Middle East
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September-October 2013
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Doha's Aspetar starts novel research programme to prevent sports injury

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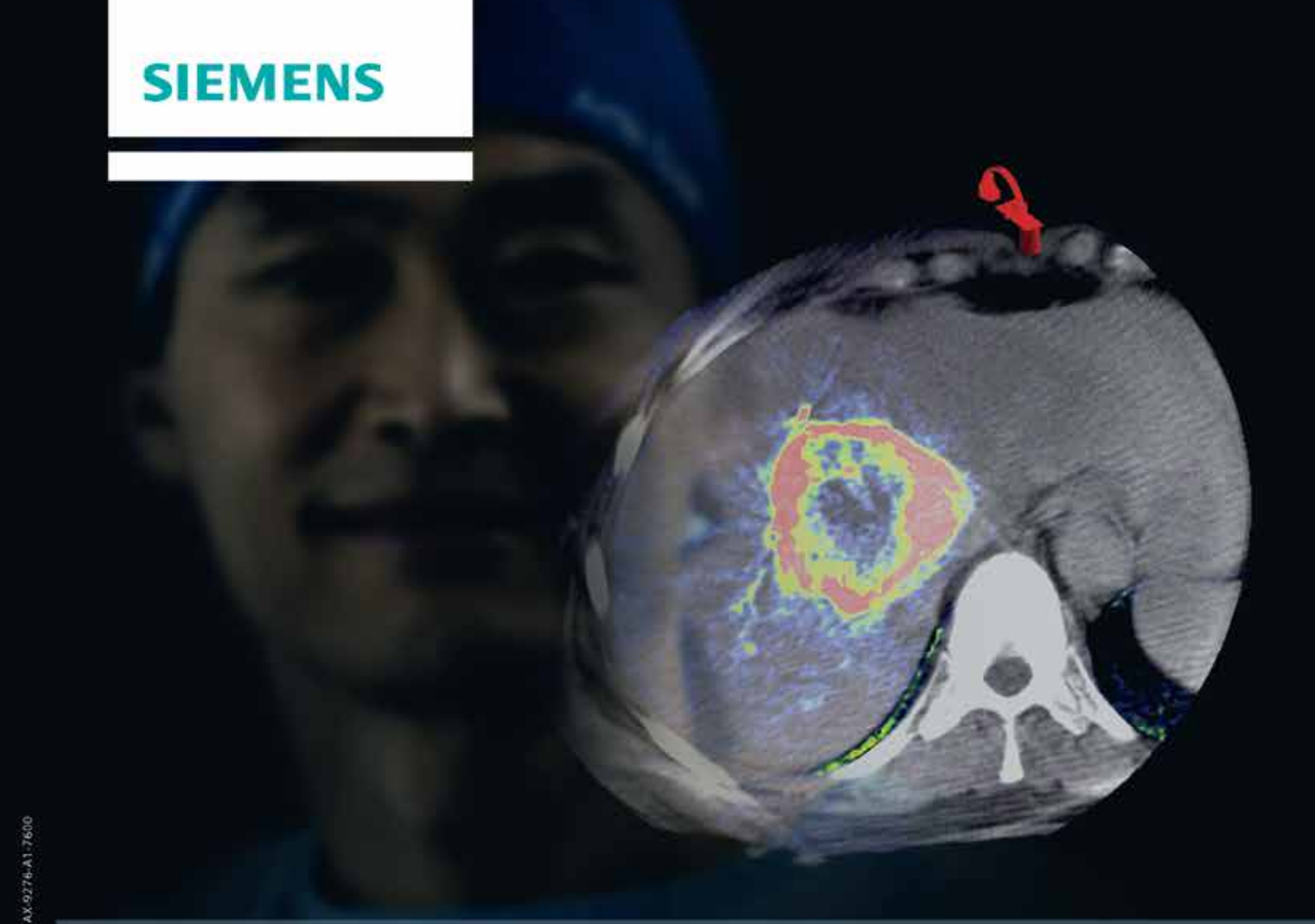

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Prognosis

Local innovation

It's always inspiring to see the implementation of local cutting-edge medical practice and research that can have implications for the wider world. Aspetar, the sports medicine hospital in Doha, is a leader in its field regionally and internationally, attracting some of the world's top sports men and women to its facility for treatment. The hospital continues to innovate. In this issue, *Middle East Health* reports on one of their new initiatives – the athlete injury and illness prevention programme (ASPREV). As well as providing a comprehensive screening programme for athletes in Doha, a core component of ASPREV is a long-term prospective cohort study designed to identify risk factors for injury and illness in athletes and then to develop prevention strategies to reduce the injury and illness incidence. This is an exciting project that is set to impact sports men and women locally and around the world. You can read the report on page 28.

Also in this issue we publish a report analysing the health status of the United Arab Emirates. A team of researchers look at the 'big 4' public health issues. Surprisingly 'injury' ranks second, being responsible for 17% of mortality in all age groups in 2010. Read the report on page 46.

German companies developing products for the medical industry continue to lead the field when it comes to innovation and quality. Add to this the close co-operation between companies and scientific research facilities and it's not difficult to see why they remain so strong and competitive in the global marketplace. The German report in this issue looks at some of the key factors that enable Germany to dominate the European healthcare market and why their products will always be sought after. The report is on page 34.

Elsewhere in this issue we look at the latest developments in the deadly Middle East Respiratory Syndrome and researchers' struggle to find the source of the coronavirus; we also look at the latest World Health Report published by the World Health Organisation in August, which calls for increased local health research in an effort to improve the provision of public health; and staying with the WHO, we look at a report the organisation released recently which provides new data on the leading causes of death globally. Cardiovascular diseases remain the number one killer, however, tuberculosis is no longer in the top 10.

I trust you will enjoy this issue and find the articles informative and useful.

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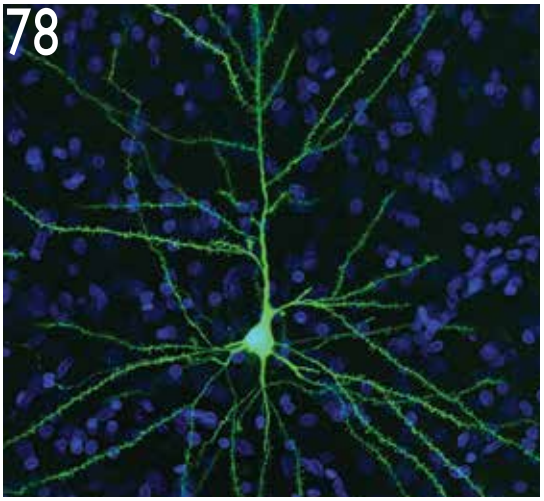

Cover Image: Courtesy Aspetar Orthopaedic and Sports Medicine Hospital.

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Update from around the region

Clifford Hudis, President, ASCO (left) and Dr Nagi El Saghir, the newly elected Chair, ASCO International.

AUBMC professor elected Chair of American Society of Clinical Oncology International Committee

Dr Nagi El Saghir, MD, FACP, Professor and Director of the Breast Center of Excellence at the American University of Beirut Medical Center (AUBMC) was elected Chair of the International Committee of the American Society of Clinical Oncology (ASCO).

Speaking at the ASCO event earlier this year when the announcement was made, Dr El Saghir spoke of his passion for research, as well as for spreading knowledge. With this new position, he said he wishes to continue "building bridges to conquer cancer and reduce disparities in patient treatment outcome worldwide".

"Every woman or man who has cancer should be treated in the best possible way," he said.

In an effort to implement this Dr El Saghir said he will put considerable effort into developing several platforms and networks to promote global information exchange, with the aim of making an impact on the improvement of care of cancer patients.

The ASCO International Committee oversees ASCO courses, educational grants, research grants, oncology in-training examinations, quality oncology care improvement, guidelines, volunteer activities in low and middle-income countries, and many ways of dissemination of latest advances in oncology.

Designed to improve oncologists' access to new advances in cancer research worldwide, the 'Best of ASCO' meeting was initiated in Washington, DC and San Francisco in 2005 and quickly developed into an international initiative. It was brought to Lebanon by Dr El Saghir in 2006. With ASCO being the premier international oncology meeting, Best of ASCO Lebanon has become the most highly regarded annual cancer meeting in the Arab region.

Dr El Saghir believes his new commitments are in line with the dedication of AUBMC to promote and spread medical knowledge throughout Lebanon, the Middle East and the world. The AUBMC's mission includes education, research and provision of better patient care in Lebanon, the Middle East and the world.

Dr El Saghir has received awards from many organisations including: Medal of Honor from the President of Lebanon, League of Lebanese Women's Rights, Lebanese Order of Physicians, and the Lebanese Society of Medical Oncology.

On 21 June this year, the Lebanese Society of Medical Oncology and the President of the Lebanese Order of Physicians, Dr Antoine Boustany honored Dr El Saghir with its first "Outstanding Excellence Award" in recognition of exceptional accomplishments.

Correction

In the article on MIOT in the India Report in July-August 2013 issue we incorrectly captioned the photo of Dr Prithvi Mohandas as Dr PVA Mohandas. The correct caption should read Dr Prithvi Mohandas.

Philips Healthcare offers Continuing Education

Philips Healthcare recognizes and commits to the need for education in the region and has opened four education centres, in Beirut, Dubai, Riyadh and Istanbul. The Philips Education Centers in the Middle East provide healthcare professionals with closer-to-home solutions when it comes to training needs.

The centres offer a range of accredited courses (ASRT / CME) such as the upcoming:

- MR Cardiac Technologist Development Course, 21 September – 22 September 2013, which is ASRT accredited.
- The Stroke Imaging Hands-On CT Workshop Course, 19 October – 20 October 2013, which is CME accredited and
- the Digital Breast Imaging Fundamentals for Technologists, 21 October – 22 October 2013, which is ASRT accredited.

Philips Healthcare says they are dedicated to providing affordable, high-quality professional education to healthcare professionals. In addition the Philips Online Learning Center provides continuing education (CE) approved and/or accredited self-directed learning activities by Recognized Continuing Education Evaluation Mechanisms (RCEEMs). Their education offerings are supported by the industry's leading academic institutions and accreditation organizations. More than 300,000 medical professionals use the Online Learning Center for their continuing education needs. The company offers training at customer sites, at their global high-tech training facilities, online, and at 30 other Philips locations as well as third party institutes – when and where you need it, flexible and convenient.

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African Journal of Urology publishes special issue on Female Genital Mutilation for MENA region

The editorial board of the *African Journal of Urology* (AFJU) has published a

special issue on Female Genital Mutilation (FGM). The issue emphasizes the myths behind this harmful practice, types of FGM, their tragic effects on women's health, and the measures that are being taken to eradicate the practice.

"This issue is an appeal to all who are connected with the problem, including health service providers. No longer should women's rights continue to be ignored, or FGM continue to be tolerated as part of communities' rituals and cultures, nor camouflaged as religious doctrine," says Ismail Khalaf, MD, Editor-in-Chief, AFJU.

Public education performed by medical personnel in hospitals, by religious leaders in mosques and churches, and through persistent media advertising may assist in modifying behavior and attitude towards FGM.

Subject experts address a range of FGM-related topics that include epidemiology, public misconceptions, challenges ahead, and religious perspectives on FGM from the holy texts of Islam, Christianity, and Judaism. The health implications of FGM including reproductive issues, psychological repercussions and sexual complications are addressed, as are the socio-cultural factors contributing to the continuation of this practice.

A vital misperception linked to FGM is a deeply rooted sense of religious duty. Female circumcision in some Muslim countries is practiced on the assumption that it is in accordance with religious instructions. In this issue, the Grand Mufti of Egypt provides evidence that the Holy Qur'an and the prophetic traditions explicitly object to FGM. Also outlined in the pages of this issue are Christianity and Judaism's rejection of bodily mutilation, except where medical reasons are concerned.

"It is hoped that this special issue of the *African Journal of Urology* will demonstrate that FGM is a violation of the health and human rights of girls and women, and that efforts to uphold the well-being of girls and women are maintained until the successful and total elimination of this senseless and dangerous practice is achieved," says Dr Khalaf.

According to the World Health Organization (WHO), FGM is currently practiced in 28 countries. An estimated 140 million girls and women worldwide – of whom 101 million are from Africa alone – live with the health consequences of FGM. African countries show the most alarming prevalence rates of female circumcision. In Somalia, Egypt, Guinea, Sierra Leone, Djibouti, Mali and Eritrea, the prevalence rate amounts to over 90%. The United Nations Children's Fund (UNICEF) indicates that over three million girls in Africa are in danger of becoming FGM victims every year.

Outside Africa, FGM has been reported in Indonesia, Malaysia, Iran, Iraq, Oman and Yemen. Moreover, FGM is also encountered among immigrant communities in the United States, Canada, Australia and New Zealand.

To date, the practice of FGM has persevered due to cultural, tribal and religious factors that vary from country to country and from region to region. Misguided and entrenched beliefs are behind the continuation of this custom.

Diverse efforts to combat FGM are discussed in this special issue. Institutional and governmental efforts in the pertinent countries, supported by the extensive work of the World Health Organization (WHO) and the African Union (AU), have in recent years sought to implement a change of attitude in target populations. There has, unfortunately, been little progress so far. Recently, the United Nations issued a declaration de-linking FGM from religion.

on the WEB *African Journal of Urology* (see articles for July / August 2013) *www.afjurology.net*

Qatar rolls out stage one of National Health Insurance Scheme

Qatar's National Health Insurance Company (NHIC) announced that Stage 1 of the National Health Insurance Scheme (NHIS) began on 17 July.

Stage 1 of the scheme will provide health insurance coverage for Qatari females from age 12 for maternity, obstetrics, gynaecology and related healthcare services.

Established in June this year, the National Health Insurance Company (NHIC) manages and operates the country's mandatory health insurance programme, mandated by Emiri Decree 7 of 2013. Rolled out in five stages – beginning with Stage 1 from 17 July 2013 to the first quarter of 2014 and completing with the fifth stage in 2015 – the scheme provides health insurance coverage for all of the population of Qatar, by including increasingly larger groups with each successive stage. It offers members the choice through a network of providers covering both the public and private sectors.

The initial provider network for Stage 1 of the scheme includes the HMC Women's Hospital and three private hospitals; Al Emadi Hospital, Doha Clinic Hospital, and Al-Ahli Hospital. More providers are expected to be added to the network over the coming months.

"This is a historic day as the first stage of the long-awaited mandatory health insurance scheme starts operations," said Abdulla Al Qahtani, Minister for Public Health and Secretary General of the Supreme Council of Health (SCH). "It took time to ensure that we have a robust and effective scheme that answers the specific needs of Qatar but it will be well worth the wait as the scheme rolls out. It is a great pleasure and honour for me to see the launch of this crucial project for our nation."

Dr Faleh Mohamed Hussain Ali, acting CEO of the NHIC and Assistant Secretary General for Policy Affairs at the SCH, said: "The National Health Insurance Scheme will ensure that the National Health Strategy's goal of affordable and accessible healthcare is now a reality.

"We've structured operational issues to make access and use of the scheme as easy as possible."

The scheme uses the Qatar ID card for identification and verification, explained Dr Faleh. Consequently, all Qatari females from age 12 onwards are automatically enrolled and do not need to register separately for the scheme. All they need to do is make an appointment directly with one of the hospitals in the network and present their QID card at the hospital's registration or reception counter on the day of their appointment. Qatari nationals do not have to make any payments to the provider for ser-

vices covered within the scheme as all their premiums will be paid by the government.

The NHIC is fully-owned by the government and managed by an executive team, reporting to a board of directors.

- Information and updates on the scheme are available on the SCH website: *www.sch.gov.qa*

The UAE Minister of Health, Dr Abdul Rahman Mohammad Al Owais inaugurates the Burjeel Hospital for Advanced Surgery and Tarabichi's Centre for Joint Surgery in Dubai.

Mediclinic Middle East achieves JCI accreditation of all hospitals and clinics

Mediclinic Middle East, Dubai's largest private healthcare group, has achieved JCI accreditation for all ten of its medical facilities.

Mediclinic City Hospital and Mediclinic Welcare Hospital were both accredited by the JCI for the first time in 2010 and have been successfully reaccredited in 2013 as part of the standard three- yearly JCI accreditation cycle. For the first time, however, the remaining eight facilities – Mediclinic Dubai Mall, Mediclinic Beach Road, Mediclinic Ibn Battuta, Mediclinic Al Sufouh, Mediclinic Mirdif, Mediclinic Al Qusais, Mediclinic Meadows and Mediclinic Arabian Ranches - applied for, and were awarded, accreditation after a stringent inspection process by JCI.

David Hadley, CEO, Mediclinic Middle East, said: "The simultaneous accreditation of all ten Mediclinic facilities in Dubai is a tremendous achievement for the company and testament to our commitment to quality patient care. Our team members work extremely hard every day to ensure that our hospitals and clinics are operated in accordance with the very highest international standards and we are delighted to receive this public assurance of our efforts."

UAE Minister of Health opens new Centre of Excellence for orthopaedics in Dubai

The UAE Minister of Health, Dr Abdul Rahman Mohammad Al Owais inaugurated the Burjeel Hospital for Advanced Surgery and Tarabichi's Centre for Joint Surgery in Dubai in July.

The hospital is considered to be one of the leading specialised orthopaedics centres in the region and is expected to decrease the need for patients with complicated bone and orthopaedic conditions to travel to Europe or the United States for treatment. The 35-bed hospital has three operating theatres designed to perform 2,500 orthopaedics procedures annually and has state-of-the-art imaging equipment including advanced CT and MRI scanners.

Burjeel Hospitals and Dr Samih Tarabichi, one of the leading orthopaedic and joint replacement surgeons in the Middle East and North Africa, have partnered to create this new Centre of Excellence for orthopaedics and joint replacement.

Speaking at the inauguration ceremony, Dr Samih Tarabichi, Director General of Burjeel Hospital for Advanced Surgery and Tarabichi's Centre of Joint Surgery said: "I was honored to see the hospital that bears my name being inaugurated by the UAE Minister of Health, Dr Abdul Rahman Mohammad Al Owais. This encouragement and support for the hospital is indeed a blessing for our profession as we see the vision of the UAE as the leading regional healthcare centre become a reality. This hospital will play a significant role in helping patients of advanced orthopaedic conditions to get treatment within the region and avoid the cost of travelling to Europe and the United States. Here we have invested in global competence with a team of 60 professionals who provide an international standard of care on par with anywhere in the world. We have installed state-of-the-art instrumentation and techniques and are poised to take the regional orthopaedics practice to the next level."

The centre offers advanced surgical treatments including Personalised Joint Creation, Patient Specific Instrumentation and Advanced Prosthetics. The centre uses state-of-the-art technology to facilitate online patient scheduling and real time patient case updates.

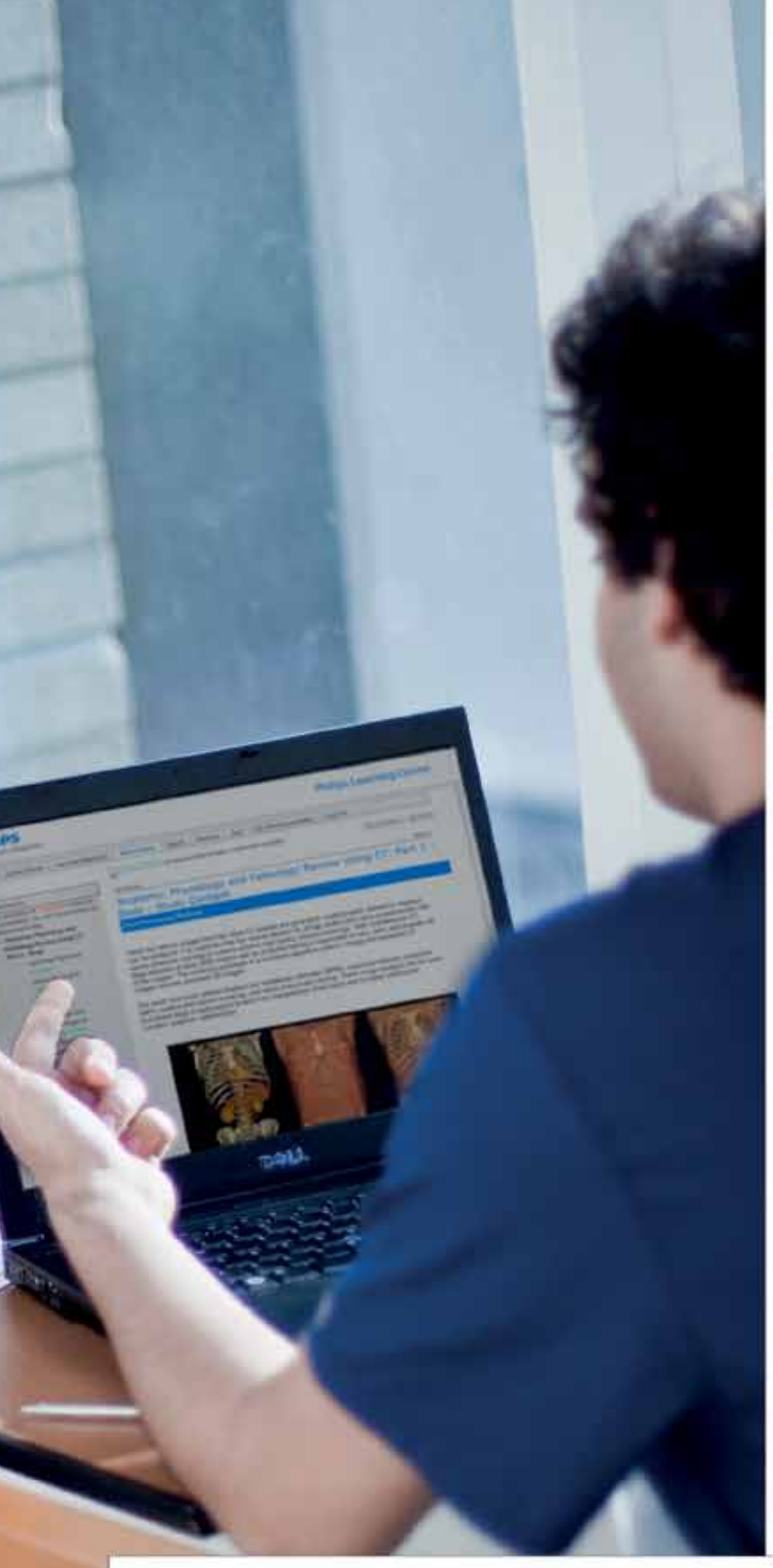
The Burjeel Hospital for Advanced Surgery has a knowledge-sharing and training partnership with HELIOS ENDO-Klinik Hamburg in Germany. HELIOS ENDO-Klinik Hamburg is specialist clinic for bone, joint, and spinal surgery with a global reputation for outstanding competence in the treatment of diseases of the locomotor system. The two centres will collaborate on research, academic papers and fellowships for doctors.

Dr Shamsheer Vayalil, Managing Director of Burjeel Hospitals, said: "With the launch of this hospital, we have made a commitment that we will bring research and academic excellence to Dubai. I would also like to welcome our knowledge partners, HELIOS ENDO-Klinik Hamburg, as they will play a significant part in developing regional talent. This partnership between UAE and German specialists and institutions will strengthen links between the two countries in the field of healthcare."

WHO EMRO criticises smoking in TV dramas, saying it promotes tobacco use

The Eastern Mediterranean Office of the World Health Organisation (WHO EMRO) has issued a statement saying the organisation is greatly concerned at the level at which tobacco use, in all its forms, has been aggressively promoted during the airing of TV drama series screened across the Eastern Mediterranean Region during the holy month of Ramadan.

"Viewers were regularly exposed to scenes in which celebrities, even those known to be non-smokers, were shown gratuitously smoking or holding unlit cigarettes or electronic cigarettes, giving the message that they were deliberately promoting tobacco. These practices raise questions about the relationship between the tobacco and en-



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tertainment industries, and reflect the tactics employed by the tobacco industry to promote and market its products through films, drama and entertainment. This is especially dangerous during Ramadan when there is high viewership of all age groups. The TV channels have a direct responsibility in allowing drama series that heavily promote tobacco to be aired during Ramadan," WHO EMRO says.

On World No Tobacco Day this year, WHO urged governments and partners to comprehensively ban all forms of tobacco advertisement, promotion and sponsorship through implementation of Article 13 of the WHO Framework Convention on Tobacco Control (WHO FCTC) to reduce the prevalence of tobacco use and exposure to second-hand smoke. The legal obligations of State Parties to the WHO FCTC to implement tobacco control measures and ban tobacco advertising, promotion and sponsorship were further reinforced by the commitments of Member States, that endorsed the United Nations Political Declaration of the High Level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases, which places tobacco control at the top of the international health agenda.

"The attempts of the tobacco industry to target youth by glamourizing tobacco use to encourage its use and initiation is particularly alarming," Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, said. "WHO is now conducting a review of drama series in regard to promotion of tobacco and other behaviours that undermine public health, which were heavily broadcast on TV this Ramadan, and will present the findings to the Sixtieth Session of the Regional Committee for the Eastern Mediterranean, to be held in Oman in October 2013, which is the annual meeting of the Ministers of Health in the Region."

The link between increased rates of tobacco use, especially among younger people, and greater promotion of tobacco use through films, drama and entertainment has been firmly established. In the Eastern Mediterranean Region, there are already high rates of tobacco use among youth and adults of both sexes. Rates for tobacco use among men range from 52% in Tunisia to 38% in Pakistan, and for women from 11% in Yemen to 6% in Jordan. Among males in the 13–15 age group rates range from 40% in Lebanon and Qatar to 20% in most countries. Among females of the same age group, rates range from 30% in Lebanon to between 10% and 20% in most countries.

While some countries are still in the process of developing comprehensive legislation to implement a full ban, WHO calls upon the drama-making industry and the TV channels to act responsibly in this matter. This is best done through total elimination of tobacco use scenes from TV series, WHO said in the statement.

Qatar to host inaugural World Innovation Summit for Health

The Qatar Foundation for Education, Science and Community Development will launch the inaugural World Innovation Summit for Health (WISH) at the Qatar National Convention Centre in Doha on 10-11 December this year.

A distinguished audience of decision-makers and influencers from across the world will convene to discuss practical, lasting and innovative solutions to global healthcare challenges. The high-profile event, which is the successor to last year's Global Health Policy Summit in London, will bring together heads of state, ministers, senior government officials, academics and thinkers, as well as some of the world's most influential business leaders.

Dr Mohammad Fathy Saoud, President of Qatar Foundation, emphasized the organization's firm commitment to WISH and to advancing healthcare through the key areas of research, development and education.

"Qatar Foundation has launched a number of crucial initiatives within medical research and healthcare that benefit people both nationally and internationally," he said. "We now have a much more enhanced understanding of how innovation can overcome globalized healthcare challenges, and the value of creating a far-reaching network that is a lasting resource for innovators and reformers worldwide."

The mission of WISH is closely aligned to the vision of Her Highness Sheikha Moza bint Nasser, Chairperson of Qatar Foundation, and represents her ongoing commitment to raising the standards of healthcare nationally and internationally.

Her Highness Sheikha Moza announced WISH during last year's Global Health Policy Summit in London's Guildhall, which was jointly organized by Qatar Foundation and Imperial College London's Institute of Global Health Innovation. During Her Highness' address she urged delegates to invest their efforts into coordinating and improving prevention and treatment of diseases by exchanging ideas, collaborating, and learning from global experiences.

The Right Honourable Professor the Lord Darzi of Denham, Chairman for the Institute of Global Health Innovation, Imperial College London and Executive Chair of the World Innovation Summit for Health

The Right Honourable Professor the Lord Darzi of Denham, Chairman for the Institute of Global Health Innovation at Imperial College London and Executive Chair of WISH said: "WISH is about action. This Summit will look at ideas which are evidence-based, scalable, and sustainable – often ideas which have already been implemented somewhere in the world – and work out how to implement them far more widely."

He added: "The Summit will be based on the concept that radical innovation is needed to meet the world's health challenges, and that this requires more collaboration between those bodies and individuals that are in a position to make a difference. I hope that in time this annual event will become the Davos of healthcare."

Prominent international healthcare innovation experts will chair the Summit's working groups which focus on eight themes: obesity, mental health, integrated and accountable care, end-of-life, road traffic accidents, empowering patients, antimicrobial resistance and big data.

on the WEB World Innovation Summit for Health
www.wish-qatar.org


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News in Brief

US NIH to fund big data centres

The US National Institutes of Health will fund up to US$24 million per year for four years to establish six to eight investigator-initiated Big Data to Knowledge (BD2K) Centers of Excellence. The centres will improve the ability of the research community to use increasingly large and complex datasets through the development and distribution of innovative approaches, methods, software, and tools for data sharing, integration, analysis and management. "BD2K aims to enable a quantum leap in the ability of the biomedical research enterprise to maximize the value of the growing volume and complexity of biomedical data," says Eric Green, M.D., Ph.D., NIH acting associate director for data science and director of the National Human Genome Research Institute.

iPad app tests for dementia

Doctors can now significantly reduce the time for testing for dementia with a new iPad app called Cantab, from Cambridge Cognition. The technology is based on testing developed at the University of Cambridge. The company warns that Cantab is only meant to aid preliminary diagnosis. The test tracks scores for memory assessment, which gives doctors a better idea of how to proceed with screening and treatment. *www.cantabmobile.com*

Faculty of 1000 launches F1000Trials

Faculty of 1000 has launched a new product, F1000Trials (*http://f1000.com/trials*), an effective way to be alerted to new clinical trial-related articles specifically designed for the needs of practicing physicians and clinical researchers. F1000Trials is a continually updated, comprehensive database of randomized controlled trial articles (including early phase oncology studies). MEH

Tobacco control measures will prevent 7.4 million premature deaths by 2050, says WHO

Tobacco control measures in place in 41 countries between 2007 and 2010 will prevent some 7.4 million premature deaths by 2050, according to a study published in the Bulletin of the *World Health Organization* on 1 July 2013.

The study is one of the first to look at the effect of measures on lives saved since the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) was established in 2005. It is important because it demonstrates the success of the WHO FCTC in reducing tobacco use and, thus, saving lives.

"It's a spectacular finding that by implementing these simple tobacco control policies, governments can save so many lives," said lead author Professor David Levy from Georgetown Lombardi Comprehensive Cancer Center at Georgetown University in Washington DC.

In 2008, WHO identified six evidence-based tobacco control measures that are the most effective in reducing tobacco use, and started to provide technical support to help countries fulfil their WHO FCTC obligations.

Known as "MPOWER", these measures correspond to one or more of the demand reduction provisions included in the WHO FCTC: Monitoring tobacco use and prevention policies, Protecting people from tobacco smoke, Offering help to quit tobacco use, Warning people about the dangers of tobacco, Enforcing bans on tobacco advertising, Promotion and sponsorship, and Raising taxes on tobacco.

The authors of the study did a modelling exercise and projected the number of premature deaths that would be averted by 2050 through the implementation of one or more of these measures.

The study focused on the 41 countries (two of which are not Parties to the WHO FCTC) that had implemented the demand reduction measures at "the highest level of achievement", that is at a level proven to attain the greatest impact.

These countries represented nearly one billion people or one seventh of the world's population of 6.9 billion in 2008. The total number of smokers in those countries was nearly 290 million in 2007.

Of the 41 countries, 33 had put in place one MPOWER measure and the remaining eight had implemented more than one.

Given that one in every two smokers dies prematurely from smoking-related diseases, the authors calculated that the selected MPOWER measures taken in the 41 countries would prevent the premature deaths of half of the 14.8 million smokers who quit – that is 7.4 million people – by 2050.

Almost half of the averted deaths would be attributable to increased cigarette taxes (3.5 million), the study showed.

New HIV infections among children down 50% in sub-Saharan Africa

A new report on the *Global Plan towards elimination of new HIV infections among children by 2015 and keeping their mothers alive* has revealed a marked increase in progress in stopping new infections among children across the Global Plan priority countries in Africa.

The report outlines that seven countries in sub-Saharan Africa –Botswana, Ethiopia, Ghana, Malawi, Namibia, South Africa and Zambia – have reduced new HIV infections among children by 50% since 2009. Two others – the United Republic of Tanzania and Zimbabwe – are also making substantial progress. It highlights that there were 130,000 fewer new HIV infections among children across the 21 Global Plan priority countries in Africa – a drop of 38% since 2009.

"The progress in the majority of countries is a strong signal that with focused efforts every child can be born free from HIV," said Michel Sidibé, Executive Di-

rector of the Joint United Nations Programme on HIV/AIDS (UNAIDS). "But progress has stalled in some countries with high numbers of new HIV infections. We need to find out why and remove the bottlenecks which are preventing scale-up."

With a 76% decline since 2009, Ghana showed the greatest decline in the rate of new infections among children and South Africa showed a 63% decline (24,000 fewer new HIV infections in 2012 than in 2009). However, the pace of decline in some of the Global Plan priority countries has been slow and in Angola, new HIV infections have even increased. New infections among children in Nigeria – which has the largest number of children acquiring HIV (nearly 60,000 new HIV infections among children in 2012) – remained largely unchanged since 2009. Without urgent action in Nigeria the global target for 2015 may not be reached.

More pregnant women living with HIV were receiving antiretroviral medicines to prevent HIV from being transmitted to their children and for their own health in 2012 than in 2009, with coverage levels exceeding 75% in many countries. Increased coverage has reduced HIV transmission rates from mother to child in most countries. Botswana and South Africa have reduced transmission rates to 5% or below.

"We have the tools required to reach the Global Plan's goals, and recent data show that we are moving ever closer to their realization," said Ambassador Eric P. Goosby, U.S. Global AIDS Coordinator. "This month, as U.S. Secretary of State John Kerry announced, the one millionth baby will be born HIV-free due to PEPFAR's support. Now, we must all continue working together to see the day when no children are born with HIV, which is within our reach," he added.

ESC, AEPC publish first joint consensus statement on paediatric arrhythmias

A joint consensus statement on the treatment of paediatric arrhythmias has been released by the European Heart Rhythm Association (EHRA) of the European Society of Cardiology (ESC) and the Association for European Paediatric and Congenital Cardiology (AEPC).

"Pharmacological and non-pharmacological therapy for arrhythmias in the paediatric population" was published in *EP-Europace*.

Consensus statements have been published on arrhythmias in adults but this is the first European statement concerning the diagnosis and management of paediatric arrhythmias. It is also the first joint document between EHRA and the AEPC.

Professor Josep Brugada (Spain), Chairman of the Working Group, said: "The numbers of children with arrhythmias are relatively small and very few clinicians and centres have the necessary expertise. Paediatric arrhythmias differ from those in adults and should be treated and diagnosed in specialised centres. The ESC and AEPC decided it was necessary to outline how paediatric arrhythmias differ from adult arrhythmias and the requirements for centres that treat children."

The paper covers four main areas: mechanisms, pharmacological treatment, radiofrequency ablation, and devices.

Professor Brugada said: "There are some indications for ablation of arrhythmias in adults that do not apply to children because their small heart puts them at higher risk of complications. But in general, if clinicians and centres have the appropriate expertise in paediatric ablations they can be performed as safely and effectively as adult ablations, even in young children."

Professor Brugada said: "The document outlines how to replace the device and the cables in the heart which is a complicated procedure but can be done safely if performed in experienced centres."

He concluded: "This extensive document covers all aspects of paediatric arrhythmias and is a working document for physicians who diagnose and treat these patients. We explain how to perform the different procedures, the indications, and how to manage complications. Centres can use it as a check list to ensure they have the equipment and experience

needed to effectively treat this specialised patient population."
The consensus statement is published in *EP Eurospace*

- **doi:** 10.1093/europace/eut082

Globally only 38% of infants are exclusively breastfed

Only 37 countries, or 19% of those reporting, have passed laws reflecting all the recommendations of the International Code of Marketing of Breast-milk Substitutes, according to a new World Health Organization (WHO) report published during World Breastfeeding Week from 1 to 7 August.

Breastfeeding is the best source of nourishment for infants and young children and one of the most effective ways to ensure child health and survival. People who were breastfed as babies are less likely to be overweight or obese later in life. They may also be less prone to diabetes and perform better in intelligence tests; but globally only an estimated 38% of infants are exclusively breastfed for six months.

"Nearly all mothers are physically able to breastfeed and will do so if they have accurate information and support," said Dr Carmen Casanovas, breastfeeding expert with WHO's Department of Nutrition for Health and Development. "But in many cases, women are discouraged from doing so, and are misled to believe that they are giving their children a better start in life by buying commercial substitutes."

Only 37 of the 199 countries (19%) reporting to WHO on implementation of the Code have passed laws reflecting all of its recommendations. For example:

- 69 countries (35%) fully prohibit advertising of breast-milk substitutes;
- 62 (31%) completely prohibit free samples or low-cost supplies for health services;
- 64 (32%) completely prohibit gifts of any kind from relevant manufacturers to health workers;
- 83 (42%) require a message about the superiority of breastfeeding on breast-milk substitute labels;
- Only 45 countries (23%) report having a functioning implementation and monitoring system.

In World Breastfeeding Week 2013, WHO and partners are called for more support for breastfeeding mothers. Breastfeeding has to be learned and many women encounter difficulties at the beginning. Nipple pain and fear that there is not enough milk to sustain the baby are common. Health facilities that support breastfeeding – by making trained breastfeeding counsellors available to new mothers – encourage higher rates of the practice.

on the WEB Country implementation of the International Code of Marketing of Breast-milk Substitutes: Status Report 2011
www.who.int/nutrition/publications/infantfeeding/statusreport201

WHO says changing age demographic necessitates shift in drug research focus

For the first time, EU countries have more people over 65 years of age than under 15 years of age. Echoing the trend seen in Europe, much of the rest of the world, including low-and middle-income countries, is moving in a similar direction. A new WHO report calls for pharmaceutical researchers to adjust their research and development efforts to account for this shifting demographic.

"Despite an over three-fold rise in spending on pharmaceutical research and development in Europe since 1990, there is an increasing mismatch between people's real needs and pharmaceutical innovation," says Nina Sautenkova, Health Technologies and Pharmaceuticals, WHO/Europe.

The report, *Priority medicines for Europe and the world 2013 update*, emphasizes that this shift in EU countries is 'bell weather' for the rest of the world as globally more people will be ageing and face similar health challenges in the future.

The report focuses on pharmaceutical 'gaps', where treatments for a disease or condition may soon become ineffective, are not appropriate for the target patient group, does not exist, or are not sufficiently effective.

"Despite an over three-fold rise in spending on pharmaceutical research and development in Europe since 1990, there is an increasing mismatch between people's real needs and pharmaceutical innovation. We must ensure that industry develops safe, effective, affordable and appropriate medicines to meet future health needs," says Sautenkova.

From a public health view, the trend of an increasing population over 65 leads to greater prevalence of diseases and conditions associated with ageing, such as heart disease, stroke, cancer, diabetes, osteoarthritis, low-back pain, hearing loss, and Alzheimer disease. In combination with health promotion and disease prevention initiatives, these conditions also require more investment in research and innovation to bridge the pharmaceutical gaps.

Patients, and particularly the elderly, often require medication for multiple chronic conditions. However, research and treatment guidelines tend to be more disease-driven than patient-centered. "Multiple small-scale trials of combination therapy have been undertaken but no large scale studies have been initiated. One such example is fixed dose polypills for ischemic heart disease (or myocardial ischaemia)," says Kees De Joncheere, Director of WHO's Essential Medicines and Products department. "Although there are some promising results from small trials, we need the investment in large-scale trials to have the evidence to see if we can get the right formulations and make this work in practice to save more lives."

In addition to conditions related to ageing, the report identifies a number of other important topics for future pharmaceutical research.

One area of concern is the need for more medicines that do not require storage in cool temperatures, such as heat-stable insulin for diabetes and oxytocin for childbirth. This would provide an important benefit to improve health services in countries without consistent access to refrigeration.

As identified in the 2004 report, the increasing resistance of common microbes to the medicines used to treat them, otherwise known as antimicrobial resistance (AMR), threatens to make many current health care interventions impossible. There is an urgent need not only to preserve current medicines, but also to develop new options MEH

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[1] U.S. News & World Report
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Medical research news from around the world

Researchers find that exercise changes the epigenetics of fat cells

In new research that may have implications for people with obesity and obesity related diseases like diabetes 2, scientists have found that exercise, even in small doses, changes the expression of our innate DNA. The research from Lund University in Sweden has described for the first time what happens on an epigenetic level in fat cells when we undertake physical activity.

"Our study shows the positive effects of exercise, because the epigenetic pattern of genes that affect fat storage in the body changes," says Charlotte Ling, Associate Professor at Lund University Diabetes Centre.

The cells of the body contain DNA, which contains genes. We inherit our genes and they cannot be changed. The genes, however, have 'methyl groups' attached which affect what is known as 'gene expression' – whether the genes are activated or deactivated. The methyl groups can be influenced in various ways, through exercise, diet and lifestyle, in a process known as 'DNA methylation'. This is epigenetics, a relatively new research field that in recent years has attracted more and more attention.

In the study, the researchers investigated what happened to the methyl groups in the fat cells of 23 slightly overweight, healthy men aged around 35 who had not previously engaged in any physical activity, when they regularly attended spinning and aerobics classes over a six-month period.

"They were supposed to attend three sessions a week, but they went on average 1.8 times," says Tina Rönn, Associate Researcher at Lund University.

Using technology that analyses 480,000 positions throughout the genome, they could see that epigenetic changes had taken place in 7,000 genes (an individual has 20-25,000 genes). They then went on to look specifically at the methylation in genes linked to type 2 diabetes and obesity.

"We found changes in those genes too, which suggests that altered DNA methylation as a result of physical activity could be one of the mechanisms of how these genes affect the risk of disease," says Tina Rönn, adding that this has never before been studied in fat cells and that they now have a map of the DNA methylome in fat.

In the laboratory, the researchers were able to confirm the findings *in vitro* (studying cell cultures in test tubes) by deactivating certain genes and thus reducing their expression. This resulted in changes in fat storage in fat cells.

The research was published in June 2013 in *PLoS Genetics*.

● **doi**/10.1371/journal.pgen.1003572

Catheter ablation to create complete linear lesions around pulmonary veins is superior to incomplete lesions – study

Using catheter ablation to create complete linear lesions around pulmonary veins, proved more effective than the creation of incomplete lesions in preventing recurrence of atrial fibrillation (AF), reports the GAP-AF study. The study, presented 25 June 2013 in the Late Breaking Clinical Trials session I at the EHRA EUROPACE 2013 meeting in Athens, Greece, represents the first time that a randomized controlled study has been undertaken comparing the two different ablation strategies for patients with paroxysmal AF.

Identification of triggers initiating AF within the pulmonary veins led to prevention of AF recurrence by catheter ablation at the site of origin of the trigger. The Heart Rhythm Society /European Heart Rhythm Association/European Society of Cardiology Expert Consensus Document on Catheter and Surgical Ablation of Atrial Fibrillation (published in 2007 and updated in 2012) states that patients undergoing catheter ablation for AF should have complete isolation of the pulmonary veins, which involves a complete circumferential lesion being created around the pulmonary vein.

"This recommendation was based on observational studies, not on a prospective randomized trial. But some electrophysiologists (EPs) continue to believe that it's sufficient to create incomplete linear lesions where conduction sites still exist between the pulmonary veins and left atrium," explained Professor Karl Kuck, from Asklepios Klinik St George, Hamburg, Germany, presenter of the GAP-AF study.

Part of their reasoning is that 95% of patients with AF recurrence after complete PV isolation procedures are found to have conduction gaps between the pulmonary veins and left atrium, he said. "Since they can't isolate the pulmonary veins permanently, they reason that incomplete isolation is sufficient and has the advantage of being a shorter procedure that has a potentially lower complication rate and costs less," said Prof Kuck.

"The study shows us for the first time that complete isolation of the pulmonary veins is more effective than incomplete isolation. It suggests that the level of evidence for complete ablation should be upgraded from class Ic to class Ia, where it is supported by a multicentre randomized trial," said Prof Kuck.

However, the study also highlighted that recurrence rates were high even for patients who had undergone complete isolation procedures. "Research is urgently needed to improve ablation techniques to make the complete lines more durable. There is a need to explore other energy sources and tools for catheter ablation," he said.

on the WEB Professor Karl Kuck's presentation
http://tinyurl.com/lkqmoj4

People with pre-diabetes may ward off diabetes with substantial weightloss

People with pre-diabetes who lose roughly 10% of their body weight within six months of diagnosis dramatically reduce their risk of developing type 2 diabetes over the next three years, according to results of research led by Johns Hopkins scientists.

The findings, investigators say, offer patients and physicians a guide to how short-term behaviour change may affect long-term health.

"We have known for some time that the greater the weight loss, the lower your risk of diabetes," says study leader Nisa Maruthur, M.D., M.H.S., an assistant professor in the Division of General Internal Medicine at the Johns Hopkins University School of Medicine. "Now we understand that we can see much of the benefit of los-

ing that weight in those first six months when people are adjusting to a new way to eating and exercising. Substantial weight loss in the short term clearly should go a long way toward preventing diabetes."

A report on the research is published in the July 2013 issue of the *Journal of General Internal Medicine*.

Patients with pre-diabetes have blood sugar levels higher than normal but not yet high enough to be classified as type 2 diabetes. Although not all people with pre-diabetes develop full-blown type 2 disease, without intervention the risk of getting it within 10 years is substantially increased and damage to health may already have begun.

The good news, Dr Maruthur says, is that studies like hers show that the progression from pre-diabetes to type 2 diabetes is not inevitable and lifestyle changes can bring blood sugar levels back to normal.

Participants in the lifestyle arm of the DPP were advised about better eating habits, directed to exercise 150 minutes a week, and given one-on-one counselling for the first six months and group counselling thereafter. Researchers found that those in the lifestyle intervention arm who lost 10% or more of their body weight had an 85% reduction in risk of developing diabetes within three years. Even more moderate weight loss showed positive effects. Those who lost 5% to 7% of their body weight reduced their risk of developing diabetes by 54% three years later.

● **doi:** 10.1007/s11606-013-2548-4

"Intelligent knife" tells surgeon which tissue is cancerous

Scientists have developed an "intelligent knife" that can tell surgeons immediately whether the tissue they are cutting is cancerous or not.

In the first study to test the invention in the operating theatre, the "iKnife" diagnosed tissue samples from 91 patients with 100% accuracy, instantly providing information that normally takes up to half an hour to reveal using laboratory tests.

The findings, by researchers at Imperial College London, were published 17 July 2013 in the journal *Science Translational Medicine*. The study was funded by the National Institute for Health Research (NIHR) Imperial Biomedical Research Centre, the European Research Council and the Hungarian National Office for Research and Technology.

In cancers involving solid tumours, removal of the cancer in surgery is generally the best hope for treatment. The surgeon normally takes out the tumour with a margin of healthy tissue. However, it is often impossible to tell by sight which tissue is cancerous. One in five breast cancer patients who have surgery require a second operation to fully remove the cancer. In cases of uncertainty, the removed tissue is sent to a lab for examination while the patient remains under general anaesthetic.

The iKnife is based on electrosurgery, a technology invented in the 1920s that is commonly used today. Electrosurgical knives use an electrical current to rapidly heat tissue, cutting through it while minimising blood loss. In doing so, they vaporise the tissue, creating smoke that is normally sucked away by extraction systems.

The inventor of the iKnife, Dr Zoltan Takats of Imperial College London, realised that this smoke would be a rich source of biological information. To create the iKnife, he connected an electrosurgical knife to a mass spectrometer, an analytical instrument used to identify what chemicals are present in a sample. Different types of cell produce thousands of metabolites in different concentrations, so the profile of chemicals in a biological sample can reveal information about the state of that tissue.

In the new study, the researchers first used the iKnife to analyse tissue samples collected from 302 surgery patients, recording the characteristics of thousands of cancerous and non-cancerous tissues, including brain, lung, breast, stomach, colon and liver tumours to create a reference library. The iKnife works by matching its readings during surgery to the reference library to determine what type of tissue is being cut, giving a result in less than three seconds.

The technology was then transferred to the operating theatre to perform real-time analysis during surgery. In all 91 tests, the tissue type identified by the iKnife matched the post-operative diagnosis based on traditional methods.

"These results provide compelling evidence that the iKnife can be applied in a wide range of cancer surgery procedures," Dr Takats said. "It provides a result almost instantly, allowing surgeons to carry out procedures with a level of accuracy that hasn't been possible before. We believe it has the potential to reduce tumour recurrence rates and enable more patients to survive."

Although the current study focussed on cancer diagnosis, Dr Takats says the iKnife can identify many other features, such as tissue with an inadequate blood supply, or types of bacteria present in the tissue.

● **doi:** 10.1126/scitranslmed.3005623

Investigational malaria vaccine found safe in clinical trial

An investigational malaria vaccine has been found to be safe, to generate an immune system response, and to offer protection against malaria infection in healthy adults, according to the results of an early-stage clinical trial published 8 August 2013 in the journal *Science*.

The vaccine, known as PfSPZ Vaccine, was developed by scientists at US-based

company Sanaria. The clinical evaluation was conducted by researchers at the National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health, and their collaborators at the Walter Reed Army Institute of Research and the Naval Medical Research Center.

Malaria is transmitted to humans by the bite of an infected mosquito. After the bite occurs, infectious malaria parasites in the immature, sporozoite stage of their life cycle first travel to the liver, where they multiply, and then spread through the bloodstream, at which time symptoms develop.

The PfSPZ Vaccine is composed of live but weakened sporozoites of the species *Plasmodium falciparum*, the most deadly of the malaria-causing parasites.

"The global burden of malaria is extraordinary and unacceptable," said NIAID Director Anthony S. Fauci, M.D. "Scientists and health care providers have made significant gains in characterizing, treating and preventing malaria; however, a vaccine has remained an elusive goal. We are encouraged by this important step forward."

The Phase I trial, which took place at the NIH Clinical Center in Bethesda, received informed consent from and enrolled 57 healthy adult volunteers ages 18 to 45 years who never had malaria. Of these, 40 participants received the vaccine and 17 did not. To evaluate the vaccine's safety, vaccinees were split into groups receiving two to six intravenous doses of PfSPZ Vaccine at increasing dosages. After vaccination, participants were monitored closely for seven days. No severe adverse effects associated with the vaccine occurred, and no malaria infections related to vaccination were observed.

Based on blood measurements, researchers found that participants who received a higher total dosage of PfSPZ Vaccine generated more antibodies against malaria and more T cells – a type of immune system cell – specific to the vaccine.

To evaluate whether and how well the PfSPZ Vaccine prevented malaria infection, each participant – the vaccinees as well as the control group that did not receive vaccine – was exposed to bites by five mosquitoes carrying the *P. falciparum* strain from which the PfSPZ Vaccine was derived. This controlled human malaria infection procedure – a standard process in malaria vaccine trials – took place three weeks after participants received their final vaccination. Participants were monitored as outpatients for seven days and then admitted to the NIH Clinical Center, where they stayed until they were diagnosed with malaria, treated with anti-malarial drugs and cured of infection, or shown to be free of infection.

The researchers found that the higher dosages of PfSPZ Vaccine were associated with protection against malaria infection. Only three of the 15 participants who received higher dosages of the vaccine became infected, compared to 16 of 17 participants in the lower dosage group who became infected. Among the 12 participants who received no vaccine, 11 participants became infected after mosquito challenge.

"In this trial, we showed in principle that sporozoites can be developed into a malaria vaccine that confers high levels of protection and is made using the good manufacturing practices that are required for vaccine licensure ," said Robert A. Seder, M.D., chief of the Cellular Immunology Section of the NIAID Vaccine Research Center and principal investigator of the trial.

An important challenge in the continued development of PfSPZ Vaccine is that the vaccine currently is administered intravenously – a rare delivery route for vaccines. Previous studies at lower doses have shown that the more common intradermal (into the skin) and subcutaneous (under the skin) routes did not yield as strong an immune response as the intravenous route.

"Despite this challenge, these trial results are a promising first step in generating high-level protection against malaria, and they allow for future studies to optimize the dose, schedule and delivery route of the candidate vaccine," said Dr Seder.

● **doi:** 10.1126/science.1241800 (2013)

Newly discovered switch plays dual role in memory formation

Researchers at Johns Hopkins have uncovered a protein switch that can either increase or decrease memory-building activity in brain cells, depending on the signals it detects. Its dual role means the protein is key to understanding the complex network of signals that shapes our brain's circuitry, the researchers say. A description of their discovery appears in the July 31 issue of the *Journal of Neuroscience*.

"What's interesting about this protein, AGAP3, is that it is effectively double-sided: One side beefs up synapses in response to brain activity, while the other side helps bring synapse-building back down to the brain's resting state," says Rick Huganir, Ph.D., a professor and director of the Solomon H. Snyder Department of Neuroscience at the Johns Hopkins University School of Medicine and co-director of the Brain Science Institute at Johns Hopkins. "The fact that it links these two opposing activities indicates AGAP3 may turn out to be central to controlling the strength of synapses."

Prof. Huganir has long studied how connections between brain cells, known as synapses, are strengthened and weakened to form or erase memories. The new discovery came about when he and postdoctoral fellow Yuko Oku, Ph.D., investigated the chain reaction of signals involved in one type of synaptic strengthening.

In a study of the proteins that interact with one of the known proteins from that chain reaction, the previously unknown AGAP3 turned up. It contained not only a site designed to bind another protein involved in the chain reaction that leads from brain stimulation to learning, but also a second site involved in bringing synapse-building activity down to normal levels after a burst of activity.

Although it might seem the two different functions are behaving at cross-purposes, Oku says, it also could be that nature's bundling of these functions together in a single protein is an elegant way of enabling learning and memory while preventing dangerous overstimulation. More research is needed, Oku says, to figure out whether AGAP3's two sites coordinate by affecting each other's activity, or are effectively free agents.

● **doi:** 10.1523/jneurosci. 0341-13.2013

New method to produce blood cells from stem cells could yield safer cell therapy

A new protocol for reprogramming induced pluripotent stem cells (iPSCs) into mature blood cells, using just a small amount of the

patient's own blood and a readily available cell type, is reported on in the August 2013 issue of *Stem Cells Translational Medicine*. This novel method skips the generally accepted process of mixing iPSCs with either mouse or human stromal cells during the differentiation process and, in essence, ensures no outside and potentially harmful DNA is introduced into the reprogrammed cells.

As such, it could lead to a purer, safer therapeutic grade of stem cells for use in regenerative medicine.

The discovery of iPSCs holds great promise for regenerative medicine since it is possible to produce patient-specific iPSCs from the individual for potential autologous treatment – that is, treatment using the patient's own cells. This avoids the possibility of rejection and numerous other harmful side effects.

CD34+ cells are a type of blood stem cell that has been linked to proliferation. However, collecting enough CD34+ cells from a patient to produce an adequate amount of blood usually requires a large volume of blood to be taken from the patient. But scientists found a way around this, as outlined in the new study conducted by researchers in the Department of Medicine and Institute for Human Genetic, University of California-San Francisco. They were led by Yuet Wai Kan, M.D., FRS, and Lin Ye, Ph.D.

"We used Sendai viral vectors to generate iPSCs efficiently from adult mobilized CD34+ and peripheral blood mononuclear cells (MNCs)," Dr Kan explained. "Sendai virus is an RNA virus that carries no risk of altering the host genome, so is considered an efficient solution for generating safe iPSC."

"Just 2 millilitres of blood yielded iPS cells from which hematopoietic stem and progenitor cells could be generated. These cells could contain up to 40% CD34+ cells, of which approximately 25% were the type of precursors that could be differentiated into mature blood cells. These interesting findings reveal a protocol for the generation iPSCs using a readily available cell type," Dr Ye added. "We also found that MNCs can be efficiently reprogrammed into iPSCs as readily as CD34+ cells. Furthermore, these MNCs derived iPSCs can be terminally differentiated into mature blood cells."

"This method, which uses only a small blood sample, may represent an option for generating iPSCs that maintains their genomic integrity," said Anthony Atala, MD, Editor of *Stem Cells Translational Medicine* and director of the Wake Forest Institute for Regenerative Medicine. "The fact that these cells were differentiated into mature blood cells suggests their use in blood diseases."

● **doi:** 10.5966/sctm.2013-0006 MEH

gene pool

Genetic research news from around the world

Research team identifies first gene for idiopathic focal epilepsy

More than 50 million people worldwide have epilepsy, with a third of these being children. The most common forms of epilepsy in children occur without any apparent trigger and only affect certain regions of the brain. This condition is known as idiopathic focal epilepsy (IFE). The hallmark of IFE is the origin of the fit being in what is termed the rolandic region of the brain. Now, thanks to the considerable input of MedUni Vienna researchers, two pan-European research networks have successfully identified the first disease gene for IFE.

The gene concerned is known as GRIN2A. Changes to this gene cause one of the key ion channels in the brain to malfunction, affecting the electrical excitation of nerve cells. This explains the increased number of electrical discharges in the brain and therefore the manifestation of epileptic fits. The results of the study, which were obtained through the two research networks EuroEPINOMICS and IonNeurOnet, have now been published in the journal *Nature Genetics*.

The research project came into being from collaboration between numerous groups of researchers in Europe who shared a common goal: to understand the genetic causes of this type of childhood epilepsy. "What was crucial for our breakthrough was the close cooperation of doctors carrying out clinical research with theoretical researchers," explains Fritz Zimprich from the University Department of Neurology at the MedUni Vienna, who coordinated the researchers involved in the project from Vienna, Graz and Innsbruck. "A third of the patients investigated with state-of-the-art genetic methods come from Austria."

All in all, genetic material from 400 patients with IFE was analysed. In 7.5% of sufferers, the scientists found changes in the GRIN2A gene. In "rolandic epilepsy", which accounts for 15% of cases of childhood epilepsy and therefore makes it the most common form of the condition, these mutations disrupt the function of the NMDA receptor, one of the brain's key ion channels. The flow of ions in this type of channel influences and determines the nerve cells' electrical excitation.

It is however still not yet fully understood how the mutation in the gene on the NMDA receptor leads to epilepsy. Says Zimprich: "We only see the condition as a result of the mutations; we haven't yet fully discovered the mechanisms behind it." The next target is to understand these mechanisms. This is also an essential step in the development of more effective and more tolerable anticonvulsant medications.

- **doi:** 10.1038/ng.2728

Study looks at how genetic variants affect health

Recent technological developments in genomics have revealed a large number of genetic influences on common complex diseases, such as diabetes, asthma, cancer or schizophrenia. However, discovering a genetic variant predisposing to a disease is only a first step. To apply this knowledge towards prevention or cure, including tailoring treatment to the patient's genetic profile – also known as personalized medicine – we need to know how this genetic variant affects health.

In a new study published recently in *Nature Communications*, Dr Constantin Polychronakos from the Research Institute of the McGill University Health Centre (RI-MUHC), and collaborators from McGill University and The University of Texas, propose a novel approach for scanning the entire genome that will help us understand the effect of genes on human traits.

"This completely new methodology really opens up different ways of understanding how the genome affects the biology of the human body," says Dr Polychronakos, corresponding author of the study and Director of the Endocrine Genetics Laboratory at the Montreal Children's Hospital and Professor in the Departments of Pediatrics and Human Genetics at McGill University.

DNA is the blueprint according to which our body is constructed and functions. Cells "read" this blueprint by transcribing the information into RNA, which is then used as a template to construct. Genes are scanned based on the association of their RNA with ribosomes – particles in which protein synthesis takes place.

"Until now, researchers have been focusing on the effects of disease-associated genomic variants on DNA-to-RNA transcription, instead of the challenging question of effects on RNA-to-protein translation," says Dr Polychronakos. "Thanks to this methodology, we can now better understand the effect of genetic variants on translation of RNA to protein – a powerful way of developing biomarkers for personalized medicine and new therapies."

- **doi:** 10.1038/ncomms3260

US NIH awards grants for genome sequencing research for healthcare

The US National Institutes of Health (NIH) has awarded four grants for up to four years to multidisciplinary research teams to explore the use of genome sequencing in medical care. The awards total approximately US$6.7 million in the first year and, if funding remains available, approximately $27 million in total.

The areas of research being pursued by these new projects include using genome sequencing to inform couples about reproductive risks, determining the genetic causes of childhood developmental delays and communicating findings to parents, and detecting genomic alterations that can lead to cancer. The new grants are funded as part of the National Human Genome Research Institute's (NHGRI) Clinical Sequencing Exploratory Research (CSER) program. NHGRI is part of NIH.

The new grants expand on the initial CSER program awards given to six research teams in December 2011. The current funding includes approximately $5 million from the National Cancer Institute, also part of NIH.

"Since the first round of CSER program awards were announced in 2011, the use of clinical genome sequencing has seen tremendous growth," said Bradley Ozen-

berger, Ph.D., CSER program director and deputy director of the Division of Genomic Medicine at NHGRI. "Genome sequencing has vast potential to uncover new targets for therapy. We're continuing to learn how best to use genome sequence data to understand disease susceptibility and causation, and to advance treatment."

Researchers identify stem cells in urine that can be directed to become multipotent

Reporting online in the journal *Stem Cells* researchers show how they have identified stem cells in urine that can be directed to become multiple cell types.

"These cells can be obtained through a simple, non-invasive low-cost approach that avoids surgical procedures," said Yuanyuan Zhang, M.D., Ph.D., assistant professor of regenerative medicine and senior researcher on the project.

In the study the team successfully directed stem cells from urine to become bladder-type cells, such as smooth muscle and urothelial, the cells that line the bladder. But the urine-derived cells could also form bone, cartilage, fat, skeletal muscle, nerve, and endothelial cells, which line blood vessels. The multipotency of the cells suggests their use in a variety of therapies.

"These stem cells represent virtually a limitless supply of autologous cells for treating not only urology-related conditions such as kidney disease, urinary incontinence and erectile dysfunction, but could be used in other fields as well," said Zhang. "They could also potentially be used to engineer replacement bladders, urine tubes and other urologic organs."

Being able to use a patient's own stem cells for therapy is considered advantageous because they do not induce immune responses or rejection. However, because tissue-specific cells are a very small subpopulation of cells, they can be difficult to isolate from organs and tissues.

Zhang's team first identified the cells, which are a small subset of the many cells found in urine, in 2006. The current research builds on earlier studies by confirming the multipotency of the cells. In addition, the research found that unlike iPS cells or embryonic stem cells, the urine derived-stem cells do not form tumours when implanted in the body, indicating they may be safe for use in patients.

Scientists uncover mutational processes that drive tumour development

Researchers have provided the first comprehensive compendium of mutational processes that drive tumour development. Together, these mutational processes explain most mutations found in 30 of the most common cancer types. This new understanding of cancer development could help to treat and prevent a wide-range of cancers.

Each mutational process leaves a particular pattern of mutations, an imprint or signature, in the genomes of cancers it has caused. By studying 7,042 genomes of people with the most common forms of cancer, the team uncovered more than 20 signatures of processes that mutate DNA. For many of the signatures, they also identified the underlying biological process responsible.

All cancers are caused by mutations in DNA occurring in cells of the body during a person's lifetime. Although we know that chemicals in tobacco smoke cause mutations in lung cells that lead to lung cancers and ultraviolet light causes mutations in skin cells that lead to skin cancers, we have remarkably little understanding of the biological processes that cause the mutations which are responsible for the development of most cancers.

"We have identified the majority of the mutational signatures that explain the genetic development and history of cancers in patients," says Ludmil Alexandrov first author from the Wellcome Trust Sanger Institute. "We are now beginning to understand the complicated biological processes that occur over time and leave these residual mutational signatures on cancer genomes."

All of the cancers contained two or more signatures, reflecting the variety of processes that work together during the development of cancer. However, different cancers have different numbers of mutational processes. For example, two mutational processes underlie the development of ovarian cancer, while six mutational processes underlie the development of liver cancer.

Some of the mutational signatures are found in multiple cancer types, while others are confined to a single cancer type. Out of the 30 cancer types, 25 had signatures arising from age-related mutational processes. Another signature, caused by defects in repairing DNA due to mutations in the breast cancer susceptibility genes BRCA1 and 2, was found in breast, ovarian and pancreatic cancers.

"Through detailed analysis, we can start to use the overwhelming amounts of information buried deep in the DNA of cancers to our advantage in terms of understanding how and why cancers arise," says Dr Serena Nik-Zainal, author from the Wellcome Trust Sanger Institute. "Our map of the events that cause the majority of cancers in humans is an important step to discovering the processes that drive cancer formation."

The team found that a family of enzymes, which is known to "edit" (i.e. mutate) DNA, was linked to more than half of the cancer types. These enzymes, known as APOBECs, can be activated in response to viral infections. It may be that the resulting signatures are collateral damage on the human genome caused by the enzymes' actions to protect cells from viruses.

Recently, the research team described a remarkable pattern of mutation in breast cancer whereby small regions of the genome are deluged with mutations. They now show that this process, known as kataegis, is present in most cancers. Researchers speculate that the onset of kataegis may also be linked to the activation of APOBEC enzymes.

"We have uncovered the archaeological traces within cancer genomes of the diverse mutational processes that lead to the development of most cancers," says Professor Sir Mike Stratton, lead author and Director of the Wellcome Trust Sanger Institute. "This compendium of mutational signatures and the consequent insights into the mutational processes underlying them has profound implications for the understanding of cancer development with potential applications in disease prevention and treatment."

● **doi:** 10.1038/nature12477

Cases of MERS-CoV infection increase as scientists struggle to find source of virus

The latest update on the Middle East Respiratory Syndrome (MERS) coronavirus at the time of going to press comes from *Epidemic - Molecular Epidemiology and Evolution of Viral Pathogens* (http://epidemic.bio.ed.ac.uk/) – which reports 119 cases as of 25th August – 1 in France, 2 in Italy, 14 in Jordan, 87 in Saudi Arabia, 4 in Qatar, 2 in Tunisia, 7 in the UAE, 2 in the UK. Of the 119 cases there have been 46 deaths reported.

The World Health Organisation says in a statement that based on the current situation and available information, WHO encourages all Member States to continue their surveillance for severe acute respiratory infections (SARI) and to carefully review any unusual patterns.

Healthcare providers are advised to maintain vigilance. Recent travellers returning from the Middle East who develop SARI should be tested for MERS-CoV as advised in the current surveillance recommendations.

Specimens from patients' lower respiratory tracts should be obtained for diagnosis where possible. MERS-CoV infection should be considered even with atypical signs and symptoms, such as diarrhoea, in patients who are immunocompromised.

Healthcare facilities are reminded of the importance of systematic implementation of infection prevention and control (IPC). Healthcare facilities that provide care for patients suspected or confirmed with MERS-CoV infection should take appropriate measures to decrease the risk of transmission of the virus to other patients, healthcare workers and visitors.

MERS not a Public Health Emergency of International Concern

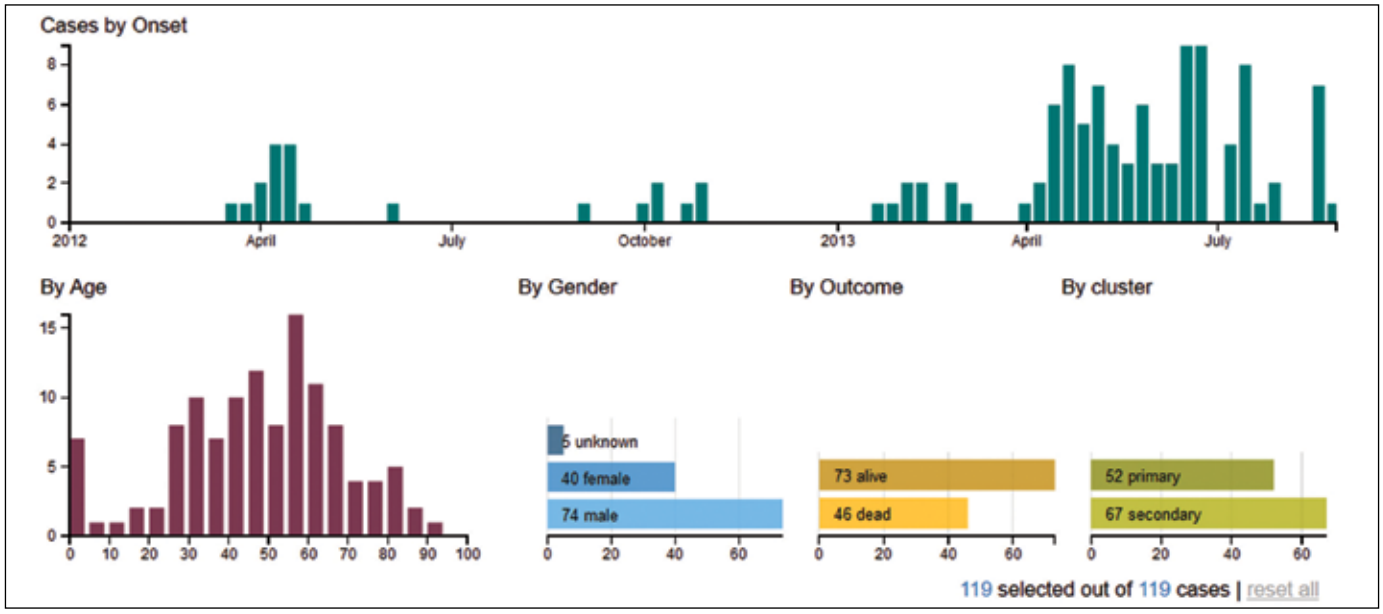
Meanwhile, on 17 July the WHO held the second meeting of the Emergency Committee convened by the Director-General under the International Health Regulations. In addition to members of the Emergency Committee, France, Germany, Italy, Jordan, Kingdom of Saudi Arabia, Qatar, Tunisia, and the United Kingdom, also participated by teleconference.

WHO issued a statement following the meeting saying that: The Committee reviewed and deliberated on information on a range of aspects of MERS-CoV, and it is the unanimous decision of the Committee that, with the information now available, and using a risk-assessment approach, the conditions for a Public Health Emergency of International Concern (PHEIC) have not at present been met.

What are the symptoms of MERS-CoV?

Common symptoms are acute, serious respiratory illness with fever, cough, shortness of breath and breathing difficulties. Most patients have had pneumonia. Many have also had gastrointestinal symptoms, including diarrhoea. Some patients have had kidney failure. About half of people infected with MERS-CoV have died. In people with immune deficiencies, the disease may have an atypical presentation. It is important to note that the current understanding of illness caused by this infection is based on a limited number of cases and may change as we learn more about the virus.

The virus can be transferred from person to person. There have been multiple clusters of cases in which human-to-human transmission has occurred. These clusters have been observed in health-care facilities, among family members and between co-workers. However, the mechanism by which transmission occurred in all of these cases, whether respiratory (e.g. coughing, sneezing) or direct physical contact with the patient or contamination of the environment by the patient, is unknown. Thus far, no sustained community transmission has been observed.



CREDIT: http://epidemic.bio.ed.ac.uk

The epidemiology of MERS CoV changes on a daily basis. For the latest figures see the website: http://epidemic.bio.ed.ac.uk
The 'Epidemics - Molecular Epidemiology and Evolution of Viral Pathogens' website notes: The list of cases has been gathered from various sources including WHO bulletins and media reports. It contains some cases that were not laboratory confirmed (but are extremely likely). There will be inaccuracies and omissions and it should be considered illustrative of the current situation.

Source of the virus

It is not yet known how people become infected with this virus. Investigations are underway to determine the source of the virus, the types of exposure that lead to infection, the mode of transmission, and the clinical pattern and course of disease.

The latest information on the source of the virus indicates it could originate in a species of bat (*Neoromicia zuluensis*) from South Africa. *Epidemic - Molecular Epidemiology and Evolution of Viral Pathogens* (*http://epidemic.bio.ed.ac.uk/*) – reports on a recent paper which describes a new coronavirus isolated from these bats that represents the closest phylogenetic relative of the MERS-CoV virus.

- Ithete NL, Stoffberg S, Corman VM, Cottontail VM, Richards LR, Schoeman MC, et al. Close relative of human Middle East respiratory syndrome coronavirus in bat, South Africa [letter]. Emerg Infect Dis [Internet]. 2013 Oct
- **doi:** 10.3201/eid1910.130946

The paper follows a previous study which described European *Pipistrellus* bat–derived CoVs that are closely related to MERS-CoV.

The authors of the study write: "Our results further support the hypothesis that, like human CoV-229E and SARS-CoV, ancestors of MERS-CoV might exist in Old World insectivorous bats belonging to the family Vespertilionidae, to which the genera *Neoromicia* and *Pipistrellus* belong.

The authors state that "studies of Vespertilionidae bats and potential intermediate hosts (e.g., carnivores and ungulates, such as camels) are urgently needed to elucidate the emergence of MERS-CoV. Such studies should focus on the Arabian Peninsula and Africa."

Animal reservoir for MERS-CoV in Saudi Arabia

Meanwhile, authors of another paper detailing the search for an animal reservoir for MERS-CoV in Saudi Arabia say the virus was found in one species of bat, *T. perforatus* – *or Egyptian tomb bat* – but cast doubt on the probability that it is sufficient to be the source of the MERS-CoV infections.

- Memish ZA, Mishra N, Olival KJ, Fagbo SF, Kapoor V, Epstein JH, et al. Middle East respiratory syndrome coronavirus in bats, Saudi Arabia. Emerg Infect Dis [Internet]. 2013 Nov
- **doi:** 10.3201/eid1911.131172

The authors conclude: A wide range of CoV species are circulating among bats in Saudi Arabia. Although the prevalence of CoVs was high (≈28% of fecal samples), MERS CoV was found in only 1 bat. A 3.5% MERS CoV infection rate (n = 29; 95% CI 0–20%) in *T. perforatus* bats is low compared with that for severe acute respiratory syndrome–like CoV in rhinolophid bats in China (10%–12.5%) but consistent with CoV prevalence among bats in Mexico. Furthermore, the sensitivity for viral nucleic acid detection in samples collected in October 2012 was probably reduced because of failure in cold chain transport. MEH

World Health Report calls for focus on local research to improve public health

The World Health Organisation released the 2013 edition of the World Health Report on August 15 with the title: Research for universal health coverage. In it the WHO calls on countries to continue investing in local research in order to develop a system of universal health coverage tailored to each individual country's situation. It notes that with universal health coverage, countries can help ensure that citizens obtain the health services they need without suffering financial hardship when paying for them.

Dr Margaret Chan, Director-General of WHO, describes universal coverage as "the single most powerful concept that public health has to offer".

"This is a state-of-the-art report on health research, and on investigative tools and networks, that can help countries make the right decisions as they move towards universal health coverage. It sets out the scientific research agenda needed to translate the growing commitment to universal coverage into evidence-based action," Dr Chan said during her speech at the launch of the report in Beijing, China.

Dr Margaret Chan, Director-General of the World Health Organisation

"I have personally been encouraged by the large number of countries, at all levels of development, that have embraced the goal of universal health coverage as the right thing to do for their citizens and societies.

"This enthusiastic response goes against historical trends. During times of financial austerity, the tendency has been to cut back on health services, not expand them.

"Universal coverage means quality health care for all delivered in ways that protect users from financial ruin or impoverishment. It is a powerful social equalizer, contributing to social cohesion and stability. It is not cheap. But when well-planned, universal coverage is affordable," Dr Chan remarked.

The report shows how countries, when developing a system for universal health coverage, can use research to determine what health issues should be addressed, how a system should be structured and how to measure progress according to their specific health situation.

The report reveals that, on average, domestic investment in research in low- and middle-income countries has been growing 5% each year. This trend is most visible in emerging economies such as Brazil, China and India, all of which have embraced the concept of universal health coverage.

Case studies from many countries demonstrate the importance of local and global research for improving health, ranging from the prevention and control of specific diseases to the better functioning of health systems. The results of these studies emphasize the critical need for research to be carried out locally, where researchers can consider specific factors critical to individual countries.

"Research for universal health coverage is not a luxury; rather, it is fundamental to the discovery, development and delivery of interventions that people need to maintain good health," the report notes.

Health Research

The report also shows that more health research is being published as a result of international collaboration. Scientists from low- and middle-income countries are increasingly engaged in these collaborations, although high-income countries continue to play a prominent role in most studies. China is one example: from 2000 to 2010 the global share of Chinese researchers

as co-authors on published research increased from 5% to 13%. Brazil, India and other countries have also increased their participation in published research. However, although research is increasing overall, growth is uneven.

"All nations should be producers as well as consumers of research. The creativity and skill of researchers are the backbone of academic and public health programs," says Dr Christopher Dye, Director, Office of Health Information, HIV/AIDS, Tuberculosis, Malaria and Neglected Tropical Diseases and lead author of the report. "A wide range of basic and applied research studies is essential to reach universal health coverage, but gaps between knowledge and action are being closed very slowly. We need to accelerate the process of bringing scientists and decision makers together to improve health service coverage."

Dr Chan explains: "The challenge is to expand health services with constant attention to causes of waste and inefficiency that can be reduced through smart policies and wise decisions.

"Research offers this guidance. It brings precision to the understanding of problems, and it offers proof of the solutions that work best. Research can uncover ways to scale up services and dial down spending.

"These are central goals of the report: to stimulate the right kind of research, but also to open the eyes of policy-makers to the power of research and evidence as a decision-making tool.

"With these goals in mind, the report demystifies the research landscape, gives it a structure, and demonstrates the potential of different kinds of studies to support the most efficient expansion of services."

A highlight of the report, Dr Chan noted, is the inclusion of 12 case studies showing how priority questions were investigated and how the results led to changes in policy and practice, with some affecting the lives of millions of people.

These case studies also illustrate the range of methods that are commonly used in health research, from observational studies to randomized controlled trials. In this way, the role of research in operationalizing universal coverage becomes readily and compellingly visible.

Skewed research interests

"Unfortunately, this role is far from being exploited to its full potential. The World Health Report makes some strong calls for change.

"Our world spends more than $100 billion on health research each year. The lion's share of this investment goes to the discovery and development of pharmaceutical and biotechnology products.

"Research on health systems and service delivery receives only a tiny proportion of this investment. But it is never too late to start research on health systems and delivery.

"We need to change the research landscape. We need to invest in the science of delivery. We must give more attention to the three Ds: discovery, development, and delivery. What are the roadblocks that prevent delivery? This question needs attention," Dr Chan emphasised.

The report points to a large number of effective and inexpensive interventions that are simply not reaching the people most in need. Many proven interventions are hardly used at all.

"How can such a potentially life-saving resource be so neglected?" Dr Chan questioned. "This is another clear case of waste and inefficiency. Here is the reality: far more research is invested in developing new technologies than in making better use of existing technologies.

"For example, syphilis is easily diagnosed and treated, with diagnostic tests and treatment each costing less than $1. Why are two million pregnant women infected with syphilis each year, with more than half transmitting the infection to newborn children?

"Recent efforts to address the problem did more than just reduce the disease burden. They provided a model for delivering services to hard-to-reach populations and a template for the introduction of new technologies."

on the WEB World Health Report 2013
http://www.who.int/whr/2013/report/en/index.html

Highlights from the World Health Report 2013

Research

More research is being done in more creative ways and the process of doing research is becoming more robust:

- Most low- and middle-income countries now have research foundations to build on.
- Research investment in low- and middle-income countries has grown rapidly (5% per year during the 2000s compared to zero growth in high-income countries).
- More authors of published research are coming from emerging economies, in particular China, but also Brazil and India.
- Increasing partnerships between universities, governments, international organisations and the private sector.

What is needed now?

The World health report 2013 calls for:

- Increased international and national investment and support in research aimed specifically at improving coverage of health services within and between countries.
- Closer collaboration between researchers and policymakers, i.e. research needs to be taken outside the academic institutions and into public health programmes that are close to the supply of and demand for health services.
- Countries to build research capacity by developing a local workforce of well-trained, motivated researchers.
- Every country to have comprehensive codes of good research practice in place.
- Global and national research networks to coordinate research efforts by fostering collaboration and information exchange.

WHO updates data on leading causes of death

WHO has updated its list of leading causes of death worldwide. The organisation found no change in the top 6 leading causes of death worldwide from 2000 to 2011. Ischaemic heart disease, stroke, lower respiratory infections, chronic obstructive lung disease, diarrhoea and HIV/AIDS have remained the top major killers during the past decade.

Tuberculosis is no longer among the 10 leading causes of death, but is still among the top 15, killing one million people in 2011.

Chronic diseases cause increasing numbers of deaths worldwide. Lung cancers (along with trachea and bronchus cancers) caused 1.5 million (2.7%) deaths in 2011, up from 1.2 million (2.2%) deaths in 2000. Similarly, diabetes caused 1.4 million (2.6%) deaths in 2011, up from 1.0 million (1.9%) deaths in 2000.

	Cause of death, 2000	Deaths in million	% of deaths		Cause of death, 2011	Deaths in million	% of deaths
	All causes	52.5	100.0		All causes	54.6	100.0
1	Ischaemic heart disease	5.9	11.2	1	Ischaemic heart disease	7.0	12.9
2	Stroke	5.6	10.6	2	Stroke	6.2	11.4
3	Lower respiratory infections	3.5	6.7	3	Lower respiratory infections	3.2	5.9
4	Chronic obstructive pulmonary disease	3.0	5.8	4	Chronic obstructive pulmonary disease	3.0	5.4
5	Diarrhoeal diseases	2.5	4.7	5	Diarrhoeal diseases	1.9	3.5
6	HIV/AIDS	1.6	3.0	6	HIV/AIDS	1.6	2.9
7	Prematurity	1.4	2.7	7	Trachea, bronchus, lung cancers	1.5	2.7
8	Tuberculosis	1.3	2.6	8	Diabetes mellitus	1.4	2.6
9	Trachea, bronchus, lung cancers	1.2	2.2	9	Road injury	1.3	2.3
10	Diabetes mellitus	1.0	1.9	10	Prematurity	1.2	2.2
11	*Road injury*	*1.0*	*1.9*	*13*	*Tuberculosis*	*1.0*	*1.8*

Road traffic accidents claimed nearly 3500 lives each day in 2011 – about 700 more than in the year 2000 – making it among the top 10 leading causes in 2011. Prematurity claimed 200,000 fewer infant lives in 2011 than in 2,000, but remains among the 10 leading causes of death.

Interview

WHO answers questions about the leading causes of death

■ ***Middle East Health*: How many people die every year?**
World Health Organisation: In 2011, an estimated 55 million people died worldwide.

■ **MEH: What kills more people: infectious diseases or noncommunicable diseases?**
WHO: Noncommunicable diseases (NCDs) were responsible for two-thirds of all deaths globally in 2011, up from 60% in 2000. The four main NCDs are cardiovascular diseases, cancers, diabetes and chronic lung diseases. Communicable, maternal, perinatal and nutrition conditions collectively were responsible for a quarter of global deaths, and injuries caused 9% of all deaths.

■ **MEH: Are cardiovascular diseases the number one cause of death throughout the world?**
WHO: Yes, cardiovascular diseases killed nearly 17 million people in 2011, that is 3 in every 10 deaths. Of these, 7 million people died of ischaemic heart disease and 6.2 million from stroke.

■ **MEH: Do most NCD deaths occur in high-income countries?**
WHO: In terms of number of deaths, 26 million (nearly 80%) of the 36 million of global NCD deaths in 2011 occurred in low- and middle-income countries. In terms of proportion of deaths that are due to NCDs, high-income countries have the highest proportion – 87% of all deaths were caused by NCDs – followed by upper-middle income countries (81%). The proportions are lower in low-income countries (36%) and lower-middle income countries (56%).

■ **MEH: WHO often says that smoking is a top cause of death. Where does tobacco use affect these causes of death?**
WHO: Tobacco use is a major cause of many of the world's top killer diseases – including cardiovascular disease, chronic obstructive lung disease and lung cancer. In total, tobacco use is responsible for the death of about 1 in 10 adults worldwide. Smoking is often the hidden cause of the disease recorded as responsible for death.

■ **MEH: What are the main differences between rich and poor countries**

with respect to causes of death?

WHO: In high-income countries, 7 in every 10 deaths are among people aged 70 years and older. People predominantly die of chronic diseases: cardiovascular diseases, cancers, dementia, chronic obstructive lung disease or diabetes. Lower respiratory infections remain the only leading infectious cause of death. Only 1 in every 100 deaths are among children under 15 years.

In low-income countries, nearly 4 in every 10 deaths are among children under 15 years, and only 2 in every 10 deaths are among people aged 70 years and older. People predominantly die of infectious diseases: lower respiratory infections, HIV/AIDS, diarrhoeal diseases, malaria and tuberculosis collectively account for almost one third of all deaths in these countries. Complications of childbirth due to prematurity, and birth asphyxia and birth trauma are among the leading causes of death, claiming the lives of many newborns and infants.

MEH: How has the situation changed in the past decade?

WHO: Ischaemic heart disease, stroke, lower respiratory infections, chronic obstructive lung disease, diarrhoea and HIV/AIDS have remained the top major killers during the past decade.

Noncommunicable diseases were responsible for two-thirds (36 million) of all deaths globally in 2011, up from 60% (31 million) in 2000. Cardiovascular diseases alone killed nearly 2 million more people in 2011 than in the year 2000.

Tuberculosis, while no longer among the 10 leading causes of death in 2011, was still among the 15 causes, killing one million people in 2011. Maternal deaths have dropped from 420,000 in the year 2000 to 280,000 in 2011, but are still unacceptably high: nearly 800 women die due to complications of pregnancy and childbirth every day.

Injuries continue to kill 5 million people each year. Road traffic accidents claimed nearly 3500 lives each day in 2011 – about 700 more than in the year 2000 – making it among the top 10 leading causes in 2011.

MEH: How many young children die each year, and why?

WHO: In 2011, 6.9 million children died before reaching their fifth birthday; almost all (99%) of these deaths occurred in low- and middle-income countries. The major killers of children aged less than five years were pneumonia, prematurity, birth asphyxia and birth trauma, and diarrhoeal diseases. Malaria was still a major killer in sub-Saharan Africa, causing about 14% of under-five deaths in the region.

About 43% of deaths in children younger than 5 years in 2011 occurred within 28 days of birth – the neonatal period. The most important cause of death was prematurity, which was responsible for one-third of all deaths during this period. MEH


Aspetar Orthopaedic and Sports Medicine Hospital, Doha

Aspetar introduces athlete injury prevention programme

Aspetar Orthopaedic and Sports Medicine Hospital, based in Doha, is one of the best dedicated sports medicine hospitals in the world. It has recently introduced an athlete injury and illness prevention programme (ASPREV) designed to reduce the rate of injury in athletes and protect athletes' health. *Middle East Health* reports.

In the world of elite sport, injuries are an all too common occurrence. In adult male football the rate has been reported to be as high as to 35.3 injuries per 1000 player hours (Morgan 2001); in professional rugby union the injury rate is reported to be around 91 injuries per 1000 player hours (Brooks 2005), and at the recent London 2012 Olympics there were 128.8 new injuries per 1000 athletes during the period of the Games (Engebretsen et al 2013). Illnesses are also common and can have a negative effect on performance, with a recent study in the Super 15 Rugby Tournament from the Southern Hemisphere reporting 20.7 illnesses per 1000 player days, rising to 32.6 in the time period following international travel (Schwellnus 2012). The London Olympics study mentioned also reported 71.1 illnesses per 1000 athletes.

The early sports medicine literature was mostly dedicated to the treatment of injuries in athletes and how to speed up a safe return to competition and the secondary prevention of injuries. Over recent times more interest has been paid to the primary prevention of injuries and the protection of the health of athletes.

To this end, most elite athletes have a periodic medical assessment, often called a 'screening medical', performed by their medical teams. Screening, in medical terms, is defined as "a strategy used in a population to identify an unrecognised disease in individuals without signs or symptoms". The World Health Organisation (WHO) published guidelines on the requirements for an optimal screening programme in 1968, that later became known as the Wilson-Jungner criteria.

Most screening tools used in athletes do not meet the Wilson-Jungner criteria, as the sort of medical conditions being sought in athletes are not important public health problems. However, for a high level sportsperson, any medical condition or injury that prevents them from playing or competing at their very best, for even a short period of time, can be disastrous and prevent them from reaching their goal which might have taken years of training and sacrifice. There are long term ramifications of injury to consider as well – for example a high rate of osteoarthritis following anterior cruciate ligament injury.

Although one of the goals of these assessments is the detection of occult medical conditions and risk factors for injury, the screening medical assessments also have other goals:

- Review of injuries sustained in the previous season to check recovery and whether any ongoing rehabilitation is required, for example ankle proprioception and strengthening exercises after an ankle sprain may be required even after a player has returned to sport.
- Check compliance with any long term rehabilitation exercises, for example maintenance of rotator cuff strengthening in someone with a previous history of shoulder pain.
- Review of chronic medical conditions, such as control of exercise induced asthma.
- Review of any other medical issues related to the sport such as nutrition, sleep and recovery patterns, psychological issues and medications which might require World Anti-Doping Agency Therapeutic Use Exemption notification.
- Cardiac screening, looking for risk factors for sudden cardiac death.

Prevention

However, the holy grail of screening is to be able to prevent future injuries or illnesses by identifying those at risk and being able to address these risk factors before an injury or illness can occur.

The four-step van Mechelen (1992) model for sports injury prevention is often used – the first step being the description of significant injuries or illnesses that are likely to affect that sport. Using football as an example, it is known from numerous high quality epidemiological studies that two of the most significant injuries are anterior cruciate ligament (ACL) tears and hamstring tears.

The second step in the van Mechelen model involves identifying risk factors for these injuries, in order for strategies to be put in place to prevent them from occurring. Unfortunately, to date the only consistent risk factor that has been identified for ACL injuries appears to be a history of previous injury to that site, which is a non-modifiable risk factor. Hamstring / quadriceps muscle imbalance, slow reaction time and joint laxity have all been suggested as risk factors, but have not been consistently predictive in adult male football players. However, in female athletes it has been discovered that female gender and a high knee abductor moment (KAM) on landing from jumps or side stepping are independent risk factors for ACL injury. However, gender is again non-modifiable. For hamstring injuries, the most significant risk factor for injury is also non modifiable, i.e. a previous history of prior hamstring strain. Older age, low hamstring strength and low hamstrings to quadriceps strength are other identified risk factors.

The third step in the van Mechelen model is to introduce injury prevention strategies, based on the risk factors identified in step two. It has been shown that KAM in female athletes can be reduced by programmes to change cutting technique in the laboratory, but whether the cutting technique changes are transferrable to real game situations and lead to a reduced ACL injury rate, remains to be seen. No studies to date have identified an at-risk subset of athletes and successfully introduced a prevention programme.

The fourth step is to repeat the first step, to see if the strategies from stage three have changed the injury incidence. It has been shown that a neuromuscular training programme applied to whole squads can successfully reduce the incidence of ACL injury in female handball players (Mykelbust 2013). A Nordic hamstring strengthening programme applied to whole squads has also been

shown to result in a reduction in hamstring tear incidence (Arnason 2008).

The impetus behind the ASPREV programme was the acknowledgement that there is still much to discover about identification of athletes at risk of injury. Aspetar provides primary medical care (via the team medical staff) and secondary care (via Aspetar hospital) to all sporting clubs in Qatar. This provides a unique opportunity to gather a number of data sets from a large number of athletes at both a club and elite level.

Research

The core component of ASPREV is a long term prospective cohort study designed to identify risk factors for injury and illness in athletes and then to develop prevention strategies to reduce the injury and illness incidence. Screening medicals will be performed annually on all the players in the Qatar Stars League (the premier football league in Qatar), as well as the youth athletes in the Aspire Academy. Over the following seasons, athletes from different sports will be added to the study. These screening medicals are designed to have the same goals as stated above, but with a particular interest in looking at potential risk factors for injury and illness.

The standard static orthopaedic musculoskeletal examination tests typically used in most screening assessments have not proven thus far to be of much use in predicting future injury. Therefore, recent research has focused on dynamic functional muscle tests. A functional muscle screen (FMS) will be included in the screening medical in the ASPREV study. Particular care will be taken to ensure that any data collected, such as joint range of movement or muscle eccentric strength, are measured in a reproducible fashion so that the data are robust. These data will be stored in a specially designed database.

Injury and illness data will also be collected by team medical staff, not only the traditional "time loss" injuries that prevent an athlete from competing, but also overuse injuries that affect performance, but do not necessarily prevent an athlete from competing. Overuse injuries appear to have been overlooked in the sports medicine literature until recently, when there has been a realisation that they can significantly negatively affect performance – 36% of a cohort of elite female handball players reported missing match play due to overuse shoulder injuries, with 76% reported shoulder pain affecting their training (Mykelbust 2013).

Other data will also be collected and added to the data base including:

- Exposure data – number of matches played, number, type, duration and intensity of training sessions performed
- Performance data – such as aerobic fitness, strength, aerobic tests
- Sleep and recovery data
- Nutrition and body composition data

Over time, these data will provide a powerful tool to investigate the various risk factors for injury and illness. It is unlikely that one single factor (for example hamstring muscle eccentric strength) will be identified as a risk factor that, when corrected, will prevent future hamstring injuries. It is more likely that a series of factors will combine to cause an injury. An example of this: a player with a reduced hamstring to quadriceps strength ratio, who has played three matches in the last two weeks, and is reporting post exercise fatigue or poor sleep, may be found to have a several fold increased risk of hamstring injury or ACL injury.

To examine multiple factors will require data to be collected from a large cohort of athletes over a period of time. It is hoped that the ASPREV study will, in time, be able to provide researchers with the data to explore these complex interactions between multiple potential risk factors. This will allow them to identify situations in which an athlete might be at risk of injury and therefore develop and test strategies to intervene and reduce injury incidence. This is a very exciting project for all involved in Aspetar and will allow the researchers to make a significant contribution to the health of athletes in the Middle East and eventually, worldwide.

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Research news round-up

Follow-up study: over half of all ACL reconstructions could be avoided

In the summer of 2010, researchers from Lund University in Sweden reported that 60% of all anterior cruciate ligament (ACL) reconstructions could be avoided in favour of rehabilitation. The results made waves around the world, and were met with concerns that the results would not hold up in the long term. Now the researchers have published a follow-up study that confirms the results from 2010 and also show that the risk of osteoarthritis and meniscal surgery is no higher for those treated with physiotherapy alone.

"We have continued with our study and for the first time are able to present a five-year follow-up on the need for and results of ACL surgery as compared with physiotherapy. The findings have been published in the *British Medical Journal* and are basically unchanged from 2010. This will no doubt surprise many people, as we have not seen any difference in the incidence of osteoarthritis," says Richard Frobell, one of the researchers behind the study, who is an associate professor at Lund University and a clinician at the orthopaedic department, Helsingborg Hospital.

"In this study, there was no increased risk of osteoarthritis or meniscal surgery if the ACL injury was treated with physiotherapy alone compared with if it was treated with surgery. Neither was there any difference in patients' experiences of function, activity level, quality of life, pain, symptoms or general health," says Richard Frobell.

"The new report shows that there was no difference in any outcome between those who were operated on straight away, those who were operated on later and those who did not have an operation at all. The message to the medical experts who are treating young, active patients with ACL injuries is that it may be better to start by considering rehabilitation rather than operating straight away."

- **doi:** *http://dx.doi.org/10.1136/bmj.f232*

Steroids reduce mental health

There is a link between use of anabolic-androgenic steroids and reduced mental health later in life. This is the main conclusion of a new study on elite male strength athletes that researchers from the University of Gothenburg recently published in the *British Journal of Sports Medicine*. Twenty per cent of the subjects in the study admitted steroid use.

The study is published by CERA, which is the University of Gothenburg's centre for education and research on addiction. Together with colleagues from Sahlgrenska University Hospital, they found a connection between abuse of anabolic-androgenic steroids (AAS) and mental health problems many years later.

The study included almost 700 former Swedish wrestlers, weightlifters, powerlifters and throwers who competed at the elite level sometime between 1960 and 1979. The purpose of the study was to look for links between AAS use and mental problems.

"We found a clear link. AAS users were more likely to have been treated for depression, concentration problems and aggressive behaviour," says Claudia Fahlke, director at CERA.

The researchers also found that AAS users were more likely to have abused other illicit drugs and alcohol. However, it remains unclear whether the steroid use actually caused the mental health problems or the mental health problems rather caused the steroid use.

"What we were able to show, though, is that psychiatric symptoms and use of steroids and other drugs tend to reinforce each other in a vicious cycle. This suggests that the anti-doping efforts remain very important, both in and outside of sports," says Fahlke.

- PMID: 23613517

Sports people die younger

Fame and achievement in performance-related careers may be earned at the cost of a shorter life, according to a study published in *QJM: An International Journal of Medicine*.

Based on the premise that an obituary in the *New York Times* (NYT) usually implies success in one's career, Professor Richard Epstein and Catherine Epstein analysed 1000 consecutive obituaries published in the NYT during 2009-2011 in terms of gender, age, occupation, and cause of death. They separated subjects into four broad occupational categories: performance/sport (including actors, singers, musicians, dancers, and sportspeople), non-performing creative (including writers, composers and visual artists), business/military/political, and professional/academic/religious.

The gender distribution of NYT obituaries was found to be strongly skewed towards males over females (813 vs. 186). In terms of occupations, younger ages of death were apparent in performers/sports (77.2 +/- 1.7) and creative workers (78.5 +/- 0.8), whereas older ages of death were seen in professionals/academics (81.7 +/- 1.4) and in business/military/political careers (83 +/- 1.2). Moreover, although the life expectancy for a US citizen born today is about 76 years for males and 81 years for females, the average age of death for NYT males was older (80.4), and females younger (78.8) than these averages; this was associated with a higher proportion of NYT females than males in performance/sports (38% vs. 18%) and fewer in professional careers (12% vs. 27%).

- **doi:** 10.1093/qjmed/hct077

Sportsmen have better attention span

An article published in the journal, *Plos One*, confirms that good physical health is related to a better functioning of both the central nervous system (CNS) and the autonomic nervous system (ANS).

New scientific evidence seems to confirm the famous Roman saying "*Mens sana in corpore sano*" (a healthy mind in a healthy body). Researchers from the University of Granada have demonstrated that people who normally practice sport have a better cognitive performance than those with bad physical health. More specifically, the results of this research indicate that the former have a better sustained attention span (they react more rapidly to an external stimulus introduced randomly while carrying out a monotonous task). Their autonomic nervous system also appears to work better when dealing with cognitive loads over a longer time period.

- **doi:** 10.1371/journal.pone.0056935

Growing Bones, Steadfast Care.

Pediatric Orthopedics at the American Hospital Dubai

Unlike adults, a child's musculoskeletal system continues to develop and grow. Therefore, treating ailments in this area requires the unique expertise of Pediatric Orthopedic surgeons. These physicians not only specialize in evaluating and treating a child's bones, joints and muscles, they do so through a special approach that comforts young patients and their anxious parents.

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Global leadership through continuing innovation

Germany continues to be a leader in healthcare innovation through research and development in the healthcare industry. Because of this many German healthcare companies are global leaders in their fields. *Middle East Health* looks at the healthcare industry in Germany and its various elements that enable it to sustain its leading position in the world.

Dr Philipp Rösler, Federal Minister of Economics and Technology, speaks highly of Germany's healthcare industry, in part because over the past 10 years, the average growth of gross value added in the healthcare industry has been significantly higher than in the overall economy, but also because in Germany, many healthcare companies are world leaders in their fields

This is partly due to a policy of consistent and early health care promotion in Germany, he says, adding that German technology suppliers possess decades of valuable experience in realising healthcare projects both at home and abroad.

"The German health care industry is a powerhouse characterised by high levels of innovation, steady growth and the continuous development of employment potential," says Rösler.

Besides the U.S. and Japan, Germany is by far the most profitable health care market (EUR 408.7 billion total volume for the healthcare industry in 2007, with a 10.5% share of GDP in 2008).

Research

Germany continues its tradition of being a leader in healthcare innovation. The industry's consistent ability to turn theory into practice has played a key role in enabling this achievement.

Reliable, close cooperation between companies and scientific research facilities are the basis of this strength.

Among Germany's globally known scientific institutions are:

- The Fraunhofer Institute, including the Department of Biomedical Technology
- Helmholtz Association of German Research Centres, including a Dementia Research Centre
- Robert-Koch Institute (RKI)
- Paul-Ehrlich Institute (PEI)
- Institute for the Hospital Remuneration System (InEK)
- The Leibniz Association, including the German Diabetes Center, among other institutes

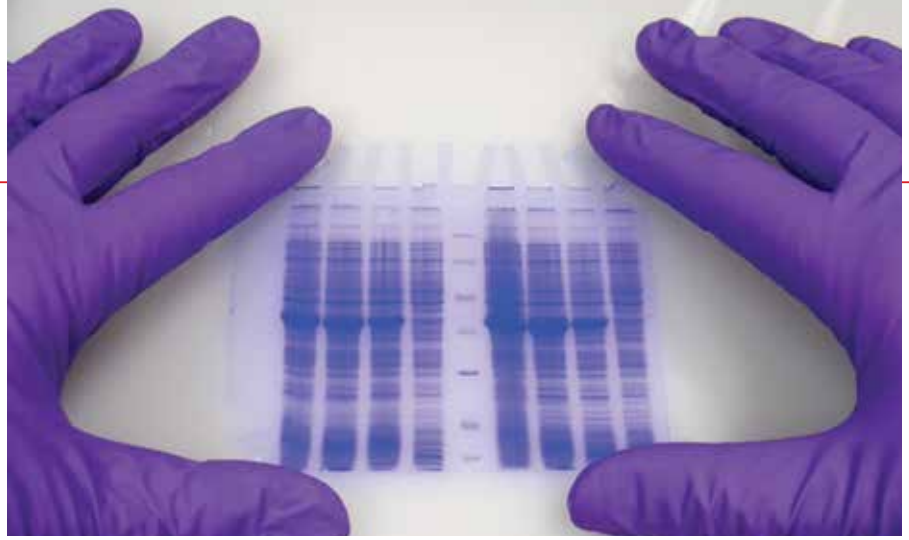
The private healthcare sector has significant support from the Government. This is manifested in a number of government initiatives, notably the Federal Government's "High-Tech Strategy" to promote innovation in the areas of biotechnology, pharmaceuticals and medical technology.

From 2006 to 2009, the Government made available a total of EUR 1.23 billion as part of this initiative.

An example of an 'innovation alliance' achieved within the framework of the High-Tech Strategy is the "Molecular Imaging for Medical Engineering" alliance formed by Bayer Schering Pharma, Boehringer Ingelheim Pharma, Carl Zeiss, Karl Storz and Siemens. This alliance has set its sights on creating new diagnostic agents and imaging procedures for clinics and the development of pharmaceuticals. Molecular imaging technologies offer an opportunity to detect diseases earlier and this alliance is expected to improve current procedures of medical imaging and therapy control. The research budget totals approximately EUR 900 million, including EUR 150 million of Federal funding.

Numerous innovations in the German healthcare industry lead to progressively improved products and constant growth in know-how. For decades German products have been associated with high quality and are in demand worldwide. As a result, many German companies in the healthcare industry can look back on years of successful, global experience.

These companies are therefore able to custom produce equipment and technology to meet the needs of customers



on-site and tailor products to suit local infrastructure.

Germany is also a leader in healthcare technology education with some 40 German universities independently offering full-fledged courses of study in the field of medical technology.

Quality

Ensuring the quality of products and services is a priority in Germany. German products continue to be associated with quality and safety worldwide because numerous institutions in Germany oversee the safety and reliability of technologies and manufactured goods. Among the organisations that certify the safety and the reliability of products "Made in Germany" are:

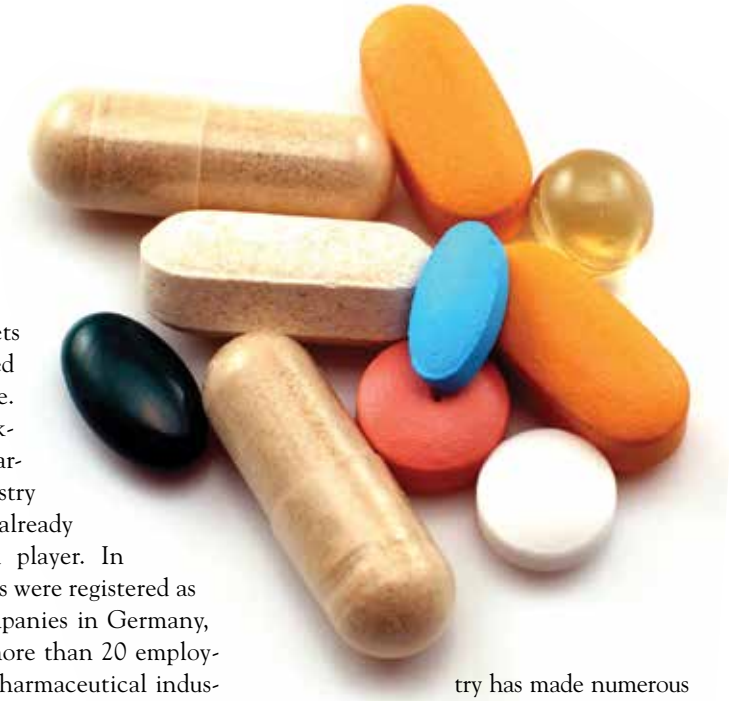
- The Medical Standards Committee (NAMed) in DIN e. V., which develops medical product and devices' standards to provide patients, users and third parties with a high level of protection, and ensures devices function as specified by the manufacturer.
- The TÜV carries out regular monitoring and issues certificates for medical and healthcare facilities (quality management and control).
- Germany complies with EU directives for development and licensing of biopharmaceuticals, and pharmaceutical and medical products.

Medical technology

Germany leads Europe as a site for locating medical technology firms – with attractive science research clusters based around Berlin and other major centres across the country. It is also the third largest producer of medical technology, after the USA and Japan.

A unique characteristic of German medical technology is that it is dominated mainly by medium-sized companies. These firms can react flexibly, meet a broad range of demands, and supply niche products for specialist applications. A significant number of manufacturers also pursue a product strategy that extends far beyond simple product provision. Integration into and compatibility with existing systems are key in this respect. After-sales provisions – including, for example, training, after-care service, and repair services – are also part of the portfolio that sets German companies apart from all the rest.

Germany's medical technology industry is still achieving strong growth and re-



mains optimistic about the future. Sales figures of some EUR 20 billion in 2010 allowed German firms in the segment to record growth of 9.4% for the year, according to the Federal Ministry of Economics and Technology.

Exports remain key to this part of the healthcare Industry. Sales to countries outside the European Union contributed particularly strongly to turnover figures for 2010. Exports to the USA increased by 14%, to China by 34%, and to Russia by 40% in that year.

Although EU countries continue to be the most important group of trading partners for German firms, Asia is well on its way to catching up. Exports to this part of the world increased by a quarter in 2010, while the figure for exports of all medical technology to this region was 17%.

Pharmaceuticals

Health care is one of the most important global growth markets that has developed in the past decade. When this began taking place, the pharmaceutical industry in Germany was already a significant global player. In 2009, 877 companies were registered as pharmaceutical companies in Germany, of which 241 had more than 20 employees. The country's pharmaceutical industry that year produced pharmaceuticals valued at EUR 26.5 billion and employed 108,230 staff. Germany exported pharmaceuticals valued at EUR 47.4 billion. In sales terms, Germany is the world's third largest pharmaceutical market.

Medical biotechnology

The medical biotechnology industry covers an enormous range of products and services. The German medical biotechnology industry has made numerous innovations that have set global standards. The German biotech industry is a major driving force in Europe, both in terms of corporate representation and capacity to generate new, profitable intellectual property.

In 2010, the German biotechnology sector comprised 538 dedicated biotechnology companies, which employed 15,480 staff. 46.5% of the biotechnology companies based in Germany develop new drugs

or diagnostic methods in the areas of human and animal medicine.

The German medical biotechnology sector is dominated by the production of biopharmaceuticals (such as antibodies), the manufacture of which is among the most demanding within the area of genetic technology. In addition to their use for making therapeutic drugs, DNA/RNA technologies also play a key role in genetic therapies and regenerative medicine as well as in medical biotechnology itself.

In 2010, 516 biopharmaceuticals were in Phase I-III clinical trials. Of these, monoclonal antibodies dominated, with 242 projects. Most of these antibodies were for treating tumours. Oncologic biopharmaceuticals accounted for a total of 37% of all new biopharmaceuticals then in a clinical trial stage or licensing process.

The German biopharmaceuticals' market grew by 12% from 2009 to 2010. That makes Germany number two in biotechnologically manufactured drugs – second in the world only to the USA. And other branches of biotechnology are growing continually as well.

German products are popular worldwide due to constantly increasing quality in development and production. This is reflected in the German market for biopharmaceuticals, which had sales of EUR 5.2 billion in 2010, an increase of 10% on the preceding year (EUR 4.7 billion).

Health-related services

Health-related services cover a wide range of different products: From construction of hospitals, to training of skilled medical personnel and beyond, to hospital management and supply. Health-related services subsume auxiliary services for the healthcare industry.

The German healthcare industry is in a position to assist foreign healthcare systems in their efforts to supply their own citizens and visitors with the highest level of integrated support and care services. At the same time, the German healthcare industry can tailor healthcare modules to suit the geographic, social and economic needs in any type of environment (urban, rural).

Germany possesses vast know-how in hospital construction and management, the education of healthcare workers, and the provision of turnkey projects. It is well positioned to export these services all over the world. MEH

German healthcare milestones

- 1710: Berlin's Charité hospital is founded. In 2003, the medical faculties at Berlin's Humboldt University and the Free University were merged and are now called Charité - Universitätsmedizin. The merger has made Charité one of Europe's largest university hospitals.
- 1810: Samuel Hahnemann published the first book on homeopathic medicine.
- 1850: Hermann von Helmholtz invented the ophthalmoscope, paving the way for the development of modern ophthalmology.
- 1854: Physiologist Karl von Vierordt developed the sphygmograph to measure arterial pulse.
- 1882: Robert Koch identified the pathogen that causes tuberculosis.
- 1895: German physicist Wilhelm Conrad Röntgen discovered x-rays.
- 1897: Chemist and pharmacist Felix Hoffmann succeeded in manufacturing a chemically pure, stable form of acetylsalicylic acid. Aspirin was born.
- 1901: Emil von Behring discovered the antitoxin for one of the most dangerous childhood illnesses of the 19th century, diphtheria. On the basis of von Behring's work, Paul Ehrlich succeeded in vaccinating people against the disease.
- 1903: German surgeon Ferdinand Sauerbruch develops the differential pressure chamber, making lung surgery possible.
- 1924: Using an artificial kidney, internist Georg Haas carried out hemodialysis for the first time.
- 1929: Hans Berger developed electroencephalography (EEG), a technique and device for measuring brain waves.
- 1957: Carl Zeiss - working in cooperation with Gerd Meyer - developed the xenon light photocoagulator, the predecessor of the optical laser.
- 1962: Dr Bernd Braun invented the first intravenous catheter, the Braunüle B. Braun.
- 2008: Harald zur Hausen is awarded the Nobel Prize in Medicine for the discovery of the role of papilloma viruses in causing cervical cancer – the 16th Nobel Prize in Physiology or Medicine awarded to a German researcher.

NLST: CT detects twice as many lung cancers as x-ray at initial screening exam

Physicians have more information to share with their patients about the benefits and risks of LDCT lung cancer screening following the 22 May 2013 publication in the *New England Journal of Medicine* of the results of the first (of three planned) annual screening examinations from the NLST (National Lung Screening Trial).

"For a cancer screening to work, it's important to verify that it can in fact discover cancers early. The analysis of NLST participants' initial annual screening examination provides evidence that the number of early-stage cancers detected in the trial's CT arm were significantly greater than the number detected in the chest X-ray arm," says Timothy Church, Ph.D., a biostatistician and professor in the School of Public Health at the University of Minnesota who has been involved with the NLST's design, implementation and analysis. Church also points out that a reduction in mortality is the ultimate indicator of a successful cancer screening strategy.

The NLST is a large-scale, longitudinal clinical trial that randomized over 53,400 study participants equally into either the LDCT or standard CXR arm to evaluate whether lung cancer screening saves lives. Published results (*NEJM*; 2011) reported a 20% reduction in lung cancer deaths among study participants (all at high risk for the disease) screened with LDCT versus those screened with CXR.

The authors report that the NLST initial-screening results are reflective of other large trials with regard to positive LDCT versus CXR results, with more positive screening exams [7191 vs. 2387, respectively], more diagnostic procedures [6369 vs. 2176, respectively], more biopsies and other invasive procedures [297 vs. 121, respectively], and more lung cancers seen in the LDCT arm than in the CXR arm during the first screening round of NLST [292 vs. 190, respectively]. Although these results were generally anticipated, a key reason to publish the data was to document the exact differences between the two arms.

"Although we did see that CT resulted in referring more patients for additional testing, the question comes down to whether the 20% reduction in mortality is worth the additional morbidity introduced by screening high-risk patients," says Church. He notes that although there were more follow-up procedures in the LDCT versus

the CXR arm, it was encouraging to confirm that the number of individuals who actually had a more invasive follow-up procedure was quite small.

Another encouraging result reported is the high rate of compliance in performing the LDCT examination as specified in the research protocol across the 33 imaging facilities that carried out the study. "The sites complied with the low-dose CT imaging protocol specifications in 98.5% of all studies performed, which is outstanding considering the many thousands of scans performed," states Denise R. Aberle, M.D., the national principal investigator for NLST ACRIN and site co-principal investigator for the UCLA NLST team. Aberle, a member of the UCLA Jonsson Comprehensive Cancer Center, professor of Radiology and Bioengineering and vice chair for Research in Radiology at UCLA, also emphasizes that the first-screen result strongly suggests that CT lung cancer screening programs with radiologists who possess similar expertise and interpret similar numbers of CT cases that are obtained on scanners of the same caliber or better as those required for the NLST are likely to have results similar to those reported in the paper.

"What we've learned from the analysis of the first-screen results provides clinicians additional facts to discuss with patients who share similar characteristics as the NLST participants (current or former heavy smokers over the age of 55)", says Church. "The results also caution against making blanket lung cancer screening recommendations, because each person's trade-off between the risk of having an unnecessary procedure and the fear of dying of lung cancer is uniquely individual."

"[This study] represents the type of immensely important data NLST will continue to provide about lung cancer screening in the United States," says Mitchell J. Schnall, M.D., Ph.D., ACRIN Network Chair, group co-chair of the ECOG-ACRIN Cancer Research Group and chair of the Radiology Department of the University of Pennsylvania. "I congratulate the NLST team on its ongoing effort to continue to mine information from the NLST trial to help guide patient, clinician and health care policy decisions." MEH

Minimal dose CT superior to chest x-ray for detection of recurrent lung cancer

Lung cancer is associated with very high mortality, in part because it is hard to detect at early stages, but also because it can recur frequently after surgical removal. The question arises as to what is the best way to follow lung cancer patients after surgery in order to spot problems early enough, before symptoms become obvious, so that patients may still be eligible for new interventions. In this study presented at the 93rd AATS (American Association for Thoracic Surgery) Annual Meeting, investigators from the University of Toronto departments of Thoracic Surgery and Diagnostic Radiology show that minimal dose computed tomography (MnDCT) of the thorax offers much greater sensitivity at detecting new or recurrent lung cancer, with equivalent amount of radiation, compared to conventional chest x-rays.

"Up to a few years ago, we were using chest x-rays to monitor patients after surgery for lung cancer, but this follow-up was ineffective, and many patients still died of recurrent lung cancer," comments lead investigator Waël C. Hanna, MDCM, MBA, of the Department of Thoracic Surgery at the University of Toronto. "While CT scans can effectively be used to monitor lung cancer after surgery, there was significant concern about the large amount of radiation that will be delivered to patients, and standard dose CT scans were not used routinely in the follow-up of lung cancer. More recently, new technology allowed us to develop MnDCT."

As reported in this study, the majority of new or recurrent cancer was detected by MnDCT at a subclinical, intrathoracic stage, within two years of surgery. This allowed for the delivery of curative treatment in the majority of patients with asymptomatic cancer and was associated with long survival.

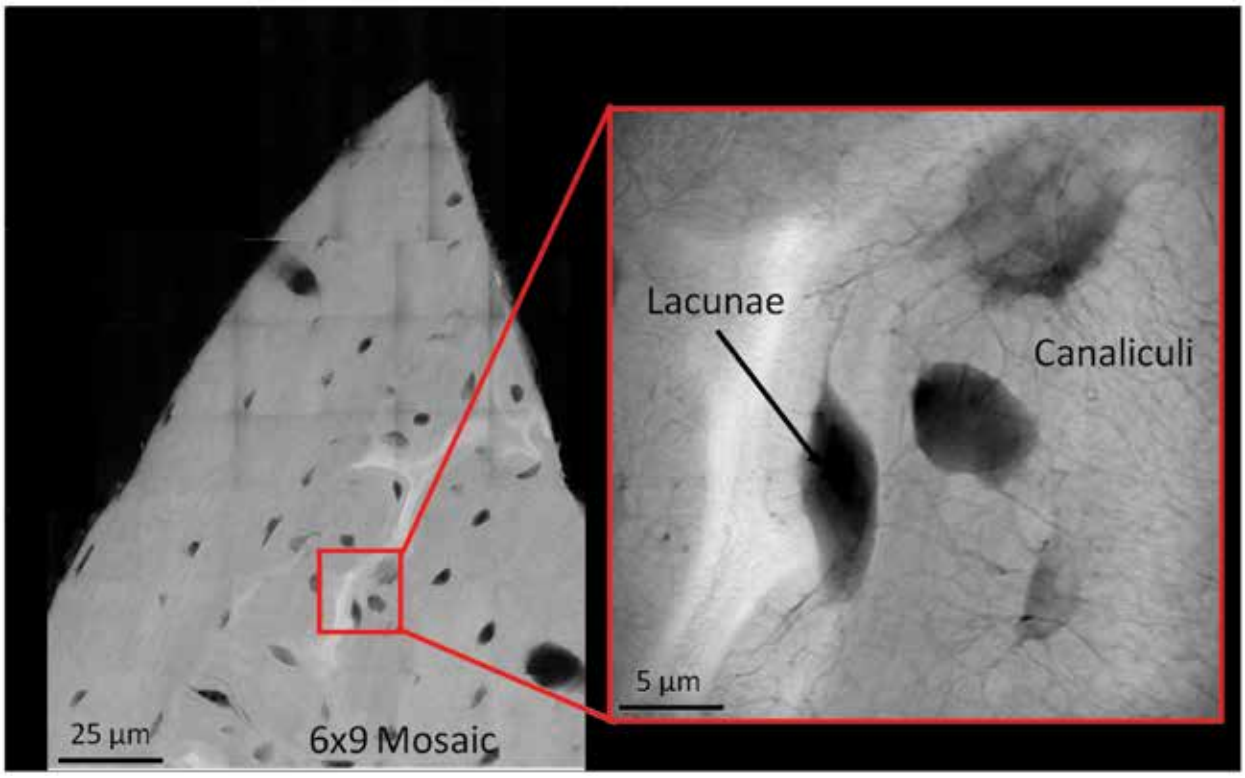
The study followed 271 patients with lung cancer (80% Stage I, 12.5% Stage II) who underwent curative resection of lung cancer. Repeated imaging occurred at 3, 6, 12, 18, 24, 36, 48 and 60 months using both standard chest x-rays and MnDCT.

Investigators found that MnDCT detected 94% of recurrent cancers compared to only 21% with standard x-rays ($p<0.0001$). Importantly, the recurrent lung cancer was detected at a much earlier stage, allowing patients to possibly undergo another curative surgery.

Detection of a new or recurrent cancer in asymptomatic patients led to further surgery or radiation for 75.5%, while palliative treatment was recommended for the remainder of patients. Survival in the treated group was significantly longer than those who were treated with palliative intent (69 months vs. 15 months, $p<0.0001$).

"MnDCT offers the best of both worlds: on the one hand it allows for precise imaging close to what is produced from a standard CT scan, and on the other hand it only delivers a small amount of radiation which is comparable to what a regular x-ray would deliver and much less than a standard dose CT scan," says Dr Hanna. "More importantly, now we can detect recurrent lung cancer at a much earlier stage, allowing patients to possibly undergo another surgery, and live longer, healthier lives."

The study did find that MnDCT results produced a high rate of false positives, and the need for surgeons to be alert to this limitation in order to make correct clinical judgments regarding follow-up treatment. MEH



Representative TXM absorption contrast image (acquired at 7.1 keV) illustrating lacunae and canaliculi present in rat cortical bone (slices 50 microns thick) with grey areas indicating bone, and black areas indicating background, lacunae and canaliculi. Left figure, 6×9 mosaic of low resolution images; right figure, single high resolution image of region. No staining is present in this image; grey-scale variation represents attenuation differences in the tissue.

Illuminating fractures: X-ray imaging sheds new light on bone damage

From athletes to individuals suffering from osteoporosis, bone fractures are usually the result of tiny cracks accumulating over time – invisible rivulets of damage that, when coalesced, lead to that painful break.

Using cutting-edge X-ray techniques, Cornell University researchers have uncovered cellular-level detail of what happens when bone bears repetitive stress over time, visualizing damage at smaller scales than previously observed. Their work could offer clues into how bone fractures could be prevented.

Marjolein van der Meulen, professor of biomedical engineering, led the study published online March 5, 2013 in *PLOS One* using transmission X-ray microscopy at the Stanford Synchrotron Radiation Lightsource, part of the SLAC National Accelerator Laboratory.

Using the high-energy hard X-rays at SLAC's synchrotron, the researchers produced images of damage in sheep bone at a resolution of 30 nanometers – several times better than standard imaging via X-ray microcomputed tomography, which is at best 2-4 microns in resolution. (A nanometer is one-billionth of a meter. For comparison, the width of a human hair is about 70 microns, or 70,000 nanometers.)

"In skeletal research, people have been trying to understand the role of damage," said van der Meulen, whose research is called mechanobiology – how mechanics intersects with biological processes. "One of the things people have hypothesized is that damage is one of the stimuli that cells are sensing."

The inability of cells to repair microdamage over time ultimately contributes to the failure and breaking of bone, van der Meulen said. Until now, visualization techniques of microdamage were limited to lower resolution images. More detailed bone features, such as the small spaces called lacunae, where cells reside, and the microscopic canals between them, called caniliculi, were not visible.

The imaging involved special preparation of sheep bone samples led by graduate student and first author Garry Brock. First they cut 2 mm square matchstick-like samples.

The matchsticks were "damaged" in the lab at various levels: Some received 20,000 cycles of "loading" in bending; others received a single dose of loading; and others were notched before loading. All samples were treated with a lead-uranyl acetate X-ray negative stain that seeps into porosity caused by damage in the bone tissue. Then sections from the loaded segment were polished to 50-micron thicknesses.

A greater amount of stain was seen in sections subjected to repetitive stress. But instead of seeing new surfaces formed by damage, or cracks, as was expected, the researchers observed damage in the cellular structures. The ▶

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X-rays picked up the dye within existing, intact structures, like the lacunae where the cells sit, and in the caniliculi.

"The tissue is not breaking, but rather, there is staining within the cells," Brock said.

Added van der Meulen: "We were surprised by how cell-based the staining was, as opposed to forming lots of new surfaces in the material."

In osteoporotic individuals, including many postmenopausal women, fractures usually occur in the forearm, spine and hip. van der Meulen's team is trying to understand why these fractures occur by studying nano- and microscale changes in bone tissue.

They are also exploring the possibility of studying whether a class of osteoporosis drugs called bisphosphonates, which reduce the overall rate of hip fractures but can lead to "atypical femoral fractures," affect nanoscale damage processes. These unusual fractures occur at sites that normally do not fracture with osteoporosis such as in the middle of the bone shaft. The new damage visualization method could lend new insights in future studies.

● **doi:**10.1371/journal.pone.0057942 MEH

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AlluraClarity's low X-ray dose settings are a radical new development in the healthcare industry that will help clinicians to better manage their patients' and their own exposure to X-ray radiation. This achievement is the result of a multi-year development programme that formed part of Philips' continuous investment in healthcare R&D, totalling EUR 803 million in 2012.

Philips' AlluraClarity was commercially introduced outside the US in mid-2012, and since then more than 200 systems have been ordered.

"All patients treated via X-ray guided interventions benefit from the advantage of low radiation exposure, but it is especially important when you are treating patients who have to undergo lengthy and complex procedures," explained Dr Marco van Strijen, interventional radiologist at the St Antonius Hospital Utrecht/Nieuwegein, the Netherlands. "We have been using Philips' AlluraClarity system for more than a year now and have really grown to appreciate the low dose settings. This technology is making a difference where it really matters."

Gene Saragnese, CEO Imaging Systems at Philips Healthcare, said: "The transition from highly invasive surgical procedures to minimally-invasive image-guided therapies, with all their intrinsic patient benefits, is a transformation in the delivery of healthcare that is rapidly accelerating around the globe.

"It is an area where technology innovation and procedure innovation go hand in hand. AlluraClarity is a perfect example of how Philips' close collaboration with clinical partners has combined these two areas of innovation to facilitate more advanced treatment while at the same time managing radiation dose." MEH

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An analysis of the health status of the United Arab Emirates: the 'Big 4' public health issues

By Tom Loney, Tar-Ching Aw, Daniel G. Handysides, Raghib Ali, Iain Blair, Michal Grivna, Syed M. Shah, Mohamud Sheek-Hussein, Mohamed El-Sadig, Amer A. Sharif and Yusra El-Obaid

Background: The United Arab Emirates (UAE) is a rapidly developing country composed of a multinational population with varying educational backgrounds, religious beliefs, and cultural practices, which pose a challenge for population-based public health strategies. A number of public health issues significantly contribute to morbidity and mortality in the UAE. This article summarises the findings of a panel of medical and public health specialists from UAE University and various government health agencies commissioned to report on the health status of the UAE population.

Methods: A systematic literature search was conducted to retrieve peer-reviewed articles on health in the UAE, and unpublished data were provided by government health authorities and local hospitals.

Results: The panel reviewed and evaluated all available evidence to list and rank (1_highest priority) the top four main public health issues: 1) Cardiovascular disease accounted for more than 25% of deaths in 2010; 2) Injury caused 17% of mortality for all age groups in 2010; 3) Cancer accounted for 10% of all deaths in 2010, and the incidence of all cancers is projected to double by 2020; and 4) Respiratory disorders were the second most common non-fatal condition in 2010.

Conclusion: The major public health challenges posed by certain personal (e.g. ethnicity, family history), lifestyle, occupational, and environmental factors associated with the development of chronic disease are not isolated to the UAE; rather, they form part of a global health problem, which requires international collaboration and action. Future research should focus on population-based public health interventions that target the factors associated with the development of various chronic diseases.

Background

The United Arab Emirates (UAE) is a country composed of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, and Umm Al-Quwain), formed in 1971, and is located in the southeast of the Arabian Peninsula[1]. Since the discovery of oil, the UAE has experienced significant economic and industrial growth, particularly in the petroleum, aviation, maritime, construction, and health care industries[2]. Several mega-projects exemplify the industrial progress over the past 10 years, including the construction of the world's tallest building (Burj Khalifa) and largest shopping complex (Dubai Mall), Jebel Ali Port and Free Zone, Dubai International Airport, and numerous artificial islands: Yas Island, Palm Dubai, and a man-made archipelago called The World. In addition, the UAE has an expanding manufacturing base with aluminium, steel, iron, and textiles contributing significantly to exports.

Population growth and demographics of the UAE

Population growth is the product of natu-

ral growth (births minus deaths) and growth from net migration[3]. Migrant workers are recruited from all over the world to satisfy the manpower demands of the fast-paced economic and industrial developments in the UAE[4].

Consequently, the UAE population has increased substantially over the past four decades, and this is primarily due to the high net inward migration of expatriate workers (population estimates: 287,000 in 1971, 4.1 million in 2005, 8.3 million in 2010)[5]. Indeed, mass recruitment of migrant workers has created an unusual population structure, with the total UAE population composed of approximately 11% (950,000) Emiratis, and the rest expatriates of varying nationalities[6]. Similarly, the total population of Abu Dhabi (the largest emirate in the UAE) is estimated to be 2.3 million, with over half of the population being expatriate males aged 20- 59 years[6].

As a result of expatriate workforce recruitment for industrial projects, males outnumber females 3:1 in the overall UAE population (nationals and non-nationals); however, there are approximately equal numbers of male and female UAE nationals[3]. Among non-nationals, the ratio of males to females is 3.7:1 due to the imbalance between the number of expatriate males employed in construction compared with migrant females working in hospitality, health care, or domestic service[3]. Principally, there is an apparent distribution of migrant workers by nationality; construction workers and manual labourers tend to be from the Indian subcontinent; middle managers and health care workers from the Philippines, India, and neighbouring Arab countries; and senior management and consultants from the UAE, Europe, North America, and Australasia. As such, the UAE is composed of a multinational population, with varying educational backgrounds, religious beliefs, and cultural practices, which pose a challenge for population-based public health strategies.

The primary aim of this article was to utilise secondary data from existing peer-reviewed journal publications and reports of government agencies and related health organisations to comment on the key public health issues in the UAE.

Methods

Materials and methods

The following method was used to obtain secondary data from existing peer-reviewed journal articles and reports of government agencies and related health organisations:

(1) systematic search of the published literature, using defined keywords;

(2) through personal contact with senior health officers at health authorities, government agencies, and local hospitals; and

(3) from publications/reports by health authorities, government agencies, and local hospitals.

Literature search strategy

A systematic literature search was conducted to retrieve peer-reviewed scientific and medical journal articles on health in the UAE. Electronic databases (MEDLINE [accessed by PubMed], EMBASE, PsycINFO) were searched covering the period from 1950 to January 2012, utilising a combination of the following MESH terms, free-text words, and entry terms – 'health, public health, morbidity, mortality, diabetes, overweight, obesity, population, United Arab Emirates'. The literature search was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines[7], which stipulate the components (e.g. multiple data sources, unpublished) associated with a high-sensitivity search strategy. In addition, references of published studies were searched manually for pertinent articles and national/local health authorities (e.g. Health Authority Abu Dhabi) were contacted for annual statistics and data. Sources of unpublished data included personal communication with senior health officers at the Health Authorities of Dubai and Abu Dhabi, the UAE Ministry of Health, publications produced by local hospitals (e.g. the cancer registry of Tawam hospital in Al-Ain, Abu Dhabi), and in-house data collected from various on-going faculty, staff, and student research projects.

Eligibility criteria

Eligible studies included only empirical research papers that were relevant to the health status of the UAE.

Exclusion criteria were:

(1) studies that highlighted the UAE in the abstract but subsequently pooled data to produce estimates for the Gulf Region or the Gulf Cooperation Council (GCC) states (i.e. Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE);

(2) articles that were not available in English; and

(3) duplicate publications or sub-studies of included articles. The systematic literature search yielded a total of 185 citations and 179 abstracts. Table 1 summarises the findings from the literature retrieval.

Photo: Callan Emery

Data extraction and synthesis

Phase one of data extraction and synthesis (DEaS) entailed one investigator (who was not blinded to authors, institutions, or journals) reviewing and evaluating the titles and abstracts of retrieved articles. Abstracts that did not provide enough information about whether the publication contained suitable and relevant information about the health status of the UAE were retrieved for full text evaluation. Phase two of DEaS involved collating the research articles into 20 specific health topics (presented in Table 1).

Phase three of DEaS required a panel of medical and public health specialists from the College of Medicine and Health Sciences, UAE University and government health agencies to convene and review the evidence for the 20 specific health topics and select the four priority public health areas for the UAE. This phase employed an iterative and inductive process, which involved the panel reviewing, discussing, and re-reviewing the evidence for each health topic until consensus was reached on the four most important public health issues for the UAE.

Phase four of DEaS used a review and rank exercise, which involved the panel evaluating the available evidence for each of the four public health areas and ranking them in order of priority (1-highest priority). The four selected public health priority areas were:

(1) cardiovascular disease;

(2) injury (including road traffic, child, and occupational injuries);

(3) cancers; and

(4) respiratory disorders

Following the review and rank exercise, medical and public health experts from each of the four identified public health priority areas were invited to produce a brief statement on the conditions in relation to the current health status of the UAE population, and to produce recommendations for improving health.

Table 1. Summary of citations and abstracts retrieved from literature search

	Citations	Abstracts
Overall	185	179
Mortality	6	5
Paediatric	2	2
Adult (Female/materna)	2	1
Environmental	2	2
UAE general health	6	5
Primary health care	1	1
Public health	3	2
Labour migration and expatriates	2	2
Injury	16	16
Traffic	8	8
Paediatric	3	3
Occupational	3	3
Older adult	1	1
Animal (Camel)	1	1
Neonatal and infant health	8	8
Nutrition and vitamin deficiency	3	3
Congenital anomalies	2	2
Birth weight and growth	3	3
Older adult health	2	2
Institutionalised	1	1
Community	1	1
Genetic health	14	14
UAE nationals	3	3
Consanguinity	3	3
Infant/birth defect	2	2
Blood/hepatitis	6	6
Cardiovascular health	12	12
Adult	12	12
UAE	4	4
Abu Dhabi	2	2
Al Ain	3	3
Dubai and Northern Emirates	1	1
Sharjah	2	2
Diabetes	13	13
Adult	6	6
UAE nationals only	3	3
Complications and cost	5	5
Paediatric	2	2
Metabolic syndrome	5	5
Adult	4	4
Paediatric	1	1
Overweight and obesity	15	15
Adult	6	6
Paediatric	9	9
Cancer	8	7
Adult	5	4
Paediatric	3	3

Table 1 (Continued)

	Citations	Abstracts
Chronic disease and disorders	7	6
Multiple sclerosis	1	1
Anorectal disease	1	0
Arthritis	1	1
Renal disease	1	1
Dermatitis and allergies	3	3
Respiratory disease and disorders	6	6
Adult	1	1
Paediatric	3	3
Both	2	2
Blood disorders	5	5
Adult	1	1
Paediatric	3	3
Both	1	1
Infectious diseases	8	7
Intestinal parasites and bacteria	2	2
Meningitis	2	2
Hepatitis (A and C)	2	1
Tuberculosis	1	1
Antibiotic use	1	1
Oral health	7	6
Adult	1	1
Paediatric	6	5
Smoking behaviour	6	6
Adult (health professionals)	4	4
Paediatric	2	2
Physical activity and exercise	3	3
Adult	1	1
Paediatric	2	2
Mental health	21	21
Adult	11	11
Al Ain	5	5
Dubai	4	4
Sharjah	2	2
Paediatric	9	9
Older Adult	1	1
Occupational health	17	17
Noise and heat	6	6
Heavy metal exposure	3	3
Particulates and exhaust fumes	4	4
Pesticides	4	4

Results

Key health indicators of the UAE

Fertility & life expectancy in the UAE

Fertility rates, the predominant driver of population growth for nationals, have declined over the past 30 years with the total fertility rate (i.e. average number of children that would be born to a woman over her lifetime) decreasing from 4.4 to 2.4 per woman between 1990 and 2010[3].

A decline in birth rates has been attributed to urbanisation, changing attitudes about family size, and improved education and work opportunities for women resulting in delayed marriage. Life expectancy in the UAE continues to improve slowly, and the most recent estimates from 2009 report 77 and 79 years for males and females, respectively[8].

Communicable diseases in the UAE

In view of the high inward migration of expatriate workers and transient influx of tourists from all over the world, infectious diseases remain an important area for public health in the UAE. However, communicable diseases were not included in the top four public health priority areas, as the UAE is considered a high-income country (based on global economic indicators) that is deemed to have passed through the epidemiologic transition[3]. As such, the burden of infectious and parasitic diseases in the UAE is low due to improvements in the standard of living and both the quality and availability of health care services. To prevent the re-emergence or outbreaks of infectious disease, the UAE has invested significant resources into population-based control measures, such as immunisation, surveil-

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lance, and the availability of post-exposure treatment (where possible). One major public health achievement in the UAE is the success rate of the national immunisation program for children under the age of 5 years. Due to the high uptake of immunisation, the rates of childhood communicable diseases in the UAE are very low. In addition, all expatriate workers seeking employment in the UAE are screened for communicable diseases, such as tuberculosis (by chest X-ray) and human immunodeficiency virus (by serology), before acquiring residence status. Additional screening for other communicable diseases is required for certain occupational categories, such as healthcare workers, cooks, house maids, and drivers.

Public health priority area 1: cardiovascular disease

Since 1971, the UAE has experienced tremendous economic and industrial development, resulting in an increase in the affluence of the Emirati population[9] and a shift from a traditional semi-nomadic lifestyle to a modern, urbanised, and technology-driven lifestyle characterised by reduced occupational, domestic, and leisure time physical activity, coupled with the over-consumption of energy-dense convenience foods with poor nutritional content. Consequently, there has been a dramatic increase in the prevalence of obesity, diabetes, and cardiovascular disease. The World Health Organisation estimates that the burden of chronic diseases is rapidly increasing worldwide, with the largest increase in cardiovascular disease occurring in the Eastern Mediterranean Region. Indeed, the UAE has one of the highest age standardised death rates for cardiovascular disease in the world, that is, 308.9 per 100,000 for males and 203.9 per 100,000 for females. Recent mortality statistics for the emirate of Abu Dhabi in 2010 reveal that 29% of all deaths were due to cardiovascular disease[10]. In the absence of any major changes in lifestyle risk factors at a population level, these rates are set to increase further as the youthful population ages.

Public health priority area 2: injury

Injury is an important cause of morbidity, disability, mortality, and economic loss in the UAE and was the second leading cause of death for all age groups, with an average of 1,120 deaths per year, between 2000 and 2008 (11-15). The main circumstances contributing to death from injury were traffic-related injuries, followed by falls and drowning[1]. Alarmingly, injury was the leading cause of death for children under 15 years of age and accounted for 9% of mortality between 2000 and 2008[16]. An average of 104 children died each year during 2000-2008, with an incidence rate (IR) of 13.6 per 100,000 (11-15). The predominant cause of death for this age group was traffic injury (62%; IR 13.6), followed by drowning (11%; IR 1.5) and falls (10%; IR 1.5). More males were injured compared to females (male:female ratio-1.78:1[1]. Analysis of the 2010 dataset revealed that injury remained the second leading cause of mortality accounting for 17% of all deaths in the UAE[17]. The World Health Organisation estimates the traffic death rate in the UAE as 37.1 fatalities per 100,000 inhabitants per year, which is several times higher than the equivalent rates in developed Western countries, such as Australia (7.8 per 100,000 population) and the United Kingdom (5.4 per 100,000 population)[18]. Recent estimates from the emirate of Abu Dhabi report that occupational injury and occupational road traffic injuries accounted for 16% of all injury deaths in 2011[19]. Consequently, occupational health has been included in the list of top public health priorities for the Health Authority of Abu Dhabi.

Public health priority area 3: cancers

Cancer is the second leading cause of death worldwide and in all regions of the world except sub-Saharan Africa.

Historically, the UAE had a much lower incidence of cancer than Western countries; however, over the last 40 years, it has undergone a period of dramatic economic, social, and demographic change, resulting in increased life expectancy and prosperity. This epidemiological transition has led to significant increases in the incidence of all chronic non-communicable diseases, including cancer, which is now the third leading cause of death in the UAE (after cardiovascular disease and injury) causing 10% of all deaths in 2010 and 16% of all deaths in the emirate of Abu Dhabi during the same year[10].

At present, there is no national or regional population-based cancer registry in the UAE, which means there is no reliable information available on the incidence of cancer in the UAE. However, the Ministry of Health collected some cancer registration data for the UAE, which has been submitted for inclusion in the Globocan database[20] and Gulf Cooperation Council-wide cancer registry report, 'Ten Year Cancer Incidence Among Nationals of the GCC States 1998-2007,' published by the Gulf Centre for Cancer Registration[21]. Data from these two sources will be used to comment on cancer in the UAE.

The Globocan data from 2008 shows that the age-standardised rates for the incidence and mortality from all cancers in the UAE is lower compared to Western countries, such as the United States. The incidence of all cancers is projected to double by 2020, primarily due to ageing and also possibly due to increased exposure to risk factors for cancer. Breast cancer is the most common cancer among Emirati females (and the most prevalent cancer in both sexes combined), lung cancer is the most common cancer amongst Emirati males but is extremely rare in females, which reflects the prevalence of smoking (23.0% vs. 0.5%, respectively), and colorectal cancer is the second most common cancer in both sexes combined[20, 21]. However, rates for all three types of cancer are much lower than most Western countries and are also lower than in Qatar, Bahrain, and Kuwait. This is likely to be due to the younger age of the population, less exposure to some risk factors, lower levels of screening compared to Western countries, and possibly incomplete registration. Rates for all three types of cancer are also projected to double by the year 2020 as the UAE population ages, total fertility declines, exposure time to lifestyle risk factors increases, the prevalence of obesity and diabetes increases, and due to the long latency period between starting smoking and developing lung cancer. Population-based education and awareness campaigns are urgently required to increase screening rates for at-risk individuals and to facilitate early diagnosis and prompt treatment, thereby reducing morbidity and improving survival.

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Public health priority area 4: respiratory disorders

Respiratory illness can be acquired following exposure to gases, dusts, and fumes (as in occupational settings), from infectious agents, or as a result of poor ambient air quality. Occupational and environmental exposures can lead to obstructive (asthma, chronic bronchitis, and emphysema) or restrictive (pulmonary fibrosis) lung disease, or lung cancer. The UAE population is at a high risk of such exposures due to increased urbanisation, reliance on motorised transportation and traffic congestion, adverse weather conditions such as dust/sand storms, and the rapid expansion of the construction and manufacturing sectors emitting air-borne pollutants.

Respiratory infections were the second most common non-life threatening condition in the UAE in 2010, accounting for almost 15% of all encounters across all healthcare facilities[10].

The major airports in Abu Dhabi, Dubai, and Sharjah serve as important stop-over locations for individuals travelling all over the world and receive a high-volume of travellers throughout the year. In view that contact between large numbers of people increases the risk of infection transmission, the UAE population is at potential risk from 'new' respiratory infections, such as 'avian' flu and SARS (severe acute respiratory syndrome)[22].

Outbreaks of the 'traditional' respiratory infections, such as tuberculosis, are also possible, although this may be less likely with the national immunisation program and the visa screening requirement for all expatriate workers in the UAE.

Recommendations

Surveillance and monitoring

Reliable and valid longitudinal data are essential for planning population-based public health programs. As such, several areas have been identified where improvements in coordination and cooperation between different agencies of the seven emirates in the UAE will produce national datasets permitting the analysis of the magnitude and trends in occurrence of specific diseases. In addition, the establishment and continuation of several public health initiatives in the UAE should be resourced adequately.

Examples include:

(1) a National Cancer Registry accredited by the International Agency for Research on Cancer;

(2) a cross-emirates Injury Registry and Surveillance Scheme;

(3) a National Genetic Disorders Registry;

(4) notification of Communicable Diseases with data from microbiology laboratories;

(5) improvements in death certification and registration of births; and

(6) development of laboratories to aid the recognition of specific diseases, and the analysis of environmental and/or biological samples for exposure to workplace or environmental hazards.

Research

Research funding should be directed toward investigating the association between lifestyle and personal risk factors that are prevalent in the UAE (namely physical inactivity, unhealthy dietary practices, smoking, obesity, vitamin D deficiency, and parental consanguinity) and the development of chronic disease, such as diabetes, cardiovascular disease, and cancer. High-quality epidemiological research will provide the foundations for the development of experimental studies and clinical trials investigating the efficacy and effectiveness of various public health interventions on reducing the risk factors associated with chronic disease. Community- and school-based intervention programs focusing on increasing physical activity, improving dietary practices, increasing safety restraint use, and reducing tobacco consumption are urgently required to slow the trajectory of the estimated mortality rates due to cardiovascular disease, injury and cancer, particularly in the young population ranges.

Training, education, and federal legislation

Training

Sufficient numbers of trained health professionals are required to improve the health status of the UAE. At present, there is a shortage of specialist physicians in fields, such as histopathology, oncology, occupational medicine, and infectious diseases, which hamper efforts for improving the health status of the UAE population.

There are already developments in place by universities and health organisations to facilitate and improve the training of clinical and public health specialists in the UAE. The key personnel are not necessarily restricted to those directly involved in curative care or prevention. For example, engineers may be better placed to improve road safety, and reduce occupational and environmental hazards. Similarly, health education and health promotion specialists are essential for campaigns focussing on the adoption of healthy lifestyles.

Education

Increased focus should be placed upon improving population health through primary prevention involving health education and awareness programs. Examples include health education activities for the reduction or cessation of tobacco use, promotion of safe driving, and compliance with safe systems of work. Currently, there is a lack of workplace health and safety programs focusing on health education, safety awareness, and training. Such programs have the potential to reduce occupational related morbidity and mortality when supported by UAE federal legislation and regulations. Finally, encouraging full uptake of immunisation is another specific health protection measure that will further enhance the health status of the UAE population.

Federal legislation

Legislation and standards for compliance to public health measures should be reviewed and revised periodically. Some aspects of UAE law and ministerial orders (e.g. requirements for health screening for new workers to the UAE, labour law) may benefit from cyclical reviews to ensure they are aligned with current concerns and international standards. Finally, a dual-pronged approach encompassing educational efforts coupled with federal legislation and enforcement should be adopted for certain public health issues, such as mandatory seat belt use for rear seat passengers, child safety restraints, and maximum working hours for professional drivers, to reduce the mortality attributable to traffic-related deaths.

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Conclusion

A number of public health issues, particularly noncommunicable diseases, significantly contribute to morbidity, mortality, and economic losses in the UAE. In view of the population demographics of the UAE, future national population-based public health initiatives should consider the sociocultural, religious, ethnic, and educational diversity of the UAE in the design, development, and implementation of campaigns, interventions, and strategies. The major public health challenges posed by certain personal, lifestyle, occupational, and environmental factors associated with the development of chronic diseases are not isolated to the UAE; rather, they form part of a global health problem, which requires international collaboration and action.

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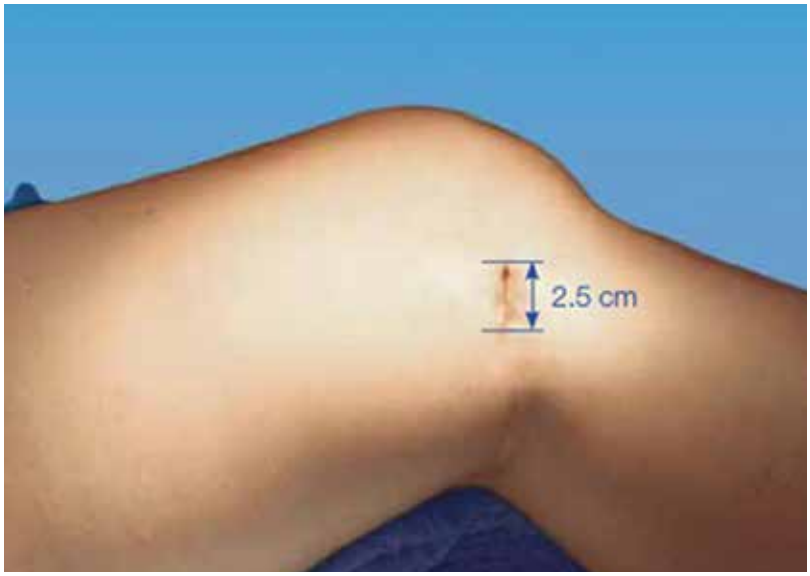
Endoscopic vessel harvesting (EVH) – a minimally invasive approach

By Dr Zubin Nalladaru



Introduction

The greater saphenous vein (GSV) is a commonly used conduit for coronary revascularizations. Traditional vein harvesting uses long incisions that can lead to significant morbidities. Depending on the required graft length, the average incision will vary between 20 and 40 centimeters. The morbidity associated with these long incisions include increased incidence of wound complications, pain, delayed mobilization and inferior cosmetic results.

A minimally invasive technique has been developed that allows the harvest of the greater saphenous vein with one incision and less morbidity. Endoscopic vein harvesting (EVH) is done through a small 3 cm incision just under the medial aspect of the knee. The entire SVG can be harvested through this small incision. An endoscope is connected to a video camera and inserted into the incision, providing the surgeon with the view needed to find the vessel. He then creates a working tunnel in order to remove the vessel with minimal stress on the leg.

Comparison of EVH with the open technique

Noninfectious healing disturbances

Analysis of randomised controlled trials showed a significant reduction of noninfectious wound healing complications (wound drainage, haematoma, oedema, dehiscence, necrosis, need for surgical debridement, and seroma formation) from 13% in open vein harvest to 4% after EVH. Diabetes, hyperlipidemia, obesity, female gender, advanced age, and peripheral vascular disease are known risk factors for wound healing disturbances after open GSV harvest. Research has however shown that particularly these high-risk patients benefit most from minimally invasive harvest techniques. For example, in patients with diabetes and obesity no additional risk of wound healing disturbances can be found anymore if EVH is used.

Wound infections

EVH reduces the number of donor-site infections because it causes less trauma to the surrounding tissue, preserves tissue perfusion, and is less likely to create vital tissue flaps. Studies have shown that the overall wound infection rate dropped from 13% in the open harvest group to 3% in the EVH group.

Postoperative pain and mobility

Postoperative pain is significantly reduced after EVH compared to the traditional open harvest method. Patients undergoing EVH rate their experience of pain 2 points lower (on a 0–10 scale) throughout the whole postoperative period and label themselves pain-free days earlier than their counterparts that underwent open harvest. It is therefore not surprising that a number of studies show that patients undergoing EVH are able to mobilize earlier and are also more mobile at hospital discharge and 6 weeks after surgery.

Hospital length of stay (LOS)

With the reduction of wound complications and earlier mobilization of patients, it is likely that recovery time and therefore LOS is reduced.

Cosmetic results

Patients are significantly more satisfied with the cosmetic result after EVH then after the traditional harvest.

Conclusion

EVH results in -

- Small incision (3cm) – excellent cosmetic result
- Less pain
- Minimal wound complications
- Earlier mobilization
- Shorter LOS in hospital
- No compromise in the quality of graft

The Author

Dr Zubin Nalladaru works in the Department of Cardiothoracic Surgery, Mediclinic City Hospital, Dubai, UAE MEH

Roche's Diagnostics Point of Care enables quicker treatment after myocardial infarction

The history of the ambulance begins in ancient times, with the use of carts to transport incurable patients by force. Ambulances were first used for emergency transport in 1487 by the Spanish, and civilian variants were put into operation during the 1830s. Advances in technology throughout the 19th and 20th centuries led to the modern self-powered ambulances.

Emergency medical services' (EMS) medical care has changed significantly since its inception. Initially, ambulances functioned merely as transport vehicles. Today, EMS has matured into an integrated part of the healthcare system, with the ability to provide advanced care en-route to a hospital. Regional dispatch centers now decide which resources should respond to an emergency call. EMS dispatchers are trained in emergency medical dispatch techniques and can provide pre-arrival instructions to bystanders, thereby expediting initial first aid and cardiopulmonary resuscitation (CPR).

Historically, much of the medical care provided by EMS grew out of traditional practice with little scientific basis. Today, in mature EMS systems, rigorous research studies are being completed and evidence-based medicine concepts used to determine proven benefit before introduction of new procedures, drugs, and adjuncts to out-of-hospital care.

A research base for EMS practice now exists, a large component of which is related to out-of-hospital cardiac arrest (OHCA) techniques and therapies to improve survival. Current research is ongoing to evaluate the best treatment options for patients with OHCA.

Emphasis is placed on layperson education and all levels of provider courses to rapidly access the emergency system in cases of OHCA to receive appropriate treatment.

The patient (before arrest) or a witness or bystander must first recognize the problem and activate the EMS system. The more rapid this activation occurs, the more rapidly definitive care can arrive to the OHCA situation. Delays in arrival affect ultimate outcomes. Depending on the circumstances surrounding the presentation, delays can frequently occur. Cardiac arrests witnessed by bystanders or that which occur in a public area result in EMS being accessed more rapidly than in un-witnessed events

The focus of Ambulatory Care within the Roche Diagnostics Point of Care is to bring clinical decision making closer to the patient, improve workflow efficiencies for the healthcare professional and improve clinical outcomes for the patient. With the increasing incidence and prevalence of cardiovascular diseases, the need to screen and monitor patients effectively, assess risk and manage long term conditions, has also increased.

Cobas h232 systems

Roche's unique portfolio of products provides a solution to support this growing need. For the cardiac events monitoring segment, and as market leader for cardiac biomarkers testing at point of care, the range of 'Cobas' h232 systems provide accurate and precise results for the physician, therefore improving the management of hospitalization in some indications such as Atrial Fibrillation, Myocardial Infarction, Heart Failure, Deep Vein Thrombosis, and Pulmonary Embolism.

The main features that support the EMS are provided through robust instruments which are fast and easy to use (three steps for result in max. 15 min), no special preparation either for the sample or the device and supported with IR scanner as well as LIS/HIS connectivity.

It measures quantitative Troponin-T, NT-pro.BNP, D-Dimer, CKMB and Myoglobin direct from 150 UL Heparinized Venous Whole Blood.

Acute Myocardial Infarction can be a STEMI or a NSTEMI - STEMI (ST-Elevated Myocardial Infarction), the ratio for between STEMI and NSTEMI is approx. 40/60. NSTEMI patients have a higher mortality rate. NSTEMI diagnosis is done via symptoms, ECG and cardiac biomarkers, mainly Troponins.

NSTEMI patients with positive Troponin T can go directly to the PCI (percutaneous coronary intervention unit). Now with the Cobas h232 there is the potential for 41% more NSTEMI patients with positive Troponin T to go directly to PCI for early management and have a better chance of survival. Research shows that when treatment starts within less than one hour after myocardial infarction the mortality rate decreases by more than 50 % and even if the treatment starts 2 to 3 hours mortality decreases by 30% (*Boresma et al. Lancet 1996; 348: 771-5*). MEH

Liver transplantation as a treatment option for Metabolic Disorders

By **George Mazariegos,** MD, FACS

Dr George Mazariegos and patient

A paradigm shift is taking place in the treatment of severe pediatric metabolic disorders that offers liver transplantation as a therapeutic modality rather than as purely a life-saving rescue. In a revolutionary change of approach, there are good reasons for physicians and transplant surgeons to consider the use of liver transplant as a viable treatment option for medical management.

Traditionally, liver transplantation has been viewed as a life-saving versus life evolving procedure reserved for severe metabolic disorders with essentially lethal outcomes. Since the first successful liver transplant was performed in a child 40 years ago, this option has increasingly become a life-saving therapy for children with liver diseases such as biliary atresia and metabolic diseases such as tyrosinemia. The availability of medical therapy, the unpredictable nature of these diseases and the potential long-term complications of tumors or neurologic problems has led to an increased consideration for alternative treatments.

In many cases, the risk of death or disability due to inborn errors of metabolism now far outweigh the morbidity or mortality of transplant or long-term sequelae related to immunosuppression. As the risks of the procedure have decreased and there is evidence of improved post-operative outcomes, the transplantation approach as a therapeutic modality for a wider variety of metabolic diseases is becoming more and more attractive to pediatric patients and their families.

Transplantation is considered curative for many metabolic disorders as patients can immediately discontinue a protein restricted diet and are protected from catabolic crisis. Often, patients see a stabilization of neurological function, which greatly reduces or eliminates the risk of strokes or death from cerebral edema. Three decades of study and outcomes by Children's Hospital of Pittsburgh of UPMC, which has performed more liver transplants for patients with metabolic disease than any other center in the world, has shown that several metabolic diseases can be cured or improved through transplantation, and further study is warranted for numerous other metabolic diseases.

On the list of metabolic diseases that can be cured are maple syrup urine disease (MSUD) and urea cycle disorders. Diseases that can be improved through transplantation include mitochondrial disease, propionic academia, and methylmalonic academia. Other diseases that are being studied for further consideration are glycogen storage disease, and phenylketonuria (PKU) for hepatocyte transplantation.

One of the most encouraging outcomes can be seen in the treatment of MSUD. Caused by mutations in six loci responsible for encoding the branched-chain alpha-ketoacid dehydrogenase complex, this disease affects the body's ability to break down the valione, leucine and isoleucine amino acids causing an accumulations of metabolites in urine, sweat and ear cerumen. A sweet, maple syrup smelling odor resonates as a result of these metabolites. Traditionally, pediatric patients were placed on a diet restricted in amino acids and treated with dietary supplements. However, during times of illness or psychological stress, patients can experience metabolic decompensation that can lead to life-threatening cerebral edema.

A team of physicians at Children's Hospital of Pittsburgh developed a protocol assessing children with classic MSUD for consideration of liver transplantation in the safest way possible. The transplant of a new liver supplies sufficient enzyme activity to metabolize unrestricted protein diets and maintain branch chain amino acid homeostasis. A genetically normal liver can also correct metabolic balance in other organs.

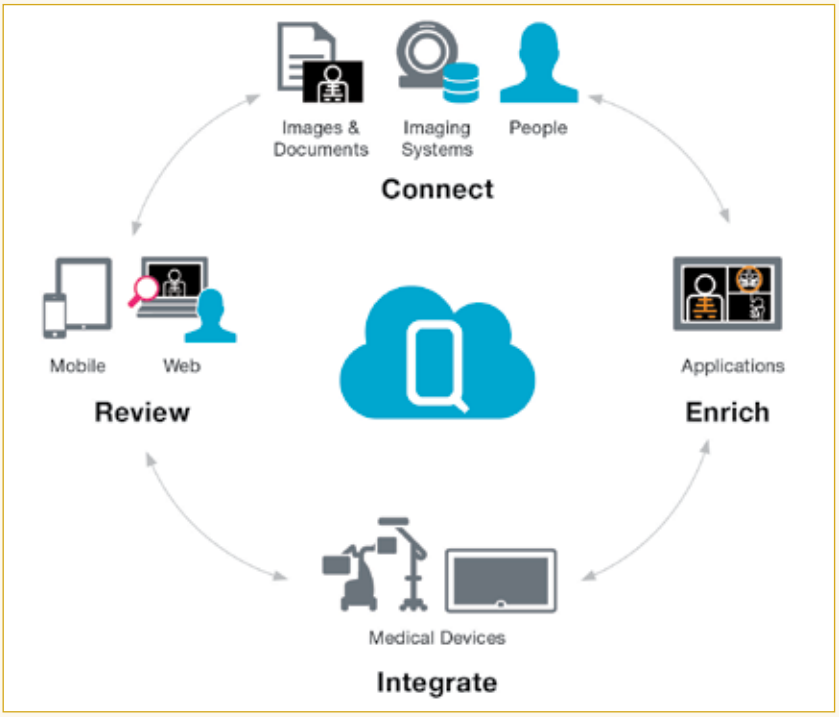
Since the inception of the protocol, more

than 50 children and young adults have been successfully transplanted at Children's Hospital. The results have been impressive with all of the patients experiencing normal liver function and enjoying an unrestricted diet. Amino acid profiles normalized within a few hours post- transplant and have remained so despite advancing to a regular diet of unrestricted protein.

Liver transplantation may also prove to be a cost effective therapy for MSUD and other metabolic diseases that may reduce the long-term cost associated with medical care and treatment for acute metabolic decompensation. Most importantly, the uncertain risk of a devastating neurologic complication can be prevented with a successful liver transplant.

These early results are encouraging and support the role of liver transplantation as a treatment option for children; not just as a last resort for metabolic rescue, but as a robust decision in variety of diagnoses. With operative mortality now at near zero, improved outcomes and increased knowledge of metabolic disease, and an increase in the range of disorders suitable for this approach, there is good reason to consider embracing the paradigm shift of transplantation beyond metabolic rescue to a viable therapeutic option worthy of consideration by physicians and families alike.

● **George Mazariegos**, MD, FACS, is the director of Pediatric Transplantation at Children's Hospital of Pittsburgh of UPMC. He is professor at the University of Pittsburgh in the departments of Surgery, Anesthesiology, and Critical Care Medicine and holds the Jamie Lee Curtis Chair in Pediatric Transplant Surgery. Dr. Mazariegos joined Children's Hospital in 1997 and specializes in the treatment of children with liver and/or intestinal disease that require transplantation. His research interests include transplant tolerance, immunosuppression withdrawal or minimization, and optimizing long-term transplant outcomes. Dr. Mazariegos has served or serves in several regional, national, and international leadership capacities. He is currently Vice Chair of Studies in Pediatric Liver Transplantation (SPLIT), an international registry of pediatric liver transplantation and Councilor for the International Pediatric Transplant Association and for the Intestinal Transplantation Association. Email: *george.mazariegos@chp.edu* MEH



Brainlab releases Quentry mobile app

Quentry is designed to protect all its data from security breaches and malicious attacks. The sophisticated security measures and architecture implemented for Quentry meet both HIPAA and HITECH requirements for PHI (Protected Health Information) and are designed in accordance with European Union Data Protection Directives.

In addition to the web portal (*www.quentry.com*) Brainlab also offers a mobile app that allows users to securely access, review and share medical data from any existing Quentry account using an iPhone or iPad. Users can:

- View images with pan/zoom, windowing and ACS view functions
- View PDF, TXT and DOC attachments
- Share patient folders with colleagues in their Quentry network
- Provide comments and review feedback from colleagues

Quentry Mobile is available on the iTunes App Store for free download and gives physicians the freedom to access their patient information from anywhere.

"Quentry brings people, data and clinical tools together in one platform and makes the decision-making, planning and treatment processes easier in the clinical environment," says Rainer Birkenbach, Executive Vice President at Brainlab.

"With our Quentry Mobile App for iPhone and iPad we enable clinical users to have even more flexibility and freedom. Doctors are able to access medical images and Brainlab clinical applications from anywhere – whether they are at the patient's bedside, on-the-go or in the operating room. Not only can they access and view image data, they also have access to a suite of Brainlab cloud-based clinical applications to assist them in enriching the medical images, providing them with additional information for decision-making and planning."

● For more information, visit: *www.quentry.com*

Techniques for hip arthroscopy have evolved rapidly

By Dr Yen Yi Meng

Hip arthroscopy has become one of the fastest growing fields within orthopaedic surgery. In 1931, Dr. Michael Burman, a young resident at the Hospital for Joint Diseases in New York, wrote the first publication about hip arthroscopy. He stated that the hip does not lend itself to arthroscopy and that is impossible to visualize between the head of the femur and the acetabulum. These comments limited the evolution of hip arthroscopy for a significant period of time until the last several decades. Contributions from many of the pioneers of hip arthroscopy (e.g., Richard Villar, Thomas Sampson, Thomas Byrd, Michael Dienst, Marc Philippon and many others) have facilitated the development of safe traction and instrumentation to address hip pathology.

In the last decade, over 700 papers have been published about hip arthroscopy. Supportive evidence for the role of hip arthroscopy in treating hip pathology is growing, while the indications for hip arthroscopy are evolving. Hip arthroscopy, like other arthroscopic techniques, was initially used as a diagnostic tool and for the removal of loose bodies. With the advent of more advanced imaging techniques, such as MR arthrography, and the recognition of intra-articular sources of pain, the role of hip arthroscopy as a diagnostic tool is minimal. Hip arthroscopy has become much more of a tool for treating pre-arthritic conditions in the hip. It is surmised that the number of hip arthroscopies will grow by 15% per year.

As with any relatively new orthopaedic technique, accurate diagnosis remains a key component in maximizing the clinical effectiveness of hip arthroscopy. Currently, hip arthroscopy is indicated for intra-articular and extra-articular conditions. Most commonly, the majority of patients presenting for hip arthroscopy have a tear of the acetabular labrum. On average, patients have seen 3.3 health care providers before being correctly diagnosed at an average of 21 months. In a majority of cases, patients with a labral tear present with an underlying bony morphology such as dysplasia or femoroacetabular impingement (FAI). The bony pathology must be addressed in conjunction with the labral tear; otherwise, there is a high risk of re-operation. Hip arthroscopy can be utilized to treat the bony morphology of FAI.

Acetabular labral tears are repaired using suture anchors and then refixed back to the acetabulum. Bony morphology from FAI consists of anterior acetabular overcoverage, a cam deformity of the femoral head-neck junction or a combination of both. The cam deformity can be resected reliably, whereas anterior acetabular overcoverage should be approached with slightly greater caution as aggressive over-resection may lead to instability and iatrogenic dysplasia. In addressing FAI, the chondral surface of the acetabulum and femoral head can also be evaluated, and a chondroplasty or microfracture can be performed. A synovectomy is also routinely conducted in most hip arthroscopic procedures.

In addition to pathology confined to the hip joint, endoscopy of structures around the hip joint can be addressed as well. Snapping iliopsoas and snapping iliotibial bands can be released effectively. Anterior iliac spine impingement can also be addressed by removing any excessive bone. Techniques are also evolving to treat gluteal medius tears, piriformis syndrome and proximal hamstring tendon repairs.

Boston Children's Hospital performs approximately 400-500 hip arthroscopies a year. A variety of conditions are treated including Legg-Calve-Perthes disease, slipped capital femoral epiphysis, multiple epiphyseal dysplasia, and FAI. We are on the forefront of advancement on the understanding of child and young adult hip pathology and in the treatment and preservation of the native hip joint. Further research is necessary on the long-term history of treated and untreated FAI and whether hip arthroscopy can change the natural history. Additionally, much more understanding is needed about when and how FAI may develop in the paediatric or adolescent patient, and whether a screening program may be effective in preserving the hip joint in the next generation. MEH

Current indications for Hip Arthroscopy

Central compartment (performed under traction)
- labral tears
- chondral pathology
- ligamentum teres pathology

Loose body, synovitis
- acetabular rim deformity
- peripheral compartment
- synovitis
- femoral head/neck junction deformity

Extra-articular
- iliopsoas tendon
- iliotibial band snapping,trochanteric bursitis
- anterior inferior iliac spine impingement
- gluteus medius avulsion
- hamstring tendon repair

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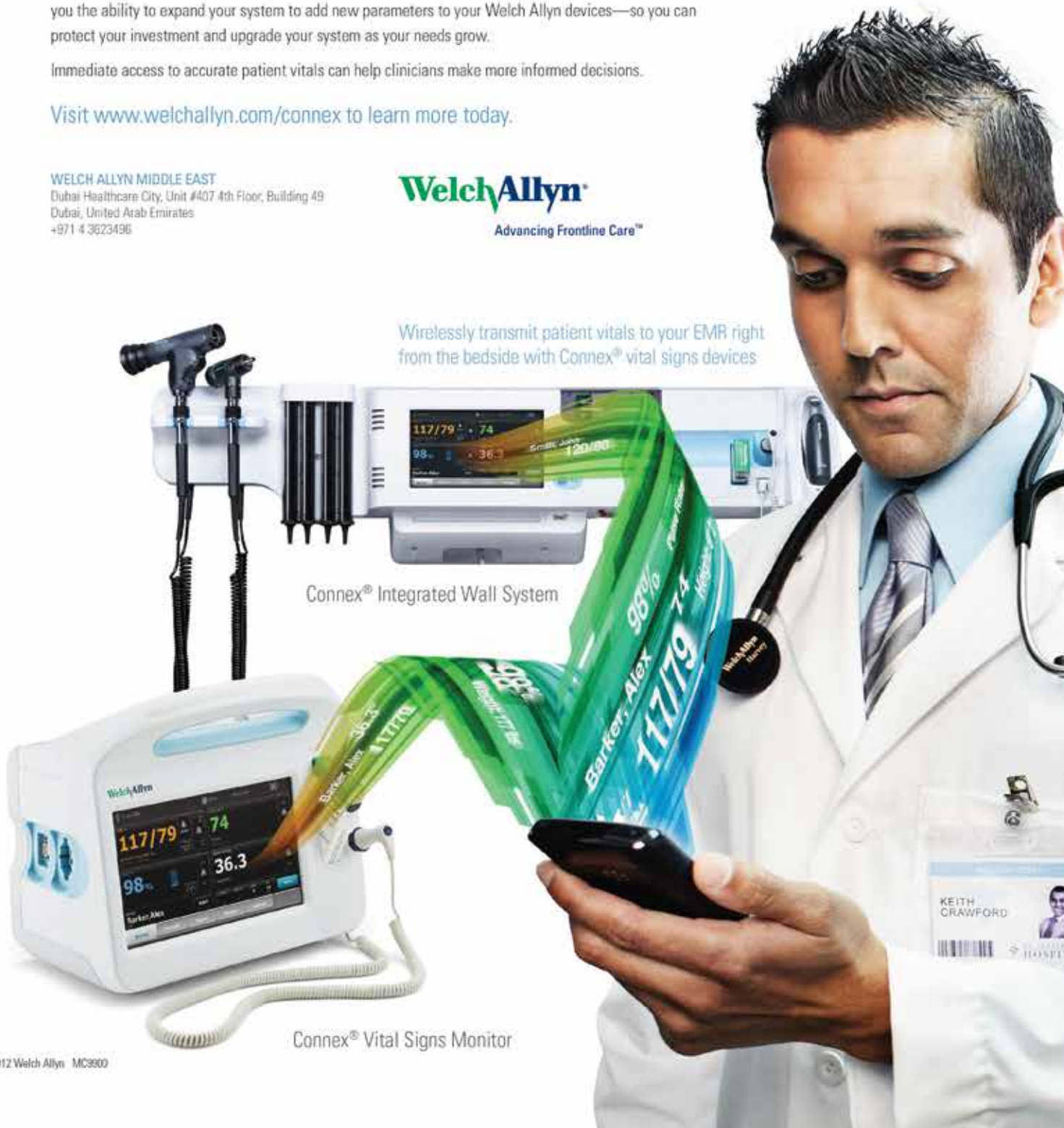


St. Luke's Hospital in the Texas Medical Center offers first Neuroendocrine Tumor Program in Texas

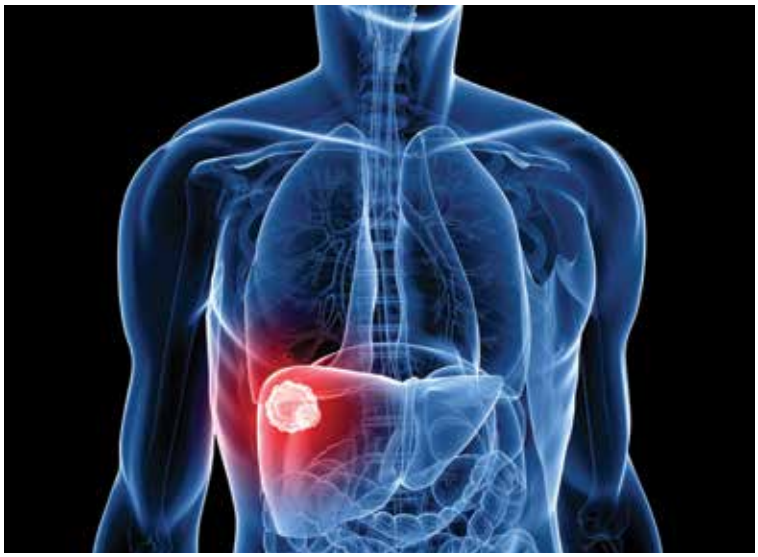
St. Luke's Hospital in the Texas Medical Center has launched its Neuroendocrine Tumor Program, the first in Texas. The program provides a multi-disciplinary approach to the diagnosis and management of neuroendocrine tumors, which are rare, slow-growing tumors that can be difficult to diagnose and treat.

Neuroendocrine tumors are a heterogeneous group of solid tumors that originate from neuroendocrine cells found throughout the body. In contrast to most common cancers, these tumors may secrete hormones that make patients feel ill. The majority of neuroendocrine tumors occur in the gastrointestinal tract and the bronchopulmonary system, however others can be found in thyroid and adrenal glands, as well as the central nervous system. There are many types of neuroendocrine tumors, each requiring a different approach in terms of diagnosis and treatment.

More than 100,000 cases of neuroendocrine tumors are estimated in the United States. They are more prevalent than many GI malignancies, including stomach and pancreatic cancer combined. Recent analysis showed a dramatic five-fold increase in diagnosed incidence of neuroendocrine tumors from 1973 to 2004, and it continues to rise at a faster rate than other malignant neoplasms. Neuroendocrine tumors are marginally more common in women than men, and the average age of people diagnosed with neuroendocrine tumor is early 60s.

"The St. Luke's neuroendocrine tumor program is dedicated to providing the best patient outcomes through a collaborative care process," said Omar Barakat, MD, FRCS, Director, St. Luke's Neuroendocrine Tumor Program.

Detected by imaging, endoscopy, biomarker and genetic testing, the Neuroendocrine Tumor Program at St. Luke's offers a wide range of diagnostic tools to reach a definitive diagnosis, including advanced endoscopic ultrasound along with endoscopic mucosal resection (EMR) performed by our gastroenterologists for the diagnosis and treatment of neuroendocrine tumors.



Because of the different types and locations of neuroendocrine tumors, treatment can be extremely complex and varied. St. Luke's specialists in oncology, surgery, radiology, gastroenterology, endocrinology, nuclear medicine, and other areas work together to diagnose and determine the most appropriate treatment protocol for all types of neuroendocrine tumors.

State-of-the-art treatment options available at St. Luke's Neuroendocrine Program on a patient-by-patient basis include:

- **Transarterial Chemoembolization (TACE)** – When it is not possible to surgically remove a liver tumor, a catheter can be placed into the artery that supplies the liver to deliver small particles to occlude the blood supply into the tumors. This can be preceded by injecting chemotherapeutic drugs directly into the tumor.
- **Selective Internal Radiation Therapy (SIRT)** – Tiny resin microshperes called SIR-Spheres (the size of which are about one-third the diameter of a strand of hair), which contain a radioactive element Yttrium-90, deliver high-dose radiation directly into the tumors, sparing normal liver tissue. Typically performed under local sedation in the radiology suite, SIRT lasts about one hour from beginning to end. Most patients are discharged within 24 hours with minimal side-effects.
- **Radiofrequency Ablation (RFA)** – This approach can be used either alone or combined with surgical resection in carefully selected patients. It involves placing a probe within the tumor using ultrasound guidance to deliver high-frequency waves that heat up the tumor in an effort to destroy the tumor. It can be performed by a radiologist through the skin or surgically using a laporascopic or open surgical technique.
- **External Beam Radiotherapy** – Using Cyberknife technology, an image-guided robotic precisely targets and destroys tumors with multiple beams of radiation. This approach offers a pain-free, non-surgical option for patients with neuroendocrine tumors who seek an alternative to surgery.

Additionally, St. Luke's is the only program in Texas that offers Peptide Receptor Radiotherapy (PRRT) for advanced neuroendocrine tumors in collaboration with Excel Diagnostics.

- For more information about International Patient Services, call Tel: +1-832-355-3350 or visit *StLukesInternational.com*

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Telepathology offers second opinion diagnoses and consultations for blood disorders

Getting the exact diagnosis is critical to treating rare and complex blood disorders such as lymphomas and leukemias. The Nebraska Medical Center and the University of Nebraska Medical Center (UNMC) Anatomic Pathology Consult Service is helping many medical centers around the world receive second opinion diagnoses and consultations from our pathologists and hematologists/oncologists. Many of these physicians are internationally renowned experts in diagnosing and treating blood disorders.

The medical center's Lymphoma and Blood and Marrow Transplant programs draw patients from around the world for treatment and second opinions. It is ranked as one of the busiest adult lymphoma and pediatric programs in the country, averaging over 150 transplants a year. It has performed more than 4,500 blood and marrow transplants since its founding in 1987.

"When it comes to rare lymphomas, you want to be at a place where there are experienced experts in diagnosis and treatment," says James Armitage, MD, hematologist/oncologist, world renown for his clinical research in lymphoma and bone and stem cell transplantation. "We were early pioneers in this field and have published many articles about treatments for lymphomas."

Over the last 30 years, Dr Armitage and his colleagues have been recognized for a number of ground-breaking advancements and improving success rates for patients. As a result, blood and marrow transplants are a more viable and promising treatment options for patients with lymphoma, leukemia, multiple myeloma and other blood disorders.

Consultative services are available from the medical center's team of 17 hematology/oncology experts that includes Dr Armitage as well as Julie Vose, MD, one of the country's foremost experts on lymphoma. Dr Vose, who is chief of the Section of Hematology/Oncology at UNMC Department of Internal Medicine, has been conducting research into the disease for more than 20 years and is the principal investigator for numerous clinical research trials.

The medical center also has a large team of pathologists who subspecialize in various areas of pathology including hematopathology and transplant pathology. "We become your partners and will work closely with you to ensure you get the right diagnosis to ensure quality care for your patients," says David Muirhead, Anatomic Pathology director at The Nebraska Medical Center.

"Getting the exact diagnosis requires experience and determines appropriate treatment," says Timothy Greiner, MD, a pathologist specializing in lymphomas for 20 years and interim director of Hematopathology, Department of Pathology and Microbiology at UNMC. "There are many different types and subtypes of lymphoma. Each subtype can behave differently and may require different treatments which can have a significant impact on outcome."

The medical center's anatomic pathology laboratories are pioneers in digital pathology technology, one of the most advanced techniques for transferring pathology microscope slides of surgical biopsies quickly, efficiently and accurately. "Our pathology program and global consultation service is available to provide second opinions for new malignancies, consultation on options and potential diagnostic approaches, coverage during vacations, consensus on a diagnosis, quality assurance and teaching opportunities," says Muirhead. "We are also available to provide a more comprehensive diagnosis using cytogenetic and molecular pathology testing."

The medical center's cancer program is part of the National Institutes of Health/National Cancer Institute Bone Marrow Transplant Clinical Trials Network – a consortium of 16 transplant centers across the United States that collaborate on clinical trials in order to derive data from a larger population of patients and to allow for greater sharing of information between centers.

One of the primary factors contributing to the success of the program is the total commitment a multidisciplinary team. "Our physicians have an international reputation not only for their research but for their clinical successes in blood and marrow transplantation," Dr Armitage says. "You get this type of reputation not only from the quality of care delivered, but also because you can offer therapies and treatment opportunities that other programs don't have the ability or scope to offer."

"Our leading national and international cancer care and transplant programs enable us to provide the latest treatment to our patients coming to our center for treatment or to provide second opinion and telepathology consultations," says Nizar Mamdani, Executive Director of the International Health Care Services. "Patients never have to leave their homes to be the beneficiary of UNMC's latest treatment options."

● Please contact Nizar Mamdani for more information about patient treatment, second opinion and telepathology programs. Tel: +1-402-559-3090, *nmamdani@nebraskamed.com*, *www.unmc.edu/international* MEH

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Herbal medicines: 'Natural' not necessarily 'safe'

By **Leslie Morgan**, OBE
Managing Director Durbin PLC.
Leslie Morgan is a member of the Royal Pharmaceutical Society of Great Britain

Herbal remedies have been around for centuries, but with increasing numbers of people turning to alternative 'medicines', many countries are bringing in regulations to improve the safety of the patients who use them.

'Herbal medicines' – those which are presented as having properties for treating or preventing disease in human beings – include herbs, herbal materials and preparations, and finished products that contain parts of plants or plant materials as active ingredients.

They appeal to a variety of people, some of whom are simply distrustful of conventional medicines and the chemicals within them, and others who feel alternative remedies more closely match their culture or belief system. In some Asian and African countries, 80% of the population depend on herbal medicines for primary health care. Whilst personal choice remains important, most would agree that patients need to be able to make an informed choice about any product that purports to have medicinal qualities.

Some herbal remedies have very powerful effects, and without the necessary information patients might not realise that in some instances they should not take conventional medicines and herbal products side-by-side. Gingko and ginseng, for example, are known to have a similar effect to the blood-thinning drug Warfarin, while one of the more popular herbal products, St John's Wort, can interfere with the contraceptive pill.

A look through the list of banned products that the UK Medicines & Healthcare Products Regulatory Agency (MHRA) have on their website is quite concerning when one considers that many of these had been freely available for years without any consideration for their possible side-effects. They include a number of traditional Indian and Chinese medicines, including teas which are now illegal to import into the UK. The Saudi Food and Drug Administration (SFDA) have similarly banned the sale and distribution of a traditional Chinese tea after samples were found to contain excessive levels of pesticides.

Until last year the UK industry had been covered by the 1968 Medicines Act, drawn up when only a few herbal remedies were seen to be conventional medicines. Due to the gradual increase in the popularity of these products however, new European Union rules came into effect on 30th April 2011. The European Traditional Herbal Medicinal Products Directive established a regulatory approval process for herbal medicines in the EU, requiring each EU member state to set up a traditional herbal registration scheme for manufactured herbal medicines that are suitable for use without medical supervision.

Companies are no longer able to sell manufactured unlicensed herbal medicines unless they have an appropriate product licence – either a full marketing authorisation based on the safety, quality and efficacy of the product (as with any regular medicine), or a traditional herbal registration (THR) based on the safety, quality and evidence of traditional use of the product.

Looking specifically to the Middle East, the UAE is an example of a country that has a long history in the use of traditional medicines. It was also one of the first countries to set up regulatory procedures for natural medicines when in 2008 the Government decided that all natural products – vitamins, minerals, herbs – must be approved by the Ministry of Health. The opening of the Zayed Complex for Herbal Research & Traditional Medicine (ZCHRTM) was seen by many as vital for the development of the registration and integration of herbal products into the healthcare system.

In essence, consumers need to bear in mind that as with any conventional drug, herbal medicines should always be taken with care. This is particularly so where the safety of a herbal product has not been established in certain key groups such as pregnant women, children and the elderly. Phrases like 'natural', 'herbal' and 'derived from plants' do not necessarily mean safe. Many plants can be poisonous to humans, and indeed many pharmaceuticals have been developed from plants using the powerful compounds they contain.

It's good to see that in recent years regulation and safety awareness programmes about herbal products has grown in many countries. For those patients that want a choice there is certainly a place for conventional medicines and herbal medicines to live side-by-side. Patient safety and information however have to be key considerations for regulatory authorities before any product is allowed for sale. MEH

Durbin PLC is a British company based in South Harrow, London. Established in 1963, the company specialises in supplying quality assured pharmaceuticals, medical equipment and consumable supplies to healthcare professionals and aid agencies in over 180 countries. As well as reacting rapidly to emergency situations, Durbin PLC responds to healthcare supply needs from local project level to national scale programmes.
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MSF provides healthcare to Syrians crossing into Iraqi Kurdistan

Médecins Sans Frontières reports that Syrian refugees are crossing the border into Iraqi Kurdistan in huge numbers, with more than 42,300 passing through the Peshkabour border crossing in a single week since it reopened on 15 August. Teams from the international medical organisation Médecins Sans Frontières/Doctors Without Borders (MSF) have set up health posts on both sides of the border, providing medical consultations and distributing water to refugees waiting to be transferred to five transit camps which are currently being set up in Erbil and Sulaymaniya governorates.


Credit: Paul Yon (MSF)

"The refugees report having fled Syria from a variety of locations after hearing that the border had reopened after being closed for several months," says Paul Yon, MSF's head of mission in Dohuk, "but in recent days, the majority reported fleeing their homes around the city of Al-Malikiyah (also known as Derek) following sporadic aerial bombardments a few days ago."

On the Iraqi side of the border, MSF is providing healthcare consultations to refugees waiting to be transferred to Erbil and Sulaymaniya. "The majority of patients are children, pregnant women and mothers who are suffering from moderate dehydration due to the long distances they've had to walk or the long waiting time before crossing the border. We are also seeing a lot of cases of asthma." The number of consultations is increasing daily, said Yon.

MSF teams have been working in the Domiz refugee camp in Dohuk governorate since May 2012, home to 42,000 Syrian refugees, providing general healthcare and mental health services. MSF also plans to assess the needs of some 70,000 refugees who have settled in the city of Dohuk. MEH

3,600 patients display neurotoxic symptoms

MSF released this statement on August 24: Three hospitals in Syria's Damascus governorate that are supported by the international medical humanitarian organisation Médecins Sans Frontières (MSF) have reported to MSF that they received approximately 3,600 patients displaying neurotoxic symptoms in less than three hours on the morning of Wednesday, August 21, 2013. Of those patients, 355 reportedly died.

Since 2012, MSF has built a strong and reliable collaboration with medical networks, hospitals and medical points in the Damascus governorate, and has been providing them with drugs, medical equipment and technical support. Due to significant security risks, MSF staff members have not been able to access the facilities.

"Medical staff working in these facilities provided detailed information to MSF doctors regarding large numbers of patients arriving with symptoms including convulsions, excess saliva, pinpoint pupils, blurred vision and respiratory distress," said Dr Bart Janssens, MSF director of operations.

Patients were treated using MSF-supplied atropine, a drug used to treat neurotoxic symptoms. MSF is now trying to replenish the facilities' empty stocks and provide additional medical supplies and guidance.

"MSF can neither scientifically confirm the cause of these symptoms nor establish who is responsible for the attack," said Dr Janssens. "However, the reported symptoms of the patients, in addition to the epidemiological pattern of the events – characterized by the massive influx of patients in a short period of time, the origin of the patients, and the contamination of medical and first aid workers – strongly indicate mass exposure to a neurotoxic agent. This would constitute a violation of international humanitarian law, which absolutely prohibits the use of chemical and biological weapons."

In addition to 1,600 vials of atropine supplied over recent months, MSF has now dispatched 7,000 additional vials to facilities in the area. Treatment of neurotoxic patients is now being fully integrated into MSF's medical strategies in all its programmes in Syria.

MSF in Syria

MSF provides medical assistance in Syria through two different approaches. MSF international and national staff operate six hospitals and four health centres in structures fully under the organisation's direct control in the north of Syria. In areas where MSF cannot send its own teams because of insecurity or lack of access, the organisation has expanded a program begun two years ago of supporting Syrian medical networks, hospitals and medical posts, by providing drugs, medical equipment, and technical advice and support. Through the latter program, MSF has been supporting 27 hospitals and 56 medical posts throughout Syria.

Hypothyroidism and cardiovascular diseases

By Dr Wiam I Hussein, MBBS, FACE, FACP

Thyroid disorders occur in a significant proportion of the general population and although they are increasingly being diagnosed, still with more than half of the cases remain undiagnosed. Its prevalence increases in women and with age.

In the third National Health and Nutrition Survey (NHANES III), conducted in the USA between 1988 and 1994, subclinical or overt hypothyroidism was found in 4.6%. In a sample of Framingham Heart Study subjects over age 60, around 10.3% had some degree of hypothyroidism, as evidenced by elevated serum TSH levels (>5 µIU/mL).

In the largest cross-sectional study to date, Canaris et al examined thyroid function tests from 25,862 participants in a state wide health fair in Colorado, USA, and revealed around 10 % of population suffer from hypothyroidism and 3% hyperthyroidism.

Thyroid nodules are very common and were found in multiple studies to reach 50% of the population without a history of clinically detectable thyroid disease.

The natural history of thyroid diseases usually evolves, but with early diagnosis and appropriate management by a specialized endocrinologist, most disorders are treatable.

Hypothyroidism is a clinical syndrome resulting from a deficiency of thyroid hormones which in turn results in a generalized slowing down of the metabolic process.

Whether hypothyroidism results from hypothalamic-pituitary disease or primary thyroid disease, symptoms and signs of the disease vary in relation to the magnitude of the thyroid hormone deficiency, and the acuteness with which the deficiency develops.

Hypothyroidism is less prominent clinically and better tolerated when there is a gradual loss of thyroid function (as in most cases of primary hypothyroidism) than when it develops acutely after thyroidectomy or abrupt withdrawal of exogenous thyroid hormone.

The symptoms are mostly related to the generalized slowing of metabolic processes. This can lead to abnormalities such as fatigue, slow movement and slow speech, cold intolerance, constipation, weight gain, delayed relaxation of deep tendon reflexes, and bradycardia.

However, the accumulation of matrix glycosaminoglycans in the interstitial spaces of tissues can lead to coarse hair and skin, puffy faces, enlargement of the tongue, and hoarseness. These changes are often more easily recognized in young patients, and they may be attributed to aging in older patients.

The cardiovascular system is one of the main targets of thyroid hormone action. This hypometabolism that is associated with hypothyroidism results in a decrease in cardiac output that is mediated by reductions in heart rate and contractility that could worsen cardiac failure. However, there is substantial evidence that hypothyroidism alters many risk factors for cardiovascular diseases and causes significant atherosclerosis.

Perhaps the earliest studies came from autopsy studies documented as early as 1878 when Dr Greenfield reported severe atherosclerosis as a case report in a 58 year-old lady but Dr Kocher, Noble prize winner, reported it in more detail and established the hypothesis of cause and effect in 1883. Since then many autopsy studies has confirmed the presence of more severe coronary atherosclerosis in hypothyroid cases than their age-matched euthyroid cases.

Moreover, several studies have examined living cases with hypothyroidism and established an association with coronary artery disease more than their age-matched controls. A study of coronary angiography in hypothyroid cases revealed a higher rate of progression in those not adequately treated compared to those adequately treated.

The Rotterdam study done on 1949 in women revealed a significant increase aortic atherosclerosis with odds ratio 1.9 and increase in myocardial infarction with odds ratio of 2.3 in hypothyroid ones compared to euthyroid women, after adjustment for age, risk factors and smoking status.

Many studies have shown multiple causes of such an increase in atherosclerotic cardiovascular diseases in hypothyroidism like the increases in the atherogenic LDL cholesterol, Lipoprotein (a), left ventricular dysfunction, diastolic hypertension, hyperhomocysteinemia, altered coagulability, flow-mediated vasodilatation, endothelial dysfunction, altered vascular smooth muscle and insulin resistance.

In one study, researchers measured CRP (an acute phase protein that circulates in higher concentrations in a variety of acute and chronic disease states) in 61 overtly hypothyroid and 63 subclinically hypothyroid patients and compared them with 40 euthyroid control subjects. CRP levels were significantly higher in both hypothyroid groups, compared with controls. Tissue plasminogen activator antigen and plasminogen activator inhibitor antigen levels were altered in some studies posing a greater risk for thrombosis.

Synergistic effects between smoking and hypothyroidism have been reported. Smokers with overt hypothyroidism have been shown to have higher serum concentrations of total and LDL cholesterol, higher clinical symptom scores, more prolonged ankle-reflex times, and higher creatine kinase concentrations than nonsmokers with hypothyroidism.

Author

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Messe Düsseldorf holds networking dinner in UAE

Intercontinental Dubai Festival City hosted a networking event yesterday that brought together Dubai Healthcare Authority, Saudi Food and Drug Authority and the Saudi German Hospital Group. The event comes a few months ahead of "MEDICA", the world´s leading medical trade fair to be organized by Messe Düsseldorf from 20-23 November 2013, in the German city of Düsseldorf.

Present at the event were Abdulrahman Al-Gifari, Executive Director for Communication and awareness, Saudi Food and Drug Authority, KSA; Dr Ramadan Ibrahim, Director of the Health Regulation Department, Dubai Healthcare Authority, Dubai, UAE; Dr Reem Osman, Chief Executive Officer, Saudi German Hospital, Dubai, UAE: Horst Giesen, MEDICA Director, Messe Düsseldorf, Germany and; Bassel Amaneddine, General Manager of IFP Emirates.

At MEDICA 2013 in mid-November, vendors will present the full spectrum of new products for good quality, efficient medical care in hospitals and the outpatient sector, from medical technology and electro medicine, laboratory technology, physiotherapy products and orthopedic technology to health IT.

The healthcare sector is among the 14 major areas attracting large forms of investment, forming part of the UAE Investment Map. Rapid increase in the population and income of UAE as well as movement towards a sedentary lifestyle are some key drivers of healthcare in the region. The Government of the UAE is committed to the healthcare sector and continuously strives to create a viable atmosphere for all stakeholders in the market including investors, professionals and individuals.

Highlights from the speakers

Dr Layla Mohamed Al-Marzouqi: The Health Regulation Department in DHA is developing at the speed as the development of other sectors like financial, tourism, trade, etc. in the UAE and Dubai. HRD is constantly issuing new/ upgrading regulations to ensure better healthcare services quality in the emirate of Dubai. DHA has taken over regulation and licensing of pharmacies and pharmacist in Dubai since last May. HRD is promoting health tourism in the emirate too. The work load is on increase in HRD due to Dubai being an attractive place for people to settle in. The applications received by HRD for licensing healthcare professionals and to open new healthcare facilities in Dubai are on increase especially after the Arab Spring.

Our vision in DHA is aligned with the one of H.H. Sheikh Mohamed to be number one in everything and health is no difference.

Dr Reem Osman CEO, Saudi German Hospital Dubai: "Saudi German Hospital Dubai has been consistently working

for a transition to shift patient care to the bedside and establish a paperless environment for facilitating an exceptional patient experience with a completely integrated and virtualized IT solution. Till date we are able to achieve a success rate of over 85% on this project".

Horst Giesen, MEDICA/ Messe Dusseldorf: MEDICA has come a long way from its beginning in 1969, when it started as a special conference for doctors of laboratory medicine, to where it is now – the leading global medical trade fair attracting visitors from nearly 120 countries and exhibitors from 70 countries. MEDICA is also focusing on the UAE and the whole Gulf region. Many innovative products shown at MEDICA are ready to be used in Arab countries.

The MEDICA networking dinner was organized by IFP Emirates, the sole representative for Messe Düsseldorf in UAE. IFP will be organizing the Emirati participation in the exhibition, as continuously done before in other regional and international exhibitions. MEH

ABILITIESme
24-26 March 2014
Abu Dhabi National Exhibition Center

ABILITIESme honoured with patronage of His Highness Sheikh Nahyan Bin Mubarak Al Nahyan

ABILITIESme, which started as a community development and CSR grass-root initiative designed to enhance the visibility of people with disabilities has morphed into a global effort for experts, technologists, parents, health specialists, educators, industrialists and policy makers vested in sustaining the empowerment of people with special needs and disabilities in the MENA region.

More recently ABILITIESme has just been privileged with the honour of receiving the patronage of His Highness Sheikh Nahyan Bin Mubarak Al Nahyan, Minister of Culture, Youth and Community Development and Honorary President of Abu Dhabi Future Special Needs Centre.

The ABILITIESme awareness campaign has been in full swing since August 2012 and has engaged the support of the UAE and GCC communities as well as international observers and participants.

Originally scheduled for December 9-11, 2013, and with the blessing of its partners, supporters and stakeholders, ABILITIESme will now move to March 24-26, 2014.

This change of dates results from a consensus and under the supervision of our new patron, ABILITIESme has been given the opportunity to extend further its reach and prospects for an even more outstanding policy outcome.

"We invite every party involved to join us in making ABILITIESme a success story that will positively affect the economic, social, educational, professional and medical expectations of people with disabilities," says Prudence Kolong, Conference Director. MEH

Praise for humanitarian aid workers who assist millions affected by war in the region

On the occasion of World Humanitarian Day – 19 August 2013 – the World Health Organisation Eastern Mediterranean Office released this statement from Dr Ala Alwan, the Regional Director.

When we talk about the World Health Organization's work in the Eastern Mediterranean Region, our focus is usually on the millions of people affected by war and natural disasters and in need of humanitarian assistance. We highlight their plight and keep them in the spotlight because as long the world is made aware of their suffering, we can count on getting the support we need to reach them.

Today, on World Humanitarian Day, we honour the people who help other people – the humanitarian aid workers who dedicate their lives to serving those in need. From the vaccinator who cycles through dirt roads and hikes up mountain paths in Afghanistan to immunize children against disease, to the epidemiologist in the Syrian Arab Republic who monitors cases of infectious diseases among internally displaced persons, to the trauma surgeon in a field hospital in Somalia – these are the individuals who dedicate their lives to helping others.

World Humanitarian Day was designated by the General Assembly to coincide with the anniversary of the 2003 bombing of the United Nations headquarters in Baghdad, Iraq, which killed 22 UN staff, including our late WHO colleague, Nadia Younes. Each year on 19 August, we take a moment to remember those who have lost their lives, and recognize those who continue to face danger and adversity every day in order to help others.

Despite international laws and conventions calling for their safety and protection, humanitarian aid workers risk their lives every day, especially those working in our Region, where the majority of attacks take place. Health workers conducting vaccination campaigns in Pakistan continue to face serious threats of violence, while health workers in many areas of the Syrian Arab Republic are often unable to report to work due to insecurity. Just last week, Médecins Sans Frontierès announced that it is withdrawing its operations from Somalia, stating that the country is one of the most difficult and dangerous environments in the world for aid workers.

The range and scale of humanitarian crisis around the world is alarming. Global humanitarian action in mid-2013 has entered

Iranian charity provides medical care

By **Sharareh Jalali** in Tehran

Ali was a two-year-old Afghan refugee when a seemingly benign lump on his nose started growing at an alarming rate. But thanks to a partnership between the UN refugee agency and the Iranian medical charity MAHAK, his frightened father now expects to see him grow up.

"At one point it was so big that it would block his eye sight," his father said. Ali, sitting in his father's lap, was drowsy after another chemotherapy treatment. "He has been enduring chemo for more than four months and is now ready for radiotherapy. The doctors are very optimistic."

Six months before, the lump had suddenly started growing and a CT scan confirmed he had a highly malignant cancerous tumour. UNHCR had earlier helped his father, a typist with two other children, to obtain health Insurance cards for his family but the ceiling would not cover the high costs of Ali's treatment.

Fortunately, UNHCR and MAHAK have worked for more than 10 years in a fruitful collaboration to provide assistance to cancer-stricken refugee children. Ali's father, among the many Afghans still refugees more than three decades after their homeland descended into war, was thrilled when UNHCR told him MAHAK could help his son.

MAHAK is a non-profit, non-political, and non-governmental charity focused on treating children with cancer. It uses the most up-to-date diagnostic, treatment and prevention methods, with both outpatient and in-patient services. It provides chemotherapy, medication, lab tests, radiation therapy, CT scan, transportation and family counselling – all without regard to religion, race or nationality of patients.

MAHAK is supported by fundraising and humanitarian assistance in the form of money, goods, services and technical expertise. Under the joint UNHCR-MAHAK project for 2013, a total of 76 Afghan and Iraqi refugee children under the age of 15 who suffer from cancer will be provided with medical treatment.

Under this project, the accompanying parent is also provided with counselling, accommodation and food when needed

uncharted territory in terms of the number of people needing help and resources to be secured, mainly as a result of the crisis in the Syrian Arab Republic, where almost 6.8 million people inside the country and 5.3 million Syrian refugees in the neighbouring countries are in need of humanitarian assistance. Overall, more than 42 million people in 13 countries in the Eastern Mediterranean Region are currently affected by emergencies resulting from political conflict and natural disasters.

To ensure that these populations are provided with one of their most basic rights – the right to health – WHO works with Member States in the Region to strengthen national health systems; intensify action to prevent communicable diseases (including poliomyelitis); improve access to essential medicine supplies for managing chronic diseases such as diabetes, heart disease and cancers; ensure access to maternal, reproductive and child health and nutrition; and support emergency response operations and reconstruction of affected health systems.

The need for increased funding impacts our efforts to reach affected populations. In Yemen and Somalia, for example – countries experiencing some of the worst humanitarian crisis – only 24%-27% of the funding requirements for the health sector have been met in 2013, leaving millions still struggling to gain access to even the most basic health services.

If we are to meet the needs of an increasing number of affected populations, we must do things differently. We need to reach out to and engage with new partners and supporters. This year's World Humanitarian Day campaign is a chance to do that.

At the heart of this campaign is a first-of-its-kind project that will literally turn words into aid for people affected by crises. Words are incredibly powerful: they can end wars and rally millions of people behind causes. We are asking organizations, companies and individuals to donate funds to match the total number of times sponsored words are shared on social media. By requesting that words be backed by resources, we will garner donor support for some of the world's most critical yet underfunded crises. MEH

to refugee children

because they reside outside Tehran and face difficult economic conditions.

Iran has generously hosted the second largest refugee population in the world for over three decades -- currently more than 880,000 refugees, some 40,000 from Iraq and the rest from Afghanistan. The government of Iran has always provided its refugees with access to the main areas of education, livelihood and health, some of which can be life-saving.

On a recent visit by UNHCR staff to MAHAK facilities, in the colourful and bright painting room mothers were creating artwork to be auctioned off to raise funds for the charity. The mothers, who get training, help with the children and paint with them, creating a warm atmosphere where they can escape the reality of what they face everyday.

MAHAK takes every opportunity to cheer up the children. Javad Nekoonam, a famous Iranian football player, recently joined them for a short game. The staff of MAHAK convey their own hope, enthusiasm and energy to the children. Some are volunteers, families of patients who have themselves survived cancer, and strong believers in what can be achieved.

Many refugee families had stories like that of Ali, all grateful for the economic and psychological help the UNHCR-MAHAK agreement has brought to their lives. There were children from 2- to 17-years-old struggling with leukaemia, Hodgkin's disease, cancerous tumours and undergoing chemotherapy and radiotherapy.

For some the difficult road of treatment has just begun and for some it has fruitfully come to an end. The lump on Ali's nose is still noticeable but his father says it has shrunk considerably with the chemotherapy.

"Without them I would have had to watch my son's condition deteriorate and die before my eyes as I would have in no way been able to afford private or even public health centres," Ali's father said. "No words suffice; no words can explain how thankful we are to every single person who has contributed to our son regaining his health. I now get to watch him grow up."

● This story was first published by the UNHCR on 14 August 2013 MEH

Timesco single-use laryngoscopes provide 100% infection control

Timesco Healthcare, England, has been at the forefront of laryngoscopes design, manufacture and innovative developments in intubation for the past four decades.

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Timesco is a progressive and innovative company; the company has recently introduced new Energy Efficient Systems for extended battery life, Kinetic energy power systems and new rechargeable systems to power their Laryngoscopes and Diagnostic systems. New LED handles and LED single use laryngoscopes blades have also been added to the ranges.

- For more information, visit: *www.timesco.com*

Surgeons use iPad app to assist with removal of liver tumour

A new iPad app from Fraunhofer Institute for Medical Image Computing MEVIS in Germany – CAScination Liver Viewer – is using augmented reality technology to help surgeons excise liver tumours without damaging critical vessels within the organ.

A liver cancer operation usually lasts many hours because the organ is difficult to operate. It hosts a branching vessel structure through which one and a half liters of blood flow every minute. If a surgeon makes a cut in an inappropriate place, this puts the patient at risk of severe blood loss. In addition, doctors must ensure that the patient retains enough organ volume for survival and that this volume is sufficiently supplied with blood. To accomplish this, doctors need to know as accurately as possible both before and during an operation where blood vessels inside the organ are located.

The new tablet app from the Fraunhofer Institute for Medical Image Computing MEVIS in Bremen promises to deliver this support. It is based on the established MEVIS software for liver operation planning that is employed in clinics worldwide and has been used for more than 6000 patients. Based on 3D x-ray images, the software can reconstruct the locations of blood vessels in the liver for each patient. Before an operation, surgeons can then precisely plan how and where to place the scalpel to most effectively remove a tumor.

However, there are limitations: doctors usually have little opportunity to view the software images during surgery and compare the surgical situation with planning data. Some surgeons even print out images to take into the operating room. "With our app, the entire set of planning data can be shown directly on the operating table" said MEVIS computer scientist Alexander Köhn.

Köhn developed the first version of the app with doctors at the Yokohama City University Hospital. The app was tested there at the end of 2012 for the first time during an operation. "The Japanese surgeons were very impressed by the capabilities of the system" said Köhn. "They hope that the app will help reduce complication rates and shorten hospital stays." For future interventions, the app offers the following capabilities:

- By simply marking the touchscreen, doctors can measure the length of a vessel to be removed. This helps the doctor estimate whether the remaining ends can be sewn together or whether a new piece of vessel must be inserted.
- After the surgeon removes certain vessels, he can remove them on the app screen with a virtual 'eraser'. The separated vessels disappear from the screen and let the doctor view underlying structures.
- If, during the operation, a tumour is judged to be larger than at first thought, surgeons must make snap decisions. The MEVIS app can also help here. If additional vessels must be removed, the app calculates which parts of the liver will no longer be sufficiently supplied with blood. This lets the surgeon better estimate whether the remaining organ volume is large enough for the patient to survive.
- App: CAScination Liver Viewer (Free) for iPad / iPhone
http://appfinder.lisisoft.com/tag/mevis.html
For more information, visit: *http://cascination.ch*

Ormiston Wire's innovative bone saws and sutures help surgeons

Ormiston Wire's products designed and approved for medical purposes have proved a great success, benefiting many customers, surgeons, and patients. The company provide Charnley Bone Saws, Gigli Bone Saws and also medical suture wire to hospitals. The products have repeatedly proved their worth in this challenging application, assisting surgeons in serious procedures where bone cutting and increased strength medical stitching is required.

All the products are approved to ISO 13485:2012 and ISO 9001:2008 standard, meaning that Ormiston Wire has in place an effective and comprehensive quality management system for the design and manufacture of medical devices.

Ormiston Wire is an approved manufacturer of stainless steel flexible bone saws, and supplies both the Gigli and Charnley Saws in 30, 40, 50 or 70 cm lengths. The Gigli Saws come with PTFE handles as standard, and are designed to provide a hygienic and reliably smooth cut. The Charnley Saw comes with stainless steel end ferrule.

The surgical Suture Wire from the company is provided in 316 grade stainless steel as well as in implant grade stainless steel. The wire is suitably strong and resilient for use on bone.

Suture wire can be supplied in bulk or 10m reels, or, if a more specific amount is required, Ormiston can cut the suture wire straight to specified lengths to order. Diameters available range from 0.315mm to 1.6mm.

- For further information, visit: *www.ormiston-wire.co.uk*

Omni Express VS for patient vital sign measurement

The Omni Express VS is a new intuitive approach to patient vital sign measurement. The Omni Express can be configured in the field by the user to measure any combination of: non-invasive blood pressure, SpO2, rapid oral temperature, and capnography (EtCO2).

Weighing in at less than 6 lbs (about 2,7kg) the portable Omni Express VS is well suited for any patient care area by offering a multitude of vital sign combinations. The Omni Express VS can be used as a simple Spo2/NIPB monitor for continual bedside measurement or Spo2/NIPB/Rapid temperature for quick vital sign spot checks. EtCO2 can also be added to recreate the Omni Express VS into a bedside or spot check Capnograph.

The Omni Express VS also simplifies clinician use by incorporating a touch screen with an easy-to-use software interface. A lithium Ion Battery is also incorporated and a 3 channel recorder can be added. Nellcor Oximax SpO2 and Suntech blood pressure can also be added as options.

- For more information, visit: *www.infiniummedical.com*

Philips Healthcare Continuing Education

Philips Healthcare recognizes and commits to the need for education in the region. We have opened four education centers, in Beirut, Dubai, Riyadh and Istanbul. Our Philips Education Centers in the Middle East provide Healthcare Professionals with closer-to-home solutions when it comes to training needs. We offer a range for accredited courses (ASRT / CME) in our training centers such as the upcoming, MR Cardiac Technologist Development Course, 21 September – 22 September 2013, which is ASRT accredited. The Stroke Imaging Hands-On CT Workshop Course, 19 October – 20 October 2013, which is CME accredited and the Digital Breast Imaging Fundamentals for Technologists, 21 October – 22 October 2013, which is ASRT accredited.

We are dedicated to providing affordable, high-quality professional education to healthcare professionals. In addition the Philips Online Learning Center provides continuing education (CE) approved and/or accredited self-directed learning activities by Recognized Continuing Education Evaluation Mechanisms (RCEEMs). Our education offerings are supported by the industry's leading academic institutions and accreditation organizations. That's why more than 300,000 medical professionals use the Online Learning Center for their continuing education needs. We offer training at customer sites, our global high-tech training facilities, online, and at 30 other Philips locations as well as third party institutes - when and where you need it, flexible and convenient.

To learn more, please visit our website *www.philips.ae/healthcare* or send us an email at: *Education.HC.ME@philips.com*

Ultrasound Education iPad app from Philips

Philips has released a new app so you can view their point-of-care ultrasound tutorials on your iPad.

All of the tutorials available on the Philips POC ultrasound education web pages are now accessible through the Philips ultrasound education app.

The tutorials are authored by experts in their fields, and include topics of interest for emergency medicine, critical care and regional anaesthesia. The tutorials are rich in content and include images of normal anatomy and pathology, videos, illustrations, photos and case studies.

The new app allows you to browse the full library of tutorials, view individual tutorials, download tutorials for off-line viewing and share selections with your colleagues. The tutorials are presented in an easy-to-navigate format.

The 'Ultrasound Education – Philips' app is available on the Apple App Store. It is free.

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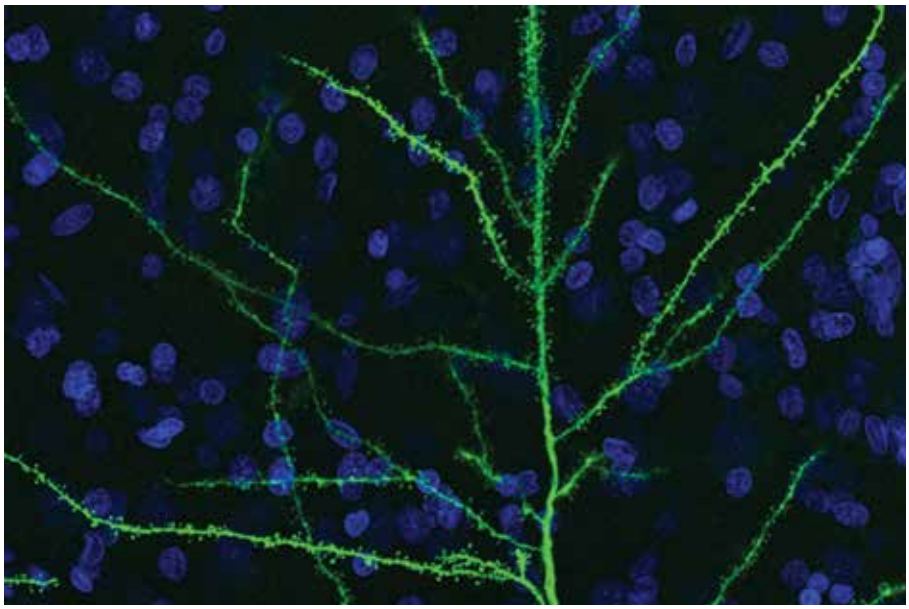
The Human Brain Project

The Human Brain Project (HBP) is a Europe-wide initiative which aims to pull together European efforts to address one of the greatest challenges of modern science: understanding the human brain. The initiative will pool all existing knowledge about the human brain in an effort to reconstruct the brain, piece by piece, in supercomputer-based models and simulations. The models offer the prospect of a new understanding of the human brain and its diseases and of completely new computing and robotic technologies.

In January this year, the European Commission supported this vision, and selected the HBP as one of two projects to be funded through the new Future and Emerging Technologies (FET) Flagship Program.

Federating more than 80 European and international research institutions, the Human Brain Project is planned to last 10 years (2013-2023). The cost is estimated at 1.19 billion euros. The project will also associate some important North American and Japanese partners. It will be coordinated at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, by neuroscientist Henry Markram with co-directors Karlheinz Meier of Heidelberg University, Germany, and Richard Frackowiak of Centre Hospitalier Universitaire Vaudois (CHUV) and the University of Lausanne (UNIL).

Switzerland plays a vital role in the Human Brain Project. Markram and his team at EPFL will coordinate the project and will also be responsible for the development and operation of the project's Brain Simulation Platform. Frackowiak and his team will be in charge of the project's medical informatics platform; the Swiss Supercomputing Centre in Lugano will provide essential supercomputing facilities. Many other Swiss groups are also contributing to the project. Through the ETH Board, the Swiss Federal Government has allocated 75 million CHF (approximately 60 million Euros) for the period 2013-2017, to support the efforts of both Henry Markram's laboratory at EPFL and the Swiss Supercomputing Center in Lugano. The Canton of Vaud will give 35 million CHF (28 million Euros) to build a new facility called Neuropolis for *in silico* life science, and centred around the Human Brain Project. This building will also be supported by the Swiss Confederation, the Rolex Group and third-party sponsors.



Confocal microscopy image of an intracellular injected layer IIIpyramidal neuron (green) of the human cingulate cortex. DAPI staining in blue to visualize nuclei, by Javier DeFelipe and his team at Universidad Politécnica de Madrid, Spain.

Scientific Portrait

The Human Brain Project will provide new tools to help understand the brain and its fundamental mechanisms and to apply this knowledge in future medicine and computing. Central to the Human Brain Project is Information and Computing Technology (ICT). The project will develop ICT platforms for neuroinformatics, brain simulation and supercomputing that will make it possible to federate neuroscience data from all over the world, to integrate the data in unifying models and simulations of the brain, to check the models against data from biology and to make them available to the world scientific community. The ultimate goal is to allow neuroscientists to connect the dots leading from genes, molecules and cells to human cognition and behaviour.

A novel medical informatics platform will federate clinical data from around the world, allowing medical researchers to unlock the clinically valuable information they contain and to incorporate it in computer models of disease. The goal is to develop techniques for the objective diagnosis of the brain's diseases, to understand their underlying mechanisms and to speed up the search for new treatments.

Finally, the HBP will build new platforms for "neuromorphic computing" and "neurorobotics", allowing researchers to develop new computing systems and robots based on the architecture and circuitry of the brain. The new systems will use detailed knowledge of the brain to address critical problems facing future computing technology: energy efficiency, reliability, the huge difficulties involved in programming very complex computing systems.

The HBP will fund independent scientists to use the new platforms for their own research, reserving a substantial part of its budget for this purpose.

on the WEB The Human Brain Project
http://www.humanbrainproject.eu

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ SEPTEMBER 2013		
Libya Healthcare Exhibition 2013-06-23	10 – 12 Sept, 2013 Tripoli, Libya	*www.maf.ly*
12th Asian Oceanian Congress on Child Neurology	14 – 18 Sept, 2013 Riyadh, KSA	*www.aoccn2013.com*
MedHealth & Wellness 2013	23 – 25 Sept, 2013 Muscat, Oman	*melissa.daleja@omanexpo.com* *www.omanexpo.com*
Health Facilities Infrastructure 2013	29 Sept – 1 Oct, 2013 Riyadh, KSA	*enquiry@iqpc.ae* *www.healthfacilitiessaudi.com*
■ OCTOBER 2013		
The 2nd Pediatric Orthopaedic Surgery Conference (POSC)	3 – 5 October, 2013 Dubai, UAE	*conference@uae.messefrankfurt.com* *www.posc-me.com*
UAE Cancer Congress 2013	3 – 5 October, 2013 Dubai, UAE	*uaecancercongress@mci-group.com* *http://www.uaecancercongress.ae/*
31st Annual Summer Meeting of the Egyptian Society of Surgeons "ESS"	3 – 5 October, 2013 Alexandria, Egypt	*info@ess-eg.org,* *www.ess-eg.org* *amir@cob-eg.org (Amir A. Abdalla)*
Iraq Health Expo 2013	3 – 6 October, 201 Basra, Iraq 3	*info@pyrmidsfair.com* *www.iraqhealthexpo.org*
8th World Congress of of Immunopathology, Respiratory Allergy & Asthma	12 – 15 October, 2013 Dubai, UAE	*info@wipocis.org* *www.wipocis.org*
Thalessemia International Federation World Congress TIF2013	20 – 23 October, 2013 Abu Dhabi, UAE	*pco@tif2013.org* *www.tif2013.org*
12th International Scientific Conference of Asia Pacific Association of Medical Toxicology	21 – 23 November, 2013 Dubai, UAE	*http://www.apamt2013.com/*
Getting into the Groin: the Role of Diagnostics in Athletic Groin Pain	23 – 24 October, 2013 Doha, Qatar	*Dayanah.cheikh@aspetar.com*
Hospital Build & Infrastructure Turkey	24 – 26 October, 2013 Istanbul, Turkey	*www.hospitalbuild-meturkey.com*
Abu Dhabi Medical Congress & Exhibition	27 – 29 October, 2013 Abu Dhabi, UAE	*www.abudhabimed.com*
8th Interdisciplinary World Congress on low back & pelvic pain	27 – 31 October, 2013 Dubai, UAE	*info@worldcongresslbp.com* *http://www.worldcongresslbp.com/*

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

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■ NOVEMBER 2013		
MedExpo 2013	2 – 4 November, 2013 Amman, Jordan	*info@meg-expo.com* *www.me-medexpo.com*
4th Emirates Cardiac Society Congress/1st Pediatric Cardiology Meeting	7 – 9 November, 2013 Dubai, UAE	*ecsc@mci-group.com* *http://www.ecsc.ae/*
Health Facilities Infrastructure Oman 2013	10 – 13 November, 2013 Muscat, Oman	*enquiry@iqpc.ae (Maneesh Nair)* *www.healthfacilitiesoman.com*
4th International Diabetic Foot Conference	14 – 15 November, 2013 Dubai, UAE	*Idfc@mci-group.com* *http://www.idfc.ae/*
Int'l Congress of the Lebanese Society of Obstetrics/Gyn.	14 – 16 November, 2013 Beirut, Lebanon	*lsog1958@gmail.com* *http://www.lsog.org.lb/*
5th Pan Arab Human Genetics Conference	17 – 19 November, 2013 Dubai, UAE	*pco@pahgc.org* *www.pahgc.org*
6th Medication Safety Congress	22 – 24 November 2013 Abu Dhabi, UAE	*info@synovetics.com* *www.medicationsafety conference.com/*
4th Aspetar Current Concept - The Athlete's Shoulder	23 – 24 November, 2013 Doha, Qatar	*Dayanah.cheikh@aspetar.com* *www.aspetar.com/ PAconference2014*
■ DECEMBER 2013		
International Congress in Aesthetic, Anti Aging Medicine and Medical Spa	6 – 7 December, 2013 Dubai, UAE	*www.antiagingme.com*
Excellence in Paediatrics 2013	4 – 7 December, 2013 Doha, Qatar	*eip@2013.com* *www.2013.excellence. in.paediatrics.org*
GULFPCR-GIM 2013	12 – 13 December, 2013 Dubai, UAE	*www.gulfpcr.com*
15th Emirates Ophthalmology Congress	12 – 14 December, 2013 Dubai, UAE	*eoc@mci-group.com* *http://www.eoc-uae.org/index.php*

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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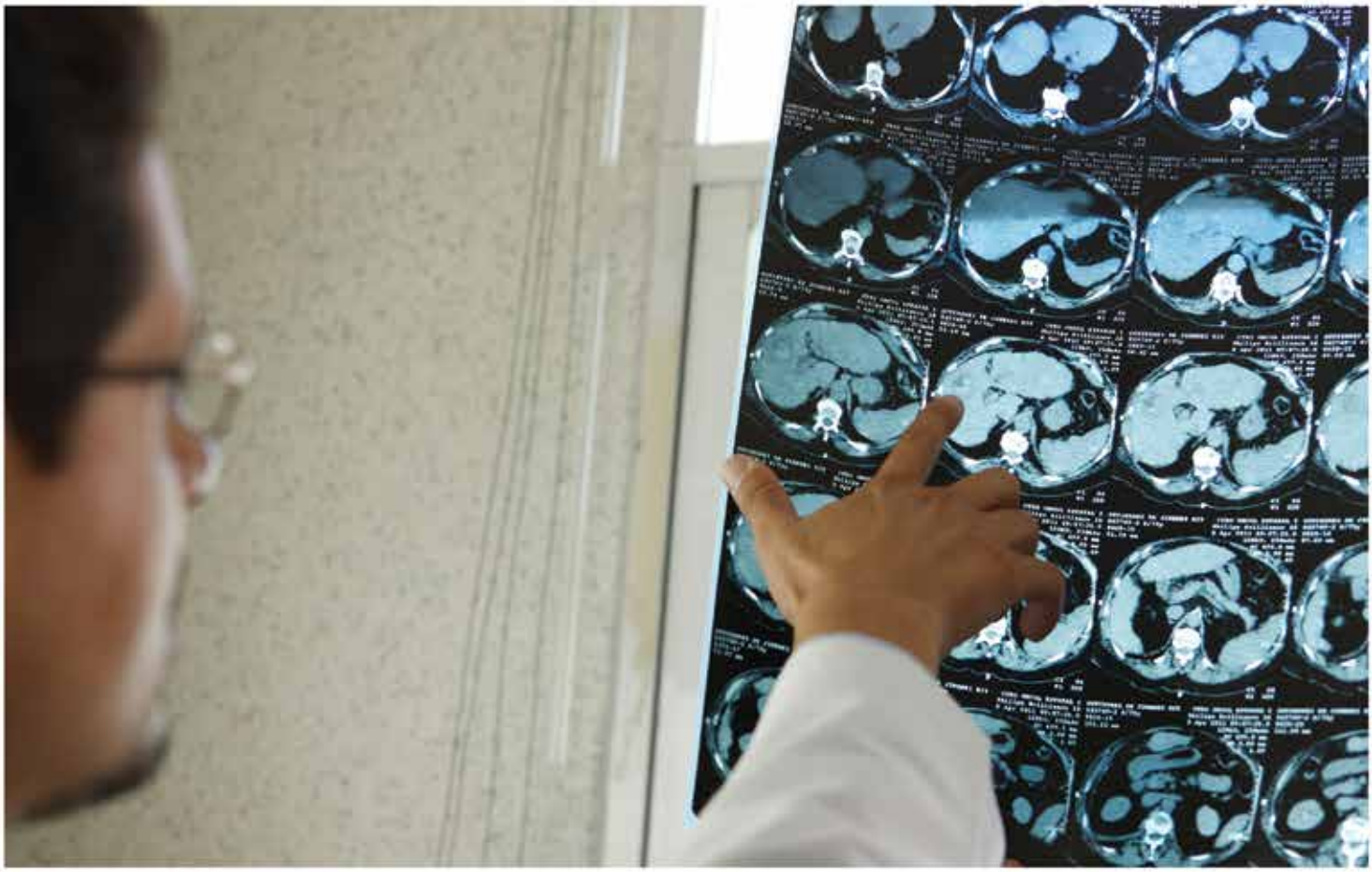

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