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July-August 2014

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Spotlight on global health

World Health Assembly focuses on
child obesity, TB, drug resistance ...

Paediatric care

US hospitals lead the way

Global warning

Polio declared Health Emergency
of International Concern

Small kick, giant leap

A first for healthcare at World Cup football

World Cardiology Congress

Gender bias in CVD diagnosis & other highlights

INTERVIEW: Sidra's Dr Ziyad Hijazi – on the new Venus P valve for young cardiac patients



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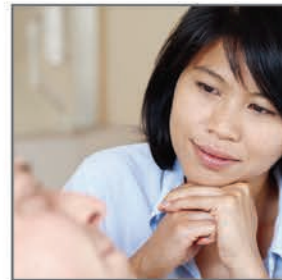
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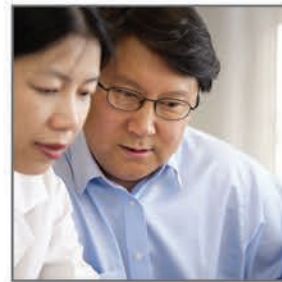
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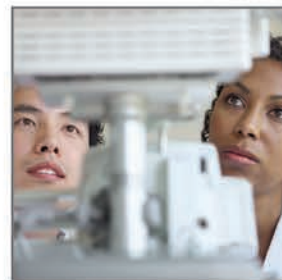
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Prognosis

World Cup first

This issue is full of interesting reports. No doubt many of you have been glued to your TVs watching the drama of the World Cup football. Interestingly and probably missed by many, the opening ceremony featured a first for healthcare. Juliano Pinto, a 29-year-old Brazilian who is paralyzed from the waist down, kicked the first ball of the World Cup football championship using a mind-controlled robotic exoskeleton. The exoskeleton is the result of the international Walk Again Project and is the culmination of years of work by an international team of scientists. Read more about this incredible feat of technology on page 27.

This is the time of year when the annual World Health Assembly is held in Geneva. A large number of important public health issues were discussed that have a bearing not just on the Middle East region but the entire world. Several resolutions were passed dealing with TB, antimicrobial resistance, violence against women and girls and more. Read the report of highlights from the 5-day meeting on page 18.

In our focus on paediatrics we invited a number of leading paediatric institutions in the United States to contribute to the feature. They highlight their areas of expertise and show why they are regarded as world leaders in paediatric healthcare and research. Find the feature on page 34.

Also in this issue we travel to India, Lebanon and Jordan and speak to the administrators and doctors of some of the leading hospitals in those countries. These are advanced, high tech, highly skilled facilities that are playing a very important role protecting the health of not just the local populace but also the many people from abroad who seek their expertise.

In other news we bring you reports from the World Cardiology Congress held in Melbourne this year, a report on the newly released WHO World Health statistics, a disturbing report on climate change and health, a timely report on obesity in the MENA region and the regular MERS update.

And there is much more insightful news, interviews and product reviews in this issue. Read on.

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good riddance!

We don't like to shout however
it's time to shout about what
we leave out...

- ✓ Dairy free chocolates
- ✓ Paraben free beauty
- ✓ Aspartame free protein
- ✓ Gluten free snacks
- ✓ Hydrogenated fat free treats
- ✓ Gelatin free vitamins

Dubai - Mirdif City Centre - Oasis Centre
- The Dubai Mall - Jumeirah 1 - Citywalk
- Madinat Jumeirah - Dubai Festival City
Fujairah - Fujairah City Centre
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middle east monitor

Update from around the region

US-Qatar-MENA Collaborative Research Grant to fund research in infectious diseases

Qatar National Research Fund, (QNRF) a member of Qatar Foundation Research and Development, has teamed up with the US-based National Institute of Allergy and Infectious Diseases (NIAID) of the National Institute of Health (NIH) to co-sponsor a joint-funding programme.

In partnership with CRDF Global, the 2014 US-Qatar-MENA Collaborative Research Grant Competition will support teams of leading scientists from Qatar, the Middle East and North Africa (MENA) region and the United States. Their research projects will focus on one or more endemic and emerging viral infectious diseases affecting the MENA region including MERS, hepatitis C and E, influenza and HIV/AIDS among others.

Awarded teams will receive up to US\$40,000 to cover research costs over a one-year period.

Commenting on the importance of the joint-funding programme, QNRF's Executive Director, Dr Abdul Sattar Al-Taie, said: "Our goal with this new joint-funding programme is to foster new biomedical research collaborations between leading researchers from Qatar, other MENA countries, and the United States.

"We want to bring the best minds of the world together to solve critical issues of direct relevance to the MENA region which will also add to global knowledge about endemic and emerging viral infectious diseases."

The announcement of the collaboration was made at a recent QNRF-sponsored workshop entitled 'The Endemic and Emerging Viral Diseases of Priority in the Middle East and North Africa,' held in Doha.

International medical and public health experts and researchers from renowned global and regional institutions gathered for the four-day workshop, and are among those eligible for funding under the new programme. They include scientists from The Johns Hopkins University and Harvard University in the United States, Toulouse University in France, and representatives from some of the MENA re-

gion's leading institutions including Weill Cornell Medical College in Qatar, the American University of Beirut, Tripoli Medical Centre in Libya, Cairo University in Egypt, and the University of Jordan.

Doris Duan-Young Autism Centre opens in DHCC

Dubai Healthcare City (DHCC) recently announced the opening of Doris Duan-Young Autism Centre, a US\$1 million-dollar plus facility, which can accommodate up to 100 adults and children. The Doris Duan-Young Autism Centre is a sister company to Behavioural Support Services, Inc. and Behavioral Support Services FZ LLC.

Opened by founder and best-selling author, Doris Duan-Young, the state-of-the-art centre will provide early intervention, speech and behavioural therapy, and vocational training for adults and children with autism.

Having successfully helped over 25,000 families to cope with autism through her centre in Orlando in the United States, Duan-Young researched facilities for developmental disabilities in the Middle East, and found the region was in need of such a centre. The centre provides sensory rooms, theatre for imaginative play, a quiet room and space for group and single therapy, accommodating up to 100 adults and children.

Duan-Young, said: "We strive to lessen the challenges of autism and developmental disabilities and developmental delays. We tailor our services to provide an enriched environment complete with educational, cultural and recreational activities that promote growth, independence and social interaction."

The CEIMC provides behavioural therapy, social therapy, communication, and academics to support inclusion of children with developmental delays in main stream schools and nurseries. It accepts children as young as 18 months.

18 new private hospitals being built in Dubai

Essa Al Maidoor, Director-General of the

Dubai Health Authority (DHA), speaking at an event to honour long-serving leaders of the DHA recently, said work on 18 new private hospitals was under way in Dubai emirate.

In a report in *Khaleej Times*, he said Dubai has a total of 25 hospitals (21 in the private sector and four in the government sector), 1,200 polyclinics and 580 pharmacies.

He noted that there were 2,229 health facilities in the emirate, with more than 21,500 healthcare professionals (15,500 in the private sector and 6,000 in the public sector) employed in Dubai.

American Hospital Dubai performs innovative heart arrhythmia procedure

The American Hospital Dubai's cardiac team presented a range of new heart procedures available in the UAE at a meeting hosted by the hospital's 'The Heart Center' for more than 50 healthcare professionals in the UAE. These procedures offer new hope in treating very common health conditions – heart arrhythmia, Abdominal Aortic Aneurysm (AAA), and resistant hypertension – which can be life threatening and are now treatable through advanced minimal access surgery.

The new cardiac surgical procedure for heart arrhythmia – called 'thoracoscopic atrial fibrillation ablation – involves burning heart tissue with a catheter to leave scar tissue that creates new pathways for electrical impulses, which restores the normal sequence of electrical impulses that trigger each heartbeat. The procedure is minimally invasive.

Speaking at the presentation Dr Nayzak Raoof, Chief Medical Officer, said: "The Heart Center ... is one of a small, select group of medical centers worldwide, and among the few private healthcare institution in the region, capable of undertaking advanced interventional and surgical procedures, such as minimally invasive cardiac surgery and beating heart bypass surgery, state of the art heart valve repair and advanced aortic arch procedures.

"We are seeing the benefits of our multi-disciplinary approach to cardiac care with

these innovative procedures, and just as important is the fact that we are meeting international standards by ensuring that patients undergo revascularization within 90 minutes, which is saving lives.”

Sheikh Khalifa Medical City sets up state-of-the-art IV cleanroom

Sheikh Khalifa Medical City (SKMC) in Abu Dhabi has implemented an open architecture smart cleanroom (IV room) with USP <797> and CETA compliant certification, believed to be the first of its kind in the Gulf.

Among other uses, the smart IV room will be used to prepare total parenteral nutrition (TPN), an intravenous administration of nutrition which can include protein, carbohydrate, fat, minerals and electrolytes, vitamins and other trace elements for patients who cannot eat or absorb enough food through tube feeding formula to maintain good nutrition. Essentially, TPN is a way of supplying all the nutritional needs of the body by bypassing the digestive system and dripping nutrient solution directly into a vein.

While preparing TPNs, unique to each individual, the process must be carefully managed in a sterile environment to protect patient health and avoid infection, disability and even death. The smart IV room offers real time 24/7 communication with operators on the room status, cleanliness level, particle count and crucial environmental information such as temperature, relative humidity and differential pressure.

TPN's prepared in a non USP <797> certified room are not recommended for use for more 24 hours but with this technology, the length of time extends up to seven days, according to Rafik Youssef, Pharmacy Manager at SKMC.

“Patients requiring Home-TPN are usually restricted in terms of mobility and being able to travel, because they must come back to the hospital every day. Now, with the smart IV room technology and sterility capabilities, Home-TPN patients can prolong that to seven days, giving them a sense of a freedom that they didn't have before,” Youssef said.

Mother of two year old Emirati boy Hamed Al Mansoori, who has been a TPN patient all of his short life, applauded the Abu Dhabi-based flagship hospital for bringing world-class technology to residents: “We knew that this kind of service and technology existed internationally, and we are extremely happy to have access to it here in the UAE.”

Stem cell therapy raises hope for Gulf's leukaemia patients

In one of the most remarkable breakthroughs in the fight against cancer, advances in stem cell transplants are resulting in lower mortality rates for children with leukaemia. According to the University of Chicago, significant improvements have been made in graft manipulation, donor selection, fine-tuning of conditioning regimens as well as new forms of immunosuppression after transplants.

The combined effect means fewer complications, higher recovery rates and greater anti-tumour effects of the stem cell grafts. This

could sway more medical experts in the Gulf to recommend the revolutionary HSCT (Hematopoietic Stem Cell Transplantation), which is now considered the most effective option for tackling leukaemia.

In order to give Gulf patients and doctors greater access to the latest cancer breakthroughs, Gulf Care International has brought one of the world's most eminent researchers in childhood cancers specifically, and blood diseases as a whole. Dr John M Cunningham is Professor of Pediatrics, Physiology and Stem Cell Research at the University of Chicago, which collaborates with Gulf Care International to provide ultra-competitive medical care for Gulf patients in the US.

Doctors from the UAE and the wider region benefitted immensely from the research presented by Dr Cunningham at the recent Arab Pediatrics Congress in Dubai.

Summarizing the insights he shared at the congress, Dr Cunningham said: “Even when a child with leukaemia has undergone stem cell grafts, that is only half the story – because some chil-

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dren tragically succumb to post-transplant complications. That's why Gulf doctors are showing greater interest in revolutionary new disease-specific post-transplant therapies and donor lymphocyte infusions (DLIs). Some of these emerging concepts are still too complex for doctors to understand, let alone the parents and certainly not the children themselves. So we need greater synergies between the Gulf and US medical communities to accelerate skills transfer and information exchange."

Dr Cunningham pointed out: "I strongly believe we are on the verge of greater progress in understanding cancer than we ever have at any point in human history. Knowledge is the best medicine, and solutions like tumour vaccines are already becoming a reality."

WCMC-Q researchers involved with developing breakthrough metabolic map

A huge leap forward has been made by researchers at Weill Cornell Medical College in Qatar (WCMC-Q) who have produced a comprehensive atlas identifying the genes that influence how the body keeps our blood levels of sugars, fats and amino acids in balance.

Dr. Karsten Suhre, professor of physiology and biophysics at WCMC-Q, worked with partners at institutions in Europe to create the map, which has recently been featured in *Nature Genetics*.

A total of 7,824 people took part in the study with the scientists determining 2.1 million genetic variants in each one of those study participants. The researchers then measured the levels of over 400 different small molecules, called metabolites, that are found in the blood of every person. The relation between metabolite levels and differences between every individual's genes was recorded and, through statistical analysis, it was found that there are 145 genes that have a significant effect on the body's metabolic capacities.

Dr. Suhre said: "Many of the 145 genes we identified are enzymes. Enzymes are there to produce the different metabolites – the sugars, fats and amino acids that are the building

blocks the body needs. They also eliminate toxic substances and excess metabolites from our system. Genetically, everyone has these enzymes but no-one is identical in what concerns their genetic make-up, so we're looking for differences in what an individual's enzymes can do by generating a comprehensive picture of over 400 metabolites for every blood sample we measure.

Essentially, a single genetic difference in the way that an enzyme behaves may have positive or negative benefits for that individual. It may make them more prone to certain diseases or protect them from some illnesses by, for example, efficiently processing a certain vitamin or being unable to process it.

"This is an atlas of how everybody is metabolically different," said Dr. Suhre. "We can now really understand the genetic part of human metabolism as a whole; that is a first. It has never been achieved to this level before."

We can now really understand the genetic part of human metabolism as a whole; that is a first. It has never been achieved to this level before.

The research has been going on for several years at WCMC-Q with international collaborators, and Dr. Suhre said, the map is the culmination of that, providing an extremely valuable tool for scientists. The map shows the different pathways between genes, enzymes and metabolites, demonstrating that a drug used to target one gene may have several different effects and consequences on other pathways. Perhaps most importantly, it shows how human metabolism works as a system and how it can potentially be modified in order to counteract what a disease has done.

Dr. Suhre said: "To treat a disease, such as diabetes or cancer, if you want to change the levels of a certain metabolite, the map

would tell you which enzyme to target, but it would also tell you which other metabolites and enzymes surrounding the target would be affected, so that you can select the right combination of drugs in order to reach a desired effect."

● doi:10.1038/ng.2982

Survey finds patient engagement critical to evolving health systems

A survey of senior regional and international healthcare industry officials concludes that patient engagement is critically important for the transformation and sustainability of global healthcare systems, including those in the Middle East.

The survey was conducted at The Gulf Intelligence Healthcare Technology Workshop Forum held recently in Abu Dhabi.

The survey results note that patient engagement is critically important to the transformation and sustainability of global healthcare systems at a time when new 'smart' solutions integrating the latest information technologies into hospitals and clinics offer patients unprecedented levels of access to medical records and health information, support illness management through remote and mobile healthcare, and minimize risk through real-time data sharing.

James Fitter, CEO of Oneview Healthcare, said: "Patient engagement and empowerment sit at the heart of the fundamental changes taking place in the healthcare industry all over the world today. At a time when healthcare costs are soaring everywhere, patient engagement is critical for moving from a volume to a value proposition in healthcare."

The same survey also found that 53% of respondents thought that involving patients in decision making on their care plans was most important for engaging patients in their care; 25% thought that providing patients with the ability to view their personal health record and exchange electronic messages with their clinicians was the most important; and 22% thought that giving patients access to educational content so they could understand their condition and their treatment was the most important. **MEH**

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Update from around the globe

Dengue on the increase in the Americas

The number of dengue cases in the Americas increased five-fold between 2003 and 2013, according to data presented at a recent high-level regional meeting on dengue hosted by the Pan American Health Organization/World Health Organization (PAHO/WHO).

Between 2009 and 2012, over 1 million cases were reported annually, on average, with more than 33,900 severe cases and 835 deaths. Last year (2013) was one of the worst years for dengue in the hemisphere's history, with 2.3 million cases, including 37,705 severe cases and 1,289 deaths. By comparison, the number of cases reported regionwide in 2003 was 517,617.

Despite countries' efforts to control the disease, dengue continues to spread due to uncontrolled, unplanned urbanization, lack of basic services in communities, poor environmental management, and climate change, among other reasons. In the Americas, nearly 500 million people are at risk of contracting the disease.

"Controlling the *Aedes aegypti* mosquito, which transmits the disease, is a great regional and global challenge," said Marcos Espinal, Director of the Department of Communicable Diseases and Health Analysis at PAHO/WHO. "All government sectors, communities, and families have to work together to fight the vector and control this disease, which knows no borders, discriminates against no one, and is everyone's problem, not just the health sector's."

Canada, continental Chile, and Uruguay are the only countries in the Region that have reported no dengue cases to date (despite the presence of *A. aegypti* in Uruguay). The United States detected dengue for the first time in 2007 and by 2013 had registered 1,292 cases, although none were severe or resulted in death.

French funding award for Argus II Retinal Prosthesis System

Second Sight Medical Products has become the first recipient of the French Government national healthcare reimbursement program entitled 'Forfait Innovation' for their Argus II Retinal Prosthesis

System, the world's first approved device intended to restore some functional vision for people suffering from blindness due to outer retinal degenerations.

The 'Forfait Innovation' Award is a new funding mechanism launched by the French Ministry of Social Affairs and Health to fast track the provision of innovative healthcare technologies.

With funding for this innovative technology now in place, a long-awaited official program to treat advanced retinitis pigmentosa (RP) is commencing in France. Up to 30 RP patients per year in France now stand to benefit from this life-changing technology.

Professor Jose-Alain Sahel, professor of Ophthalmology, University Pierre et Marie Curie, head of department, Quinze-Vingts Hospital, director of the Vision Institute (UPMC/INSERM/CNRS), said of this decision: "We have been involved in the development of this product for more than five years. This announcement is hugely significant for us and for French patients blinded by retinal diseases. These patients face a great unmet medical need, as there are no current solutions to improve their vision. Additionally, the announcement provides encouragement for other solutions currently under development at Vision Institute in Paris, to further ameliorate conditions resulting in blindness."

Gregoire Cosendai, Second Sight's vice president, Europe, said: "It is tremendous news for several patients in France who have been blind for some time and are awaiting a treatment to improve their vision and quality of life. It's also a great tribute to the excellence of the Quinze-Vingts Hospital who participated in the multicenter clinical trial that led to the first market approval of the Argus II retinal prosthesis in Europe and the USA."

The Argus II System works by converting video images captured by a miniature camera housed in the patient's glasses into a series of small electrical pulses that are transmitted wirelessly to an array of electrodes on the surface of the retina. These pulses are intended to stimulate the retina's remaining cells resulting in the corre-

sponding perception of patterns of light in the brain. The patient then learns to interpret these visual patterns, thereby regaining some visual function.

● doi:10.1136/bjophthalmol-2012-301525

WHO issues guidelines for treatment of hepatitis C

The World Health Organization (WHO) has issued its first guidance for the treatment of hepatitis C, a chronic infection that affects an estimated 130 million to 150 million people and results in 350,000 to 500,000 deaths a year.

The publication of the *WHO Guidelines for the screening, care and treatment of persons with hepatitis C infection* coincides with the availability of more effective and safer oral hepatitis medicines, along with the promise of even more new medicines in the next few years.

"The WHO recommendations are based on a thorough review of the best and latest scientific evidence," says Dr Stefan Wiktor, who leads WHO's Global Hepatitis Programme. "The new guidance aims to help countries to improve treatment and care for hepatitis and thereby reduce deaths from liver cancer and cirrhosis."

WHO will be working with countries to introduce the guidelines as part of their national treatment programmes. WHO support will include assistance to make the new treatments available and consideration of all possible avenues to make them affordable for all. WHO will also assess the quality of hepatitis laboratory tests and generic forms of hepatitis medicines.

"Hepatitis C treatment is currently unaffordable to most patients in need. The challenge now is to ensure that everyone who needs these drugs can access them," says Dr Peter Beyer, Senior Advisor for the Essential Medicines and Health Products Department at WHO. "Experience has shown that a multi-pronged strategy is required to improve access to treatment, including creating demand for treatment. The development of WHO guidelines is a key step in this process."

The new guidelines make nine key recommendations. These include approaches to

increase the number of people screened for hepatitis C infection, advice as to how to mitigate liver damage for those who are infected and how to select and provide appropriate treatments for chronic hepatitis C infection.

Screening: WHO recommends a screening test for those considered at high risk of infection, followed by another test for those who screen positive, to establish whether they have chronic hepatitis C infection.

Mitigating liver damage: Since alcohol use can accelerate liver damage caused by hepatitis C, WHO now advises that people with chronic hepatitis C infection receive an alcohol assessment. The Organization also recommends providing counselling to reduce alcohol intake for people with moderate or high alcohol use. In addition, the guidelines provide advice on the selection of the most appropriate test to assess the degree of liver damage in those with chronic hepatitis C infection.

Treatment: The guidelines provide recommendations on existing treatments based on interferon injections as well as the new regimens that use only oral medicines. WHO will update recommendations on drug treatments periodically as additional antiviral medicines are registered on the market and new evidence emerges.

Prevention: The 2014 recommendations also summarize for policy makers and health care workers interventions that should be put in place to prevent transmission of hepatitis C, including measures to assure the safety of medical procedures and injections in health care settings and among persons who inject drugs. Rates of new hepatitis C infections remain unacceptably high in many countries because of the reuse of injection equipment and lack of screening of blood transfusions.



WHO Guidelines for the screening, care and treatment of persons with hepatitis C infection
www.who.int/hiv/pub/hepatitis/hepatitis-c-guidelines

Hill-Rom to acquire medical division of Trumpf

The Medical Technology division of the Ditzingen-based machine tool and laser manufacturer Trumpf, with its two Ger-

man factories in Saalfeld (Thuringia) and Puchheim (Bavaria) and its foreign subsidiaries, is to be acquired by the American medical technology manufacturer Hill-Rom Holdings, Inc. TRUMPF and Hill-Rom have signed the relevant contracts.

Completion of the sale is still subject to approval from the anti-trust authorities and is expected to be concluded by the end of quarter 3, 2014.

Hill-Rom, founded in 1929, is an internationally recognized manufacturer of medical products (including hospital beds, patient lifts, and patient positioning systems in operating rooms). Trumpf Medical Systems focuses on innovative system solutions for operating rooms and intensive care units; the portfolio includes operating tables, operating lights, ceiling-mounted supply units, video solutions and assistance-systems.

Commenting on the deal, Harald Völker, Head of Medical Technology in the Trumpf Group Management said: "The product portfolios of both companies enhance each other perfectly, and in international sales, too, we both cover more international markets than either of us would on their own."

This will have positive effects on the development of the division: "Joining forces with Hill-Rom offers excellent prospects for rapid and sustainable further development of the German and foreign sites," he added

Imperial College London to create new biomedical engineering centre

Imperial College London is to build a new and pioneering biomedical engineering centre thanks to an unprecedented £40 million (US\$69m) gift from Michael Uren OBE and the Michael Uren Foundation.

The donation will support the construction of the Michael Uren Biomedical Engineering Hub, a building at Imperial West, the College's new research and innovation campus in White City, west London.

The centre will house life-changing research into new and affordable medical technology, helping people affected by a diverse range of medical conditions. Imperial's world-class engineers, scientists and clinicians will work together in the new space and facilities alongside spin-out companies, helping to cre-

ate a vibrant innovation district at Imperial West. The Hub will also incorporate clinical areas, providing patients with direct access to innovations in healthcare.

The building and its location will cement Imperial and the UK's position as world-leaders in biomedical engineering research and application.

Sir Keith O'Nions, President of Imperial College London, said: "Imperial is profoundly grateful to Michael Uren and his Foundation for this remarkable gift, the most generous it has ever received. It will create a wholly new building and set of facilities for engineers and medics to come together and make new discoveries and innovations on an unparalleled scale. It provides enormous impetus to the development of Imperial West as an innovation district."

Michael Uren OBE said: "It is an honour for me to be able to help this great university. Medical teaching and research didn't exist at Imperial in my day, but it has evolved into an institution where the work between engineering and medicine is today one of its outstanding strengths. Imperial has always applied academic excellence for the greater good, and I am thrilled by the prospect of this Biomedical Engineering Hub doing exactly that.

"What I find so exciting about this project is that here is Imperial building one of the biggest research centres in the world within a few miles of the City of London, which itself has become the biggest financial centre in the world today. By putting the two together, what is quite clear is that the investment world will be watching for, and waiting for, the research and inventions which will create tomorrow's great companies.

Imperial is already world-renowned for excellence in biomedical engineering research. Its Institute for Biomedical Engineering, founded in 2004, draws together expertise from across the College's Faculties of Engineering and Medicine, incorporating a wide range of collaborative networks and research centres.

Johns Hopkins receives funds for worldwide influenza virus research

The US National Institutes of Health



(NIH) has awarded a contract to researchers at The Johns Hopkins University to launch a new centre devoted to developing innovative ways to identify and track influenza viruses worldwide.

One top goal is to rapidly identify new influenza virus strains that may emerge as the next seasonal influenza or global pandemic that could threaten public health.

Under terms of the contract from NIH's National Institute of Allergy and Infectious Diseases, Johns Hopkins will be one of only five institutions in the United States to be a part of the Centers of Excellence for Influenza Research and Surveillance (CEIRS). The institutions in the CEIRS network will pursue independent research projects and collaborate on others.

A high priority for the Johns Hopkins centre is to develop better ways to rapidly identify which circulating influenza virus strains are robust enough to infect large numbers of people and cause serious, widespread illness, said Andrew Pekosz, Ph.D., Johns Hopkins University Bloomberg School of Public Health, who will co-direct the new centre.

To that end, the Johns Hopkins CEIRS team plans to track human influenza virus strains in the United States and Taiwan as part of an effort build a database of influenza cases in real time from hospitals and other healthcare facilities.

The data will be stored in a central, cloud-based computer network so that researchers across the CEIRS network can access the information for their own projects and share insights and findings from across the country and around the world.

The centre's staff will also analyze genetic characteristics of influenza viruses and use genome sequencing technologies on viruses collected for the database.

The Johns Hopkins CEIRS team hopes to improve the response to influenza epidemics and pandemics by isolating and characterizing new influenza virus strains faster and earlier in the influenza season, thereby giving more time to generate vaccines and formulate public health intervention policies.

Other projects the Johns Hopkins cen-

tre will focus on include:

- Using human cell cultures to determine the likelihood of influenza viruses infecting humans;
- Using advanced computer modelling to assess how well different public health intervention strategies work to slow or mitigate an emerging pandemic;
- Using global modelling to assess a country or region's risk for an epidemic or pandemic; and
- Developing tactical response training programs for medical support and virus surveillance for a pandemic.

Air quality deteriorating in many of the world's cities

Air quality in most cities worldwide that monitor outdoor (ambient) air pollution fails to meet World Health Organization (WHO) guidelines for safe levels, putting people at additional risk of respiratory disease and other health problems.

WHO's Urban Air Quality database covers 1600 cities across 91 countries – 500 more cities than the previous database (2011), revealing that more cities worldwide are monitoring outdoor air quality, reflecting growing recognition of air pollution's health risks.

Only 12% of the people living in cities reporting on air quality reside in cities where this complies with WHO Air Quality Guideline levels. About half of the urban population being monitored is exposed to air pollution that is at least 2.5 times higher than the levels WHO recommends – putting those people at additional risk of serious, long-term health problems.

In most cities where there is enough data to compare the situation today with previous years, air pollution is getting worse. Many factors contribute to this increase, including reliance on fossil fuels such as coal fired power plants, dependence on private transport motor vehicles, inefficient use of energy in buildings, and the use of biomass for cooking and heating.

But some cities are making notable improvements – demonstrating that air quality can be improved by implementing policy measures such as banning the use of

coal for “space heating” in buildings, using renewable or “clean” fuels for electricity production, and improving efficiency of motor vehicle engines.

The latest available data have prompted WHO to call for greater awareness of health risks caused by air pollution, implementation of effective air pollution mitigation policies; and close monitoring of the situation in cities worldwide.


“Too many urban centres today are so enveloped in dirty air that their skylines are invisible,” said Dr Flavia Bustreo, WHO Assistant Director-General for Family, Children and Women's Health. “Not surprisingly, this air is dangerous to breathe. So a growing number of cities and communities worldwide are striving to better meet the needs of their residents – in particular children and the elderly.”

In April 2014, WHO issued new information estimating that outdoor air pollution was responsible for the deaths of some 3.7 million people under the age of 60 in 2012. The Organization also emphasised that indoor and outdoor air pollution combined are among the largest risks to health worldwide.

There are many components of air pollution, both gaseous and solid. But high concentrations of small and fine particulate pollution is particularly associated with high numbers of deaths from heart disease and stroke, as well as respiratory illnesses and cancers. Measurement of fine particulate matter of 2.5 micrometers or less in diameter (PM2.5) is considered to be the best indicator of the level of health risks from air pollution.

In high-income countries, 816 cities reported on PM2.5 levels with another 544 cities reporting on PM10, from which estimates of PM2.5 can be derived.

In low-and middle income countries, however, annual mean PM2.5 measurements could be accessed in only 70 cities; another 512 cities reported on PM10 measurements.

 Ambient (outdoor) air pollution in cities database 2014

<http://tinyurl.com/lm7l87c>



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Process devised to make minimally invasive surgery more accurate

Johns Hopkins researchers have devised a computerized process that could make minimally invasive surgery more accurate and streamlined using equipment already common in the operating room.

In a report published recently in the journal *Physics in Medicine and Biology*, the researchers say initial testing of the algorithm shows that their image-based guidance system is potentially superior to conventional tracking systems that have been the mainstay of surgical navigation over the last decade.

“Imaging in the operating room opens new possibilities for patient safety and high-precision surgical guidance,” says Jeffrey Siewerdsen, Ph.D., a professor of biomedical engineering in the Johns Hopkins University School of Medicine. “In this work, we devised an imaging method that could overcome traditional barriers in precision and workflow. Rather than adding complicated tracking systems and special markers to the already busy surgical scene, we realized a method in which the imaging system is the tracker and the patient is the marker.”

Siewerdsen explains that current state-of-the-art surgical navigation involves an often cumbersome process in which someone – usually a surgical technician, resident or fellow – manually matches points on the patient’s body to those in a preoperative CT image. This process, called registration, enables a computer to orient the image of the patient within the geometry of the operating room. “The registration process can be error-prone, require multiple manual attempts to achieve high accuracy and tends to degrade over the course of the operation,” Siewerdsen says.

Siewerdsen’s team used a mobile C-arm to develop an alternative. They suspected that a fast, accurate registration algorithm could be devised to match two-dimensional X-ray images to the three-dimensional preoperative CT scan in a way that would be automatic and remain up to date throughout the operation.

Starting with a mathematical algorithm

they had previously developed to help surgeons locate specific vertebrae during spine surgery, the team adapted the method to the task of surgical navigation. When they tested the method on cadavers, they found a level of accuracy better than 2 millimetres and consistently better than a conventional surgical tracker, which has 2 to 4 millimetres of accuracy in surgical settings.

“The breakthrough came when we discovered how much geometric information could be extracted from just one or two X-ray images of the patient,” says Ali Uneri, a graduate student in the Department of Computer Science in the Johns Hopkins University Whiting School of Engineering. “From just a single frame, we achieved better than 3 millimetres of accuracy, and with two frames acquired with a small angular separation, we could provide surgical navigation more accurately than a conventional tracker.”

The team investigated how small the angle between the two images could be without compromising accuracy and found that as little as 15 degrees was sufficient to provide better than 2 millimetres of accuracy.

An additional advantage of the system, Uneri says, is that the two X-ray images can be acquired at extremely low dose of radiation – far below what is needed for a visually clear image, but enough for the algorithm to extract accurate geometric information.

The team is translating the method to a system suitable for clinical studies. While the system could potentially be used in a wide range of procedures, Siewerdsen expects it to be most useful in minimally invasive surgeries, such as spinal and intracranial neurosurgery.

Disorganised cortical patches suggest prenatal origin of autism

The architecture of the autistic brain is speckled with patches of abnormal neurons, according to research published in the *New England Journal of Medicine* on March 27, 2014.

The study suggests that brain irregularities in children with autism can be traced

back to prenatal development.

“While autism is generally considered a developmental brain disorder, research has not identified a consistent or causative lesion,” said Thomas R. Insel, M.D., director of US-based National Institute of Mental Health (NIMH). “If this new report of disorganized architecture in the brains of some children with autism is replicated, we can presume this reflects a process occurring long before birth. This reinforces the importance of early identification and intervention.”

Eric Courchesne, Ph.D. and Rich Stoner, Ph.D., of the Autism Center of Excellence at the University of California, San Diego joined colleagues from the Allen Institute for Brain Science to investigate the cellular architecture of the brain’s outermost structure, the cortex, in children with autism. Courchesne recently reported an overabundance of neurons in the prefrontal cortex of children with autism.

For the current study, the researchers analyzed gene expression in postmortem brain tissue from children with and without autism, all between 2 and 15 years of age.

As the prenatal brain develops, neurons in the cortex differentiate into six layers. Each is composed of particular types of brain cells with specific patterns of connections. The research team focused on genes that serve as cellular markers for each of the cortical layers as well as genes that are associated with autism.

The study found that the markers for several layers of the cortex were absent in 91% of the autistic case samples, as compared to 9% of control samples. Further, these signs of disorganization were not found all over the brain’s surface, but instead were localized in focal patches that were 5-7 millimetres in length and encompassed multiple cortical layers.

These patches were found in the frontal and temporal lobes of the cortex – regions that mediate social, emotional, communication, and language functions. Considering that disturbances in these types of behaviours are hallmarks of autism, the researchers conclude that the specific locations of the patches may un-



derlie the expression and severity of various symptoms in a child with the disorder.

The patchy nature of the defects may explain why early treatments can help young infants and toddlers with autism improve. According to the researchers, since the faulty cell layering does not occur over the entire cortex, the developing brain may have a chance to rewire its connections by sidestepping the pathological patches and recruiting cells from neighbouring brain regions to assume critical roles in social and communication functions.

● doi: 10.1056/NEJMoa1307491



Youtube - Patches of Disorganization in the Neocortex of Children with Autism

<http://youtu.be/B3Jv16KsAwE>

Recycling a patient's blood during surgery better than using banked blood

Patients whose own red blood cells are recycled and given back to them during heart surgery have healthier blood cells better able to carry oxygen where it is most needed compared to those who get transfusions of blood stored in a blood bank, according to results of a small study at Johns Hopkins.

In a report for the June issue of the journal *Anesthesia & Analgesia*, the researchers say they found that the more units of banked blood a patient received, the more red cell damage they observed. The damage renders the cells less flexible and less able to squeeze through a body's smallest capillaries and deliver oxygen to tissues. Among patients who received five or more units of red blood cells from a hospital blood bank during the study, the damage persisted for at least three days after surgery. In the past, studies have linked transfusions to increased risk of hospital-acquired infections, longer hospital stays and increased risk of death.

"We now have more evidence that fresh blood cells are of a higher quality than what comes from a blood bank," says study leader Steven Frank, M.D., an associate professor of anesthesiology and critical care medicine at the Johns Hopkins University School of Medicine. "If banked blood, which is stored for up to six weeks, is now shown to be of a lower quality, it makes more sense to use recycled blood that has only been outside the body for one or two hours. It's always been the case that patients feel better about getting their own blood, and recycling is also more cost effective."

To recycle the blood, a machine known as a cell saver is used to collect what a patient loses during surgery, rinse away unneeded fat and tissue, and then centrifuge and separate the red cells, which are then returned to the patient should he or she need it.

"If something is bad for you, a little bit might be OK, but a lot of it is much worse," Frank says. "It turns out that blood is more like milk, which has a relatively short shelf life, than a fine wine, which gets better with age."

Frank cautions that cell saver machines are not appropriate for all operations, and not all hospitals have access to round-the-clock perfusionists to run them. For heart surgeries, however, a perfusion-

ist is already in the operating room to run the heart-lung bypass machine. And, he adds, many operations are considered to be low risk for blood loss, in which case the cell saver is unnecessary. But he advocates wider use of recycled blood.

"In any patient where you expect to give one unit of red blood cells or more, it's cost-effective and beneficial to recycle," he says.

New immunotherapy could be effective against wide range of cancers

A new method for using immunotherapy to specifically attack tumour cells that have mutations unique to a patient's cancer has been developed by scientists at the US National Cancer Institute (NCI), part of the National Institutes of Health. The researchers demonstrated that the human immune system can mount a response against mutant proteins expressed by cancers that arise in epithelial cells which can line the internal and external surfaces (such as the skin) of the body. These cells give rise to many types of common cancers, such as those that develop in the digestive tract, lung, pancreas, bladder and other areas of the body.

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The research provides evidence that this immune response can be harnessed for therapeutic benefit in patients, according to the scientists. The study was published May 9, 2014, in the journal *Science*.

“Our study deals with the central problem in human cancer immunotherapy, which is how to effectively attack common epithelial cancers,” said Steven A. Rosenberg, M.D., Ph.D., chief of the Surgery Branch in NCI’s Center for Cancer Research. “The method we have developed provides a blueprint for using immunotherapy to specifically attack sporadic or driver mutations, unique to a patient’s individual cancer.”

All malignant tumours harbour genetic alterations, some of which may lead to the production of mutant proteins that are capable of triggering an antitumor immune response. Research led by Rosenberg and his colleagues had shown that human melanoma tumours often contain mutation-reactive immune cells called tumour-infiltrating lymphocytes, or TILs. The presence of these cells may help explain the effectiveness of adoptive cell therapy (ACT) and other forms of immunotherapy in the treatment of melanoma.

In ACT, a patient’s own TILs are collected, and those with the best antitumor activity are grown in the laboratory to produce large populations that are infused into the patient. However, prior to this work it had not been clear whether the human immune system could mount an effective response against mutant proteins produced by epithelial cell cancers. These cells comprise more than 80% of all cancers. It was also not known whether such a response could be used to develop personalized immunotherapies for these cancers.

In this study, Rosenberg and his team set out to determine whether TILs from patients with metastatic gastrointestinal cancers could recognize patient-specific mutations. They analyzed TILs from a patient with bile duct cancer that had metastasized to the lung and liver and had not been responsive to standard chemotherapy. The patient, a 43-year-old woman, was enrolled in an NIH trial of ACT for patients with gastrointestinal cancers (Clinical trial number NCT01174121).

The researchers first did whole-exome sequencing, in which the protein-coding regions of DNA are analyzed to identify mutations that the patient’s immune cells might recognize. Further testing showed that some of the patient’s TILs recognized a mutation in a protein called ERBB2-interacting protein (ERBB2IP). The patient then underwent adoptive cell transfer of 42.4 billion TILs, approximately 25% of which were ERBB2IP mutation-reactive T lymphocytes, which are primarily responsible for activating other cells to aid cellular immunity, followed by treatment with four doses of the anticancer drug interleukin-2 to enhance T-cell proliferation and function.

Following transfer of the TILs, the patient’s metastatic lung and liver tumours stabilized. When the patient’s disease eventually progressed, after about 13 months, she was re-treated with ACT in which 95% of the transferred cells were mutation-reactive T cells, and she experienced tumour regression that was ongoing as of the last follow up (six months after the second T-cell infusion). These results provide evidence that a T-cell response against a mutant protein can be harnessed to mediate regression of a metastatic epithelial cell cancer.

“Given that a major hurdle for the success of immunotherapies for gastrointestinal and other cancers is the apparent low frequency of tumor-reactive T cells, the strategies reported here could be used to generate a T-cell adoptive cell therapy for patients with common cancers,” said Rosenberg.

● doi: 10.1126/science.1251102.

Discovery of anti-appetite molecule released by fibre could help tackle obesity

New research has helped unpick a long-standing mystery about how dietary fibre suppresses appetite.

In a study led by Imperial College London and the Medical Research Council (MRC), an international team of researchers identified an anti-appetite molecule called acetate that is naturally released when we digest fibre in the gut. Once released, the acetate is transported to the brain where it produces a signal to tell us to stop eating.

The research, published in *Nature Com-*

munications, confirms the natural benefits of increasing the amount of fibre in our diets to control over-eating and could also help develop methods to reduce appetite. The study found that acetate reduces appetite when directly applied into the bloodstream, the colon or the brain.

Dietary fibre is found in most plants and vegetables but tends to be at low levels in processed food. When fibre is digested by bacteria in our colon, it ferments and releases large amounts of acetate as a waste product. The study tracked the pathway of acetate from the colon to the brain and identified some of the mechanisms that enable it to influence appetite.

“The average diet in Europe today contains about 15 g of fibre per day,” said lead author of the study Professor Gary Frost, from the Department of Medicine at Imperial College London. “In stone-age times we ate about 100g per day but now we favour low-fibre ready-made meals over vegetables, pulses and other sources of fibre. Unfortunately our digestive system has not yet evolved to deal with this modern diet and this mismatch contributes to the current obesity epidemic. Our research has shown that the release of acetate is central to how fibre suppresses our appetite and this could help scientists to tackle overeating.”

Co-author on the study Professor Jimmy Bell from the MRC Clinical Sciences Centre said: “It’s exciting that we have started to really understand what lies behind fibre’s natural ability to suppress our appetite and identified acetate as essential to the process. In the context of the growing rates of obesity in western countries, the findings of the research could inform potential methods to prevent weight gain.”

Professor Gary Frost added: “The major challenge is to develop an approach that will deliver the amount of acetate needed to suppress appetite but in a form that is acceptable and safe for humans.”

● doi: 10.1038/n-comms4611

Longer stay in ICU has detrimental effect on patient’s long term quality of life

Patients have substantial physical impairments even two years after being dis-



charged from the hospital after a stay in an intensive care unit (ICU), new Johns Hopkins research suggests.

The scientists found that for every day of bed rest in the ICU, muscle strength was between 3% and 11% lower over the following months and years.

“Even a single day of bed rest in the ICU has a lasting impact on weakness, which impacts patients’ physical functioning and quality of life,” says Dale M. Needham, M.D., Ph.D., an associate professor of medicine and of physical medicine and rehabilitation at the Johns Hopkins University School of Medicine and senior author of the study described in the April issue of *Critical Care Medicine*. “We previously thought that bed rest and sedation in an ICU were helpful for patients, but we’re finding this approach to care is actually harmful to the long-term recovery of many.”

For the study, the Johns Hopkins team followed up on 222 patients discharged from one of 13 ICUs at four Baltimore hospitals between October 2004 and October 2007. All patients spent time on a mechanical ventilator as part of their successful treatment for acute lung injury, a syndrome marked by inflammation and excessive fluid in the lungs and frequent multiorgan failure. The disorder is considered an archetype disease in studying patients with critical illness.

The patients underwent evaluation of muscle strength at hospital discharge and also three, six, 12 and 24 months later. More than one-third of survivors had muscle weakness at discharge, and while many saw improvement over time, the weakness was associated with substantial impairments in physical function and quality of life at subsequent follow-up visits.

The two variables most associated with a patient’s muscle weakness were age and the duration of bed rest in the ICU, a unit where patients are traditionally confined to their beds because of deep sedation, breathing tubes and life-sustaining machinery. “Age is not a modifiable risk factor, but bed rest is,” Needham says. “We need to focus on changing bed rest to improve patients’ recovery.”

Previous research has shown that during

the first three days a severely ill patient spends in the ICU, he or she can expect a 9 percent decrease in muscle size. The patients in this new study spent an average of two weeks in the ICU.

The key to improving long-term physical outcomes for survivors of critical illnesses may be in rethinking how patients are treated in the ICU, the researchers say.

“The standard of care for really sick patients has been keeping them sedated and in bed,” says Eddy Fan, M.D., Ph.D., a former Johns Hopkins physician who now works at the University of Toronto and the study’s first author. “Many doctors and nurses believe that when there’s a breathing tube in place, patients need deep sedation, not rehab. But that is a myth. We need our patients awake and moving.”

Needham stresses the importance of keeping ICU patients as active as possible, even for severely ill patients who may only be able to sit up at the edge of the bed or have their arms and legs exercised by a physical or occupational therapist.

● doi: 10.1097/CCM.000000000000040

Researchers use stem cells to create light-sensitive retinal tissue in a dish

Using a type of human stem cell, Johns Hopkins researchers say they have created a three-dimensional complement of human retinal tissue in the laboratory, which notably includes functioning photoreceptor cells capable of responding to light, the first step in the process of converting it into visual images.

“We have basically created a miniature human retina in a dish that not only has the architectural organization of the retina but also has the ability to sense light,” says study leader M. Valeria Canto-Soler, Ph.D., an assistant professor of ophthalmology at the Johns Hopkins University School of Medicine. She says the work, reported online June 10 in the journal *Nature Communications*, “advances opportunities for vision-saving research and may ultimately lead to technologies that restore vision in people with retinal diseases.”

Like many processes in the body, vision

depends on many different types of cells working in concert, in this case to turn light into something that can be recognized by the brain as an image. Canto-Soler cautions that photoreceptors are only part of the story in the complex eye-brain process of vision, and her lab hasn’t yet recreated all of the functions of the human eye and its links to the visual cortex of the brain. “Is our lab retina capable of producing a visual signal that the brain can interpret into an image? Probably not, but this is a good start,” she says.

The achievement emerged from experiments with human induced pluripotent stem cells (iPS) and could, eventually, enable genetically engineered retinal cell transplants that halt or even reverse a patient’s march toward blindness, the researchers say.

Retinal tissue is complex, comprising seven major cell types, including six kinds of neurons, which are all organized into specific cell layers that absorb and process light, “see,” and transmit those visual signals to the brain for interpretation. The lab-grown retinas recreate the three-dimensional architecture of the human retina. “We knew that a 3-D cellular structure was necessary if we wanted to reproduce functional characteristics of the retina,” says Canto-Soler, “but when we began this work, we didn’t think stem cells would be able to build up a retina almost on their own. In our system, somehow the cells knew what to do.”

Canto-Soler says that the newly developed system gives them the ability to generate hundreds of mini-retinas at a time directly from a person affected by a particular retinal disease such as retinitis pigmentosa. This provides a unique biological system to study the cause of retinal diseases directly in human tissue, instead of relying on animal models. The system, she says, also opens an array of possibilities for personalized medicine such as testing drugs to treat these diseases in a patient-specific way. In the long term, the potential is also there to replace diseased or dead retinal tissue with lab-grown material to restore vision. **MEH**



There were 5 technical briefings at this year's World Health Assembly, on key public health issues. This technical briefing was on "Strengthening health security by implementing the International Health Regulations".

Public health challenges 'growing in complexity'

The 67th World Health Assembly wrapped up its 5-day session in Geneva on 24 May, after adopting more than 20 resolutions on public health issues of global importance. *Middle East Health* reports.

"This has been an intense Health Assembly, with a record-breaking number of agenda items, documents and resolutions, and nearly 3500 registered delegates," said Dr Margaret Chan, WHO's Director-General. "This is a reflection of the growing number and complexity of health issues, and your deep interest in addressing them."

In her opening address to the Health Assembly, Dr Chan voiced her deep concern about the increase worldwide of childhood obesity, with numbers climbing fastest in developing countries. "As the 2014 World Health Statistics report bluntly states,

"Our children are getting fatter," she said.

To gather the best possible advice on dealing with this crisis, Dr Chan announced that she has established a high-level Commission on Ending Childhood Obesity. The Commission - co-chaired by Sir Peter Gluckman, Chief Science Advisor to New Zealand's Prime Minister, and Dr Sania Nishtar, founder of Pakistan's health policy think tank, Heartfile - will produce a consensus report specifying which approaches are likely to be most effective in different contexts around the world. The recommendations



Dr Margaret Chan, Director-General of WHO, makes her opening statement at the plenary session of the Sixty-seventh World Health Assembly.

of the report will be announced at next year's Health Assembly.

Key resolutions adopted at the World Health Assembly



Delegates pose next to a giant mosquito, one of the exhibits at the Assembly that was created for World Health Day 2014 to raise awareness of vector-borne diseases.

Poverty

Dr Chan challenged the Health Assembly to consider the potential impact on health worldwide of the changing poverty map – with 70% of the world's poor living in middle-income countries with emerging economies. “Will economic growth be accompanied by a proportionate increase in domestic budgets for health? Will countries put policies in place to ensure that benefits are fairly shared?” she asked. “If not, the world will see a growing number of rich countries full of poor people.”

Climate Change

She also alerted delegates to the importance of addressing climate change: “In March, the Intergovernmental Panel on Climate Change issued its most disturbing report to date, with a strong focus on the consequences for health.” Many delegates focused on the links between climate and health in the Health Assembly's opening plenary debate, particularly the impact of climate on important social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

Polio

Dr Chan warned about the resurgence of polio. “Two years ago, the international spread of polio virus had nearly ceased.

● New global strategy and targets for tuberculosis

Member States approved a resolution endorsing a new global strategy and targets for tuberculosis (TB) prevention, care and control after 2015. The strategy aims to end the global TB epidemic, with targets to reduce TB deaths by 95% and to cut new cases by 90% by 2035. It sets interim milestones for 2020, 2025, and 2030. The resolution calls on governments to adapt and implement the strategy with high-level commitment and financing. It reinforces a focus within the strategy on serving populations highly vulnerable to infection and poor health care access, such as migrants. The strategy and resolution highlight the need to engage partners within the health sector and beyond, such as in the fields of social protection, labour, immigration and justice. The resolution requests the WHO Secretariat to help Member States adapt and operationalize the strategy, noting the importance of tackling the problem of multidrug-resistant TB and promoting collaboration across international borders. WHO is also asked to monitor implementation and evaluate progress towards the milestones and the 2035 targets.

The estimated number of people falling ill with tuberculosis each year is slowly declining and the world is on track to achieve the Millennium Development Goal to reverse the spread of TB by 2015. However, TB remains one of the world's deadliest communicable diseases, present in all regions of the world. In 2012, 8.6 million people fell ill with TB and 1.3 million died from TB. Some 450,000 people developed multidrug-resistant TB in 2012.

● Antimicrobial drug resistance

The delegates recognized their growing concern of antimicrobial resistance and urged governments to strengthen national action and international collaboration. This requires sharing information on the extent of resistance and the use of antibiotics in humans and animals. It also involves improving awareness among health providers and the public of the threat posed by resistance, the need for responsible use of antibiotics, and the importance of good hand hygiene and other measures to prevent infections. The resolution urges Member States to

strengthen drug management systems, to support research to extend the lifespan of existing drugs, and to encourage the development of new diagnostics and treatment options.

As requested in the resolution, WHO will develop a draft global action plan to combat antimicrobial resistance, including antibiotic resistance for presentation to the World Health Assembly for approval next year.

● Addressing the global challenge of violence, in particular against women and girls

Across the world, each year, nearly 1.4 million people lose their lives to violence. Women and girls experience specific forms of violence that are often hidden. Globally, one in three women experience physical and/or sexual violence at least once in her life. For every person who dies as a result of violence, many more are injured and suffer from a range of adverse physical and mental health conditions.

Member States will work to strengthen the role of the health system in addressing violence. WHO will develop a global plan of action to strengthen the role of national health systems within a multi-sectoral response to address interpersonal violence, in particular against women and girls, and against children.

● Access to essential medicines

WHO's strategy to help countries improve access to essential medicines was approved. Key principles include selecting a limited range of medicines on the basis of the best evidence available, efficient procurement, affordable prices, effective distribution systems, and rational use. The WHO Essential medicines list was recognized as a valuable tool that enables countries to identify a core set of medicines which need to be available to provide quality medical care.

● Health intervention and technology assessment in support of universal health coverage

Many countries currently lack the capacity to assess the merits of health technology. Health Technology Assessment (HTA) involves systematically evaluating the properties, effects, and/or impacts of different health technologies. Its main

Not anymore. At end-2013, 60% of polio cases resulted from international spread, with strong evidence that adult travellers were playing a role. The trend has continued this year, during the low-transmission season for polio, a situation described by the emergency committee as “extraordinary”.

“What accounts for this change? Armed conflict that flies in the face of international humanitarian law. Civil unrest. Migrant populations. Weak border controls. Poor routine immunization coverage. Bans on vaccination by militant groups. And the targeted killing of polio workers.

“Two years ago, polio was on its knees, thanks to committed political leadership, better strategies and tools, and the dedication of millions of polio workers.

“The factors responsible for this setback are largely beyond the control of the health sector. They are only some of several dangers for health in a world shaped by some universal and ominous trends,” she cautioned.

“Given the challenges that lie ahead, and the high expectations for health, WHO’s dedicated and committed staff will need to perform better than ever. We are well-motivated to do so.

“Better health is a good way to track the world’s true progress in poverty elimination, inclusive growth, and equity.” **MEH**



WHO Director-General Dr Margaret Chan at a technical briefing on the “Goals and targets for health in the post-2015 development agenda”.

purpose is to inform technology-related policy-making in health care, and thus improve the uptake of cost-effective new technologies and prevent the uptake of technologies that are of doubtful value for the health system. Wasteful spending on medicines and other technologies has been identified as a major cause of inefficiencies in health service delivery.

Following the adoption of a resolution on HTA at the Health Assembly, WHO will support capacity-building for health technology assessment in countries. It will provide tools and guidance to prioritize health technologies and intensify networking and information exchange among countries to support priority setting.

● **Health in the post-2015 development agenda**

Member States approved a resolution on health in the post-2015 development agenda, stressing the need for ongoing engagement in the process of setting the agenda. This includes a need to complete the unfinished work of the health Millennium Development Goals, newborn health, as well as an increased focus on noncommunicable diseases, mental health, and neglect-

ed tropical diseases. The resolution also stresses the importance of universal health coverage and the need to strengthen health systems. Accountability through regular assessment of progress by strengthening civil registration, vital statistics and health information systems are crucial. Member States emphasized the importance of having health at the core of the post-2015 development agenda.

● **Newborn health: draft action plan**

The first-ever global plan to end preventable newborn deaths and stillbirths by 2035, calls for all countries to aim for fewer than 10 newborn deaths per 1000 live births and less than 10 stillbirths per 1000 total births by 2035.

Every year almost 3 million babies die in the first month of life and 2.6 million babies are stillborn (die in the last 3 months of pregnancy or during childbirth). Most of these deaths could be prevented by cost-effective interventions.

The Plan’s goals will require every country to invest in high-quality care before, during and after childbirth for every pregnant woman and newborn and highlights the urgent need to record all births and deaths. **MEH**

Awards

At the World Health Assembly, WHO Director-General Dr Margaret Chan and the President of the 67th World Health Assembly, Dr Roberto Tomas Morales Ojeda, awarded four prizes to leaders in public health.

The Ihsan Dogramaci Family Health Foundation Prize is awarded to Professor Zulfiqar Bhutta (Pakistan) for his global work on child and newborn survival and health.

The Sasakawa Health Prize is awarded to the Leprosy Control Foundation /Dominican Institution of Dermatology and Skin Surgery “Dr Hubert Bogaert Diaz” to expand services for children affected by skin diseases other than leprosy.



Every year the World Health Assembly recognizes outstanding contributions to public health. The Director-General, the President of the Health Assembly, award recipients and representatives of the awarding institutions stand on the podium of the plenary.

The United Arab Emirates Health Foundation Prize was awarded to the Institution for Research in Health (INISA) (Costa Rica) for its work on gastric cancer and occupational exposure to pesticides.

The Dr Lee Jong-wook Memorial Prize for Public Health was awarded jointly to Professor Sinata Koulla-Shiro (Cameroon) and the Czech Society of Cardiology (Czech Republic). **MEH**



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The Liver Intensive Care Unit at King's College Hospital, London



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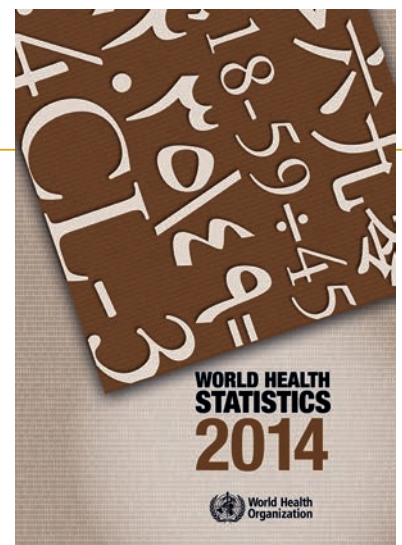


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Latest World Health stats show large gains in life expectancy

People everywhere are living longer, according to the World Health Statistics 2014 published in May by the World Health Organization (WHO). *Middle East Health* reports.

Based on global averages, a girl who was born in 2012 can expect to live to around 73 years, and a boy to the age of 68. This is six years longer than the average global life expectancy for a child born in 1990.

WHO's annual statistics report shows that low-income countries have made the greatest progress, with an average increase in life expectancy by 9 years from 1990 to 2012. The top six countries where life expectancy increased the most were Liberia which saw a 20-year increase (from 42 years in 1990 to 62 years in 2012) followed by Ethiopia (from 45 to 64 years), Maldives (58 to 77 years), Cambodia (54 to 72 years), Timor-Leste (50 to 66 years) and Rwanda (48 to 65 years).

"An important reason why global life expectancy has improved so much is that fewer children are dying before their fifth birthday," says Dr Margaret Chan, WHO Director-General. "But there is still a major rich-poor divide: people in high-income countries continue to have a much better chance of living longer than people in low-income countries."

Gaps between rich and poor countries

A boy born in 2012 in a high-income country can expect to live to the age of around 76–16 years longer than a boy born in a low-income country (age 60). For girls, the difference is even wider; a gap of 19 years separates life expectancy in high-income (82 years) and low-income countries (63 years).

Wherever they live in the world, women live longer than men. The gap between male and female life expectancy is greater in high-income countries where women live around six years longer than men. In low-income countries, the difference is around three years.

Women in Japan have the longest life expectancy in the world at 87 years, followed by Spain, Switzerland and Singapore. Female life expectancy in all the top 10 countries was 84 years or longer. Life expectancy among men is 80 years or more in nine

countries, with the longest male life expectancy in Iceland, Switzerland and Australia.

"In high-income countries, much of the gain in life expectancy is due to success in tackling noncommunicable diseases," says Dr Ties Boerma, Director of the Department of Health Statistics and Information Systems at WHO. "Fewer men and women are dying before they get to their 60th birthday from heart disease and stroke. Richer countries have become better at monitoring and managing high blood pressure for example."

Declining tobacco use is also a key factor in helping people live longer in several countries.

Key facts from World Health Statistics 2014

- The top three causes of years of life lost due to premature death are coronary heart disease, lower respiratory infections (such as pneumonia) and stroke.
- Worldwide, a major shift is occurring in the causes and ages of death. In 22 countries (all in Africa), 70% or more of years of life lost (due to premature deaths) are still caused by infectious diseases and related conditions. Meanwhile, in 47

countries (mostly high-income), noncommunicable diseases and injuries cause more than 90% of years of life lost. More than 100 countries are transitioning rapidly towards a greater proportion of deaths from noncommunicable diseases and injuries.

- Around 44 million (6.7%) of the world's children aged less than five years were overweight or obese in 2012. Ten million of these children were in the WHO African Region where levels of child obesity have increased rapidly.

- Most deaths among under-fives occur among children born prematurely (17.3%); pneumonia is responsible for the second highest number of deaths (15.2%).

- Between 1995 and 2012, 56 million people were successfully treated for tuberculosis and 22 million lives were saved. In 2012, an estimated 450 000 people worldwide developed multi-drug resistant tuberculosis.

- Only one-third of all deaths worldwide are recorded in civil registries along with cause-of-death information.



World Health Statistics 2014

<http://tinyurl.com/obl7lfv>

Life expectancy at birth among men and women in 2012 in the 10 top-ranked countries*

Men			Women		
Rank	Country	Life expectancy	Rank	Country	Life expectancy
1	Iceland	81.2	1	Japan	87.0
2	Switzerland	80.7	2	Spain	85.1
3	Australia	80.5	3	Switzerland	85.1
4	Israel	80.2	4	Singapore	85.1
5	Singapore	80.2	5	Italy	85.0
6	New Zealand	80.2	6	France	84.9
7	Italy	80.2	7	Australia	84.6
8	Japan	80.0	8	Republic of Korea	84.6
9	Sweden	80.0	9	Luxembourg	84.1
10	Luxembourg	79.7	10	Portugal	84.0

*Countries with a population below 250 000 are omitted due to uncertainty in life-expectancy estimates.

37% of Saudi MERS cases are healthcare workers

At the time of going to press the latest update from WHO (26 June 2014) on MERS in the Kingdom of Saudi Arabia stated that the National IHR Focal Point of Saudi Arabia reported 113 laboratory-confirmed cases of infection with Middle East respiratory syndrome coronavirus (MERS-CoV), including 34 deaths. These cases and deaths were identified through retrospective review of hospital records, dating between 5 May 2013 and 6 May 2014.

The majority of the cases (84) occurred after 1 March 2014; and the rest of cases (29) occurred between 5 May 2013 and 28 February 2014.

Of the 113 cases, 69 are Saudi nationals, while 44 are non-Saudi nationals.

The median age of the cases is 41 years (ranging from 3 months to 89 years) and

57% (64) are males.

Information on the symptoms was reported for 111 of the 113 cases. Of these, 32 cases had no symptoms of illness (asymptomatic), while 79 were reported to have symptoms. Of the cases with symptoms, 70 were reported to have been hospitalized. No information was provided on existing underlying medical conditions.

Information on the final outcome was provided for 113 cases as follow: 76 recovered, 3 were still hospitalized and 34 died.

Information on possible source of infection was reported for 72 out of the 113 cases. Of these 18 cases acquired infection from a non-human source at the community level and 54 cases acquired infection from another person. Of the infections acquired from another person: health care acquired infection was re-

ported for 41 cases and household infection was reported for 13 cases.

Thirty-seven percent (42 out of 113 cases) are health care workers. Among these, 19 were reported as asymptomatic and 23 were reported to have symptoms. Information on the severity of these symptoms was not reported. The final outcome for the health care workers was provided as follow: 39 recovered, 1 still hospitalized and 2 died.

The characteristics of the 113 cases are similar to those previously reported. The pattern and dynamic of the epidemic and the risk assessment remain unchanged.

Globally, 820 laboratory-confirmed cases of infection with MERS-CoV including at least 286 related deaths have officially been reported to WHO. This global total includes all the cases in this update.

Researchers identify possible anti MERS drugs

A May 19 report from the American Society of Microbiology notes that a series of research articles published ahead of print in the journal *Antimicrobial Agents and Chemotherapy* have identified a number of existing pharmaceutical drugs and compounds under development that may offer effective therapies against Middle East Respiratory Syndrome (MERS).

In the first study, researchers screened a library of 290 pharmaceutical drugs, either FDA-approved or in advanced clinical development for antiviral activity against the MERS coronavirus (MERS-CoV) and severe acute respiratory syndrome coronavirus (SARS-CoV) in cell culture. They found 27 compounds that were active against both viruses including some cancer drugs and antipsychotics.

“Repurposing of approved pharmaceutical drugs for new indications presents an attractive alternative to the normal paradigm of huge library screening against a specific viral enzyme,” says author Matthew Frieman of the University of Maryland Medical School. “Given development times and manufacturing

requirements for new products, repurposing of existing drugs is likely the best solution to rapidly identify therapeutics for outbreaks due to emerging viruses.”

Researchers from the US National Institutes of Health, the United States Army Medical Research Institute of Infectious Diseases and Zalicus Inc, Cambridge MA, were also involved in the study. A copy of the manuscript can be found online at <http://bit.ly/asmtp0514e>.

In the second study, researchers collaborating in the European antiviral research program SILVER (www.silver-europe.com) used a similar methodology to screen a library of 348 FDA-approved drugs for anti-MERS-CoV activity in cell culture. They identified four compounds that inhibited MERS-CoV, SARS-CoV and Human Coronavirus 229E at relatively low concentrations. Two of the compounds were also identified by the US study: the antimalarial drug chloroquine and the antipsychotic chlorpromazine.

“Although their therapeutic potential (alone or in combination) remains to be

assessed in animal models, our findings may offer a starting point for treatment of patients infected with zoonotic coronaviruses like MERS-CoV,” says corresponding author Eric Snijder of Leiden University Medical Center, the Netherlands. Researchers from the Rega Institute for Medical Research in Leuven, Belgium and the Erasmus Medical Center in Rotterdam, the Netherlands were also involved in the study.

A copy of the manuscript can be found online at <http://bit.ly/asmtp0514f>.

The third study finds that an experimental compound, previously shown to block SARS-CoV replication, can inhibit replication of two other coronaviruses, MERS-CoV and mouse hepatitis virus.

“This study shows that it is possible to target multiple coronaviruses through broad-spectrum inhibitors,” says corresponding author Stefan Sarafianos of the Bond Life Sciences Center at the University of Missouri, an author on the study. “This compound could serve as a lead for the development of effective broad-spectrum anti-coronavirus drugs.”

Polio declared a Public Health Emergency of International Concern

At a meeting of the International Health Regulations Emergency Committee on 28 and 29 April to discuss the international spread of polio virus, the committee advised that “hat the international spread of polio to date in 2014 constitutes an ‘extraordinary event’ and a public health risk to other States for which a coordinated international response is essential”.

The committee issued a statement saying: “The current situation stands in stark contrast to the near-cessation of international spread of wild poliovirus from January 2012 through the 2013 low transmission season for this disease (i.e. January to April). If unchecked, this situation could result in failure to eradicate globally one of the world’s most serious vaccine preventable diseases. It was the unanimous view of the Committee that the conditions for a Public Health Emergency of International Concern (PHEIC) have been met.”

At end-2013, 60% of polio cases were the result of international spread of wild poliovirus, and there was increasing evidence that adult travellers contributed to this spread. During the 2014 low transmission season there has already been international spread of wild poliovirus from 3 of the 10 States that are currently infected: in central Asia (from Pakistan to Afghanistan), in the Middle East (Syrian Arab Republic to Iraq) and in Central Africa (Cameroon to Equatorial Guinea). A coordinated international response is deemed essential to stop this international spread of wild poliovirus and to prevent new spread with the onset of the high transmission season in May/June 2014; unilateral measures may prove less effective in stopping international spread than a coordinated response. The consequences of further international spread are particularly acute today given the large number of polio-free but conflict-torn and fragile

States which have severely compromised routine immunization services and are at high risk of re-infection. Such States would experience extreme difficulty in mounting an effective response were wild poliovirus to be reintroduced. As much international spread occurs across land borders, WHO should continue to facilitate a coordinated regional approach to accelerate interruption of virus transmission in each epidemiologic zone.

The over-riding priority for all polio-infected States must be to interrupt wild poliovirus transmission within their borders as rapidly as possible through the immediate and full application in all geographic areas of the polio eradication strategies, specifically: supplementary immunization campaigns with oral poliovirus vaccine (OPV), surveillance for poliovirus, and routine immunization. The Committee provided the following advice to the Director-General for her consideration to reduce the international spread of wild poliovirus, based on a risk stratification of the 10 States with active transmission (i.e. within the previous 6 months) as of 29 April 2014.

States currently exporting wild poliovirus

Pakistan, Cameroon, and the Syrian Arab Republic pose the greatest risk of further wild poliovirus exportations in 2014. These States should:

- officially declare, if not already done, at the level of head of state or government, that the interruption of poliovirus transmission is a national public health emergency;
- ensure that all residents and long-term visitors (i.e. > 4 weeks) receive a dose of OPV or inactivated poliovirus vaccine (IPV) between 4 weeks and 12 months prior to international travel;
- ensure that those undertaking urgent travel (i.e. within 4 weeks), who have not

The current situation stands in stark contrast to the near-cessation of international spread of wild poliovirus from January 2012 through the 2013 low transmission season for this disease. If unchecked, this situation could result in failure to eradicate globally one of the world’s most serious vaccine preventable diseases.

received a dose of OPV or IPV in the previous 4 weeks to 12 months, receive a dose of polio vaccine at least by the time of departure as this will still provide benefit, particularly for frequent travellers;

- ensure that such travellers are provided with an International Certificate of Vaccination or Prophylaxis in the form specified in Annex 6 of the International Health Regulations (2005) to record their polio vaccination and serve as proof of vaccination;

- maintain these measures until the following criteria have been met: (i) at least 6 months have passed without new exportations and (ii) there is documentation of full application of high quality eradication activities in all infected and high risk areas; in the absence of such documentation these measures should be maintained until at least 12 months have passed without new exportations.

States infected with wild poliovirus but not currently exporting

Afghanistan, Equatorial Guinea, Ethiopia, Iraq, Israel, Somalia and particularly Nigeria, given the international spread from that State historically, pose an ongoing risk for new wild poliovirus exportations in 2014. **MEH**

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Call to protect health workers in crisis situations

Experts are calling for increased protection to healthcare workers and patients in crisis situations in the face of growing attacks on health facilities, which challenge notions of their neutrality. **IRIN News** reports.

“We need multiple and reinforcing means to protect health care in situations of violence, including the well-developed mechanisms of human rights monitoring, reporting and accountability,” Leonard Rubenstein, chair of Safeguarding Health in Conflict Coalition, a group of humanitarian and human rights organizations, told IRIN from the World Health Assembly, which was held from 19 to 24 May in Geneva.

A 2014 report by the Safeguarding Health Coalition and Human Rights Watch documents attacks in 18 countries and claims that both the frequency and severity of violence against health care has increased in recent years – including killings and torture of staff, and damage to facilities and ambulances.

A resolution in 2012 by the World Health Assembly committed the UN World Health Organization (WHO) to “provide leadership at the global level in developing methods for systematic collection and dissemination of data on attacks on health facilities, health workers, health vehicles, and patients in complex humanitarian emergencies”.

“We are pleased that, as part of its humanitarian reform initiative, the WHO is moving forward in providing global leadership in methods for systematic collection and dissemination of data on attacks on health facilities, health workers, health transports, and patients in complex humanitarian emergencies,” Rubenstein.

Consultations with humanitarians and NGOs shaping the mechanism are ongoing. Activists and experts say a major impediment to combating increasing rates of violence against healthcare outlets is the lack of centralized data.

But experts say the picture is incomplete as many attacks go unreported and perpetrators are unnamed – a fact which has curtailed effective responses to the violence. They point to the complexity of protection at the local level as an important consideration as global systems emerge.

According to Rudi Coninx, coordi-

nator for emergency risk management and humanitarian action at WHO: “The objective of the central data collection methodology we are spearheading is first to document attacks and to have information about trends. And second, to act – we need all actions taken against these horrific attacks to be based on evidence.”

Hostilities and health

“Attacks against health workers and facilities undermine often already fragile health systems,” said Joe Amon, health and human rights director at Human Rights Watch (HRW).

Ongoing conflicts around the world – from Ukraine, to Yemen, to South Sudan – have featured attacks on healthcare workers and facilities, and patients. On 29 April an attack on a healthcare centre in the Central African Republic, embroiled in a brutal internal armed conflict, left 22 civilians dead.

A 2013 report by the International Committee of the Red Cross (ICRC) revealed 1,809 attacks on healthcare outlets in 23 countries between January 2012 and December 2013: 91% of the incidents involved violence against healthcare workers. The report was compiled by 23 ICRC delegations based on interviews with hospital staff, and victims and witnesses of attacks.

Health providers and humanitarian actors have used a variety of protection methods.

For example, the humanitarian medical organization, Médecins Sans Frontières (MSF), has stationed armed guards at some of its facilities in Somalia – a tactic MSF officials admitted was “not ideal”. Research in Myanmar suggests “community collectivity” strategies, in which attacks on health care are framed as affecting the population instead of individuals, are another violence aversion strategy. The ICRC has held confidential negotiations with attackers to curb ambulance attacks in Yemen.

Pierre Gentile, head of the Health Care In Danger project at ICRC, said: “There is no... one single recommendation that

would change the landscape and provide safety for health care. There are a lot of measures that have been taken by stakeholders in various countries around the world to improve healthcare delivery.”

Activists hope improved data collection will increase humanitarian and human rights actors’ ability to react to violence by expanding the scope of protection methods for healthcare workers.

Doctors can’t always be neutral

“The humanitarian value of neutrality is an important one but adherence to neutrality is not a predicate to the right to medical services without interference,” explained Rubenstein, who directs the Centre for Public Health and Human Rights at Johns Hopkins University in the US.

In a 2013 article in the International Review of the Red Cross, he wrote: “Unlike humanitarian providers... local doctors, nurses and other health workers need not and often cannot be neutral - that is, they cannot refrain from ‘taking sides in hostilities or engaging in controversies of a political, racial, religious, or other ideological nature’.”

Studies have documented how healthcare workers in conflict areas develop coping mechanisms to continue their work, albeit with limited capacity to deliver much-needed services.

Experts say a human rights approach to protecting healthcare workers – including dissenters, minorities, and the marginalized who take sides in conflict – is essential to supporting healthcare workers operating in tense situations.

“Different contexts will require different solutions, but it’s important we have the best information possible so we can act together,” argued WHO’s Coninx.

Said Rubenstein: “Protection must begin by changing norms and expectations, so that it is no longer considered legitimate for states and armed groups to attack medical providers because they offer care to persons affiliated with a political opposition.” – IRIN News

One small kick at World Cup is one large step for paraplegics

Juliano Pinto, a 29-year-old Brazilian who is paralyzed from the waist down, kicked the first ball of the 2014 World Cup football championship at the Opening Ceremony on 12 June in Sao Paul Brazil using a mind-controlled robotic exoskeleton.

The robotic exoskeleton which weighs around 27 kg is built from lightweight alloys and is powered by hydraulics. It is controlled by thought brain waves that are picked up by electrodes in a helmet worn by Pinto. These signals are passed to a computer worn in a backpack, where they are decoded and used to move hydraulic drivers on the suit.

The exoskeleton is the result of the international Walk Again Project and is the culmination of years of work by an international team of scientists. Led by Miguel Nicolelis, the Walk Again Project is a nonprofit, international collaboration among the Duke University Center for Neuroengineering, the Technical University of Munich, the Swiss Federal Institute of Technology in Lausanne, the Edmond and Lily Safra International Institute of Neuroscience of Natal in Brazil, The University of California, Davis, The University of Kentucky, and Regis Kopper of The Duke immersive Virtual Environment.

This started with research from the Nicolelis lab using hair-thin and flexible sensors, known as microwires, that have been implanted into the brains of rats and monkeys. These flexible electrical prongs can detect minute electrical signals, or action potentials, generated by hundreds of individual neurons distributed throughout the animals' frontal and parietal cortices – the regions that define a vast brain circuit responsible for the generation of voluntary movements.

Restoring the perception of walking

The paraplegic patient in control of the exoskeleton is typically unable to know



Paraplegic Juliano Pinto, wearing a thought-controlled exoskeleton, makes the first kick off at the World Cup football championship in Brazil.

the position of his legs in space, the height of each step, or the intensity of his stride. Under such conditions, it is difficult to precisely coordinate the motion of walking. It was precisely to address this problem that EPFL researchers became involved.

As part of the Switzerland-based National Centre of Competence in Research (NCCR) Robotics team, Hannes Bleuler has developed a system to give the young patient – deprived of sensations below the pelvis – sensory information by transmitting it as vibrations to the upper body.

Sensory feedback on the forearm

Their system takes the form of electronic armbands placed on the forearm of the patient which generate vibrations when walking. Induced by sensors placed under the patient's feet, these vibrations vary in intensity depending on whether the foot is in contact with the ground or according to the position of the legs during the stride. At each step, the necessary infor-

mation is transmitted to the pilot of the exoskeleton.

To function properly, the system requires some practice. Volunteers in Brazil have been training for months with a full environment in virtual reality (VR). This learning process allowed them to integrate the relationship between the different vibrations felt on the arms with the position of their lower limbs. In the end, it was proved possible to “feel” the pressure of the foot on the ground from heel to toe, or even to know the exact position of the leg when the foot leaves the ground between strides. This is how the exoskeleton is controlled with such fluidity and dexterity.



● Youtube: Juliano Pinto kicks the first ball of the World Cup 2014

<http://www.youtube.com/watch?v=fZrvdODE1QI>

● Walk Again Project

http://www.inmf.net/walk_again.php

WHO issues document of resources to help protect health from climate change

The World Health Organisation has produced a document that provides an important set of resources that will support effective and evidence-based action to protect health from climate change.

The document is available for free online at: <http://tinyurl.com/pjkw4q4>

In the preface to the document the WHO notes that there is now strong evidence that the earth's climate is changing rapidly, due mainly to human activities. Increasing temperatures, sea-level rises, changes in precipitation patterns and extreme events are expected to increase a range of health risks, from the direct effects of heatwaves, floods and storms, to more suitable conditions for the transmission of important infectious diseases, to impacts on the natural systems and socioeconomic sectors that ultimately underpin human health.

Importantly the organisation adds that much of the potential health impact of

climate change can be avoided through a combination of strengthening key health system functions and improved management of the risks presented by a changing climate.

The WHO says that the critical first step in this process is to carry out a vulnerability and adaptation assessment. This allows countries to assess which populations are most vulnerable to different kinds of health effects, to identify weaknesses in the systems that should protect them, and to specify interventions to respond. Assessments can also improve evidence and understanding of the linkages between climate and health within the assessment area, serve as a baseline analysis against which changes in disease risk and protective measures can be monitored, provide the opportunity for building capacity, and strengthen the case for investment in health protection.

WHO points out that climate change

will make it more difficult to control a wide range of climate-sensitive health outcomes. Therefore, to maintain and improve current levels of population health, it will be necessary not only to continue to strengthen core functions of health systems, but also to explicitly consider the risks posed by a changing climate and to modify current health risk management activities to respond.

The organisation recommends that policies and programmes will need to go beyond addressing current vulnerabilities, to protect against health risks from future and possibly more severe climate change. Because of the inherent inertia in the climate system and the length of time required for carbon dioxide to come to equilibrium in the atmosphere, the world is committed to three to five decades of climate change, no matter how quickly greenhouse gas emissions are reduced.

WHO warns that the future health impacts of climate change will vary over spatial and temporal scales, and will depend on changing socioeconomic and environmental conditions, with possibilities for diseases to increase in incidence or change their geographical range. Therefore, capacity needs to be built within and outside the health sector to identify increased risks and then prepare and then manage them by evaluating the effectiveness of current and proposed programmes. These evaluations should consider both rapid climate change over the next few decades and longer-term changes in the averages of meteorological variables. Policies and programmes to address the health risks from climate change should explicitly consider how to avoid severe health impacts from cumulative or catastrophic events.



Protecting Health from Climate Change

<http://tinyurl.com/pjkw4q4>

The effects on health of climate change

Climate change is adversely affecting the health of populations around the world, with the greatest impacts in low-income countries. Impacts can arise from the following:

- The effects of climate change on natural and physical systems, which in turn alter the number of people at risk of malnutrition, the geographical range and incidence of vector-borne, zoonotic and food- and waterborne diseases, and the prevalence of diseases associated with air pollutants and aeroallergens. Additional climate change in coming decades is projected to significantly increase the number of people at risk of these major causes of ill health.
- Climate change-related alterations in the frequency, intensity and duration

of extreme weather events (e.g. heatwaves, floods, droughts and windstorms). Each year, these events affect millions of people, damage critical public health infrastructure, and cause billions of dollars of economic losses. The frequency and intensity of some types of extreme weather events are expected to increase over coming decades as a consequence of climate change, suggesting that the associated health impacts could increase without additional preventive actions.

- Climate change can affect population health through climate-induced economic dislocation and environmental decline, and through development setbacks incurred by damage to critical public health infrastructure and to livelihoods by extreme weather events.

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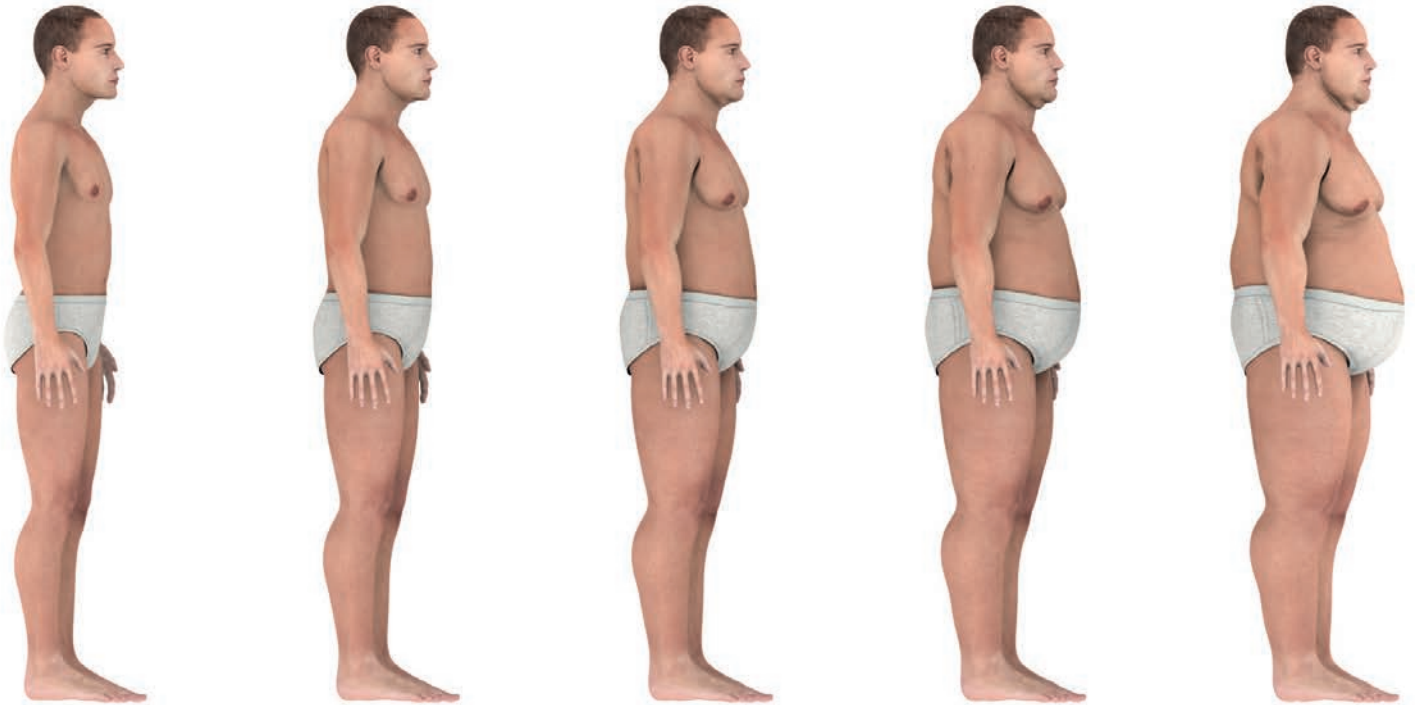
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New data analysis shows troubling rise in obesity across the MENA region

According to a new, first-of-its-kind analysis of trend data from 188 countries released May 29 this year, more than 58% of men and more than 65% of women across the Middle East and North Africa were found to be either overweight or obese in 2013. *Middle East Health* reports.

Worldwide, prevalence of overweight and obesity combined rose by 27.5% for adults and 47.1% for children between 1980 and 2013. The number of overweight and obese individuals increased from 857 million in 1980, to 2.1 billion in 2013, according to disturbing new data from the Institute for Health Metrics and Evaluation (IHME) at the University of Washington.

Increases were recorded in developed and developing countries, but with different sex patterns, according to the report. In developed countries, more men than women were overweight and obese, whereas in developing countries, overweight and obesity was more prevalent in women than in men, and this association persisted over time.

More than three-quarters of the countries in the MENA (Middle East North Africa) region had overweight and obesity rates of more than 50% among both men and women. Overall, there are an estimated 259 million overweight (180 million) or obese (79 million) people living in the region today.

The study, “Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013,” conducted by the IHME was published in *The Lancet* on May 29.

The authors write: “Unlike other major global risks, such as tobacco and childhood malnutrition, obesity is not decreasing worldwide. Obesity is already a major public health challenge in many middle-income countries, and tracking this important risk to health with increased precision and disaggregation in both developing and developed countries is a key global health priority.”

Overweight is defined as having a Body Mass Index (BMI), or weight-to-height ratio, greater than or equal to 25 and lower than 30, while obesity is defined as having a BMI equal to or greater than 30.

The prevalence of overweight and obesity in adults in North Africa and the Middle East rose from nearly 53% to 62% over the study period. In 2013, the preva-

lence of overweight and obesity in adult males was nearly 59%, while in females this prevalence was substantially higher, nearly 66%. Within this region, Kuwait experienced the highest prevalence for adults overall.

MENA region

“As a region, the Middle East and North Africa has done a tremendous job combating infectious diseases and improving child and maternal survival, but now we are seeing a very disturbing trend with obesity,” said Ali Mokdad, director of Middle Eastern Initiatives at IHME. “Obesity is growing unchecked throughout the region and threatens to undo the success the region has seen in improving health for the past three decades.”

Over the 33-year period of research, several countries in the Middle East showed the largest increase in obesity rates globally, including Bahrain, Egypt, Saudi Arabia, Oman, and Kuwait. The top three countries with the greatest prevalence for obesity among men in 2013 were Qatar (44%)

Key findings

- More than 50% of the world's 671 million obese live in 10 countries (ranked beginning with the countries with the most obese people): US, China, India, Russia, Brazil, Mexico, Egypt, Germany, Pakistan, and Indonesia.

- Globally, countries in the Middle East and North Africa, Central America, and island nations in the Pacific and Caribbean have already reached exceptionally high rates of overweight and obesity – 44% or higher.

- Today, 2.1 billion people – nearly one-third of the world's population – are overweight or obese. The number of overweight and obese individuals in the world has increased from 857 million (~20%) in 1980 to 2.1 billion (~30%) in 2013. Globally, the prevalence of overweight and obesity combined increased by nearly 50% among

persons under age 18 between 1980 and 2013.

- Being overweight or obese is also a major problem for the world's children. From 1980 to 2013, the prevalence of overweight and obesity in children increased by nearly 50%.

- The global rise in overweight and obesity represents a major public health epidemic in both the developed and the developing world.

Health risks such as cardiovascular disease, cancer, diabetes, osteoarthritis, and chronic kidney disease increase when a person's BMI exceeds 23. In 2010, obesity and overweight were estimated to have caused 3.4 million deaths globally, most of which were from cardiovascular causes. Research indicates that if left unchecked, the rise in obesity could lead to future declines in life expectancy.

Obesity is an issue affecting people of all ages and incomes, everywhere. In the last three decades, not one country has achieved success in reducing obesity rates, and we expect obesity to rise steadily as incomes rise in low- and middle-income countries in particular, unless urgent steps are taken to address this public health crisis.

and Kuwait (43%), followed by Bahrain (31%). The prevalence of obesity among women exceeded 50% in three Middle Eastern countries – Kuwait (59%), Libya (57%), and Qatar (55%).

In most countries, including Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, and the United Arab Emirates, overweight and obesity rates were higher than 50% percent among both men and women.

Qatari men (76%) and Kuwaiti women (84%) showed the greatest rates of overweight/obesity prevalence in the Middle East and North Africa. In Egypt, more than 71% of men and 79% of women were overweight/obese. Nearly three-quarters of Saudi women were found to be either overweight or obese, as were 69% of Saudi men. In Oman, prevalence of overweight/obesity was 54% among men and 73% among women.

Being either overweight or obese is also a major health issue for Middle Eastern and North African children. Among children, the prevalence of overweight and obesity in the region rose substantially from nearly 19% to 25% over the study period, making it the third highest regional prevalence in 2013.

Worst affected countries

The top three countries in the region with the greatest rates of overweight or obesity among girls include Kuwait (46%), Oman (42%), and Libya (42%). Among boys the countries with the highest rates are Qatar (34%), Libya (33%), and Lebanon (33%).

In Egypt, nearly one-third of boys and 40% of girls are either overweight or obese. Nearly 40% of Saudi girls are overweight or obese, as are nearly one-quarter of boys.

When compared with the United States, where the greatest proportion of the world's obese people live, obesity prevalence among Middle Eastern and North African women was the same, about 34%. However, a larger proportion of American men (71%) were obese than men in the Middle East and North Africa (59%).

“Obesity is an issue affecting people of all ages and incomes, everywhere,” said Dr Christopher Murray, director of IHME and a co-founder of the Global Burden of Disease (GBD) study. “In the last three decades, not one country has achieved success in reducing obesity rates, and we expect obesity to rise steadily as incomes rise in low- and middle-income countries in particular, unless urgent steps are taken to address this public health crisis.”

Worldwide problem

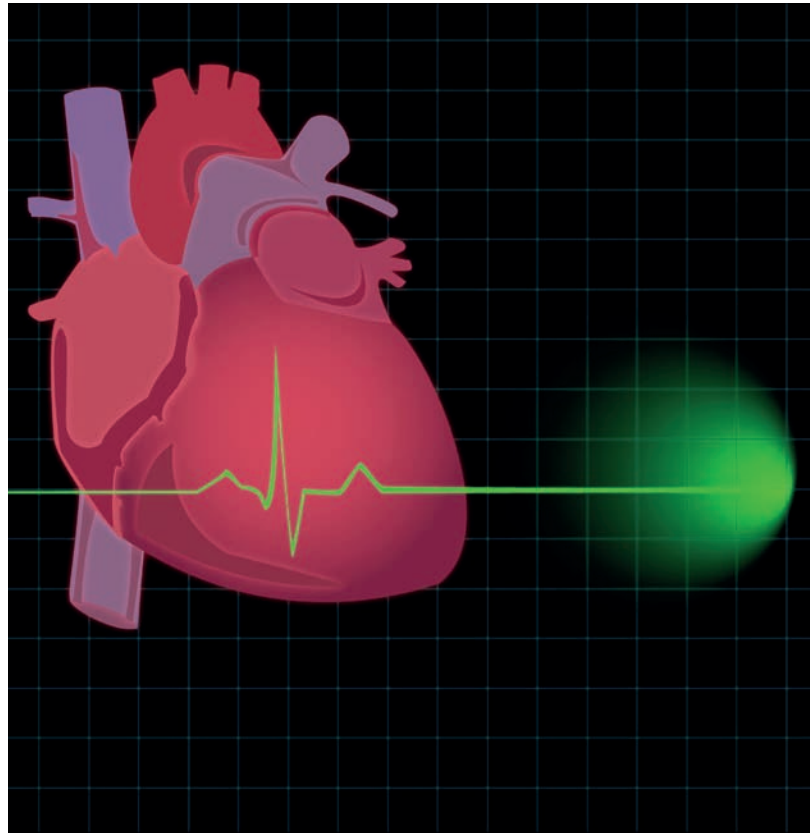
Looking at individual countries, the highest proportion of the world's obese people (13%) live in the United States. China and India together represent 15% of the world's obese population.

While the percentage of people worldwide who are either overweight or obese has risen substantially over the last 30 years, there have been marked variations across regions and countries. In developed countries, increases in obesity that began in the 1980s and accelerated from 1992 to 2002 have slowed since 2006. Conversely, in developing countries, where almost two-thirds of the world's obese people currently live, increases are likely to continue.

The global study found that among children and adolescents, obesity has increased substantially worldwide. Between 1980 and 2013, the prevalence of overweight or obese children and adolescents increased by nearly 50%. In 2013, more than 22% of girls and nearly 24% of boys living in developed countries were found to be overweight or obese. Rates are also on the rise among children and adolescents in the developing world, where nearly 13% of boys and more than 13% of girls are overweight or obese. **MEH**

Latest findings on cardiology presented at WCC

The World Heart Federation held the World Congress of Cardiology (WCC) in Melbourne, Australia in May. *Middle East Health* reports on some of the highlights from the congress.



Gender bias in CVD diagnosis

Despite the fact that half of the 17.3 million deaths from cardiovascular disease (CVD) each year happen in females, women are still discriminated against when it comes to the management and treatment of this disease. Women are more likely than men to be under-diagnosed and under-treated, mostly because the presentation, progression and outcomes of the disease are different and less understood in women than in men. Although there has been progress in raising awareness about CVD in women and studying the specifics of the disease, as well as in adapting CVD treatment and care for women, the gap is still too wide. A group of leading experts at the World Heart Federation's World Congress of Cardiology (WCC) is calling for further research, better information for healthcare professionals and women and tailor-made treatments to bridge this gap once and for all.

Professor Linda Worrall-Carter, Director of St Vincent's Centre for Nursing Research (SVCNR) & The Cardiovascular Research Centre (CvRC) presented a new study that further reinforces the

need for research and better information for women: in a sample of 2000 Australian women, Professor Worrall-Carter and colleagues found that young women aged 35-59 years experiencing acute coronary syndromes were less likely than men to undergo coronary interventions. Future research investigating symptom presentation of younger women as well as exploring perceptions of health care workers is needed, as it could explain the reasons of this disparity, says Professor Worrall-Carter.

"We need to ensure that all health professionals understand gender differences when it comes to cardiovascular disease. Awareness regarding atypical symptom presentations of women and understanding healthcare workers perceptions are key to ensure women are getting the most appropriate and timely treatment, no matter their age or background," Prof Worrall-Carter said.

Women themselves also need to be better informed: CVD is the number one killer of women, but the risk of dying or becoming seriously harmed due to heart disease and stroke is still largely underestimated by the majority of women, who

do not perceive CVD as one of their major health concerns.

At the forefront of clinical care: learnings from the US

In Chicago and Los Angeles, in-clinic research has looked at the way women seek CVD treatment and how collaborations with colleagues treating other female-specific disease can improve care of CVD for women.

Heart damage related to chemotherapy and premature heart disease is a problem for breast cancer survivors. Researchers at the Barbra Streisand Women's Heart Center (BSWHC) at the Cedars-Sinai Heart Institute are calling for the introduction of cardio-oncology clinics, to support cancer survivors in implementing lifestyle changes and preventive measures for heart disease. The research team has established a multidisciplinary program including cardiologists, breast cancer surgeons, medical and radiation oncologists, as well as colleagues from cardiac imaging and rehabilitation medicine.

Dr Puja K. Mehta explains: "Out of

New data supports use of polypill

New data presented at the World Heart Federation's World Congress of Cardiology 2014 shows a significant improvement in both patient adherence and risk factor control when patients at high risk of heart attack or stroke receive a polypill, compared to usual care. A polypill is a fixed dose combination of commonly-used blood pressure and cholesterol lowering medications, along with aspirin, which helps prevent cardiovascular disease (CVD).

The 'Single Pill to Avert Cardiovascular Events' (SPACE) project, led by researchers from The George Institute for Global Health, analysed data from 3140 patients with established CVD or at high risk of CVD in Europe, India and Australasia. The results showed a 43% increase in patient adherence to medication at 12 months with the polypill, in addition to corresponding improvements in systolic

blood pressure and LDL-cholesterol that were highly statistically significant. The largest benefits were seen among patients not receiving all recommended medications at baseline, which corresponds to most cardiovascular disease patients globally.

"These results are an important step forward in the polypill journey and management of cardiovascular disease," commented Ruth Webster of the George Institute for Global Health, Sydney. "Most patients globally either don't start or don't continue taking all the medications they need, which can lead to untimely death or further CVD events. An important finding from our analyses is that the greatest benefits from a polypill were for currently untreated individuals. Although the idea of a polypill has always been appealing, we now have the most comprehensive real-

world analysis to date of this treatment strategy in high risk CVD patients. Given the potential affordability, even in low income countries, there is considerable potential to improve global health."

Professor Salim Yusuf, President-elect of the World Heart Federation said: "These results emphasize the importance of the polypill as a foundation for a global strategy on cardiovascular disease prevention. It will improve patient access to essential medications at an affordable cost and wide use of the polypill can avoid several millions of premature CVD events. The polypill is however not a replacement for a healthy lifestyle and should be combined with tobacco avoidance, a healthy diet and enhanced physical activity. This broad strategy, if adopted widely, can reduce cardiovascular disease to a large extent."

World's largest study on stroke evaluates risk factors

Preliminary findings from the completed INTERSTROKE study presented at the World Congress of Cardiology reported new and important results.

INTERSTROKE evaluates the importance of risk factors for stroke and the first phase showed that 10 known risk factors are associated with about 90% of strokes. The new preliminary results confirm these findings in larger patient populations and further to the first phase, demonstrate an overall consistency in the collective importance of these risk factors around the world. This reinforces the fact that action is needed worldwide to control those 10 risk factors:

1. hypertension,
2. lipids,
3. smoking,
4. physical inactivity,

5. abdominal obesity,
6. cardiac causes,
7. diet,
8. alcohol,
9. diabetes mellitus and
10. psychosocial factors.

Of these, hypertension is the most important.

INTERSTROKE is the largest international study ever to evaluate the importance of both established and novel risk factors for stroke, which affects millions of people worldwide. Completed in March 2014, the much anticipated study led by Dr Martin O'Donnell (Population Health Research Institute, McMaster University and HRB-Clinical Research Facility, NUI Galway, Ireland) and Dr Salim Yusuf (Population Health Research Institute, McMaster University,

Canada) included over 27,000 patients from 32 countries across the world. It involved an international collaboration of committed stroke physicians cardiologists and researchers, keen to build on the landmark INTERHEART study led by Dr Yusuf, which looked at modifiable risk factors for heart attacks.

"The INTERSTROKE study represents an important resource to progress our understanding of the causes of stroke, both in estimating the contribution of known modifiable risk factors for stroke and in identifying and clarifying the role of new ones, such as genetics," said Dr O'Donnell.

"These results are the completion of eight years of work. We especially look forward to sharing our full data results later this year."

nearly 900 women we saw at the BSWHC over a seven month period, a significant number of cancer survivors also had cardiac problems such as hypertension, high cholesterol, diabetes or coronary artery disease. Programs and strategies to identify cardiac risk factors in cancer survivors are needed and represent an excellent preventive opportunity."

Furthermore, in Chicago, a team of physicians at Rush University Medical Center found that there are important differences between women who seek CVD care at heart centres for women or at general cardiology offices. Dr Annabelle Volgman of Rush University talks about this research of 365 women and their care preferences: "Our most interesting finding was that the

majority of women didn't have a strong preference to see a female doctor, however, it was really important to them that the doctor they saw specialized in heart disease in women. Our research is a starting point in looking at women's preferences and we need to do more in this area to confirm these findings and put them into practice." MEH

Craniosynostosis: Mayo's individualised approach

By Barbara J. Toman
Science writer of Mayo Clinic's
Neuroscience Update

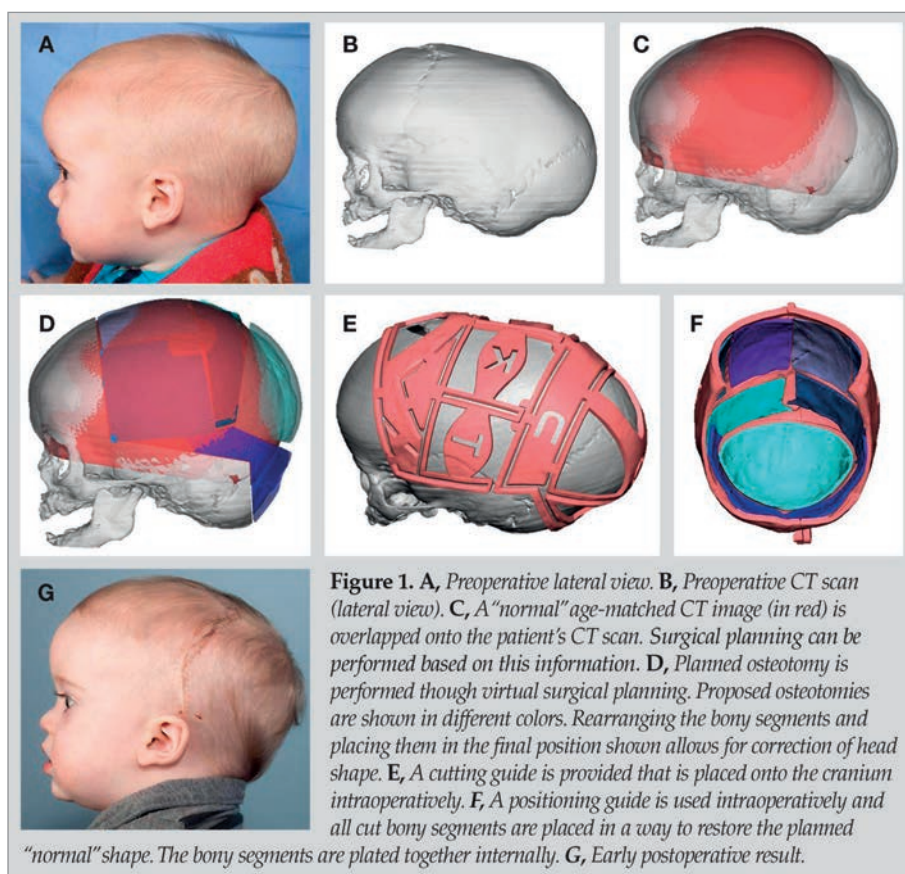
Craniosynostosis is a common congenital condition, occurring in 1 in 2,500 births. Most of these cases involve the fusion of a single skull suture. Complex or syndromic craniosynostosis involves the fusion of multiple sutures. Although neurological damage can occur in severe cases, most children can have normal cognitive development and achieve good cosmetic results after surgery. Early diagnosis and treatment are key.

At Mayo Clinic in Rochester, Minnesota, specialists in the Cleft and Craniofacial Clinic treat craniosynostosis ranging from severe syndromes to simple fusions. Every child treated for craniosynostosis is seen by a pediatric neurosurgeon, plastic surgeon and medical geneticist. For patients with syndromic craniosynostosis, oral surgeons, otorhinolaryngologic surgeons, orthodontists, speech pathologists, social workers and psychologists may be consulted.

"We have a very large and comprehensive craniofacial team," says Nicholas M. Wetjen, M.D., a pediatric neurosurgeon at Mayo in Minnesota. "Not every patient needs all parts of the clinic, but all parts are available."

Advantages of early referral

Most of the cases seen at Mayo are sagittal craniosynostosis, the most prevalent type. Patients are generally referred by pediatricians after a well-child visit. Although



there is no upper age limit for referral, the optimal time is between 1 and 2 months of age. Up to age 6 months, patients with all types of single-suture craniosynostosis – sagittal, metopic, coronal and lambdoid – may be candidates for endoscopic surgery (Figure 3). After that, however, open surgery is generally required.

"Early diagnosis and treatment facilitate the brain's normal growth and reshaping of

the head into the appropriate configuration," Dr. Wetjen says. "With referral we also can offer the option of endoscopic surgery and make sure patients are receiving care tailored to their needs."

Both endoscopic and open procedures generally produce very good cosmetic results with low risk of complications. However, compared with an open procedure, endoscopic surgery has a lower rate of

complications, requires only a one-night hospital stay and has a patient-transfusion rate of just 10%. After endoscopic surgery, children must wear a series of two to three helmets for up to a year. “Each helmet has a significant cost, but the overall cost of endoscopic surgery is still less than open surgery,” Dr. Wetjen notes.

Open surgery lasts two to three hours and requires a three- or four-day hospital stay. Transfusion also is necessary in all open cases, although no helmet is required afterward. “In open surgery, we fix the skull in position with plates and screws that are absorbable. It’s a onetime procedure that requires less follow-up than endoscopic surgery,” Dr. Wetjen says.

For parents whose children qualify for either endoscopic or open surgery, Mayo specialists outline the pros and cons and let the parents decide. “We try to present a balanced view because when the patient presents at a young age, either endoscopic or open surgery can be appropriate,” Dr. Wetjen says.

Virtual surgical planning

Mayo is one of the few centers in the world that offers virtual surgical planning for treatment of craniosynostosis (Figure 1). In virtual surgical planning, high-definition 3D CT scans of the patient’s skull are sent to a device manufacturer. Engineers at the company consult via Web conference with Dr. Wetjen and Samir Mardini, M.D., a plastic surgeon in Mayo’s Cleft and Craniofacial Clinic. During the meeting the CT data are used to construct a computer-simulated, individualized surgical plan. Based on that virtual surgical plan, patient-specific templates are constructed to guide the Mayo surgeons during the procedure.

“In the past, there has been a standard surgical procedure for sagittal craniosynostosis. These templates allow us to customize the procedure to the individual patient, with a high degree of detail,” Dr. Wetjen says.

Complex or syndromic craniosynostosis

Only 6% of craniosynostosis cases involve multiple sutures or are related to a hereditary syndrome. As a major pediatric neurology center, Mayo has experience with

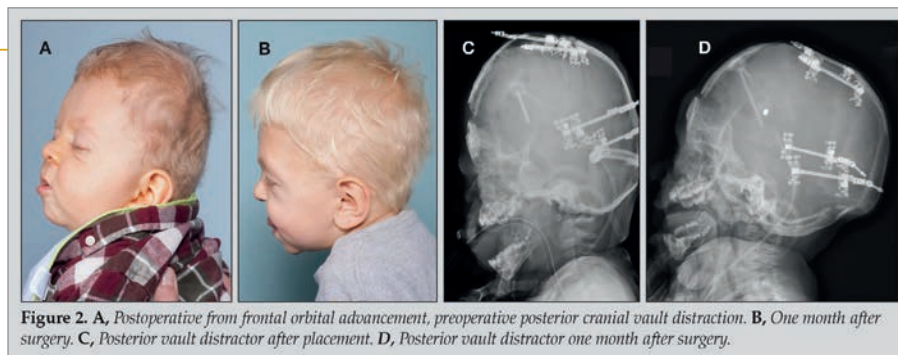


Figure 2. A, Postoperative from frontal orbital advancement, preoperative posterior cranial vault distraction. B, One month after surgery. C, Posterior vault distractor after placement. D, Posterior vault distractor one month after surgery.

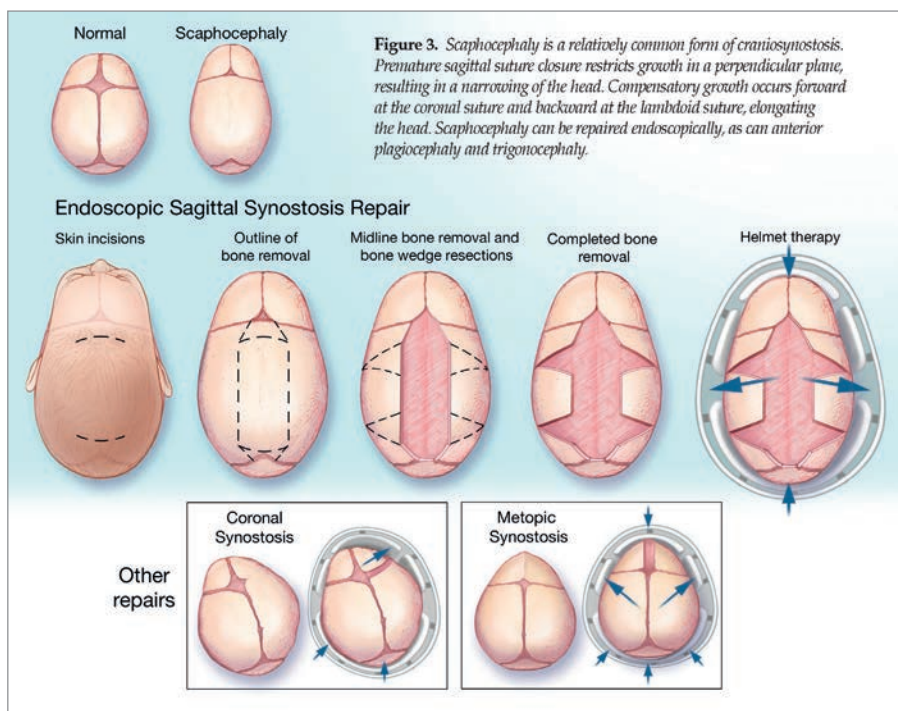


Figure 3. Scaphocephaly is a relatively common form of craniosynostosis. Premature sagittal suture closure restricts growth in a perpendicular plane, resulting in a narrowing of the head. Compensatory growth occurs forward at the coronal suture and backward at the lambdoid suture, elongating the head. Scaphocephaly can be repaired endoscopically, as can anterior plagiocephaly and trigonocephaly.

these complex and syndromic cases. Multiple surgeries are often required to correct the patient’s head shape.

Treatment for complex or syndromic craniosynostosis often involves the use of a distractor – a device placed in the skull for a period of three to four months. The distractor is widened a millimeter a day to separate the skull bones. Over time, new bone grows across the gap. Cosmetic results are generally very good (Figure 2).

Ongoing research

Considerable progress has been made in understanding the genetic causes of syndromic craniosynostosis. But the etiology of about 85% of nonsyndromic cases remains unknown. Mayo researchers are analyzing bone removed during craniosynostosis surgery in a genome-wide search for novel genes for the condition.

In a study published in the February 22, 2013, issue of *The Journal of Biological Chemistry*, Mayo researchers showed that the molecular and functional interplay between the RUNX2 and AXIN2 genes controls the rate of cranial suture closure in

laboratory animals. The research identifies a key mechanistic pathway for regulating bone development within the skull and thus suggests a potential means of preventing premature cranial suture closure.

Other research at Mayo involves the use of MRI rather than CT scan for diagnosis and treatment of craniosynostosis, strategies for minimizing blood transfusion during surgery, and the use of magnetic resonance elastography as a noninvasive way to measure intracranial pressure.

Dr. Wetjen stresses that the risk of intracranial pressure from simple craniosynostosis is small. “As long as the suture and head shape are fixed, the child’s IQ is likely to end up being just like any other child’s,” he says. As Dr. Wetjen sometimes tells parents, “You can have craniosynostosis and grow up to be a brain surgeon.”

Reference

McGee-Lawrence ME, et al. Runx2 protein represses Axin2 expression in osteoblasts and is required for craniosynostosis in Axin2-deficient mice. *The Journal of Biological Chemistry*. 2013;288:5291. **MEH**

Interview

Sidra researcher studies new percutaneous valve for young cardiac patients

Middle East Health speaks to **Professor Ziyad M Hijazi, MD, MPH, FACC, MSCAI**, the Acting Chief Medical Officer, Service Chief – Pediatrics and Director at Sidra's Cardiovascular Center of Excellence in Doha and to **James A. Hunter, MD**, Professor of Pediatrics and Internal Medicine at Rush University Medical Center, Chicago, about new percutaneous valves for paediatric patients that they are researching.

Middle East Health: Can you give me some background about percutaneous valves?

■ **Ziyad M Hijazi & James A. Hunter:** Percutaneous valves mean valves that can be implanted in the body without open heart surgery, via a catheter from the groin most of the time. They were implanted for the first time in September 2000 in a child in Paris.

Valves are designed for both children and adults. Unfortunately, because of the size of the catheter required, small children are not eligible for them yet; we are working on miniaturization of technology. The current valves are made of either cow tissue or pig tissue. Currently, we are also working on stem cells ... so it will be the patient's own tissue. The first human valve was developed and implanted in a child in Paris. In 2002, the first valve implanted in the aortic position was also in France.

MEH: Can you give some journal references to the research?

■ **ZH & JH:** Here are some references:
A. Bonhoeffer P, Boudjemline Y, Saliba Z, et al. Percutaneous replacement of pulmonary valve in a right-ventricle to pulmonary-artery prosthetic conduit with valve dysfunction. *Lancet* 2000;356:1403–1405.

B. Garay F, Webb J, Hijazi ZM. Percutaneous replacement of pulmonary valve us-

ing the Edwards-Cribier percutaneous heart valve: first report in a human patient. *Catheter Cardiovasc Interv* 2006;67:659–662.

C. Kenny D, Hijazi ZM, Kar S, et al: Percutaneous implantation of the Edwards SAPIEN transcatheter heart valve for conduit failure in the pulmonary position. *J Am Coll Cardiol* 2011;58:2248-56.

D. McElhinney DB, Hellenbrand WE, Zahn EM. Short- and medium-term outcomes after transcatheter pulmonary valve placement in the expanded multicenter US Melody Valve trial. *Circulation* 2010;122:507-516.

MEH: What is unique about these valves?

■ **ZH & JH:** The valve I'm working on (the Venus P valve) has special features: first, it can be implanted in patients who have what we call "trans-annular patch" and those patients represent the majority of patients after tetralogy of Fallot repair. The currently available valves can be implanted only in patients who received a "conduit" between the right ventricle and the pulmonary artery and these patients represent only 15% of the patients. Second, these valves can be inserted in the body using a smaller catheter making the number of children eligible larger.

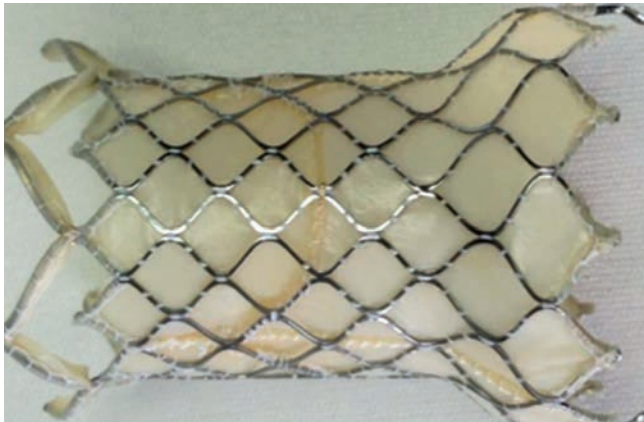
MEH: I am told that you want to use them in paediatric patients to reduce



Professor Ziyad M Hijazi, MD, MPH, FACC, MSCAI

the number of open heart surgery cases. What medical conditions will this cover? What age group?

■ **ZH & JH:** Yes, my goal is reduce the number of open heart surgeries a child needs in his/her lifetime ... usually children (who require heart valve replacement) will require about four open heart surgeries in their lifetime ... because the valves do not last long (10-15 years), some valves even do not last 2-5 years. So, if I put this valve without open heart surgery, I succeed in reducing the number of operations these kids endure in their life. We use these valves for a variety of conditions. Most commonly, patients after tetralogy of Fallot repair. This disease is common in children with congenital heart disease. Almost all tetralogy of Fallot patients will require a valve at one point ... the valve can be put surgically via open heart surgery or via a catheter ... that is where my valve comes in handy. Other conditions include patients who undergo what we call a Ross operation and of course any patient who receives a surgical valve between the right ventricle and pulmonary artery. The age group is



The Venus P valve that is being tested by Dr Ziyad Hijazi

currently anyone older than 5 years old. But quite honestly, it is not the age factor, it is the weight. We can put this valve in any patient with a weight of more than 20 kg.

MEH: I understand they are not being used in Europe or the US. Is this an issue for you? In other words – that they have not been used extensively enough to prove their efficacy?

■ **ZH & JH:** True, this valve is relatively new, about one year. They are still investigational and not yet approved for commercial use. I did “FIM” (first in man) last year in China with excellent results. We have done extensive animal work that showed great results. So, the fact that it is not yet approved in the US and Europe does not mean it is not good, simply we are new and we believe these valves will be approved at one point. That is why we are doing an extensive study and collecting a lot of information so that we can submit to the FDA and European notified body for commercial approval.

MEH: How many cases do you see per year? And how many cases do you envisage these valves will assist?

■ **ZH & JH:** In Qatar we expect about 20 cases per year. However, if we are in the US, we expect much larger population, around 5,000 per year. Not all of them we can do it without open heart surgery. Worldwide we expect 100,000 cases per year.

MEH: Can you explain the procedure to insert the valves?

■ **ZH & JH:** The procedure is done under general anaesthesia. We insert a catheter from the femoral vein in the groin and under X-ray guidance, we deploy the valve (the valve is mounted over a catheter), once in the desired position, we retract the catheter and the valve made of a stent, will deploy and start functioning immediately. The procedure for the most part is very safe, the patient goes home within 24 hours and they can go back to activities within a week.

MEH: What challenges do you envisage with inserting these valves?

■ **ZH & JH:** The most important challenge is the sizing of the valve. Each patient has different size and choosing the correct size is crucial so that the valve does not migrate at all. **MEH**



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M
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Preventing rheumatic heart disease in children

At the recent World Congress of Cardiology held in Melbourne two new studies were presented showing the importance of collecting comprehensive patient information nationally and providing timely access to health services in tackling one of the world's most neglected and easily prevented diseases in children, rheumatic heart disease (RHD). *Middle East Health* reports.

RHD, a chronic heart condition caused by acute rheumatic fever (ARF), is the most common acquired heart disease amongst children in developing countries and affects over 15 million people. RHD is not only a neglected disease, it is also easily prevented and controlled; acute rheumatic fever can mostly be avoided by treating acute throat infections caused by group A streptococcus (GAS) with a simple, short course of antibiotics. For those who have had rheumatic fever, monthly injections of long-acting penicillin can prevent recurrent attacks of rheumatic fever which can lead to further heart valve damage.

On the same day a unique new handbook to support the development of RHD control programmes is launched, new research puts a spotlight on the steps two countries are taking to better manage RHD and improve the lives of thousands of children at risk of developing the condition.

New Zealand: a country tackling RHD head on

The New Zealand government has put a priority target in place to reduce rheumatic fever by two thirds by 2017 and is investing in education and prevention work in at-risk communities in New Zealand's North Island, working together with partners to find innovative solutions. As part of these solutions, improvements to the surveillance system to support programme planning and monitoring have been introduced and a revised patient management system to prevent recurrences of rheumatic fever is planned.

In addition, the Department of Paediatrics at the University of Auckland and epidemiological experts from across the country have independently undertaken a large scale audit of different RHD surveillance processes in Auckland to better understand their

strengths and weaknesses, as well as identify children with or at risk of developing RHD.

As a result of this audit, over 500 children with definite or probable ARF were identified in Auckland through a range of these complementary methods. There is a necessity to have high quality and all-encompassing processes to identify as many cases as possible of ARF, which can prevent the deaths of hundreds of children every year.

"Rheumatic heart disease is responsible for the deaths of thousands of young people under the age of 25 each day around the world and cannot be ignored. New Zealand is at the forefront when it comes to RHD prevention and our study shows the important role that efficient surveillance tools can play to avoid the devastating consequences of acute rheumatic fever being left untreated," said Professor Diana Lennon, Department of Paediatrics: Child & Youth Health, The University of Auckland.

Finding and preventing the burden of RHD in India

RHD continues to be a problem in India, but despite this it is overlooked as a public health priority. A study organised by the Indian Council of Medical Research (ICMR) established 10 registries between 2000 and 2010 to look at a range of factors, which contribute to RHD, including biology and the existing health infrastructure. In addition, the registries undertook a wide range of prevention activities across India, including community health education campaigns, additional training for medical teams and prescription of oral antibiotics.

The results of this large study show that the use of this registry-based prevention programme in existing healthcare settings works well and is a practical and achievable means of preventing and controlling RHD, which

can ultimately lead to fewer deaths in children across India. The study also illustrates the challenges in obtaining representative data from large countries with great geographic and socio-economic diversity. Additionally, sustaining the effort over several years will require robust long term policies based on the experience of the registry.

Tools for implementing RHD programmes: TIPs toolkit

Based on 60 years of experience in RHD prevention and control around the world, the TIPs handbook compiles interviews, case studies, unpublished reports and peer reviewed publications into an accessible format for the very first time. Topics include burden of disease data, fundraising, development of RHD registries and the interface with cardiac surgery. TIPs will be distributed to clinicians and policy makers tackling RHD in endemic countries.

Lead author, Dr Rosemary Wyber, Rheumatic Heart Disease Program Manager at RhEACH describes: "TIPs provides a foundation to describe, design and implement comprehensive RHD control programmes in the areas of greatest global need. Collating and disseminating lessons from around the world will help make the delivery of RHD control programmes more effective, efficient and sustainable."

The TIPs handbook is designed to build health system capacity to reach the World Heart Federation's goal to achieve a 25% reduction in premature deaths from rheumatic fever and RHD among individuals aged under 25 years by 2025. It is also well aligned with WHF CVD "roadmaps" for implementing national targets around CVD.



The TIPs Toolkit
www.rheach.org/tips



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On Collaboration

By Charles C. Roberts, MD
& David Westbrook

When collaboration comes to medicine, good medicine comes to patients. Collaboration between providers, institutions and other countries is important for quality medical care, particularly for the complex, chronically-ill children. At Children's Mercy Kansas City, we are dissolving silos in order to achieve true collaboration.

Collaborate as a team because none of us is as smart as all of us

Modern medicine is changing in major ways. Although the expert mind of the well-trained and experienced physician has been, is, and always will be paramount, the care of one patient often needs expertise from multiple specialties or disciplines. This need is seen every day in our Fetal Health Center. Here, healthy mothers diagnosed with an at-risk pregnancy are served by integrated teams of surgical and medical subspecialists, social workers, and others. Before the birth takes place, these teams come together to develop a diagnosis and treatment plan to share in detail with the family. When the birth comes, the entire team is there, ready not only to take care of the critically ill infant, but to remain connected to that child until conditions are stabilized and progress is achieved.

Collaborate internationally to bring collective wisdom to a case and improve quality and safety

We collaborate with colleagues around the world, particularly to evaluate treatment approaches for pediatric disease too uncommon to be fully tested at one center. Through our work with the Children's Oncology Group, we are able to gain access to multi-center data and protocols, enabling us to compare our rare oncology cases with others throughout the nation, improving survival for pediatric cancer patients here and across the country.

Other such examples include our involvement with the Improve Care Now Network (pediatric IBD), the Pediatric Trials Network (drug therapy), the Neonatal Research Network, and our leadership

in the development of international pediatric dialysis guidelines.

Collaborate to improve outcomes

The successes of pediatric medicine cause celebration, but bring challenge. The patients we treat today are far more complex than ever before. Those who come to us with chronic issues often bring comorbidities or complexities that require multiple subspecialists to treat the conditions expressed. A prime example of this collaboration is the Ward Family Heart Center. Our whole team, including cardiologists, CV surgeons, neonatologists, intensivists, psychologists, nurses, radiologists and anesthesiologists, are now organized to function as one coordinated unit. In order to assess and improve care, the team has developed a software tool used to track thousands of data points for all patients.

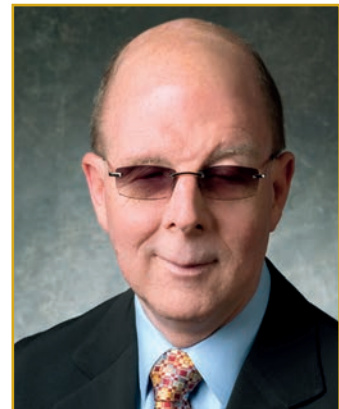
Another example is our approach to chronic pain. For years we have had multidisciplinary clinics for pain, headache and abdominal pain. New to Children's Mercy is the Rehabilitation for Amplified Pain Syndrome Program (RAPS). The RAPS program is an intense, no-medication, collaborative program focused on returning adolescents who have failed traditional pain treatment to full function. The results are impressive.

Collaborate to nurture innovation

As an academic institution, we find ourselves rarely satisfied with the present. We seek always to find the better in the future. The multidisciplinary Center for Pediatric Genomic Medicine headed by Dr. Stephen Kingsmore collaborates internationally, nationally and locally. The center has developed a test (TaGSCAN) to look for 750 rare genetic disorders greatly reducing the cost and time to make a diagnosis. STAT-Seq, recognized by *Time* magazine as one of the top 10 medical breakthroughs in 2012, decodes and interprets a newborn's genome in less than 50 hours. This gives clinicians the potential for early intervention in critically ill neonates.



Charles C. Roberts, MD



David Westbrook

Collaborate to deliver the best possible value into the future


We collaborate, of course, with physicians who refer their patients to us for special care. Our Quality Program professionals collaborate to measure and report on outcomes. As those outcomes produce evidence of progress, the standards will be promulgated to achieve clinical integration. For us at Children's Mercy, collaboration is more than a popular word of the day. Collaboration is a practical protocol that delivers better care for patients and families and better value to those who pay for it.

Collaborate across borders

For more information on how you or your institution can collaborate with Children's Mercy Kansas City to provide high quality pediatric care, contact International Services +1 816-701-4524 or send an email to international@cmh.edu

The Authors

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Hospital Medical Center

Sultan, a colorectal and urology patient from United Arab Emirates



Cincinnati Children's Hospital Medical Center Case Study: Anorectal Malformation

This case study describes work at Cincinnati Children's Hospital Medical Center that demonstrates the multidisciplinary, collaborative effort to care for pediatric patients with anorectal malformations (ARM).

Clinical history

A male patient was born with an anorectal malformation and bilateral pelviectasis. He was born to a G3P3 healthy female. After birth, it was noted he had a high imperforate anus, bifid scrotum and hypospadias. He had a divided colostomy performed on day of life two.

The family elected to travel to Cincinnati, Ohio to bring their child to the Alberto Peña, MD, Colorectal Center at Cincinnati Children's Hospital Medical Center for care of the ARM and the urologic issues.

Our approach

On initial assessment of the patient's chart, it was apparent that he required a combined approach to manage his anorectal malformation and urogenital malformation.

On initial assessment of all patients with anorectal malformations, we look for associated defects. This not only gives us a good idea of other anomalies, but can help us predict the future continence of the patient. The screening process includes a voiding cystourethrogram and renal ultrasound to assess the urinary system. The spinal cord is also assessed because there is an association of anorectal malformations, spinal anomalies, tethered cord and possible presacral masses. This can all be seen with a spinal MRI. If needed, the heart will be assessed with an echocardiogram if there is any suspicion of cardiac disease.

To look at the severity of the anorectal malformation, a high pressure distal colostogram is obtained. This helps us plan our surgical operation and give the parents a good idea of the type of operation the baby will need.

Diagnosis of anomalies

This patient was identified as having a prostatic fistula on the distal colostogram.

There was enough colon to perform a posterior sagittal incision without entering the abdomen. In our experience, patients with an ARM and hypospadias have been at higher risk of associated urologic issues and potential bladder dysfunction. This was found to be true with this patient; he was found to have Grade 2 vesicoureteral reflux on his VCUG. His renal function and kidneys looked normal.

On his screening MRI, he was found to have a shortened sacrum and a tethered cord with a cord lipoma.

The family was counseled at length regarding the prostatic fistula and the long term prognosis of bladder and bowel control. We discussed the findings of the studies, including the implication for decreased potential for bladder and bowel control, and the possibility of clean intermittent catheterization and enemas in the future to stay clean and dry.

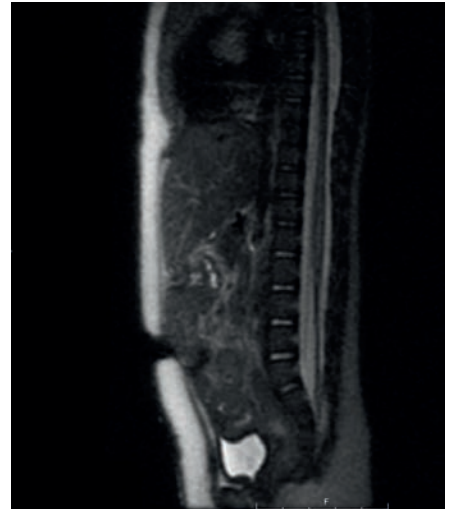
Both urology and neurosurgery were consulted and an overall plan of care was developed for the patient.

Because of the severity of the tethered cord, Francesco Mangano, DO, director of pediatric neurosurgery, performed a release of his tethered cord and removal of the lipoma prior to any other interventions.

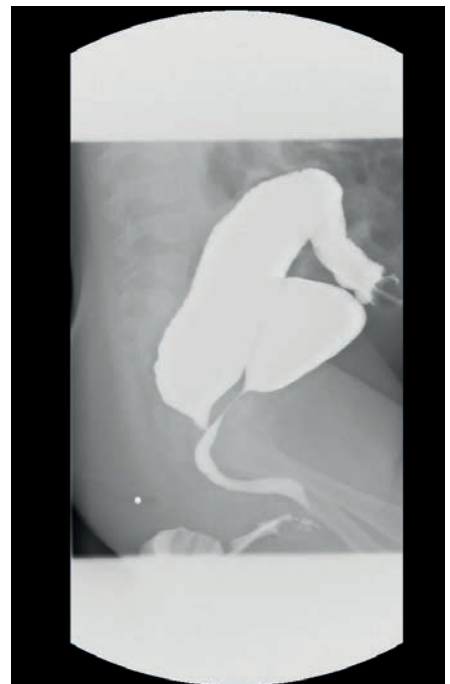
Surgical course

Cystoscopy and repair of the ARM was performed by Belinda Hsi Dickie, MD, PhD, pediatric surgeon from the colorectal team, eight weeks after the tethered cord release. The cystoscopy was performed by our pediatric urology team to delineate the anatomy. The repair of the ARM was all done posteriorly or sagittally with no need to enter the abdomen. The patient recovered without incident, and was able to void after the catheter was removed two weeks after surgery.

While he was still diverted from any stool near his perineum, our pediatric urologists proceeded to repair his hypospadias and bifid scrotum. Four weeks following this surgery, he underwent closure of his colostomy. He has since recovered without incident and has returned home with strict



MRI showing anorectal malformation



Colostogram showing anorectal malformation

guidelines for follow-up of his urologic system and his bowel management.

Summary

This case demonstrates the benefit of multidisciplinary evaluation that all patients receive at the Peña Colorectal Center at Cincinnati Children's. All charts are reviewed and the trigger list helps ensure that urologic conditions are not missed.

The patient described had a unique set of conditions that were addressed efficiently in one evaluation. We have learned that a thorough evaluation and treatment plan before surgery helps to minimize anesthetics, improve family understanding and expectations, and may result in better outcomes. A collaborative, multidisciplinary model helps achieve these goals. **MEH**



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Two-in-one stem cell transplant

Innovative procedure pairs half-match stem cells with umbilical cord blood to treat young woman's relapsed leukemia

By Gretchen Rubin

Daniela Lakosilova still remembers what John Cunningham, MD, promised her the first time they met.

"If you need a stem cell transplant, we'll find you a donor," she recalled the pediatric hematologist/oncologist saying to her in his clinic at the University of Chicago Medicine Comer Children's Hospital.

Now a college freshman, Daniela was first diagnosed with acute lymphoblastic leukemia (ALL) in 2007 when she was 12 years old. She underwent the standard frontline treatment for the disease – chemotherapy and radiation treatment over two years – at another hospital. While this therapy is successful for most children with ALL, a small percentage of patients relapse and require additional therapy. For Daniela, the leukemia recurred in 2012 during her junior year of high school.

Her doctors gave her a choice. The teenager could undergo more chemotherapy or consider having a stem cell transplant – a process that replaces damaged or diseased blood stem cells with healthy stem cells from a donor. She opted for transplant and her physicians used the National Marrow Donor Program (NMDP) registry to look for a donor.

At the forefront of stem cell transplant

Although millions of potential donors are listed on NMDP, there wasn't a suitable match for Daniela. According to Cunningham, director of stem cell transplantation at Comer Children's Hospital, this situation occurs in up to 50% of children and adults who need this type of transplant.

In 2011, University of Chicago Medicine physician-scientists reported they had successfully refined a procedure known as haplo-cord transplantation. The technique combines cells from a half-matched (haploidentical) related donor and well-matched, unrelated umbilical cord blood.

"Separately, half-match and cord blood stem cell transplantation have many challenges, but together we have shown them to be effective," Cunningham said, explaining that half-matched stem cells engraft quickly but only produce blood cells for a limited time. Nevertheless, they provide a bridge that allows the umbilical cord cells to grow and reproduce healthy cells for the long term.

Haplo-cord transplant is only offered to patients for whom initial treatment has failed. In recent years, haplo-cord transplant has opened up the option of stem cell transplantation to nearly all patients for whom the procedure was not previously available. The University of Chicago Medicine was the first medical center in the United States to offer the innovative technique.

Looking forward

When Daniela's parents, Petr Lakosil and Radka Lakosilova, heard about haplo-cord transplants offered at Comer Children's Hospital, they brought their daughter to the hospital for a second opinion. Cunningham's team identified a closely matched umbilical cord donor and determined that Daniela's father would be the best half-match for her.

Daniela underwent the haplo-cord transplant in November 2012. In the months following, she experienced graft vs. host disease followed by other complications of stem cell transplantation. Each time, her medical team successfully addressed the problem. Nurse coordinator, Caitlin Beaudoin, APN, admired Daniela's attitude and resilience during the post-transplant period. "She was always positive," Beaudoin said. "She was always looking forward."

Moving forward

While Daniela spent much of her senior year in the hospital, she kept up with her studies



Stem cell transplant recipient Daniela Lakosilova with the University of Chicago Medicine's John Cunningham, MD

and frequently attended class via FaceTime on an iPad. She graduated from school on time and in the top 10% of her class.

"Even though I missed a lot of school, I could see my friends' faces in the classroom," she said. "It was nice just to hear them say 'hi' to me." She was able to leave the hospital to join her classmates for senior ditch day and to attend her prom. Her date was a fellow patient who she met at Comer Children's Hospital.

Writing on her blog about prom, Daniela said: "It is days like this that make me think deeply. [Having cancer] showed me how strong I really am – showed me that life is too short and that you should enjoy every minute."

This past fall, Daniela started classes at Triton College in River Grove, Illinois. Influenced by an art therapist who helped her cope with her illness and treatments, she plans to pursue a psychology degree and a career in art therapy.

Cunningham and Beaudoin say that Daniela's long-term prognosis is outstanding. Now past the one-year mark, the risk of relapse is very low. After two years, there is less than a 5% chance that the cancer will return. **MEH**

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**CANCER
2014-15**



Simple interventions can save the lives of children in under-resourced areas

By Judith Palfrey, MD

Diarrhoea is a bigger global killer than HIV and malaria combined. It accounts for more than 800,000 deaths each year among children 0-5 years. And how tragic this is when the simple intervention of hand washing can prevent some of these deaths. Results of a trial, published in the March 2014 edition of *The Lancet Global Health*, indicate that teaching families in under-resourced areas of the world about hand washing is not only possible but also scalable, sustainable and successful – if it's done the right way.

Hand washing is a simple intervention, but the prevalence of the behaviour is as low as 1 to 2% in some under-resourced global settings. A London School of Hygiene and Tropical Medicine group, led by Adam Biran, PhD, decided to try to improve these statistics by devising an effective intervention.

However, the route to simple solutions is often complex. The researchers used very sophisticated methodology to identify the levers of behavioural change. They realized that health messages about hand washing have not worked. The idea that what I do today may prevent diarrhoea down the road just did not have enough oomph to motivate people to adopt a new routine.

The researchers hypothesized that emotional drivers (including nurture, status, disgust and belonging) would be strong pushes to get families to wash their hands. And they were right.

So, how did the group achieve the positive health-related outcome of good hand hygiene using non-health-oriented methodology? They employed best practices

in social motivation and marketing and turned to media consultants and event planners. Their multi-faceted intervention involved championing by village leaders, school programming, public pledges by parents and colourful badges for children.

The campaign featured a video, posters and other materials starring an attractive, articulate woman named SuperAmma and a comedic, disorderly, dirty male character as a foil. The contrast between the two characters was captivating, motivating and effective. Parents wanted to nurture their children the way SuperAmma did. Children were disgusted by the squalid, nasty behaviours of the man who did not clean his hands after defecating. Adults viewed hand washing as a status symbol, and they wanted very much to belong in that community.

The campaign made the right choice the easy choice and promoted the healthy behaviour as the norm by drawing on the villagers' emotions rather than on their cognitive reasoning.

The SuperAmma campaign increased hand washing from 1% at baseline to 19% at six weeks and 37% at the six-month follow-up. These results indicate that once the behaviour took hold in the communities it was sustained.

The success of this campaign points to the value of simple interventions and also shows the underlying complexity involved in achieving elegant results. In the global context, there are many opportunities for simple interventions of this type to address the challenges that continue to claim the lives of 6 million children under the age of 5 each year.

The researchers hypothesized that emotional drivers (including nurture, status, disgust and belonging) would be strong pushes to get families to wash their hands. And they were right.

Other simple global health interventions – like a minimally invasive and relatively inexpensive operation for hydrocephalus that avoids the need for shunts, infant warmers and bubble c-pap for newborns, and the Helping Babies Breathe program – also have produced dramatic outcomes in low-resource settings.

These examples, along with the findings of Biran and his colleagues, could set the stage for additional simple interventions, including hand washing in clinical settings, breast feeding enhancement, provision of nutritional supplements to starving children, distribution of bed nets to prevent malaria and other mosquito-borne illnesses, provision of insulin for children with diabetes and anti-convulsant medications for children with seizures and dissemination of pneumococcal vaccine for children with sickle-cell disease.

The author

Judith Palfrey, MD, is director of the Global Pediatrics Program in the Department of Medicine at Boston Children's Hospital.

● doi:10.1016/S2214-109X(13)70160-8

**On my Mom's birthday
I found out I was sick.**

It was a sad day, but I knew it would be ok.

The medicine made me lose my hair,
but I didn't care. It was making me better.

Soon my doctors, and my brother
Bradley, made the bad stuff go away.

**Now birthdays
are happy again.**

Mya
Leukemia Survivor
Lake Village, IN

**Two years ago, Mya was
diagnosed with leukemia.**

She was a brave little girl, ready to get better.

We treated her with chemotherapy and
radiation. When she was ready for a bone marrow
transplant, her brother was a perfect match.

Mya's full recovery has kept us smiling.

**Because saving kids' lives
is something to celebrate.**

John M. Cunningham, MD,
Chief, Section of Pediatric
Hematology/Oncology



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Children's Healthcare of Atlanta celebrates 1,000th blood and marrow transplant



In January, Children's Healthcare of Atlanta made history. The team at the Aflac Cancer and Blood Disorders Center of Children's performed their 1,000th blood and marrow transplant (BMT).

Three months later, the Aflac Cancer and Blood Disorders Center community came together to celebrate this incredible milestone – and all the lives saved through BMT. In attendance was Agnes Timoh. She has a unique perspective on how important the resources and pediatric experts are to families in need.

A BMT changed her son's life too.

Meet Tendoh

Tendoh Timoh was diagnosed with sickle cell disease at six months old. Growing up, he endured numerous complications, including asplenic, acute chest syndrome, many infections and osteonecrosis of his hip.

Because of his condition, Tendoh could not participate in sports and was absent from school at least a third of each academic year. Tendoh's condition also placed burden on his mother and siblings, who had to care for him throughout his painful episodes and frequent hospital admissions.

At 17, things changed. Tendoh underwent a BMT after his brother, Patrick, donated. The recovery process was arduous; Tendoh missed the first semester of his senior year of high school because of the immunosuppressive drugs he was taking, and he had a difficult time dealing with the side effects from the chemotherapy. However, he said the physicians and staff at the Aflac Cancer and Blood Disorders Center never failed to lift his spirits.

Tendoh's successful BMT not only improved his health, but also lessened the burden on his family and gave him the liberty to attend school and achieve both physical and academic goals.

He now enjoys a life free from the debilitating effects of sickle cell disease thanks to the BMT he received. Now a cardiology fellow at Washington Hospital Center and Georgetown University Hospital in Washington, D.C., Tendoh

is looking to pursue further subspecialty training in cardiac imaging through the National Institutes of Health.

Trust the pediatric experts

Tendoh is one of thousands of sickle cell and BMT patients who have benefited from the pediatric expertise of the Aflac Cancer and Blood Disorders Center team at Children's.

The Aflac Cancer and Blood Disorders Center has the largest pediatric sickle cell program in the U.S., with more than 1,700 active patients. The Sickle Cell Disease Program offers comprehensive clinics, transfusion services, specialty clinics and inpatient care.

As the home to one of the top pediatric BMT programs in the U.S., the Aflac Cancer and Blood Disorders Center provides expertise in autologous and allogeneic transplants. Through BMT, the Aflac Cancer and Blood Disorders Center has cured more than 50 children of sickle cell disease, with 98% of patients transplanted with a matched sibling going on to live a life free from sickle cell. The center also provides transplant treatment for other blood disorders such as thalassemia major and marrow failure syndromes, in addition to cancer and immune disorders.

In addition, the BMT team has day +100 survival rates that are better than the national average for both autologous and allogeneic transplants. The program is accredited by the Foundation for the Accreditation of Cellular Therapy (FACT).

Kids are our focus

Making kids happier and healthier is the mission of the Aflac Cancer and Blood Disorders Center. The multidisciplinary staff members work together to address the unique clinical and psychosocial needs of pediatric patients.

The Aflac Cancer and Blood Disorders Center has more than 60 faculty members, including pediatric hematologist/oncologists, neurologists, endocrinologists and psychologists. More than 30 family support team members, in addition to child- and family-focused programs and services, are there when families need them.

The Aflac Cancer and Blood Disorders Center features:

- 54 inpatient beds
- 10 HEPA-filtered rooms for inpatient BMT patients
- Private BMT infusion and procedure rooms
- Outpatient clinics with a full range of procedural, infusion and apheresis services
- Onsite diagnostics, marrow processing lab, surgical oncology and pharmacy services

The center's size allows entire teams of providers to focus on numerous individual types of childhood cancer and blood disorders. This degree of specialization means that every child is cared for by a team that is focused solely on his disease.

Specialized care for international patients

The Aflac Cancer and Blood Disorders Center's international patient service offerings are built uniquely for patients traveling to the United States for care. A few of our international service highlights include:

- **Translation and interpreting services**
The team of translators is highly qualified in the field of pediatric medical interpretation.
- **Financial counseling**
Counselors can help families estimate their medical and travel expenses and understand their insurance benefits and obligations.
- **Single point of contact**
A main point of contact will help your family obtain medical records, schedule appointments, and coordinate travel and lodging arrangements.
- **Transitional or temporary housing**
Housing options have been chosen for safety, cleanliness, amenities and distance from the hospital.

Visit choa.org/international for more information about the Aflac Cancer and Blood Disorders Center of Children's Healthcare of Atlanta. Contact our international program manager at 404-785-2432 or international@choa.org for more details.

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Interview

AUBMC initiates preventive cardiology programme

The American University of Beirut Medical Center recently launched a new heart attack prevention initiative. **Callan Emery** spoke to Dr Wael Al Jaroudi, the Director of the Cardiac Rehabilitation Program, and Assistant Professor of Medicine in the Division of Cardiology in the Department of Internal Medicine at AUBMC, about the initiative.

Callan Emery: Why has AUBMC set up this programme?

■ **Dr Wael Al Jaroudi:** Part of AUBMC's mission is to provide not only state-of-the-art health care and therapy, but also to prevent diseases and contribute to a healthy and productive society. Cardiac preventive programmes are associated with significant decrease in morbidity and mortality from cardiovascular diseases. Therefore, we opted to launch a comprehensive preventive cardiology programme that includes screening for diseases, and diet and smoking cessation counselling. Given that lack of exercise is notoriously common in our society and is a major contributor to obesity and other cardiovascular risk factors, we also decided to start a cardiac rehabilitation programme to promote healthy lifestyle, exercise philosophy, and modify risk factors.

CE: What are the latest stats for cardiovascular disease (CVD) in Lebanon?

■ **WAJ:** 84% of deaths in Lebanon are due to non-communicable diseases. Of those, 45% are due to cardiovascular disease.

36% of the total population smoke; 47% are inactive; 39% have high blood pressure; 12% are diabetic; 62% are overweight; and 27% are obese.

CE: Can you explain how the programme will work?

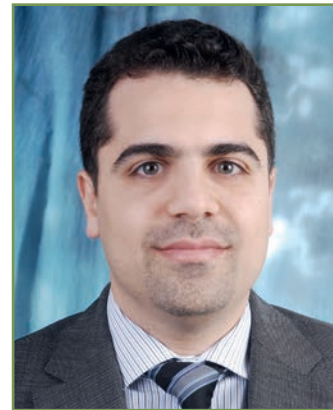
■ **WAJ:** Patients are referred to the physical therapy department by their physician. They are screened by a cardiologist who, in collaboration with the referring physician, will determine each patient's goals, such as weight

loss, improving cholesterol panels, improving fitness and endurance levels, etc. The patient then starts working with a physical therapist with expertise in cardiac rehabilitation for one hour sessions up to three times a week. In the first session, an assessment of baseline functional capacity is performed, and it is repeated at the end of the programme to check for improvement. During the sessions, the physical therapist trains the patient gradually and provides him/her with a tailored exercise programme to meet the set goal. At the end of the programme, the patient should be able to pursue such exercise regimens on his/her own.

CE: Who are you targeting?

■ **WAJ:** Currently, phase one of the programme targets patients without known heart disease, but have one or more risk factors. They will therefore benefit from the programme to modify their risk factors and prevent the occurrence of heart disease and complications. Such patients include the morbidly obese who need or have recently underwent bariatric surgery to reduce weight. In such cases, adding exercise is essential to maintain weight loss, build muscle and improve functional capacity.

Phase two of the programme (which will be launched soon) targets patients with known heart disease, particularly those who had a recent heart attack, coronary artery stenting, or open heart surgery. These patients are at risk of developing future events. Many of them are afraid to exercise or cannot because they are deconditioned. The aim of the programme is to rehabilitate them and re-integrate them into a



Dr Wael Al Jaroudi

healthy lifestyle with daily exercise. Such programmes have been shown to decrease the rate of death, recurrent hospitalization and future events by more than 25%.

CE: How many people do you expect to see doing the programme?

■ **WAJ:** Each session consists of up to four patients. This allows more one-on-one time with the therapist. We expect gradual increase in numbers, and we are currently expanding the programme to allow for more machines and increased capacity. We expect to recruit 10 new patients each month.

CE: How long will patients participate in the programme?

■ **WAJ:** For those enrolling in phase one of the programme, we recommend a 12-session package (3 one-hour sessions a week). We also have a 6-session package.

For those enrolling in phase two of the programme, we recommend 20 sessions with the possibility of renewal depending on a patient's needs.

CE: How will people pay for the programme?

■ **WAJ:** The current packages are competitively priced taking into account all the benefits to the patient.

We have approached insurance companies and third party payers to cover this service which is known to be cost-effective, and which will save the public money in the long-term as well as result in an overall healthier population. We are currently still waiting for their feedback.

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Lebanese Syndicate of Medical Laboratories calls for implementation of international standards for labs

The Lebanese Syndicate of Medical Laboratories hosted a media roundtable recently to announce measures intended to improve the quality and reliability of medical laboratories in Lebanon. The session was headed by Dr. Christian Haddad, president of the Lebanese Syndicate of Medical Laboratories, Dr. Ghazi Zaatari, chair of the Department of Pathology and Laboratory Medicine at the Faculty of Medicine of the American University of Beirut (AUB) and Dr. Ghassan Hallak, director of Laboratoires St. Elie Antelias.

Entitled “ISO certifications and accreditations: similarities and differences”, the session discussed the importance of implementing the globally recognized standards that aim at achieving excellence at the medical laboratories.

“The optimal performance at the laboratories is absolutely critical and adopting global standards is becoming increasingly a necessity at every touch point,” said Dr. Haddad. “Lebanon is one of the most dynamic healthcare markets in the Arab region; hence global standard serves as a call to the medical industry to promptly adopt the best practice framework.”

The syndicate aims at initiating the implementation of accreditation standards

such as ISO 15189 and CAP, for the clinical laboratories in Lebanon. ISO 15189 issued by the International Standards Organization (ISO), is intended to objectively assess the quality and performance of laboratories at different operational stages within a laboratory starting with the advice to patients and clinicians, collection, transportation, reception and examination of patients’ samples and finishing with reporting and interpreting the results.

As it stands today in Lebanon, Laboratoires St. Elie - Antelias is the first and the only medical laboratory to adopt the ISO 15189 standard. “Obtaining this accreditation further demonstrates our commitment for excellence and quality for the benefit of our patients,” said Dr. Hallak. “The new standard validates our system to deliver accurate results to the physicians therefore keeping the patient’s health at the centre of everything we do,” he added.

The clinical laboratories at the American University of Beirut Medical Center were the first in Lebanon to seek accreditation for its services and it did that from the College of American Pathologists (CAP), a world leader in the accreditation of clinical laboratories based in the USA.



Dr. Ghassan Hallak, director of Laboratoires St. Elie Antelias

“We have been committed to this basic principle in the delivery of our services and it is for that purpose we sought the accreditation from CAP,” commented Dr. Zaatari. “In our daily work, the faculty and staff work diligently together to meet these high standards of quality to accomplish the mission of the Department of delivering best care possible to the people of Lebanon and the region,” added Dr. Zaatari.

ISO certificates, such as ISO 9001, specify requirements for Quality Management System (QMS). ISO 9001 is generic and is intended to all organizations, regardless of type, size and product provided. However, ISO 15189 specifies requirements for Quality and Competence in Medical Laboratories. This standard particularly recognizes the laboratory’s superior level of quality, competence of services, and its ability to consistently deliver valid and accurate test results. **MEH**

CE: How can you ensure that people will continue with their new healthy lifestyle after they have completed the programme?

■ **WAJ:** After seeing improvement in their fitness, endurance, weight loss, decrease in their cholesterol levels, blood pressure or glucose readings, most patients are encouraged to maintain this healthy lifestyle. Part of the physical therapist’s work is to provide a tailored exercise programme that is suitable for each patient, and that they can manage to maintain despite their time restrictions. We strive to promote the philosophy of exercise and a healthy lifestyle. Throughout the sessions, patients are counselled on the benefit of exercise and healthy choices.

We can’t force patients to continue with this brand new lifestyle; however, for those motivated enough to enrol, we meet them halfway.

CE: The programme is largely a preventive measure to help reduce the risk of

CVD. Lifestyle modification to help prevent CVD is notoriously difficult. Generally people are extremely reluctant to alter their lifestyle unless they have suffered a significant cardiac event. What are your comments on this?

■ **WAJ:** This is sadly true. People are very reluctant to see a doctor when they are asymptomatic. However, screening for breast, cervical, prostate and colon cancer are now routinely done by patients and covered by insurance companies. Patients do ask to be screened and are motivated enough to present for check-up for these diseases. Still, cardiovascular disease remains the leading cause of death, moreso than breast or colon cancer. As such, we have been promoting the preventive cardiology clinic and programme, asking patients to come in and get screened for heart disease, similar to breast or colon cancer, even if they are asymptomatic. We have a Saturday clinic for those busy at work on the weekdays, and provide significant discount rates for the visit

and all the required tests. It will help if insurance companies and third party payers cover some of the expenses (mainly coronary artery calcium score, smoking cessation counselling, and cardiac rehab programme) similar to what they do for other preventive screening tests; the message has been relayed to them and we await their response.

CE: To show that this programme works, how will you measure the success of it?

■ **WAJ:** We plan on measuring patients’ functional capacity through a standard 6-minute walk test at the first session and at the end of the programme to check for percentage improvement. We will also look for weight loss, improvement in blood pressure, oxygen level, and the metabolic profile (cholesterol and glucose). We also plan to have a small questionnaire to assess whether there is improvement in mood (pre and post), and to assess patients’ overall experience and feedback. **MEH**



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Clemenceau Medical Center wins award for Best Facilities Management Service Strategy at Middle East Hospital Build & Infrastructure Exhibition & Congress 2014

Clemenceau Medical Center (CMC) in Beirut has won the “Best Facilities Management Service Strategy” award at the awards ceremony during Hospital Build & Infrastructure Exhibition & Congress, held in Dubai on June 2, 2014. The award recognises outstanding healthcare facilities in the Middle East. The hospital was also been highly commended for “Best Hospital Design”, “Best Physical Environment”, “Best Laboratory Design” and “Best Healing Environment” awards.

Clemenceau Medical Center (CMC), established in 2006 and affiliated with Johns Hopkins Medicine International, is a state-of-the-art medical center in the heart of Beirut. CMC has been JCI accredited and is capable of delivering high-quality health care services in a timely, cost-efficient and pleasant environment to patients from Lebanon and the Middle East. Its mission being “Caring, Safety, Excellence”, Clemenceau Medical Center has established centers of excellence in several specialties, including cardiology, ophthalmology, hematology and oncology, digestive and liver diseases, cardiothoracic surgery, and minimally invasive and colorectal surgery. CMC houses all specialty branches



and is fully equipped with the most advanced medical technology.

‘Best Facilities Management Service Strategy Award’ is a new category granted for outstanding healthcare service providers who have demonstrated excellence in the provision of a facilities management strategy that embraces the widest possible scope of services, meeting the needs of the clinical teams and improving patient safety.

Commenting on the award, Dr.

Mounes Kalaawi, CEO of Clemenceau Medical Center, said: “What an honor to be recognized this year again by regional and international leaders in the healthcare sector.”

Speaking to the team at the hospital, he wrote: “Once again this year, your commitment to quality and service excellence is recognised beyond our organization, at the hospital build Dubai. I am proud, as you all should be. Thanks to your hard work, commitment and loyalty.” **MEH**



An artist's impression of the new wing at King Hussein Cancer Center in Amman, currently under construction.



By **Dr. Asem Mansour**, Director General of King Hussein Cancer Center

King Hussein Cancer Center undergoes expansion

Filled to capacity, the excellent King Hussein Cancer Center is undergoing expansion to accommodate demand for world class cancer care, not only from Jordan but from the entire Middle East region. **Dr. Asem Mansour**, the Director General of King Hussein Cancer Center, writes about some of the new facilities the new expansion will house.

The King Hussein Cancer Center in Amman is a comprehensive cancer care institution serving patients in Jordan and the Middle East region. It is the only healthcare institution in the Arab world and the sixth in the world to receive disease-specific accreditation from the Joint Commission International (JCI) for its Oncology Program. The center is also recognized by a spectrum of international, regional, and national ac-

creditation bodies including the College of American Pathologists (CAP), the Healthcare Accreditation Council (HCAC), and the American Nurses Credentialing Center (ANCC) among many others.

The center hosts 200 internationally qualified oncologists and consultants and over 600 oncology trained nurses under its roof. Its bone marrow transplant (BMT) program is the only program of its kind in

Jordan, and one of two in the region; offering highly-specialized transplants.

Pursuing its mission of providing compassionate quality care for cancer patients, the King Hussein Cancer Center treats over 3500 new patients annually. However, due to space limitations, the center has recently been incapable of meeting the rising demand of local and regional patients even while working at full-capacity. For this rea- ▶

son, the center took an urgent strategic decision to expand. In 2011, it broke ground on the construction of new cutting-edge facilities.

Expected to be functional in June 2016, the expansion will include an inpatient tower and outpatient building that will double the capacity of the existing Center and provide improved, integrated space for research, education and patient care. The expansion will not only provide more life-saving space so that no patient is left behind, but will also accommodate technologically advanced medical services.

Cell Therapy and Applied Genomics

The new facilities will feature a cutting-edge Cell Therapy and Applied Genomics Floor, including the first public cord bank in Jordan, and state-of-the-art stem cell labs. The center currently performs approximately 100 bone marrow transplants per year. Its BMT program is one of the largest and most successful programs in the Middle East, achieving cure rates compatible with international standards. It oversees both matched allogeneic and autologous transplants. With the expansion, 200 additional bone marrow transplants can be performed; which will sum up to 300 transplants in total. Having a national public cord blood bank with a capacity of 10,000 units collected from Jordanians enhances the chances of finding matching cord blood units. These units can be used as a database for potential transplants in the center's own program, in other programs in the country and as a part of an international cord blood registry that patients from all over the world can have an access to it.

Educational and Training Center

The Academic Affairs Office at the King Hussein Cancer Center administers both medical and non-medical programs and courses through its training center. Specialized oncology courses for fellows and residents as well as general leadership workshops for non-medical staff are held in the premises of the center. The new outpatient building will host the Khalid Shoman Educational Center. It will include an auditorium, a skills lab, seminar rooms, a physician's library and a social interactive lounge. The center envisions be-

coming a regional hub in oncology training and firmly believes in the social impact and academic value of collaborative work.

Diagnostic Radiology and Radiotherapy Expansions

The new inpatient tower will contain expanded diagnostic imaging & radiotherapy units. The department of diagnostic radiology performs an average of 83,700 diagnostic tests annually which are expected to double by the end of 2017. The expansion of the diagnostic radiology floor will include intraoperative space and rooms for various high-precision imaging equipment including MRI machines, CT-scanners, fluoroscopy x-ray setups, interventional radiology setups, and ultrasound machines.

The radiation oncology department currently provides brachytherapy and external radiotherapy treatment options dictated by the type and location of malignancies. It executes 82,500 external radiotherapy sessions annually. With the expansion, the department will extend its functions to include a state-of-the-art robotic radiosurgery unit to target tumours located in critical areas. In addition to the linear accelerators available in the current vicinity, the expansion will include 2 more medical accelerators allowing 650 new patients to receive radiotherapy sessions each year.

Women's Health Center

Breast cancer cases make up over 35% of the total annual number of diagnosed cancer cases among females in Jordan according to the National Cancer Registry. The King Hussein Cancer Foundation and Center took a major initiative in raising awareness on breast cancer and the importance of early detection. The center believes that its responsibility must extend from awareness to providing specialized care for the diagnosed women; thus the idea of a dedicated Women's Health Center came into fruition. The women's center will constitute of ultrasound and mammogram rooms, chemotherapy infusion rooms, specialized procedure rooms, and gynecology clinics. In addition the women's center will boast exceptional support services, such as hair and wig assistance.


Expected to be functional in June 2016, the expansion will include an inpatient tower and outpatient building that will double the capacity of the existing Center and provide improved, integrated space for research, education and patient care.

As the King Hussein Cancer Center embarks on this mega infrastructure expansion of 84,700 square meters, it continues to pursue innovation of programs, development of staff, and advancement of research to ultimately combat cancer one case at a time.

The Author

Asem Mansour, M.D. is Chief Executive Officer/Director General, King Hussein Cancer Center. He joined KHCC in 1998 as the Chairman of the Department of Diagnostic Radiology. In 2006 and in addition to his role as the Chairman of Department of Diagnostic Radiology; Dr. Mansour was also appointed as the Deputy Director General at King Hussein Cancer Center, followed by his appointment as a CEO/ Director General in April, 2012.

He carries the Jordanian Board in Radiology, the fellowship of the Royal College of Radiologist (FRCR-London), the European fellowship in Neuroradiology (ECNR) and master degree of medical management (MMM) from Carnegie Mellon University, USA.

He has published many articles in international journal and he is renowned expert in oncologic and neuroimaging. 

A first: King Hussein Cancer Center surgical team resects whole vertebra afflicted with a rare malignant tumor



Dr Rakan Shahaltoukh, Consultant Orthopaedic Spine Surgeon, and chief of the spine unit, at King Hussein Cancer Center

King Hussein Cancer Center surgical team headed by Dr. Rakan Kamal Shahaltoukh, Consultant Orthopaedic Spine Surgeon, and chief of the spine unit, has successfully conducted for the first time in Jordan and the Middle East, an eight-hour surgery resecting a whole diseased vertebra for an 18-year-old female patient.

The patient was complaining of severe back pain for two months prior to her first clinic visit and after completing a thorough examination, X-ray and MRI for the patient, a lesion was detected in the first lumbar vertebra. Biopsy taken from the related vertebra showed that the lesion was malignant with no indication of cancer spread to other body organs.

Dr. Asem Mansour, the General Manager of the King Hussein Cancer Center, stated that this type of surgery is being conducted only at the best cancer centers in the world and is a very demanding and lengthy procedure that carries significant risks, therefore requiring great effort and a highly experienced and skilled surgical team including surgeons, surgeon assistants, anesthesiologists, anesthetic specialists and nurses.

Dr. Mansour said that this is a one-of-a-kind achievement to add to the cen-

ter's work and that the center always aims to excel in all aspects of medicating and caring for cancer patients.

Dr. Shahaltoukh, indicated that this type of cancer (Leiomyosarcoma of bone) is extremely rare to occur in bones, and rarer in the spine as a first place for a malignant lesion to appear, as the lesion appeared in one vertebra and was not due to a cancer spread from any other organ in the body.

Dr. Shahaltoukh also clarified, that the best decision in this young patient's case was to resect the entire vertebra in two pieces through only one approach to ensure complete cure for the patient and minimize the risk of tumor cell spread or contamination.

The surgery was done by doing a single incision in the back, removing the affected vertebra back elements as complete piece and the front elements (the vertebral body) as one piece without invading the tumor, and then reconstructing the defect by a titanium expandable cage filled with bone graft material, and stabilizing the spine with titanium pedicle screw construct and titanium rods. The procedure is called Tomita L1 posterior en bloc spondylectomy.

The surgery was done in December 2013 after taking the consent and approval of the patient and her family. After the surgery the patient remained in King Hussein Cancer Center for three weeks and was subjected to intensive physiotherapy sessions until she was able to walk unassisted, the patient returned to her home and was able to conduct daily activity.

Four months after the surgery and regular follow up and examinations by the center, the patient was found to be doing well and happy and there was no sign of tumor recurrence or spread and the construct was stable with evidence of solid bone healing inside the cage.

Two types of surgery

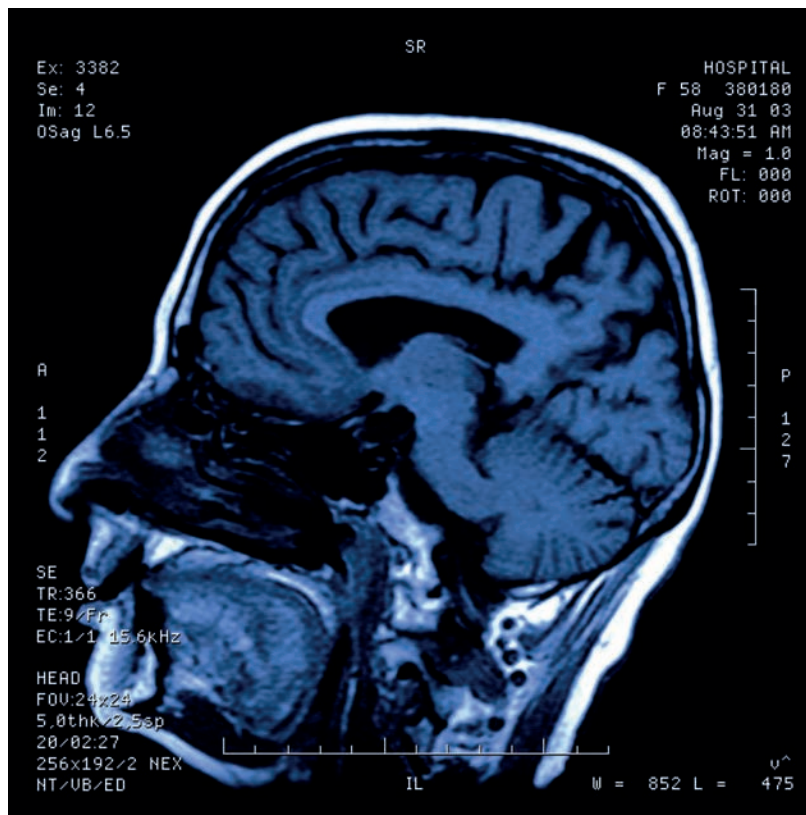
Dr. Shahaltoukh also explained that surgical intervention in malignant spine prob-

This type of surgery is being conducted only at the best cancer centers in the world and is a very demanding and lengthy procedure that carries significant risks.

lems is divided into two main types of surgeries.

1. Palliative surgeries: Those are divided into two subcategories: Major surgeries which aim to decompress and protect the nerves and the spinal cord and stabilize the spine to control pain, and the other part are the minimal invasive surgeries such as vertebral cement augmentation (Vertebroplasty, kyphoplasty) and minimally invasive decompression and fixation. Such palliative surgeries are more common to be done as the main aim of this kind of procedures is to protect the nerves and reduce pain, as most malignant lesions occurring in the spine are metastatic; that are caused by a spread of a remote cancer from other body organs such as breast, colon and lung cancers.

2. Curative surgeries: These are not conducted as much because the indications for such surgeries are extremely rare. This type aims to remove the entire malignant lesion with the goal of cure. These are done for primary malignant spine tumors which have not spread. They constitute less than 5% of malignant vertebral tumor cases. It was this kind of surgery that was conducted for the above mentioned case concluded Dr. Shahaltoukh. **MEH**



Researchers combine imaging techniques to get clearer view of the brain

Combining two imaging technologies, such as MRI for structure and MEG for activity, could provide a new understanding of how our brain works. *Middle East Health* reports.

New advances related to new uses of imaging technologies could help scientists uncover the brain's mysteries. Now, European scientists have successfully combined magnetic resonance imaging, or MRI, scanning with an emerging imaging technology called magnetoencephalography, or MEG. They have bundled two ways of imaging the brain in one helmet-like device. Because MEG records the magnetic fields produced by the brain, as brain cells fire off messages to one another, it gives scientists a real-time insight into the brain as it processes its world around it. MRI, meanwhile, gives structural images of the brain by looking at blood flow and oxygenation levels. Combining these techniques is precisely what the MEG-MRI project, funded by the EU, did.

Ultimately, these new advances in technology imaging could help doctors understand what is happening in the brains

of patients, such as those with epilepsy. Another potential application would be in helping guide brain surgeons away from critical areas of a patient's brain. It could help visualise areas of the brain that light up when a patient talks, for example.

How does it work?

"You can look at streams of information as someone is reading or looking at visual images," explains Risto Ilmoniemi, professor of biomedical engineering at Aalto University in Finland and the lead scientist in the project. "MRI gives the location, but not the sequence of when things happen."

For MEG to pick up the electrical currents, at least a thousand neurons firing is needed. "They are sending signals to each other and there are electrical currents involved, produced by neurons, and these currents can be measured. MEG

measures what comes out of the brain, the electromagnetic field generated," Ilmoniemi explains. The MEG machine is shaped like a bicycle helmet, but contains hundreds of sensors inside.

Other scientists have previously been using MEG, and separately followed up using functional MRI (fMRI). The latter measures brain activity related to a given function by detecting associated changes in blood flow.

"We use a variety of imaging techniques for the brain, but I prefer to use MEG for a number of reasons," says Thomas Elbert, professor of neuropsychology at the University of Konstanz in Germany. "First of all, the brain operates much faster than blood oxygen levels would indicate [which is what fMRI detects]," he says, adding: "Also fMRI is too slow and too gross when you are looking at activity, it

just finds peaks of activities rather than the complex range of mountains." So the full range of peaks and valleys can be better seen through the use of MEG.

Therefore, experts see real benefits in combining the two imaging techniques. "Doing simultaneous recordings is often very valuable scientifically and clinically: measuring different types of signals at different times means you're not sure if they're measures of the same events," says Gregory Miller, clinical psychologist at University College California, Los Angeles. "When the machines are separate, the patient or research participant has to be removed from the equipment and the procedure repeated, which means the recordings are done under different circumstances. For example, there can be changes due to practice, boredom, or fatigue."

There are other advantages as well.

"Combining MEG and MRI in a single instrument would likely provide cost savings, which means not only saving money but making the technology more widely available. This is particularly important because MEG is severely underutilised, in clinical practice and in research," observes Miller. "Second, the combination would greatly reduce the footprint in space-constrained labs and clinics, again making the capabilities available to more scientists, clinicians, and patients. Third, the combination would potentially allow near-simultaneous recordings of very different types of biological signals."

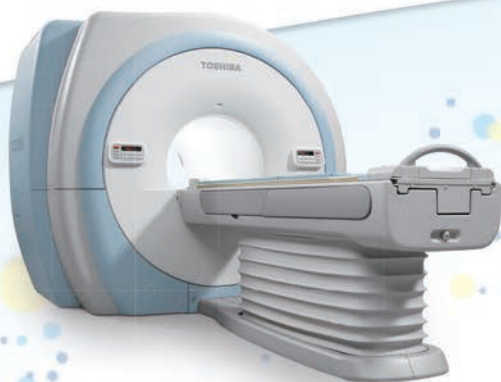
Miller notes that MEG is safer than fMRI, provides enormously better temporal resolution than fMRI and sometimes can image more deeply in the brain than another method, called scalp electroencephalography (EEG).

"So, having more access to MEG would let me study fast neural activity in deeper brain structures than I can with fMRI or EEG. This would help us address key issues about brain networks – brain circuitry – in depression, anxiety, and schizophrenia," Miller says.

Debates about whether imaging techniques such as EEG, MEG, MRI, positron emission tomography (PET), or optical is generally the best imaging method are "silly," says Miller. "It's been common to assume that a scientist has to choose which type of imaging method is best, but that's like trying to decide whether a hammer or a chisel is better. For some jobs, one is clearly better. For other jobs, you need both." The European project has now produced a prototype that combines MEG and MRI. They hope to make improvements and have it suitable for the clinic in four to five years. **MEH**

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Healthpoint opens its doors in Abu Dhabi

Middle East Health speaks to Dr. Nader Darwich, Medical Director at Healthpoint, about the new hospital which recently opened in Abu Dhabi.

Middle East Health: I understand Healthpoint is a relatively new healthcare facility in Abu Dhabi – when did it open? Where in Abu Dhabi is it situated?

■ **Dr. Nader Darwich:** We opened the first phase of our outpatient services in June last year, which included the family medicine, dentistry, pediatrics, gynecology, orthopedics, spine and physiotherapy and rehabilitation departments. Today, this list also includes nephrology, diagnostics imaging, and visceral medicine, which encompasses gastroenterology and surgical procedures related to the digestive tract. Our state-of-the-art facility is centrally located in Zayed Sports City, Abu Dhabi, off of Airport road and right next to the iconic Zayed Stadium.

MEH: Is Healthpoint an independent organization or is it partnered with any other organizations? If so, who?

■ **ND:** Healthpoint is part of Mubadala, which is an investment and development company owned by the Government of Abu Dhabi that was formed to support the diversification of the emirate's economy.

Specifically, we are part of Mubadala's healthcare unit, which plays an instrumental role in the development of a pioneering, commercially-sustainable, world-class healthcare sector for the emirate through the creation of specialist healthcare facilities prioritizing the region's most pressing healthcare needs.

Our management partner is Asklepios, one of the largest private operators of hospitals and healthcare facilities in Germa-

ny. The hospital group boasts over 25 years of experience in healthcare and hospital management and currently operates more than 140 healthcare facilities, providing care for over two million patients annually.

MEH: What type of healthcare facility is Healthpoint?

■ **ND:** Healthpoint is a fully integrated primary care and multi-specialty facility. We are a highly-elective facility with a comprehensive range of in- and out-patient treatments.

Our aim is to provide the highest quality of care, all in one place. We also strive to become an innovative, research-participative medical facility that provides our patients with peer-reviewed, multi-disciplinary and patient-focused care benchmarked against international best practices.

MEH: In what areas of medicine does its expertise lie?

■ **ND:** Healthpoint incorporates multiple specialties into one convenient location, which means that we have a broad base of medical expertise. Our current outpatient services include family medicine, dentistry, pediatric dentistry, gynecology, visceral medicine (gastroenterology care and imaging), nephrology and diagnostic services. We will also soon offer dermatology, plastic surgery, pulmonary care, wound care, podiatry and urology. [Emergency services are not offered at Healthpoint.]

MEH: What are its key specialties?

■ **ND:** Healthpoint has a strong focus on



Dr. Nader Darwich

orthopedic medicine. Our Orthopedics Department offers the latest advances in rehabilitation and surgical techniques for sports and other injuries of the shoulders, hips and knees, including: arthroscopically assisted ACL surgery, meniscus preservation, articular cartilage repair, minimally invasive knee replacement surgery, total hip and knee replacements and arthroscopic and open shoulder procedures. We are also the only healthcare facility in the Middle East and North African region offering the option of musculoskeletal allograft tissue to patients with complex knee problems.

Our Spine Care Department is a specialist unit entirely dedicated to the treatment of spinal injuries and chronic back pain – from diagnostics and pain management through to advanced surgical techniques. We pursue conservative management of neck and back problems, including scoliosis, and also perform occupational and sports assessments following injury. We are pioneers in minimally-invasive spinal surgery, utilizing an endoscopic laser to effectively treat disorders of the spinal disc and in doing so, reducing surgical damage to muscle and tissue, minimizing scarring and significantly improving recovery times.

Complementing both our orthopedic and spine care offerings is a state-of-the-art, 1,000 square meter physiotherapy center, the largest of its kind in Abu Dhabi. Our physiotherapy treatment plans are individualized and include therapeutic exercise, functional rehabilitation and personal wellness tips to increase the chances

of long-term results and to help our patients feel their best beyond the course of their treatment at Healthpoint. We utilize a range of musculoskeletal physiotherapy treatments – including manual therapy, dry-needling, myofascial therapy, hydrotherapy and Proprioceptive Neuromuscular Facilitation (PNF) – to improve the condition of the neck, back and knees by reducing pain, increasing mobility and correcting posture. Our center also includes dedicated space for women and children’s unique physiotherapy needs.

Furthermore, we are very proud of our new Department of Visceral Medicine, the first of its kind in Abu Dhabi and the UAE. It’s an innovative concept, where gastroenterologists and general surgeons work closely together to provide comprehensive services that assist in the diagnosis and treatment of abdominal and liver disorders, such as inflammatory bowel disease, liver lesions, and cancers of the stomach and other parts of the gastrointestinal tract. We are one of the first hospitals in the UAE to use carbon dioxide insufflation during endoscopy; the technique eliminates the typical discomfort, bloating and pain of endoscopy by using carbon dioxide, as opposed to standard air, to perform endoscopy for maximum patient comfort. Our department also uses Narrow Band Imaging (NBI) to diagnose and remove pre-cancerous lesions via endoscopy, eliminating the need for surgery in most cases and adding to patient convenience; and, offers contrast enhanced ultrasound (CEUS), an ultrasound technique that helps to diagnose abdominal and liver disorders without exposing patients to radiation.

In addition, we are proud to offer family medicine alongside these specialties. This team’s focus is on preventative medicine, a newer concept in the region, and we are proud to help Abu Dhabi families get and stay healthy through a focus on wellness.

MEH: How big is it, how many beds? What is the staff complement?

■ **ND:** The facility itself is spread over 53,000 square meters, and, once fully operational, will offer a total of 75 beds across our three suite types of standard, executive and VIP.

Of the 53,000 square meters, 1000 sq m are dedicated to our state-of-the-art physiotherapy and rehabilitation center, the largest in Abu Dhabi. It is also the first in Abu Dhabi to offer separate areas for men, women, and children – the women’s and children’s areas alone cover almost 325 sq m.

When fully operational, our team will comprise of more than 50 physicians, and more than 500 staff members including nurses and allied health professionals.

MEH: From where have you drawn your doctors and nurses? What qualifications do they have?

■ **ND:** We set out to bring the best and brightest talents internationally to our clinical team, and I think we have succeeded in doing that. We have a great mix of people from across the globe, with various backgrounds and cultures, many holding European and North American Board Certifications. We’ve also sought out the best in Emirati talent. Our physicians are either members or fellows of medical boards in countries such as Germany, the UK, and the USA. In fact, quite a number of our physicians are either leaders or pioneers in their fields, and we’re excited to be bringing their international expertise to the people of Abu Dhabi.

MEH: Several new healthcare facilities have been developed in Abu Dhabi over the past few years – a trend in many countries in the GCC. What sets Healthpoint apart from the competition?

■ **ND:** Healthpoint utilizes an Integrated Practice Unit (IPU) model which brings together teams of physicians and specialists to address complex medical conditions through the full cycle of care. This innovative and efficient model minimizes a patient’s need to seek multiple opinions from physicians and specialists, resulting in a highly patient-centric and multi-disciplinary approach to diagnosis, treatment and disease management. We recognize that patients here tend to travel abroad in search for medical excellence; we want them to realize that they no longer have to do that in order to receive the highest level of expertise and care.

In addition, our brand new, purpose-

built building is one of the few hospitals in the region to pre-qualify for a “Gold” LEED award. LEED, or Leadership in Energy and Environmental Design, is a US-based green building certification program that recognizes best-in-class building strategies and practices dedicated to sustainable building design and construction.

Healthpoint was designed with both experience and environmental sustainability in mind for the benefit of current and future patients alike, and to have minimal impact on public and residential natural resources. The building stands to receive high points in water efficiency, indoor environmental quality and sustainable sites, among other areas.

MEH: Can you tell me about some of the specialized equipment the facility has and explain how patients can benefit from this equipment?

■ **ND:** Visceral Medicine at Healthpoint is an area of innovation. We are one of the first hospitals in the UAE to use carbon dioxide insufflation during endoscopy, which eliminates the typical discomfort, bloating and pain of endoscopy by using carbon dioxide, as opposed to air, to perform endoscopy. The carbon dioxide is rapidly absorbed during the procedure, as opposed to the gradual absorption post-appointment when standard air is used, which makes for a much more comfortable experience for the patient.

Healthpoint’s Visceral Medicine physicians also use Narrow Band Imaging (NBI) to diagnose and remove pre-cancerous lesions via endoscopy. These lesions are removed during the same appointment as the endoscopy, eliminating the need for surgery in most cases. In addition, our hospital is one of the first in the UAE to offer contrast enhanced ultrasound (CEUS), an ultrasound technique that helps to diagnose abdominal and liver disorders without exposing patients to radiation.

Our orthopedic, spine care, and physiotherapy departments also offer a number of tools that are unique in Abu Dhabi, including the Centaur, a device used to strengthen back muscles, and the Neurac sling, which facilitates muscle reactivation following surgery. **MEH**

Bold new alliance among Houston's leading healthcare providers to transform healthcare delivery in Texas and the United States

Three of the Houston's leading medical institutions – Baylor College of Medicine, CHI St. Luke's Health and Texas Heart® Institute (THI) – have significantly expanded and enhanced their long-standing educational, clinical and research affiliations in conjunction with Englewood, Colorado-based Catholic Health Initiatives (CHI), which CHI St. Luke's Health is now a member.

St. Luke's Episcopal Health System, now the newly named CHI St. Luke's Health, which includes six hospitals, outpatient clinics and emergency centers throughout Greater Houston, joined Catholic Health Initiatives in 2013.

Catholic Health Initiatives, formed in 1996, operates in 18 states and includes 89 hospitals; including four academic medical centers; 23 critical-access facilities; community health services organizations; accredited nursing colleges; home-health agencies; and other facilities that span the inpatient and outpatient continuum of care. Throughout the United States, CHI serves more than four million people each year through acute care hospital; long-term care, assisted- and residential-living facilities, community-based health services; home care research and development and reference laboratory services.

"These agreements will bring to bear new capabilities and resources in an alliance that doesn't exist anywhere else in the region," said Kevin E. Lofton, FACHE, President and Chief Executive Officer, Catholic Health Initiatives. "This is a clinical, educational and research-focused enterprise that we think will be capable of creating miracles."

CHI St. Luke's Health and Baylor signed a joint-venture agreement to open a new, acute care, open-staff hospital on Baylor's McNair Campus in the Texas Medical Center, which is currently home to two outpatient facilities owned by the college – the Baylor College of Medicine Medical Center, and the Lee and Joe Jamail Specialty Care Center. Baylor and CHI St. Luke's Health will jointly operate the new hospital. Wayne Keathley, former President of the Baylor College of Medicine Medical Center and Health Network, now serves as president of CHI St. Luke's Health Baylor St. Luke's Medical Center.

The joint-venture acute care hospital, which is part of CHI St. Luke's Health, named CHI St. Luke's Health Baylor St. Luke's Medical Center will eventually replace the existing, 850-bed St. Luke's Medical Center in the Texas Medical Center. The first phase of the project – a 250-bed inpatient facility – is expected to open by spring 2015. The second phase, adding up to 400 additional acute care beds, is expected to be completed in 2018.

"This is a relationship unique in academic medicine. We will be in this together, with joint governance, sharing the rewards and the risks," said Paul Klotman, MD, Baylor President and CEO, Baylor College of Medicine. "It is a novel approach to create an alignment that brings in the most cost-effective, high quality care."

CHI also has established a new, strengthened affiliation with Texas Heart Institute that calls for a significant, 10-year investment in the renowned institution to expand education and research into cardiovascular diseases. James T. Willerson, MD, Texas Heart Institute President, which was created by THI Founder and President Emeritus Denton A. Cooley, MD, said: "Our mission is to prevent cardiovascular disease, and these affiliations will help the kind of life-changing advancements THI has pioneered for more than 50 years come even more rapidly."

The affiliation agreement with THI

represents a dramatic expansion of CHI St. Luke's historic research affiliation with THI, which has been ranked for 23 consecutive years by U.S. News & World Report as one of the nation's top 10 for cardiology and heart surgery, and is one of the world's most renowned centers for education and research of cardiovascular diseases.

CHI will work in concert with THI in its mission of reducing the devastating toll of cardiovascular disease. In addition to working closely with CHI's Institute for Research and Innovation to help further that broad mission, CHI St. Luke's Health, Baylor, and THI will work to develop a state-of-the-art cardiovascular program that will be capable of transforming cardiovascular medicine through leadership in areas such as regenerative medicine and the development of next-generation medical devices.

"This is a wonderful fit, a perfect collaboration for all of our organizations," said Lofton. "We share a common vision of clinical and operational excellence and innovation and a firm commitment to lead the way in an entirely new healthcare environment that focuses on value-driven, high-quality care."

● For more information contact St Luke's International Patient Center, at stlukesinternational@stlukeshealth.org or call +1- 832-355-3350 or visit StLukesInternational.com Texas Medical Center, Houston, Texas, USA **MEH**





IMAGINE

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CHI St. Luke's Health is now part of Catholic Health Initiatives, one of the largest and most influential health systems in the United States.

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India's medical tourism industry set to boom

With the current growth rate, India's medical tourism sector is forecast to become a US\$2-billion industry by next year. *Middle East Health* visits several leading hospitals in the country and looks at the medical tourism phenomenon in India.

Medical tourism is growing rapidly in India. The medical tourism sector in the subcontinent is expected to see an annual growth rate of 30%, making it a US\$2 billion industry by 2015, according to a report in *The Economic Times*.

As medical treatment costs in the developed world escalate, more and more Westerners are finding the prospect of international travel for medical care increasingly appealing. An estimated 150,000 people travel to India for low-priced healthcare procedures every year, according to *Medical Tourism* magazine.

The reduced cost of medical treatment in India is one of the key advantages for seeking treatment in the country. And, frankly unexpected in India, the cleanliness and hygiene in the leading medical facilities we visited is on a par with that of the developed world. Patients considering India as an option for treatment should also be aware that the country's leading medical facilities are recently built, modern and house the latest world class medical technology. And most importantly they are staffed with well trained and experienced specialist doctors.

English-speaking foreign patients can keep in mind that they won't face a language barrier in India, which can be a problem in some other countries offering medical tourism.

Furthermore, the Indian Government is taking steps to address infrastructure issues that hinder the country's growth in medical tourism. The government has removed visa restrictions on tourist visas that required a two-month gap between consecutive visits for people from Gulf countries, which is likely to boost medical tourism. A visa-on-arrival scheme for tourists from select countries has been



instituted which allows foreign nationals to stay in India for 30 days for medical reasons.

The Confederation of Indian Industry reported that 150,000 medical tourists came to India in 2005, based on feedback from the organization's member hospitals. The number grew to 200,000 by 2008. A separate study by the Associated Chambers of Commerce and Industry of India reported that 2011 saw 850,000 medical tourists in India and projected that by 2015 this

number would rise to 3.2 million.

Most estimates claim treatment costs in India start at around a tenth of the price of comparable treatment in America or Britain. For example, open-heart surgery could cost up to \$70,000 in Britain and up to \$150,000 in the US; in India's best hospitals it could cost between \$3,000 and \$10,000. Knee surgery (on both knees) costs 350,000 rupees (\$7,700) in India; in Britain this costs £10,000 (\$16,950), more than twice as much.

Tackling overweight and obesity



By Dr Vinodha Reddy

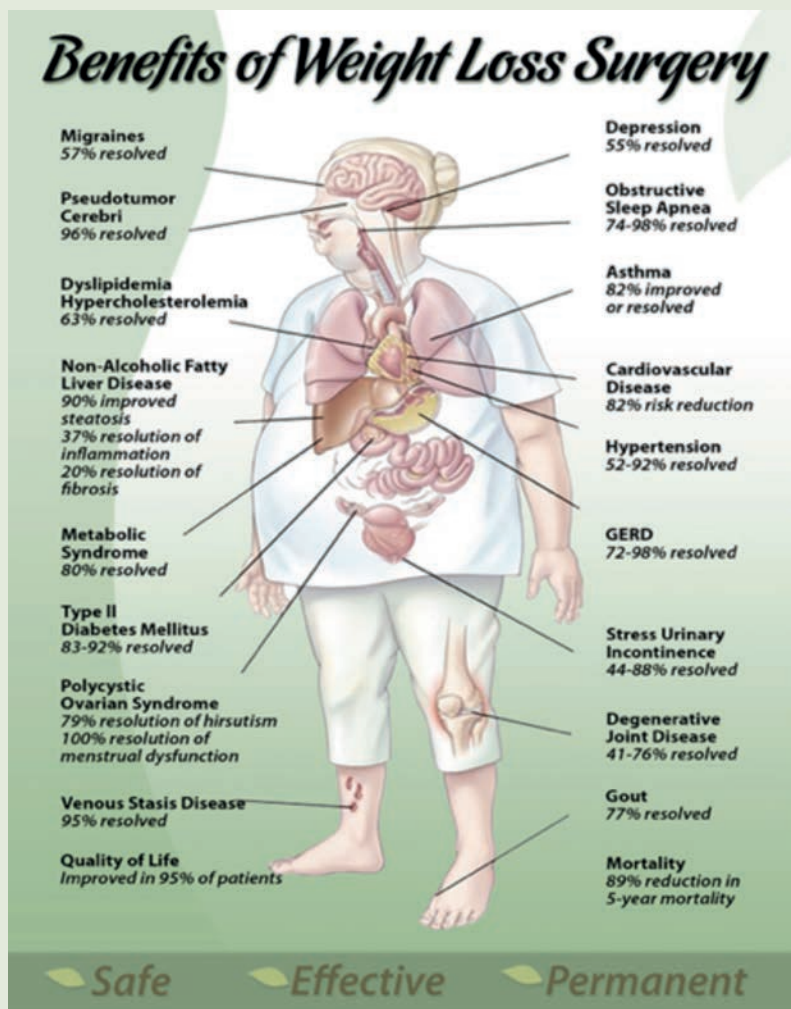
It doesn't take much more than a casual glance around you to know that overweight and obesity rates have risen during the past half century, specifically skyrocketing over the past five to ten years. Overweight and obesity is a public health problem that has raised concern worldwide.

According to the World Health Organization (WHO) worldwide obesity has more than doubled since 1980. In 2008, more than 1.4 billion adults, 20 and older, were overweight. Of these over 200 million men and nearly 300 million women were obese. 35% of adults aged 20 and over were overweight in 2008, and 11% were obese. 65% of the world's populations live in countries where overweight and obesity kills more people than underweight. More than 40 million children under the age of five were overweight in 2011.

An overabundance of highly processed, fructose-infused convenience foods and meals eaten at fast food restaurants have been significant contributors to the rapidly growing problem. To put it simply, people today eat differently than their parents and grandparents, and our fast paced lifestyle and lack of physical activity are accumulating pounds around the waists of many children and adults.

Health problems related to excess

India has a lot of hospitals offering world class treatments in nearly every medical sector, such as cardiology and cardiothoracic surgery, joint replacement, orthopaedic surgery, gastroenterology, ophthalmology, transplants and urology, to name a few.



weight impose substantial economic burdens on individuals, families and communities. Most people do not realize that the protruding bellies so commonly seen today are a major factor in the development of certain diseases such as type-2 diabetes, hypertension, some types of cancer, excess cholesterol, stroke, cardiovascular diseases, gallstones, gout, and of course psychological problems such as stress and low self-esteem.

Bariatric surgery is proving to be the most effective form of treatment for morbid obesity, performed as a laparoscopic procedure, with minimal pain, faster recovery, and short hospital. Not only does the surgery help to reduce weight but also to control and treat obesity related diseases

Lower treatment cost does not necessarily mean lower healthcare standards. The country is becoming increasingly compliant on international quality standards. There are 21 JCI accredited hospitals in India, according to the latest figures from

like type II diabetes mellitus, hypertension, sleep apnea (interrupted breathing during sleep), poly cystic ovarian disease, arthritis and high blood cholesterol levels.

The most commonly performed bariatric surgery are the Gastric bypass, Sleeve Gastrectomy, and Gastric Band.

The author

Dr Vinodha Reddy K, MBBS, MS, DNB, FRCS (UK), Diploma In Advanced LapSurgery (France), Fellow Bariatric Surgery (Belgium) is a Consultant in Surgical Gastroenterology and Bariatric Surgery at Manipal Hospital, Bangalore.

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Joint Commission International. The list is available here: <http://tinyurl.com/p7sbnx4>

India's health capital

The city of Chennai has been termed 'India's health capital'. The city's multi- and

super-specialty hospitals attracts an estimated 150 international patients every day and accounts for about 45% of health tourists from abroad arriving in the country and 30 to 40% of domestic health tourists.

Factors behind the tourist inflow in the city include low costs, little to no wait-

ing period, and facilities offered at the specialty hospitals in the city. The city has an estimated 12,500 hospital beds, of which only half is used by the city's population with the rest being shared by patients from other states of the country and foreigners.

Recuperation after treatment in India is also a major draw card because of the enormous array of tourist attractions in the country. Check the Indian tourism website – www.incredibleindia.org – for details about the rich and varied attractions this vast country has to offer. **MEH**

An insight into vascular surgery



By **Vasudeva U Rao**, MS FRCS (Engl)
FRCS (Glasgow) FICS FAIS

Vascular surgery is a new super specialty of surgery which deals with diseases of arteries and veins. It is well established in the West and gaining popularity in the Developing World. Arteries are the conduits taking blood from the heart to various parts of the body and veins bring back the deoxygenated blood back to the heart from where it goes to the lungs for oxygenation

Diseases of the artery are mainly caused by atherosclerosis which results in blockage of the artery supplying specific organs. Diabetic patients and chronic smokers are more prone to develop arterial occlusion. Blockage of the artery gives varying symptoms depending on which organ it supplies. If the brain is the organ affected, the patient may have what is known as transient ischemic attack or even stroke. If the arteries supplying the limbs are blocked, patients complain of pain in the calves when walking. If the disease is advanced there may be discolouration or ulcers in the foot.

After the clinical assessment these patients are initially subjected to duplex ultrasound scan which shows the nature and extent of the blockage. More specific details about the occlusion and status of proximal, as well distal, vessels are obtained by angiogram which can be either conventional or through CT or MRI.

There are three options for management of the disease. Mild to moderate disease can be controlled by medical treatment – medication, lifestyle changes, control of risk factors and exercise, particularly when the lower limbs are involved.

Open surgical procedures involve either removing the blockage (endarterectomy) or bypassing the block. Carotid endarterectomy is one of the most frequently performed procedures for patients who have recovered from stroke or those with transient ischemic attacks. Bypass procedures are commonly done for lower limbs. The patient's own vein is used for bypass, but prosthetic grafts are also available specially for more proximal lesions.

Endovascular treatment is another option where facilities and expertise are available. In this procedure the blocked artery is opened up with balloon dilatation and a stent is inserted to keep it open. The advantages are avoidance of anaesthesia, early recovery and early return to work. More and more patients are now treated by this technique with extremely good results. Even the long segment occlusion and more distal lesion are nowadays managed by angioplasty and stenting.

At Manipal Hospital Bangalore we have performed more than 1000 bypass procedures and saved quite a number of legs from amputation. We also have vast experience in endovascular treatment as

the hospital has the most modern angiogram suite.

Venous disease is very common in the adult population globally. The most common condition is varicose veins which may involve one leg or both legs. The primary fault is the incompetency of the valve which normally directs blood towards the heart and prevents reflux when the patient is in an upright position. Patients complain of aching and heaviness and in more advanced stages the patient develops skin changes and ulceration. A duplex scan is the investigation of choice for detecting where the fault lies and also the stage of the disease.

Mild to moderate disease can be treated with stockings and medication, but moderate to severe disease requires intervention. Surgical management involves ligation of the faulty vein and stripping, but more recently endo venous laser treatment has been introduced which gives better results with minimal discomfort and early return to work.

Manipal Hospital is one of the few centres in India to have this facility and so far nearly 5000 patients have been treated by this method with excellent results.

Other common vascular procedures done at our centre are arterio venous malformations, carotid body tumours, AV access for haemodialysis, aneurysms and vascular trauma.

The Author

Vasudeva U Rao, MS FRCS (Engl) FRCS (Glasgow) FICS FAIS, is a Consultant Surgeon (General & Vascular) at Manipal Hospital, Bangalore



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LIFE'S ON 

Manipal trauma care – advanced and specialised

■ By Dr Raghavendra K. S.

Trauma is the commonest cause of death in people from 1-44 years of age throughout the world. The largest proportions of death (1.2 million per year) result from road traffic accidents. The World Health Organization (WHO) predicts that by 2020 road traffic accidents will rank third in the causes of death and disability.

Manipal Hospital, with its Integrated Trauma Center, is the best choice when it comes to trauma care.

Manipal Hospital follows the “Golden Hour” principle. Patients who come to the

hospital after a major accident are at a risk of falling into what is termed the ‘Second Death Peak’. This period of one hour is called the “Golden Hour”, during which effective resuscitation can save the life of the patient.

When there is a large number of trauma patients (polytrauma) being rushed into the hospital simultaneously (mass casualty), it becomes necessary to prioritise the patients according to the seriousness of their trauma. This is done in Manipal Casualty and Emergency Centre and is known as triage.

The care of the trauma patient begins

with the ‘Advanced Trauma/Life Support’ (ATLS) guidelines formulated by the Committee on Trauma of the American College of Surgeons.

We take all the surgical cases into the operating theatre within one hour of arrival at casualty. Our advanced imaging, lab services and dedicated 24-hour trauma team makes us to work fast.

The Author

Dr Raghavendra K. S., MS(Ortho), is a Consultant Trauma, Spine and Joint Replacement Surgeon at Manipal Hospital, Goa, India.

The advantages of using LRS in orthopaedic practice

LRS – Limb Reconstruction System

Patients who sustain compound fractures of the lower limbs with bone loss often suffer with infections after native or improper treatment in the initial stages of treatment.

In orthopaedic practice we come across various types of complications following compound fractures, like infected non-union (malunion), deformities, etc. We also see many patients with limb length discrepancies following trauma, congenital conditions, epiphyseal disorders, etc.

Selecting of fixation system

The pre operational planning of correction is based upon the mechanical axis and anatomical features of the limb with reference to the mal-alignment test described by Paley and Tet Sworth (1992). The surgical technique selected must take account of the available muscle cover, the neurovascular structures in

the region and whether the site is cortical or cancellous (middle or ends of the bones).

LRS Fixation System

The LRS Fixation System is a strong monolateral rail to which a variety of modular clamps can be attached. It has large, medium and small rails with a large nail and three clamps. Each clamp can take three conical thread tapering screws for straight forward diaphyseal fracture management if it is compound. The LRS monolateral frame can be a definitive treatment for compound fractures.

LRS in compound fractures

Being monolateral, it is easier for the plastic surgeon to provide skin cover. This will help the fracture to unite as this gives elastic fixation of the fracture leading to new bone formation if the covering layer of bone is reasonably good. If there is no new bone, bone grafting may be done keeping the external fixator without opting for internal fixation.

LRS in infected non-union of long bones

If infected non union with implant in situ, it is necessary to examine the case thoroughly regarding the skin condition, scarring, ulceration, etc. The status of the proximal and distal joints, neurovascular problems, etc should also be examined. X-ray will show loose implants with sequestrum (dead bone), after metal exit and sequestrectomy and thorough debridement, the cavity may be filled with antibiotic impregnated cement beads followed by LRS application with the provision for bone transport and lengthening if necessary.

LRS in limb reconstruction

Since deformities of the skeleton are frequently associated with either real or apparent shortening of the limb, this device will enable the smooth transition to correction or by gradual correction.

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Consultants in the prominent specialties are also available in the evening clinics between 4 pm to 8 pm every day except Sunday.



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We are proud to offer a 24/7, fully equipped 785-bed state-of-the-art facility which is visited by patients from more than 25 countries. Our broad range of services covers over 50 specialties, some of which are:

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- Infertility & Reproductive Medicine
- Critical Care and Pain Medicine
- Endocrinology, Diabetes & Metabolism
- Dental & Faciomaxillary Surgery
- Neonatology
- Haematology and Bone Marrow
- Organ Transplantation
- Medical and Surgical Gastroenterology
- Nephrology, Dialysis & Renal
- Neurology
- Neuro Surgery
- Oncology
- Paediatrics
- Paediatric Cardiac Surgery
- Plastic Surgery & Reconstructive Surgery
- Rheumatology
- Surgical Gastroenterology
- Urology
- Vascular Surgery

Centres of excellence

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- Aesthetic Surgery
- Sports Medicine Centre
- Asthma and Allergy Clinic
- Cleft Lip & Palate Clinic
- Diabetic Clinic
- Epilepsy Clinic
- Hypertension Clinic
- Immunization & Well Baby Clinic
- Ortho/Joint Replacement Clinic
- Foot Clinic

In addition the hospital offers a host of diagnostic and allied health services, such as:

- 24-hour laboratory services
- Speech, Language & Hearing therapy including audiogram, puretone and impedance
- Physiotherapy & Cardiac Rehabilitation Centre
- Psychotherapy & Hypnosis
- Genetic counseling
- Round-the-clock dialysis services
- 24-hour clinical laboratory with auto analyser and other state-of-the-art instruments
- The Radiology department is equipped with 1.5 Tesla MRI, CT scan, Nuclear Gamma Camera, Invasive Radio Diagnosis, Mammogram, Colour Doppler, Ultrasound, X-ray. This department offers services around the clock.
- An Interventional Radiology division for complex neurosurgical interventions like AVM clipping and coil embolization of aneurysms
- The Cardiology department has installed 64-slice CT Angio, multi-channel ECG, TMT, Echo Lab, Bi-Plane Catheterization Lab, and Colour Doppler
- The Urology department uses hi-tech ESWL, Urodynamics & Ultrasound machines for diagnostic and therapeutic purposes.
- Gastroenterology Endoscopy services are available in the gastroenterology department for diagnostic & therapeutic purposes.
- PFT in Pulmonology Department, Colo-

noscopy unit and OB & G department give a new dimension in treatment

Sri Ramachandra Medical Centre is ready to provide assistance at every step, and ensures each patient has comfort and peace of mind. Services include:

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- Co-ordination of the admission process.
- Confirmation of all arrangements by fax.
- Apart from hospital diet for the patients, the medical centre provides an outstanding restaurant for relatives and visitors in a clean environment.
- Sri Ramachandra Annexe is a tastefully decorated guesthouse with expanded amenities including double-bed non A/C & A/C suites to accommodate patients and relatives.
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Enhance point-of-care testing in emergency settings with Roche's connectivity solutions

Seamless workflow and rapid diagnoses of cardiovascular diseases

Globally, cardiovascular diseases continue to be a leading cause of death, from myocardial infarctions and strokes to heart failure and venous thromboembolisms¹, and yet, their diagnosis remains a challenge in critical care settings and emergency departments, where fast intervention and early treatment is key to a patient's survival. Time is an invaluable puzzle piece to the cardiac healthcare cycle. When every second counts in the life of a patient, solutions that enable early diagnosis are essential, and healthcare professionals need to be able to take immediate action once results are produced.

Time is muscle.

Roche Diagnostics Point of Care testing for cardiovascular events eases fast decision-making processes and improves workflow efficiencies for healthcare professionals. Whether used by a general practitioner, nurse or doctor in an emergency department, point-of-care testing (near patient testing) facilitates targeted individual diagnosis and prognosis of detected heart conditions in the patient. As a market leader for cardiac biomarker testing, Roche's point-of-care portfolio in the cardiac events monitoring segment includes the cobas h 232 system. Management of patients and their hospitalization for cardiovascular cases such as atrial fibrillation, myocardial infarction or heart failure, can be improved with instrument's accurate and precise results. The portable and easy to use point-of-care instruments can provide physicians with results in as fast as 15 minutes without any additional preparation for the sample or device.

The strength of the system's quantitative results is evident in cases of acute myocardial infarctions, which can be STEMI or NSTEMI-STEMI (St-Elevated Myocardial Infarction). The ratio between STEMI and NSTEMI is approximately

40/60, where NSTEMI patients have a higher mortality rate². The diagnosis of NSTEMI relies on observation of the symptoms, ECG and cardiac markers such as Troponins.

NSTEMI patients with positive Troponin T should immediately be sent to the Cardiac Care Unit for further evaluation. More than 30% of the NSTEMI patients (Troponin T >100ng/L) have positive Troponin T in the Ambulance, and 47% of the NSTEMI patients (Troponin T >100ng/L) in the Hospital. If the in hospital Troponin T test is used with the cut-off level 50ng/L, 82% of the NSTEMI patients would be identified. With the cobas h 232 and its cut-off at level at 50ng/L there is a potential to identify even more than 30% NSTEMI patients already in the Ambulance and around 82% in the hospital.³

When active treatment is initiated for AMI patients within one hour, mortality rate decreases by 50%. In addition to Troponin T, Roche's cobas h 232, point-of-care device can test for a broad menu of biomarkers: NT-proBNP, D-Dimer, CK-MB and Myoglobin; this enables healthcare professionals to make rapid decisions about a patient's condition and level of risk.

Complete management of POC testing

Connectivity capabilities in a system, such as that offered with Roche's cobas point of care IT solution, contribute to the improvement of laboratory cost and quality, resulting in a beneficial improvement of testing efficiency and patient care. The unique benefit of Roche's cobas point-of-care (POC) IT solution is the seamless connection of devices with LIS/HIS connectivity, consolidating patient results throughout the hospital's laboratories and databases. Healthcare professionals can rely on a system that matches test results to each patient and provides useful ana-



lytical reports of results, while maintaining documentation and quality control.

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Experts worried about spread of MERS



By Leslie Morgan, OBE
CEO, Durbin PLC
Leslie Morgan is a Fellow of the Royal
Pharmaceutical Society of Great Britain

Perusing the pages of the *Financial Times* on my computer tablet recently, I read with interest that Saudi Arabia has replaced its health minister amid concerns about the spread of the coronavirus, Middle East Respiratory Syndrome (MERS CoV), throughout and beyond the Gulf.

First detected in Saudi Arabia in September 2012, MERS can cause symptoms such as fever, breathing problems, pneumonia and kidney failure, and is from the same family as the SARS virus which killed around 800 people worldwide. Whilst it has not spread as fast as SARS it has been more deadly, and at the time of writing 92 of the 238 people confirmed to have been infected with MERS have died. Concerns that it is being passed between humans has reportedly seen some medical staff express fears about their own increased chances of catching the disease if they treat victims. This in turn has prompted the Saudi government to warn staff that they will be suspended if they refuse to carry out their duties. Figures nonetheless show that over 20 health-

care workers have already been infected in Saudi Arabia and the UAE in recent weeks, and furthermore King Fahd Hospital in Jeddah was forced to close its emergency department recently prior to a thorough clean after an infected health-care worker died.

Whilst initially it was thought there was no scientific evidence to justify ordering preventative measures such as travel restrictions, virus experts have warned that they are now becoming increasingly concerned about the pace at which the disease is spreading and that it may be becoming difficult to contain. Cases have already been reported in the UK, USA, Germany, Italy, France and Tunisia, and with the death of a Malaysian man who returned home from a pilgrimage to Saudi Arabia and another passenger who travelled on a flight from Abu Dhabi to Manila being diagnosed, the disease has now also reached Asia.

The jump in Saudi cases is of course of particular concern because of the expected influx of pilgrims from around the world during Ramadan in July, followed by the arrival of millions more to perform the annual Haj in Mecca and Medina in early October.

So what can be done to contain the outbreak? Firstly we must consider the source of the problem. Research has linked the virus to a camel infection, although it is not yet known exactly how the infection transfers between camels and humans. Screening camels for infection and then quarantining them is certainly one option, and avoiding their noses and mouths is of particular importance as studies have shown that the greatest amount of the virus is contained in these areas. The World Health Organisation is also warning against close contact with camels when visiting farms or barn areas

where the virus is known to be circulating. Medical staff of course need to be particularly vigilant in looking out for possible MERS cases and to follow containment procedures rigorously when it is identified. Saudi butcher shops and restaurants have also reported a decline in the sale of camel meat and milk after the acting health minister advised against consumption as a further preventative measure. Other tips include wearing masks to Haj, washing hands regularly, particularly after coughing or sneezing, and heating unpasteurised milk to 70°C before drinking.

As there is as yet no known cure for MERS, the Saudi Health Ministry has said that a major international pharmaceutical company would soon be visiting the kingdom to explore the possibility of manufacturing a vaccine for the virus. It's certainly a comfort to know that the medical scientists whose work saves lives daily may in time be able to come up with something that helps contain the disease, but until then everyone has a part to play in being as hygienic as possible so as to help keep the spread of this deadly virus in check. **MEH**

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Infinium Medical launches new Omni series patient monitors



Infinium Medical recently introduced the latest Omni series patient monitors with 2014 version A.1.0 vital signs software. This product offers a new level of performance, customization, and connectivity and accommodates a full range of acuity

levels for all areas of patient care. The New A.1.0 software user interface is easily navigated and simplified with a standard touch screen. The Infinium Omni series offers standard parameters of Non-Invasive Blood Pressure, ECG, Temperature, Respiration,

SpO₂, Invasive Blood Pressure, and Capnography. For higher acuity measurements, 12 lead ECG and Cardiac Output can be added as options.

● For more information, visit: www.infiniummedical.com

Timesco Callisto single use laryngoscopes at forefront of preventing cross contamination and spread of disease

AIDS, Hepatitis C, Sepsis, MERS, with the proliferation of contagious diseases across the world, cross contamination between patients has become a major issue. Timesco single use laryngoscopes Callisto are leading the way in preventing the spread of microorganisms, infections, spores and prions.

In guidelines published in the association of anaesthetists of Great Britain magazine, "Anaesthesia", it was recommended that all laryngoscopes blades and handles should be autoclaved and the use

of single use devices encouraged. However, autoclaving does not guarantee the total elimination of prions on laryngoscopes.

Timesco's Callisto single use laryngoscopes offer ready to use convenience and cost savings compared to reusable laryngoscopes: Guaranteed control of cross contamination; no reprocessing or autoclaving costs; clinically clean, single use pre-packed; will not bend / deform in use; can be used with fibre reusable handles: Optima, Sirius, Optima XLED and

single use handles Callisto S and Callisto LED.

The Callisto system is latex free, non-toxic and can be disposed in standard hospital waste. Timesco products are ISO, CE, FDA, SFDA, etc. worldwide approved.

Timesco Callisto Laryngoscopes are the premier choice for cross contamination prevention.

● For more information, visit: www.timesco.com



Vernacare Single Use System – a new approach for infection control

Vernacare's single use disposable system helps hospitals reduce operating and cleaning costs, as well as reducing the financial burden of healthcare associated infections (HCAI) such as *Clostridium difficile* and *Escherichia coli*. The Vernacare disposable single use system brings a number of financial, infection control, nurse time and environmental benefits. These include eliminating the breakdowns and blockages which may be associated with the use of bedpan washer/disinfectors.

Single use disposable systems are used within 94% of UK hospitals and can break the chain of infection by providing a clean product for every use. Single use items, provided new and unused to patients for each use, are disposed of in the Vortex disposal unit, using cold water and significantly

less energy than traditional bedpan washers. Vernacare's single use products are manufactured using over-issued clean newspaper and a wax resin to ensure products hold water for up to four hours. No bleach colouring is added, to ensure products are as environmentally friendly as possible.

Vernacare is the only company to manufacture the complete human waste disposal system, including Vortex disposal units and range of single use products. Working alongside a global network of international partners and employing over 200 people, Vernacare aim to provide their customers with the highest standard of educational support, technical assistance and customer care, on a global scale.

● For more information, visit: www.vernacare.com



Varian's i5DR U-Arm gets digital upgrade

Varian's i5DR digital upgrade will improve workflow, enhance image quality and prolong the life of your asset. The i5DR software is a cost effective solution that is fully integrated into industry standard U-arms. The i5DR user interface provides fully integrated control of the u-arm positioner, collimator and generator allowing for

seamless image acquisition. I5DR is optimized for use with Varian's 17" x 17" (43cm x 43cm) flat panel digital detector. The i5DR upgrade provides significant savings in comparison to purchasing an entirely new digital system and extends the life and utility of the existing asset.

● For more information visit: www.varian.com/uarm



A fresh look at pediatric environments

The approach to pediatric medicine is markedly different to adult medical treatment. So it stands to reason, if pediatric medicine is specialized, why wouldn't the pediatric environment be special too?

Since parents are the real consumers in choosing a pediatric healthcare provider and parent satisfaction equals a successful practice, modern pediatric practices are designed to appeal to both parents and children.

Transforming a space into a pediatric environment that captures the imagination of children and parents means more than applying a fresh coat of brightly colored paint. It means creating a synergy between the elements in the space.

Clinton's 'Clinton Kids' brand is the ultimate in coordinated child-friendly pediatric products. This innovative product line features exclusive designs



created by Clinton Industries that have universal appeal to children and parents everywhere.

The 'Clinton Kids' Fun Series features treatment tables in fun vehicle shapes. These tables offer unobstructed 360 degree access, washable high pressure laminate graphics, full storage and a comfortable padded top.

Imagine being an astronaut, living under the sea or exploring deep into the rainforest, Clinton's Imagination Series of treatment and scale tables take you there and more places with bold, colourful graphics, large storage areas and a comfortable top.

Both the Fun Series and Imagination Se-

ries of tables, have complementary cabinets with companion graphics that carry each Clinton theme from table to casework. Clinton doesn't stop there. With the introduction of "Clinton Complete" Clinton designers transform ordinary medical space into an extraordinary pediatric environment. Plus, "Clinton Complete" offers a package discount on table and coordinating cabinets.

With over 100 different products and dozens of options Clinton and its Clinton Kids brand has become the premier name in innovative pediatric environments.

● See all Clinton's products at www.clinton-ind.com

Cochlear launches its new Nucleus Profile implant series

Cochlear Limited, the market-leading in implantable hearing solutions developer, has announced the recent release of its Cochlear 'Nucleus Profile' series internationally. The Cochlear Nucleus Profile implant with the Contour Advance electrode (CI512) is the first in the Profile series launched by the company. The Profile Series has the thinnest implant body on the market and will be the platform for Cochlear's next generation of implants.

The Profile with Contour Advance electrode is an improved version of CI500 series of implants. The new product was approved by TÜV Rheinland, a global technical, safety and certification services provider, after



the company relocated and built a new production process at its Macquarie University facility. Cochlear will introduce more Profile series implants with different electrodes in the coming months.

Richard Brook, President, EMEA & Latin America, Cochlear Ltd, said: "We have successfully expanded what is already the industry's largest cochlear implant portfolio, with the launching of CI512. Our latest product supports a wider range of surgical techniques among implanting surgeons, giving them and their patients the greatest possible choice."

Cochlear Limited invented the world's first multi-channel cochlear implant over 30 years ago. The company conducts extensive research and development on hearing products and has made breakthroughs in developing world-class hearing solutions. Together with the support of the well-developed healthcare sector in the region and particularly in the UAE in Dubai Health Care City, Cochlear aims to make a difference in the life of every person with hearing disabilities.

● For more information, visit: www.cochlear.com

Forgetting is actively regulated

In order to function properly, the human brain requires the ability not only to store but also to forget: Through memory loss, unnecessary information is deleted and the nervous system retains its plasticity. A disruption of this process can lead to serious mental disorders. Basel scientists have now discovered a molecular mechanism that actively regulates the process of forgetting. The renowned scientific journal *Cell* has published their results.

The human brain is built in such a way, that only necessary information is stored permanently – the rest is forgotten over time. However, so far it was not clear if this process was active or passive. Scientists from the transfaculty research platform Molecular and Cognitive Neurosciences (MCN) at the University of Basel have now found a molecule that actively regulates memory loss. The so-called musashi protein is responsible for the structure and function of the synaptic connections of the brain, the place where information is communicated from one neuron to the next.

Using olfactory conditioning, the researchers Attila Stetak and Nils Hadzisehimovic first studied the learning abilities of genetically modified ringworms (*C.elegans*) that were lacking the musashi protein. The experiments showed that the worms exhibited the same learning skills as unmodified animals. However, with extended duration of the experiment, the scientists discovered that the mutants were able to remember the new information much better. In other words: The genetically modified worms lacking the musashi protein were less forgetful.

Forgetting is no coincidence

Further experiments showed that the protein inhibits the synthesis of molecules responsible for the stabilization of synap-

tic connections. This stabilization seems to play an important role in the process of learning and forgetting. The researchers identified two parallel mechanisms: On the one hand, the protein adducin stimulates the growth of synapses and therefore also helps to retain memory; on the other hand, the musashi protein actively inhibits the stabilization of these synapses and thus facilitates memory loss. Therefore, it is the balance between these two proteins that is crucial for the retention of memories.

Forgetting is thus not a passive but rather an active process and a disruption of this process may result in serious mental disorders. The musashi protein also has interesting implications for the

development of drugs trying to prevent abnormal memory loss that occurs in diseases such as Alzheimer's. Further studies on the therapeutic possibilities of this discovery will be done.

The Transfaculty Research Platform MCN is a joint endeavor of the Faculty of Psychology at the University of Basel and the Psychiatric University Clinics Basel. Its goal is to advance research on the neurobiological underpinnings of human emotional and cognitive processes and to contribute to the development of novel treatment options for neuropsychiatric disorders. The platform is jointly led by Prof. Dominique de Quervain and Prof. Andreas Papassotiropoulos.

● doi: 10.1016/j.cell.2014.01.054



Illustration: MCN

The nervous system of the ringworm *C. elegans*

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions



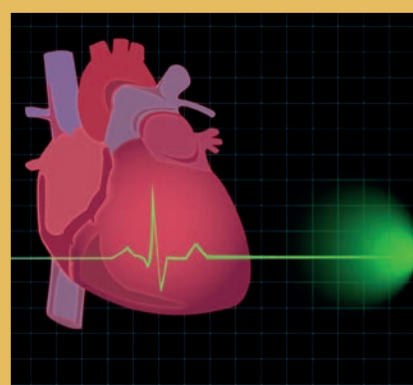
Event

Date / City

Contact

■ September 2014

Tabriz Med 2014	4 – 7 September, 2014 Tabriz, Iran	info@icffair.com www.icffair.com
2nd INCAN (International Nursing Conference of Al Noor Hospital)	5 September 2014 Abu Dhabi, UAE	cme@alnoorhospital.com www.incanuae.com
7th Medication Safety Congress	7 – 9 September 2014 Dubai, UAE	info@synovetics.com www.medicationsafetyconference.com/
Oman Health 2014	9 – 11 September, 2014 Muscat, Oman	info@omanexpo.com www.omanhealthexpo.com
World Congress on Controversies in Hematology conference	11 – 13 September 2014 Istanbul, Turkey	cohem@comtecmed.com http://www.comtecmed.com
Arab Neonatal Congress and MEMAP Update on Pediatrics	12 – 14 September, 2014 Dubai, UAE	http://www.anc2014.com/index.html
International Conference of The Arab Society for Medical (ASMR) Research	13 – 16 September 2014 Suez, Egypt	http://www.asmr.eg.net/ asmr@asmr.eg.net society_arab@yahoo.com kammahdy@yahoo.com
GCC Pharmaceutical Congress	14 – 16 September 2014 Dubai, UAE	http://gccpharmacongress.com/ info@gccpharmacongress.com
Medical Cities	14 – 16 September 2014 Dubai, UAE	www.medicalcitieslse.marcusevans.com/
Patient Safety Middle East	16 – 18 September, 2014 Dubai, UAE	info@lifesciences-exhibitions.com http://patientsafety-me.com/
Pediatric Critical Care Symposium	17 – 18 September, 2014 Jeddah, KSA	jcme.kfshrc.gm rdmello@kfshrc.edu.sakl
4th IDCAN (International Dental Conference of Al Noor Hospital)	18 – 19 September 2014 Abu Dhabi, UAE	cme@alnoorhospital.com www.idcanuae.com
7th Pan Arab Osteoporosis Society Congress	24 – 26 September, 2014 Dubai, UAE	paos2014@infoplusevents.com http://www.paos2014.com/
Turkey Healthcare Exhibition 2014	25 – 26 September, 2014 Istanbul, Turkey	info@oliverkinross.com www.turkeyhealthsummit.com www.oliver-kinross.com
2nd Abu Dhabi Obstetrics, Gynecology, & Midwifery Congress 2014	25 – 26 September 2014 Abu Dhabi, UAE	http://adogc.com/ info@synovetics.com www.synovetics.com
4th Abu Dhabi Advanced Rheumatology Review Course	27 – 29 September 2014 Abu Dhabi, UAE	info@adarrc.org http://www.adarrc.org/



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ October 2014		
3rd IPCAN (International Pharmacy Conference of Al Noor Hospital)	10 October, 2014 Abu Dhabi, UAE	www.ipcanuae.com cme@alnoorhospital.com
Pan GHQ Medical	16 – 18 October, 2014 Dubai, UAE	bkadara@diaedu.com http://www.adpmc.org/
DHRC 2014	22 – 23 October, 2014 Dubai, UAE	www.dhrc.ae info@dhrc.ae
Clinical Congress And Gulf Chapter Annual Meeting	23 – 25 October 2014 Abu Dhabi, UAE	http://www.aacegulf.org/
The International Nursing Management Conference	27 – 29 October 2014 Bodrum, Turkey	http://www.inmc2014.org/ inmc@hacettepe.edu.tr
2014 Sheikh Khalifa Medical City Multispecialty Conference	28 Oct – 1 November, 2014 Abu Dhabi, UAE	bkadara@diaedu.com http://www.smc2014.ae/
2014 UAE Cancer Congress	31 Oct – 1 November, 2014 Dubai, UAE	www.uaecancercongress.ae uaecancercongress@mci-group.com
■ November 2014		
Hospital Build & Infrastructure Turkey	4 – 6 November, 2014 Istanbul, Turkey	www.hospitalbuild-turkey.com
ASPED – Arab Society for Paediatric Endocrinology and Diabetes Conference	6 – 8 November, 2014 Abu Dhabi, UAE	www.aspedconference.com
7th Medication Safety Conference	7 – 9 November, 2014 Abu Dhabi, UAE	info@synovetics.com http://medicationsafetyconference.com/index.aspx
4th Saudi International Paediatric Neurology Conference	9 – 11 November, 2014 Riyadh, KSA	cpd@kfmc.med.sa www.kfmc.med.sa
1st Conference on Adult Critical Care – Medicine Update	12 – 13 November, 2014 Riyadh, KSA	mazfar@ksu.edu.sa
5th International Diabetic Foot Conference	13 – 14 November, 2014 Dubai, UAE	www.idfc.ae
Emirates International Urological Conference 2014	13 – 15 November, 2014 Dubai, UAE	www.atnd.it/12331-0
AMASICON 2014	14 – 16 November, 2014 Dubai, UAE	www.amasi.org amasi.india@gmail.com
The Middle East Pharma Cold Chain Congress	17 – 20 November, 2014 Dubai, UAE	www.pharmacoldchainme.com



List your conference:

If you have upcoming conference/exhibition details which you would like to list in the agenda, please email the details to the editor: editor@MiddleEastHealthMag.com

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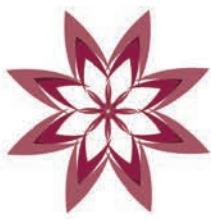
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