.

For instance, while the system used in this study successfully relayed signals from the brain to the spine, it lacks the ability to return sensory information to the brain. The team was also unable to test how much pressure the animals were able to apply to the affected leg. While it was clear that the limb was bearing some weight, it wasn't clear from this work how much.

"In a full translational study, we would want to do more quantification about how balanced the animal is during walking and measure the forces they're able to apply," Borton said.

Despite the limitations, the research sets the stage for future studies in primates and, at some point, potentially as a rehabilitation aid in humans.

"There's an adage in neuroscience that circuits that fire together wire together," Borton said. "The idea here is that by engaging the brain and the spinal cord together, we may be able to enhance the growth of circuits during rehabilitation. That's one of the major goals of this work and a goal of this field in general."

● doi: 10.1038/nature.2016.20967

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Beware of black market cosmeceuticals



By Leslie Morgan, OBE DL
CEO, Durbin PLC
Leslie Morgan is a Fellow of the Royal
Pharmaceutical Society of Great Britain

The growing popularity of cosmetic procedures is becoming increasingly impossible to ignore due to its high profile on TV, social media, the internet and as a hot topic in general conversation. It has been said that the global cosmetics market will reach \$61 billion by 2020. The most popular cosmetic procedures in the Middle East are liposuction, breast augmentation, abdominoplasty and rhinoplasty. This rising trend is not limited to women, in fact The Emirates Medical Association has established that 47% of all cosmetic surgery patients in the UAE are indeed men. Evidently the need to have sculptured torsos, defined muscles and the 'perfect face', is increasingly appealing to the male population just as much as women in the Middle East.

I find myself being curious as to what has made cosmetic surgery and non-surgical treatments so popular? Is it all for vanity, health or beauty purposes? It is clear to say this revolution has taken over the way beauty is perceived and can even become an addiction to some. Research in Oman has shown that liposuction and abdominoplasty are more likely to be chosen over diet or ex-

ercise, with a thriving number of overweight people opting for one of these surgeries. Whilst some recruit surgeons to remove excess fat from their bodies completely, many now request the fat to be removed and injected elsewhere to enhance other areas, for instance the buttocks. With no chemicals injected in this procedure, as there are with many other enhancing surgeries, fat transfer has become more favourable.

A huge number of male and female patients are opting for smaller noses in a bid to look 'more desirable'. Nearly 40,000 cosmetic surgeries take place in Iran each year - 60% of these are rhinoplasty and have led to Tehran being dubbed the 'nose job' capital of the world. While new less invasive surgeries are constantly being introduced, there is a growing and undeniable demand for non-invasive cosmetic procedures. Fast evolving technologies means Botox and dermal fillers have become such a quick process that there is little downtime. Indeed, so quick, that women and men are popping to their local clinic with ease for a readily available procedure - even during lunch breaks! Although there are many beauty products that claim to improve the appearance of ageing and enhancing features (e.g. lips, eyes and cheeks), cosmetic surgery is somewhat more of an effective way to achieve the desired look for instant, longer-term results.

As a quick-fix to treat signs of ageing, Botox is by far the most popular procedure and has many alternative health purposes. Botox helps patients recover from medical disorders such as hyperhidrosis, migraines, bruxism and more. For hyperhidrosis, using Botox reduces sweat produced by the body by preventing the muscles from contracting. This may be beneficial to many living in the region as temperatures can reach as high as 45°C. The same process is used to reduce oily looking skin by cutting down excess production of sebum that is released; these require regular treatments

and are never a one-off fix.

As with every type of business, the same services are offered on the black market at a much lower cost but the associated risks here are much higher. Botched jobs, product sourced from unregulated suppliers, unsanitary conditions, a lack of medical knowledge, no insurance and no after-care are just a few examples that can cause huge complications. Quality cosmetic treatments can cost the customer thousands of dollars, which is merely a drop in the ocean for the wealthy. However, many others save up for smaller procedures, which are not as expensive, such as facial injections. With competitive prices, there will always be a risk of unlicensed cosmetic surgery. That's why with over 50 years' experience Durbin understands the need for quality-assured cosmeceuticals in the industry. We have built up a global network of reliable suppliers and supply cosmetic fillers, disposables and surgical equipment at great competitive prices, but never with a compromise on quality. **MEH**

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Collective action, R&D and the urgent need for new antibiotics

Médecins Sans Frontières (MSF) is witnessing first-hand the emergence of antibiotic resistance in its recent humanitarian work in Jordan, Iraq, Syria, Afghanistan, Pakistan and Palestine with war-wounded people and refugees. In our surgical programmes in Jordan, for example, over half of orthopaedic and maxillofacial surgery patients admitted arrive with a multi-drug resistant infection. There is an urgent need for new antibiotics to counter resistant infections in our surgery programme in Jordan.

Antibiotic resistance, responsible for an estimated 700,000 deaths globally every year. In the US alone, antimicrobial resistance (AMR) is estimated to cost the healthcare system an annual \$20-35 billion, with additional costs to society for lost productivity as high as \$35 billion per year. These antibiotic resistant infections threaten people's lives and greatly increase costs of care.

Unlike many other public health priorities, antimicrobial resistance is attracting political attention at the highest level. Conservation and rational use of antibiotics, along with stimulating research and development of new treatments to address antimicrobial resistance (AMR), are now recognised as critical imperatives.

Research and development forms an essential part of the WHO's Global Plan of Action on AMR. The 2015 G7 Leaders' Declaration acknowledged the need for the development of new antibiotics, therapies, vaccines and diagnostics, with a subsequent Health Ministers' Declaration both calling for a UN High Level Meeting in 2016 on AMR that may include R&D, and making note of specific R&D incentives to develop new antibiotics, including a WHO-supported R&D facility that has since been established. It is expected that the 2016 G7 will continue to look in greater depth at incentive models for the development of new drugs and diagnostics.

Yet the current biomedical innovation system is ill-equipped to address the challenge of R&D for antimicrobial resistance. While it is largely uncontroversial to say that the current patent-based model of medical innovation is at odds with the need for strict



Dr Ashraf Al Bustani with a patient at MSF's reconstructive surgery project in Amman, Jordan, awaits his second surgery on his jaw.

conservation of new antibiotics, progress to develop new incentive models has so far been slow. European efforts to explore and test new, commercially-viable R&D models through the Innovative Medicines Initiative have so far shown little progress, and US initiatives such as the funding of research projects through BARDA or the GAIN Act, for example, have either focused on providing R&D subsidies to industry or further extending product monopolies, without consideration of how this will be at odds with the necessary subsequent stewardship, access and conservation strategies.

Declaration

At the World Economic Forum in 2016, a 'Declaration by the Pharmaceutical, Biotechnology and Diagnostic Industries on Combating Antimicrobial Resistance' recognised that antibiotics need to be developed using new incentive mechanisms, but did not fully commit to a 'de-linked' model of R&D, and instead focused upon other funding measures and market incentives that could also feature some elements of a de-linked R&D model.

The Drugs for Neglected Diseases initiative, with the support of WHO, is establishing a global antibiotic research and development facility, (GARD) which will focus on global health needs and ensure that any new products are also suitable for resource-limited

settings. This facility will be based on the principles of de-linkage, in that the costs of R&D will be financed through other means than high prices and sales volumes. Such a model looks particularly promising in addressing the incentive challenge of 'creation-conservation' that antibiotic R&D entails, and addresses the access and suitability challenges for developing countries.

Despite such promising measures, governments still need to work together to establish a systematic approach to incentivise the development of appropriate drugs and diagnostics to address antibiotic resistance. Collective action, whether via WHO, the UN or even the G20, is urgently needed to ensure appropriate incentives are able to respond to this medical need. **MEH**

MSF UAE

MSF has been in UAE since 1992 under the patronage of Sheikh Nahyan Bin Mubarak Al Nahyan, the UAE Minister of Culture, Youth, and Community Development. MSF in UAE consists of Executive, Finance, HR & Administration, Communications & Fundraising, Logistics and Desks (program manager, HR, Finance, logistics and medical referent).

Visit: www.msf-me.org

New technologies used in the fight against lung cancer

Lung cancer has been the most common cancer in the world for several decades as 1.8 million people develop this disease every year. This is more per year than breast, colorectal and prostate cancer combined. Yet, in spite of the tremendous efforts by researchers and the medical community, awareness on the gravity of the situation still lags. When 3 people die of this cancer every minute, the need to shed light on the prevention, diagnosis and treatment is greater than ever. To explore this in depth, we spoke to *Dr Norbert Dreier*, Head of Department – Oncology, Hematology at Burjeel Hospital, at the 4th International Oncology Conference in the United Arab Emirates.



Dr Norbert Dreier

“One of the most important steps for physicians in treating lung cancer is to identify the specific mutation of the patient’s tumour to be able to accurately determine if they will benefit from a particular treatment. A cunning disease like lung cancer that can shift forms with time and requires constant follow up,” said Dr Dreier. “The survival rate in lung cancer is considerably low in comparison with other cancers where only 10% of patients can survive for 5 years or more. When the cancer is advanced, even with treatment, patients can find it difficult to survive for more than a year. The best way to cure lung cancer is to detect it early.”

However, with diseases like non-small cell lung cancer it is difficult to resect

enough tissue from the biopsy for biomarker testing, due to the health of the patient or the location of the tumour. Thus, a liquid biopsy is a critical procedure for patients with cancer. It provides much needed information on diagnosis, prognosis, and prediction of response or resistance to treatment.

“Luckily, treatment options for patients are much better than what they used to be in the past. There are genetic tests available that patients can take to obtain personalised treatments that can prolong their life. However, these treatment options are for patients with advanced lung cancer where disease management rather than treatment is required,” Dr Dreier said.

This paradigm shift from one-size-fits-all treatment to targeted therapies is the core of Personalised Healthcare. The latest innovations from Roche, as the world’s leading biotech company, come at a perfect time as it offers a ground-breaking approach in fighting cancer by strengthening the patient’s immune system. Thanks to the new testing methods, physicians and labs can use plasma from the patient, which contains proteins, nucleic acids and cancerous cells from a tumour. The blood draw is a non-invasive procedure for patients and a repeatable testing method that has great potential to transform cancer patient-testing and management, and is quickly becoming a complement to

the common tissue biopsy technique.

Dr Dreier explained: “Now with the development of immunotherapy, we can activate our own immune systems in the fight against cancer cells. This is not the first line of treatment, but if the patient does not respond to standard treatment options, we can – with immunotherapy – see if the body responds better. It can aid patients greatly with relatively minimal side effects in most cases. The current trend is to shift towards more personalised treatment. This targeted approach requires very advanced diagnostics solutions and these tools will definitely change the dynamics of oncology.”

In terms of awareness on the importance of screening for lung cancer, Dr Dreier believes a lot more can be done to educate the public; particularly for heavy smokers with 15 years or more of heavy smoking at 40 cigarettes or more a day.

“When symptoms such as severe coughing or the presence of blood when coughing, the case is inspected with a CT scan or X-ray. The best screening tool for lung cancer is a CT scan, but because it is cumbersome and costly to screen every patient, the identification of a risk group is an important step – similar to what is being done in breast cancer, for example. Implementing such programs will definitely be a step forward in raising awareness of this deadly disease.” MEH



Carestream takes orders for new OnSight 3D Extremity System

Carestream is taking orders from healthcare providers worldwide and was due to begin shipping its OnSight 3D Extremity System in December.

The OnSight 3D Extremity System uses cone beam CT (CBCT) technology to capture weight-bearing and other types of extremity exams.

Helen Titus, Carestream's Worldwide Marketing Director for Ultrasound & CT Solutions, said: "The compact system provides high-quality, lower-dose 3D imaging studies. This makes it an ideal diagnostic tool for orthopaedic and sports medicine practices, hospitals, imaging centres, urgent care facilities and other healthcare providers."

It's designed to provide high quality 3D images at the point of care – with easy open bore and patient access to allow weight-bearing studies not possible with traditional CT.

Site and install requirements are low to enable a fast, affordable, convenient imaging process for timely diagnosis and commencement of treatment.

"Orthopaedic imaging is a major focus for Carestream because of the prevalence of musculoskeletal conditions among people of all ages. Youth and adults often suffer sports-related injuries to their knees, ankles and feet while older adults experience arthritis, joint instability, meniscus loss and other conditions," Titus explained.

The new extremity imaging system

can help with diagnosis and treatment for orthopaedic conditions that affect the biomechanical behaviour of the joints such as arthritis, meniscus loss, instability and malalignment syndromes.

The CT system enables healthcare providers to capture high-quality 3D images and conduct a patient consultation

in a single visit, which helps improve productivity and convenience for both specialists and patients. An additional benefit is the ability for patients to view a 3D image that illustrates their condition or injury to help them understand the reason for a treatment or surgical procedure. **MEH**

System features

- Ability to perform upper and lower extremity 3D exams, including weight bearing
- Wide door opening for easy, step-in patient access for weight-bearing exams
- Provides high-resolution 3D images that can help to reveal subtle or occult fractures
- Reduced dose compared to conventional CT systems
- Small footprint and simplified design to cut the time and cost of system installation, compared to conventional CT systems

Image features

- High resolution isotropic image capture
- Large field of view
- Provides high-resolution 3D images that can help to reveal subtle or occult fractures
- Advanced metal and scatter correction algorithms
- Reduced noise via algorithmic iterative reconstruction techniques

Workflow features

- Ability to perform both high-resolution 2D and 3D exams
- Simplified user interface to guide the technologist through the exam
- Fast equipment setup with preprogrammed auto-positions
- Dual operator controls on each side of the system for fine positioning
- Easy interoperability in a DICOM supported environment

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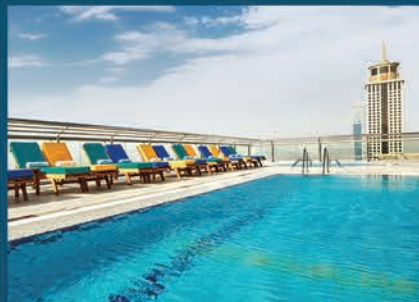
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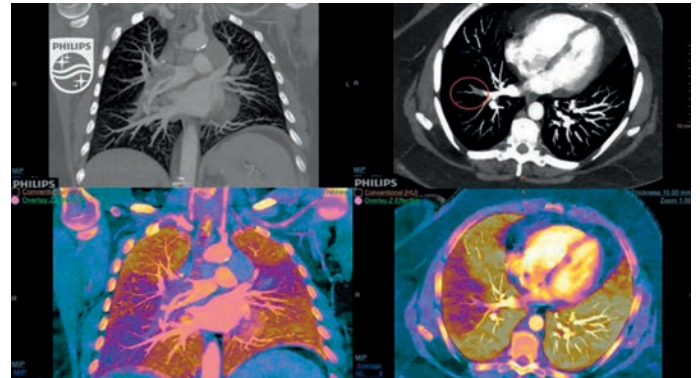
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Philips launches world's first detector-based spectral CT scanner

Philips Healthcare launched their IQon Spectral CT in Canada in November. The IQon Spectral CT is the world's first and only spectral detector CT, designed specifically for spectral imaging. It delivers on-demand colour quantification and the ability to characterize structures simply and at a low dose.

The IQon Spectral CT provides multiple layers of retrospective, diagnostic data in a single, low-dose scan with seamless integration into existing hospital system protocols. It can provide sufficient information with only one scan to help clinicians make fast, confident diagnoses, driving improved clinical and economic outcomes, said Philips in press statement.

The IQon Spectral CT adds spectral resolution to traditional CT scanning through a new dual-layer spectral detector. It identifies photons of high energy and low energy simultaneously, allowing not only the view of anatomy, but also uses colour to characterize the material content of critical structures.

"The Philips IQon Spectral CT is further proof of our commitment of delivering meaningful innovation," said Iain Burns, President and CEO, Philips Canada. "Today's patient-centred healthcare environment requires the ability to enable 'first-time' right testing and diagnostics. With just one scan, the new IQon Spectral

CT can provide clinicians with the information required to help them make confident diagnoses quickly."

Spectral Diagnostic Suite

Philips's has developed the Spectral Diagnostic Suite (SpDS) – a set of advanced visualization and analysis tools designed for the IQon Spectral CT to deliver enhanced spectral viewing and advanced clinical applications capabilities.

By providing spectral capabilities within traditional CT applications, SpDS offers a new level of flexibility and clinical information for CT users, allowing clinicians to utilize the spectral information "on-demand", to achieve better clinical decision support without

any added complexity of special modes or workstations that disrupt user workflow.

Additionally, because there is no need to bring the patient back for additional imaging, on-demand spectral analysis of a particular region allows the physician to further analyze incidental findings and at the same time reduce dose exposure to the patient.

Dr Prabhakar Rajiah, MBBS, M.D., FRCR, Assistant Professor of Radiology, University Hospitals of Cleveland, UH Case Medical Center, Department of Radiology, who collaborated with Philips on the development of the suite, said the Spectral suite "offers a new level of control for clinicians, allowing for segmentation on different energy levels, more detailed comparison between images, and advanced fusion capabilities, for diagnostic confidence".

The Philips SpDS package includes:

- Spectral enhanced Comprehensive Cardiac Analysis (sCCA)
- Spectral enhanced Advanced Vessel Analysis (sAVA)
- Spectral enhanced Tumor Tracking (sTT).

The Philips SpDS also allows for viewing and analysis of spectral datasets in a variety of settings: a reading room, on picture archiving and communication systems (PACS), or from remote locations. **MEH**

Philips' IQon Spectral CT identifies photons of high energy and low energy simultaneously, allowing not only the view of anatomy, but also uses colour to characterize the material content of critical structures.



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GE adds to Revolution CT family

GE Healthcare continues to invest in the Revolution family of CT systems with innovations that help clinicians redefine what's possible with CT.

GE says each product in the Revolution family is designed to deliver four key benefits: diagnostic confidence, patient care, financial performance and clinical excellence.

At the 2016 annual meeting of the Radiological Society of North America (RSNA 2016), GE Healthcare launched the Revolution CT scanner with Whisper Drive technology. The CT scanner is designed to take high-speed scans that allow full imaging of the heart in just one heartbeat.

Full imaging of the heart in one heartbeat is accomplished via a high-speed X-ray tube that reaches 70 Gs as it spins around the patient lying inside the scanner's gantry up to five times per second. This high

speed, combined with intelligent motion correction, allows doctors to image the heart in just one heartbeat.

Revolution CT generates 512 slices, allowing easier imaging of moving parts like the heart.

Also at RSNA – the largest radiological exhibition in the world – GE introduced their Revolution CT with Gemstone Spectral Imaging (GSI) Xtream.

GE says the Revolution CT with GSI Xtream provides “uncompromised image quality and clinical capabilities across all clinical areas through the convergence of whole organ coverage, speed, image quality and spectral imaging all in one CT system”.

The Revolution CT with GSI Xtream features Smart Technologies and comprehensive stroke and trauma capabilities focused on key clinical outcomes.

The company says GSI is unique in

its ability to optimize contrast volumes, reduce beam hardening from dense objects such as metal and perform material characterization. GE notes that the GSI feature is 510(k) pending at US FDA. It is not CE marked and is not available for sale in all regions.

At RSNA GE announced two key technologies to help providers with standardization of protocols across multiple CTs and locations – Imaging Protocol Manager and Dose-Optimized CT Protocols. Imaging Protocol Manager is a cloud-based protocol management solution that reduces the time that protocol teams spend in developing, distributing and monitoring protocols for CT, MI, MR and X-ray devices, helping them deliver the right exam for each patient, every time by leveraging the GE Health Cloud to provide access, insight, and governance for GE and eventually other devices. **MEH**



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On the pulse

EKF Diagnostics' point-of-care HbA1c analyzers come with connectivity package to transmit data

EKF Diagnostics will be previewing the new connectivity solution for their range of point-of-care HbA1c analyzers at Arab Health 2017 in Dubai.

Quo-Test and Quo-Lab now come with a connectivity package that allows the analyzers to transmit patient data to most Lab Information Management Systems (LIS).

The connectivity package uses the POCT1-A2 communication protocol and unlocks a host of new features aimed at improving security and quality control.

For the first time, patient demographic information and additional test commentary can be added to each test result including name, date of birth and patient ID number, using either the standard barcode scanner or the new add-on keyboard. This enables patient results to be linked and traced throughout the healthcare system.

Operator IDs can also be added to each test result, significantly improving the traceability and security applied to every HbA1c



reading. A controlled list of trained operators assures that only those with sufficient competency have access to the system.

In addition to these functions enhanced quality control is available with multiple user-defined QC lockout options, ensuring that tests can only be run according to localised quality assurance procedures.

These new connectivity solutions take Quo-Test and Quo-Lab to the next level in point-of-care patient management.

- For more information, visit: www.ekfdiagnostics.com
- Arab Health booth: Z1.H30

Source Quality Products at High-energy Fair

HKTDC Hong Kong International Medical Devices and Supplies Fair 2017 is Asia's leading source of products and services for the healthcare sector. The eighth edition is expected to feature more than 260 exhibitors while the 2016 fair welcomed more than 10,000 buyers.

Comprehensive Sourcing

NEW in 2017 World of Healthcare presents healthcare products and services across all age groups. These include health foods and beverages, nutrition supplements and related services.

Rehabilitation & Elderly Care Zone serves the ageing population with mobility aids, monitoring devices and wheel chairs.

Hospital Equipment Zone offers buyers electro-medical equipment, ultrasound and imaging equipment, and surgical instruments.

Household Medical Products Zone responds to a growing market for self-monitoring of health through products such as blood pressure monitors, sleep apnea recorders and fitness equipment.

Physiotherapy Zone supports buyers of massage equipment and supplies, and exercise-related products.

Medical Cosmetology Zone gives a choice of IPL and laser devices for beauty and dermatology applications.

Tech Exchange is the place to look for concepts, innovations and prototypes with commercial potential offered by entrepreneurs and research institutions.

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- **Seminars** on technology and market updates

- **Exhibitor Forums** for new products' demonstration

- **Buyer Forums** for potential market development and opportunities

- Concurrent **Hospital Authority Convention**, with 90 expert speakers and over 5,000 healthcare professionals as participants

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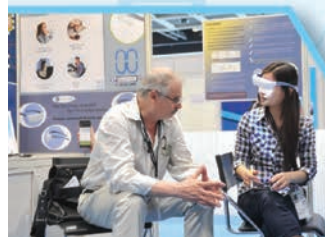


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StayInPlace is a ground-breaking technology that is only available with the Progressa Bed System which prevents patient migration; hence, minimizing the need for patient repositioning.

The Progressa Bed System is the only ICU bed platform on the market that meets the needs of Critical Care patients in different ICU disciplines through upgradability and configurability.



The Progressa Bed System can be configured and upgraded to meet a wide range of requirements within a hospital, while providing a consistently superior user experience. You can decrease total-cost-of-ownership by using one supplier to reduce maintenance, spare parts and training costs.

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- Significantly contributes to shortening ICU length of stay
- Enables Progressive Mobility while reducing the risk of adverse events such as line displacement
- Shortens time to first out of bed.

• For more information, visit:
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On the pulse

Primera Technology showcases efficient specimen identification at MEDLAB



Primera Technology is set to showcase its Signature line of specimen identification and printing solutions at its MEDLAB stand #Z5B42.

Primera's Signature line includes the Signature Slide and Cassette Printers. They are for use in pathology, cytology and histology labs. By placing a cassette printer at each grossing station and a slide printer at each microtome station the labs' efficiency is significantly increased while the risk of specimen misidentification is reduced or even eliminated. Labs can certainly afford and cost-justify to

do so as the Signature printers cost less than all other monochrome-only slide and cassette printers currently available. They are easily integrated into existing LIS or can be purchased as stand-alone systems.

Other benefits include:

- Fast, full-colour or black printing of text, graphics, linear and 2D Barcodes
- On-demand on-slide or direct-to-cassette printing eliminates handwriting or expensive and difficult-to-apply labels
- Cost reduction by inventorying only

white-frosted slides and white cassettes

- Small and space-efficient
- Designed for efficient, hands-free operation
- Two years' warranty (after product registration within 6 months)

Primera's Signature printers offer a new and better way for laboratories as well as medical, education and research organizations to process and manage slides and cassettes.

- For more information, visit: www.primerahealthcare.com
- MEDLAB booth: Z5B42

Konica Minolta's AeroDR X30 Mobile X-ray easy to manoeuvre for bedside exams

Not all X-ray exams can be performed in the X-ray room itself. Sometimes, care needs to come to the patient. Konica Minolta's AeroDR X30 Mobile X-ray System enables you to perform digital diagnoses wherever the patient is in the hospital or medical facility.

Bedside exams may be needed in case patients can't be moved or diagnosed in regular X-ray rooms. In those cases, Mobile Digital X-ray is the right technology to use. AeroDR X30 is specifically designed to carry out bedside exams as easy and straightforward as possible.

The AeroDR detector can be easily stored and at the same time automatically charged in the bin, even during driving. The unique Lithium-Ion-Capacitor technology of the AeroDR detectors allows charging whenever and wherever without losing any performance capacity.

AeroDR X30 is easy to manoeuvre and is a very compact system with a smart, space saving design. Two detectors can be carried along in the bin. AeroDR X30 can be combined with Konica Minolta's robust, carbon fibre Flat Panel Detectors available in various sizes: 10x12", 14x17" and 17x17".

- For more information, visit www.konicaminolta.eu/healthcare
- Arab Health booth: S1E50



ivNOW fluid warming system improves efficiency

The ivNOW fluid warming system enables clinicians to improve operational efficiencies, clinical outcomes, patient safety and patient satisfaction.

Ready immediately: Unlike an inline warmer which can only be set up at the time of the procedure and must be set up for each patient separately, the ivNOW warmer can warm IV fluid or Contrast Media fluid ahead of a procedure by being turned on 24 hours. The ivNOW can warm several bags at the same time for use on several patients simultaneously.

Versatility: The ivNOW system can be made of 1 pod or up to 6 pods and can be placed on a counter, affixed to a wall, a cart or a mobile stand. It can be placed next to patients rather than having to go and get bags from a warming cabinet. Each pod contains one bag. As soon as a bag is removed from a pod to be used on a patient, another bag can be inserted and start warming. It can be used in any department.

Safe Inventory Management: The ivNOW tracks the shelf life of a bag by showing how long a bag has been warming (days / hours / minutes) and will display a message when the shelf life of the bag is expired.

Low Operating Cost: The ivNOW saves energy as each individual pod is turned on only when a bag is present. The ivNOW is low cost to use as there are no disposables (unlike the in-line system).

● For more information, visit: www.enthermics.com/products/fluid-warmers/ivnow-fluid-warmers/ivnow



Champion dialysis chair ensures patient comfort

When designing a healthcare recliner, Champion Manufacturing focuses on durability, ease of use and patient comfort. A large choice of options and accessories help enhance their treatment experience.

Medical recliners must make patients feel comfortable in healthcare centers or homes, while also providing the necessary support and durability (the frame is made of steel to last many years of repeated reclining).

To help fight bacteria contamination, the chairs have features that allow easy cleaning which improves infection control and simplifies the process.

The recliners are manual or electrical and designed to effortlessly change reclining positions without staff assistance.

● For more information, visit: www.championchair.com

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Kugel Medical exhibits fully automated formalin mixing and dispensing station AFMDS-100

This year we are presenting a very special innovation to the Middle Eastern market: the fully automated formalin mixing and dispensing station AFMDS-100 for contact-free formalin mixing and dispensing. Hence, laboratory staff does not get into contact with concentrated formaldehyde and the formaldehyde contamination in the working area is subsequently reduced.

Thanks to its compact design, the formalin mixing and dispensing station AFMDS-100 is also suitable for small laboratories. All operations such as preparing a 3.7% standard formalin solution or a customized solution with variable quantities of formalin, water and a buffer solu-

tion are controlled through one single surface. The integrated microprocessor allows you to save and recall your settings for later purposes.

The prepared mixture can be drained directly from a tap at the device or transferred to multiple remote stations that can be up to 200 meters away – a particularly interesting feature for laboratories with working stations in different rooms. The integrated peristaltic pump enables you to drain the exact quantity of the prepared formalin solution without dripping or leaking.

- For more information, visit: www.kugel-medical.de
- Arab Health booth: Z3B14



Multivac provides packaging solutions for sensitive products

Multivac has been offering solutions for the packaging of sterile medical products since 1968 and has invested continuously in this business sector.

Sterile medical products and pharmaceutical drugs are increasingly these days being produced to suit specific country requirements, and for this reason they are often packed in small batches. Flexibility and cost effectiveness of packaging lines are important features for global pharmaceutical companies, manufacturers of sterile medical products and contract packers. Multivac is continuously developing for this target group new integrated packaging systems for the fully automatic packaging of sensitive products in both large and small batch sizes.

High process reliability and product quality

The reliable and efficient packaging of sterile medical products and pharmaceutical drugs demands the very strict application of the highest quality standards. Multivac's user-friendly line-motion control via the HMI 2.0 operator interface, as well as the highly sensitive sensor technology of the machines, ensure that a consistently high product quality is maintained, as well as an overarching quality assurance and a track-and-trace function for meeting the serialisation and mark-



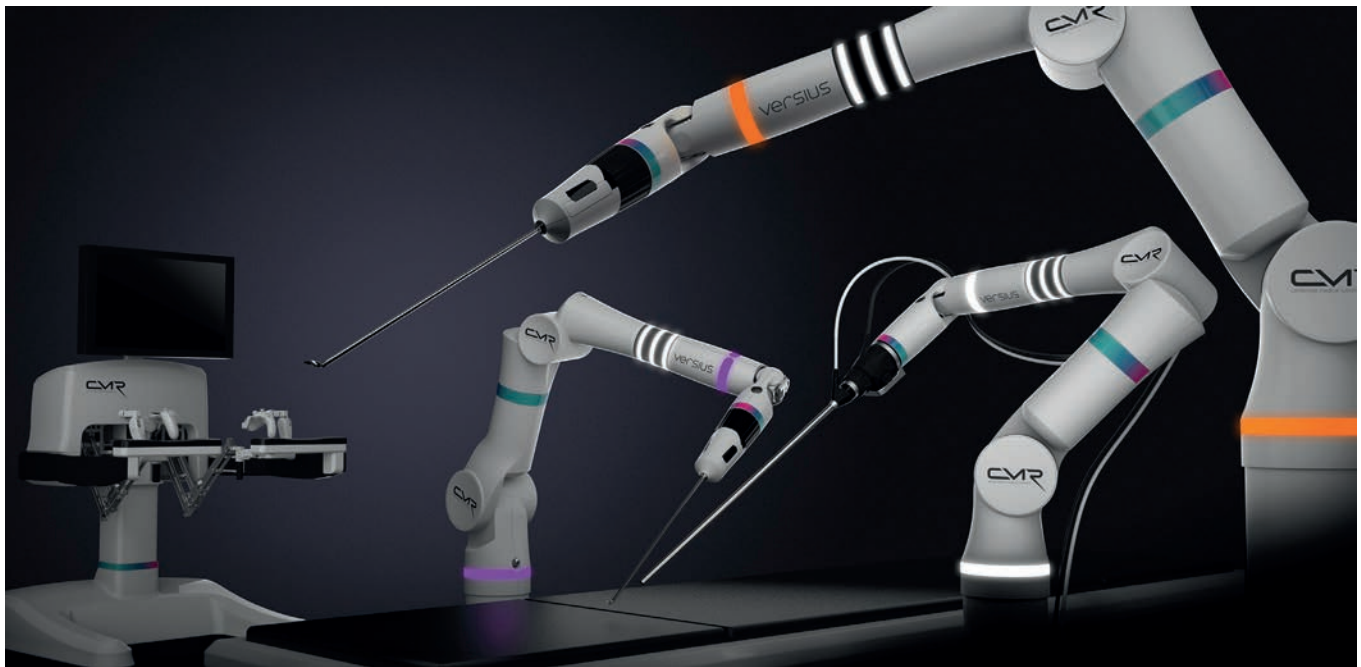
ing requirements of individual countries.

Multivac Middle East will be exhibiting at the Arab Health 2017 for the first time.

"Multivac have great references and success stories globally in the medical and pharmaceutical sector. We see the potential and growth in the local market and with our global experience, we want to

introduce our innovative packaging solutions to the local manufacturers and to be part of this growing sector in the local region," says Amir Sotoudeh, Managing Director of Multivac Middle East.

- For more information, visit: www.multivac.ae
- Arab Health booth: Z3H15



Next generation robotic surgery system performs well in trials

Cambridge Medical Robotics, the private company developing a next-generation robotic system for universal minimal access surgery, revealed its Versius system in December and provided an update on ongoing cadaveric studies.

CMR is presently evaluating the ability of the Versius system to perform upper GI, gynaecological, colorectal and renal surgery in cadaveric trials. The system has already demonstrated the ability to visualise and access all these surgical workspaces and to perform tissue manipulation, suturing, needle driving and electro-surgery.

CMR has now built 20 proprietary robotic arms, built and tested nine different variants of its fully articulated 5mm instruments, and conducted 11 usability studies; to date the Versius system has been used by 32 surgeons.

According to a Medgadget report, each of the arms can be placed around the patient table or hung from above to save space. The surgeon wears a pair of 3D glasses and operates by looking at a monitor instead of peering into a scope common on existing

systems. This can help improve ergonomics and allow the surgeon to see and interact easier with clinicians managing the patient and the robot.

The robot is operated using a controller similar to video game joysticks and the system delivers haptic feedback from the instrument to the controller, so the surgeon can feel the anatomy being worked on.

Commenting on the trial, Luke Hares, Technology Director, said: "I am pleased to say the system performance in the October and November cadaveric trials was exactly as expected. This has validated the universal surgical robot concept that CMR has been developing – using numerous robotic arms in a flexible, modular, system to provide the versatility and dexterity necessary to support most laparoscopic procedures."

Unlike existing robotic surgical systems, the Versius can work with instruments requiring only a 5 mm incision. Typically, the smallest instrument sizes on existing robotic systems is 8 mm, and unlike 5 mm incisions these typically require suturing.

Earlier trials demonstrated some of these advanced capabilities such as the haptic force feedback and the use of fully wristed 5mm instruments. The CMR system showed the ability to perform a wide range of multi-quadrant minimal access procedures including urological, gynaecological, upper GI and colorectal procedures, all with standard port placements making the future transition to robotics as easy as possible for surgeons."

Mark Slack, Medical Director, said: "In the first round of trials we were able to confirm the ability of the system to perform surgery in the upper abdomen, and for colorectal and pelvic surgery. In the next phase, we have progressed to the study of individual operations to further assess the capability of the system and the performance of the graspers, scissors, electrocautery and needle drivers. I am delighted with the progress made so far. We will continue with a series of studies to further assess and perfect the system while also exploring new operations previously difficult to perform with robotic surgery." **MEH**

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
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■ January 2017

EROC 2017 — 7th Emirates Otorhinolaryngology Audiology and Communication Disorders Congress	18 – 20 January 2017 Dubai, UAE	www.emiratesrhinologyandotology.ae
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Arab Health 2017	30 January – 2 February 2017, Dubai, UAE	www.arabhealthonline.com
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■ February 2017

Medlab Dubai 2017	6 – 9 February 2017 Dubai, UAE	www.medlabme.com
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Saudi Gastroenterology Association 15th Conference & 4th SASLT Meeting 2017	11 – 12 February 2017 Saudi Arabia	www.saudigastro.net
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5th International Child and Adult Behavioral Health Conference 2017	12- 14 January 2014 Abu Dhabi, UAE	www.menaconference.com/events/icabh
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International Symposium on Neurovascular & Neurosurgical Disorders	12 – 15 February 2017 Abu Dhabi, UAE	www.isnnd.com/index.php
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Fourth Annual Extracorporeal Life Support Organization - The South and West Asia Chapter of (SWAC ELSO)	15 – 18 February 2016 Doha, Qatar	www.else-swac2017.org
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2017 4TS International Conference	16 – 18 February 2017 Dubai, UAE	www.4tsconference.com
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7th Emirates Diabetes & Endocrine Congress (EDEC 2017)	16 – 18 February 2017 Dubai, UAE	www.edec-uae.com
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3rd Experts in Stone Disease Conference	16 – 18 February 2017 Dubai, UAE	www.endourology.org/event/experts-in-stone-disease-esd
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Arab African API Congress (AAAPCI)	21 – 22 February 2017	www.aaapci.com
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10th International Conference on Healthcare, Nursing and Disease Management (HNDM)	22 – 23 February 2017 Dubai, UAE	www.iaphlsr.org
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■ March 2017

HEC 2017: Health and Environment Conference	6 – 8 March 2017 Dubai, UAE	www.innovationarabia.ae/health-environment-conference
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The 4th International Family Medicine Conference & Exhibition (IFM)	6 – 9 March 2017 Dubai, UAE	www.ifm.ae
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Dubai Pharmaceutical & Technologies Exhibition 2017	7 – 9 March 2017 Dubai, UAE	www.duphat.ae
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Abu Dhabi Pelvic Floor Weekend 2017	9 – 11 March 2017 Abu Dhabi, UAE	www.adpww-2017.com
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Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
7th International Neonatology Conference 2017	9 – 11 March 2017 Abu Dhabi, UAE	www.menaconference.com/events/7neoc
2nd International Dermatology and Cosmetology Congress	15 – 18 March 2017 Istanbul, Turkey	www.indercos.org
Dubai International Humanitarian Aid & Development Conference & Exhibition	21 – 23 March 2017 Dubai, UAE	www.ihad.org
International Emergency Catastrophe Management Exhibition	21 – 23 March 2017 Dubai, UAE	www.emergency.ae
4th Evolving Practice of Ophthalmology Middle East Conference 2017 (EPOMEC 2017)	23 – 25 March 2017 Dubai, UAE	www.epomec.ae
MSK MRI Workstation Workshop	31 March – 1 April 2017 Dubai, UAE	www.mskmridubai.eventbrite.sg
Egyptian Society of Cardiothoracic Surgery 23th Annual Conference 2017 (ESCTS 2017)	4 – 7 April 2017 Cairo, Egypt	www.escts2017.com
6th International Conference and Expo on Cosmetology, Trichology & Aesthetic Practices	10 – 11 April 2017 Dubai, UAE	www.cosmetology-trichology.conferenceseries.com
6th Global Experts Meeting on Cardiovascular Pharmacology and Cardiac Medications	13 – 14 April 2017 Dubai, UAE	www.cardiac.pharmaceuticalconferences.com
3rd Annual Congress & Medicare Expo on Primary Healthcare	17 – 19 April 2017 Dubai, UAE	www.primaryhealthcare.conferenceseries.com
2nd International Conference on Neuro Oncology and Brain Tumour	24 – 25 April 2017 Dubai, UAE	www.neurooncology.conferenceseries.com
3rd International Conference on Neurological Disorders and Stroke	24 – 26 April 2017 Dubai, UAE	www.stroke.global-summit.com
4th International Conference on Hepatology	27 – 28 April 2017 Dubai, UAE	www.hepatology.conferenceseries.com
4th International Conference and Exhibition on Rhinology and Otology	1 – 3 May 2017	www.otolaryngology.conferenceseries.com
International Medical Exhibition & Conference (Egymedica)	4 – 6 May 2017 Cairo, Egypt	www.egymedica.com
Advanced Diabetes Conference	19 – 20 May 2017 Abu Dhabi, UAE	www.icldc.ae/event/advanced-diabetes-conference-2017#Home
25th European Congress of Obstetrics and Gynaecology 2017 (EBCOG 2017)	17 – 21 May 2017 Antalya, Turkey	www.ebcog2017.org

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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Giving new hope to children with metabolic disease

Children's Hospital of Pittsburgh of UPMC is a leading international center for liver transplantation as a treatment for metabolic disease.

As one of the top ten pediatric hospitals in the United States, as ranked by *U.S. News & World Report*, Children's Hospital of Pittsburgh of UPMC is a pioneer in the field of liver transplantation, which has proven to be a life-changing solution for patients with metabolic disease.

Liver transplantation can dramatically reduce symptoms, and in cases like maple syrup urine disease (MSUD), can provide a cure.

Liver transplantation is more than a lifesaving procedure; it's also an attractive approach for improving quality of life for many patients with metabolic disease. In 2004, we developed the protocol for liver transplantation for MSUD. Today, we've performed more transplants on patients with MSUD than any other center in the world. That's more than 65 patients with a 100-percent survival rate. All of these patients show normal liver function, have avoided the risk of neurological complications, and enjoy an unrestricted diet.

We've performed more liver transplants for patients with metabolic disease than any other transplant center.

Since the inception of our program in 1981, our world-renowned experts have performed more than 1,700 liver transplants — that's more than any other center in the United States — with survival rates that exceed national averages. Additionally, we've performed more than 320 liver transplants for patients with metabolic disease, which is more than any other center, including adult facilities. Also, we're leaders in living-donor liver transplants, which eliminate wait times for a deceased donor and can provide excellent outcomes.

Find out more about our excellent outcomes and extraordinary care.

Our experience, expertise, and commitment to innovation and compassionate care are reasons why patients and families from around the world travel to Children's Hospital of Pittsburgh of UPMC. For a free phone consultation with one of our experts on liver transplantation as a therapeutic option for metabolic disease, please visit www.chp.edu/metabolic or send an email to International@chp.edu

Sources: Internal data, Hillman Center for Pediatric Transplantation; Scientific Registry of Transplant Recipients (www.srtr.org), December 2015 release.

