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July–August 2016

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Bold new era for global health

Achievements, challenges outlined at World Health Assembly
as leaders chart the way forward

Leishmaniasis

Researchers warn of
epidemic in Middle East

Conflict zones

Security Council demands
protection of health workers

2020 Vision

AUBMC initiative on track to
transform health in Lebanon

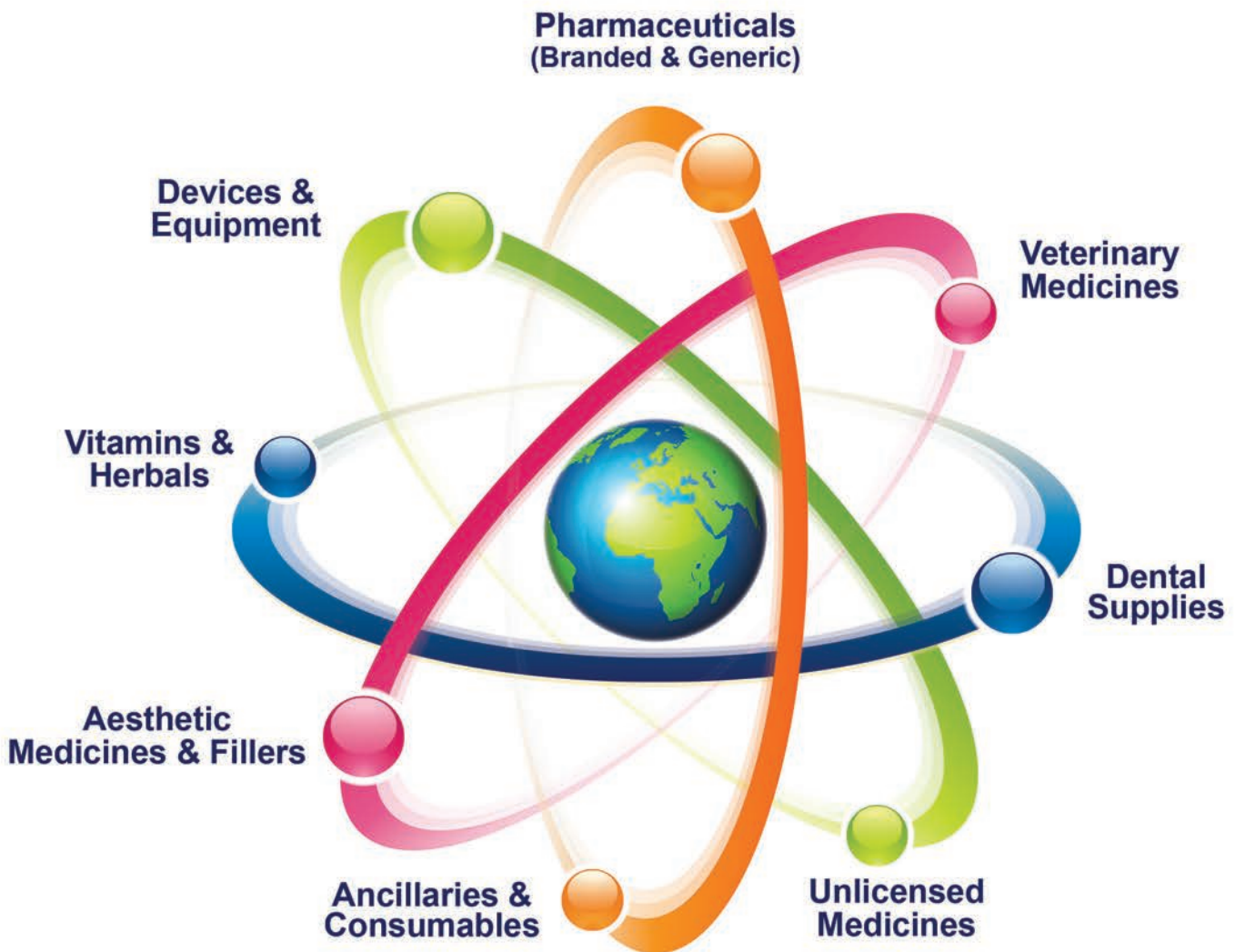
In the News:

- World Bank launches insurance to protect against pandemics
- Medical errors now third leading cause of death in the US
- Promising results from malaria vaccine trial
- New treatment for MS shown to fully halt clinical relapses



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Prognosis

The way forward

The World Health Assembly was held in Geneva in May where global health-care leaders set out an ambitious plan for a new era of healthcare. In a wide-ranging and important speech, Dr Margaret Chan, the WHO Director-General, noted the great achievements that have been made in the past 15 years and clearly pointed to the challenges humanity faces with regards healthcare. In this issue – read her speech and check the key resolutions adopted by the Assembly.

In the wake of a swathe of attacks on medical facilities and health workers in Syria and Yemen, the Security Council – the highest council in the United Nations – unanimously adopted an important resolution, demanding countries and their militaries respect and protect hospitals and health workers in conflict zones.

In a hard-hitting statement, Ban Ki-moon, UN Secretary-General, said: All too often, attacks on health facilities and medical workers are not just isolated or incidental battlefield fallout, but rather the intended objective of the combatants. This is shameful and inexcusable.”

The Red Cross's Peter Maurer said: “Attacking a hospital, threatening a doctor, coercing a nurse to give preferential treatment to armed fighters, hijacking ambulances, using patients as human shields – these are not collateral damage. These are not sad realities we have to get used to. They are abominations to fight and trends to roll back.”

In our focus on paediatrics in this issue we look at hepatocyte transplantation in children, which offers a promising alternative to orthotopic liver transplantation. We also highlight new research into the discovery of a disease gene for severe paediatric heart disease. The researchers say the gene should be checked in routine diagnostic screening to identify affected children and their families.

Also in this issue, we speak to Dr Mohamad Sayegh, Dean of the Faculty of Medicine at American University of Beirut about, and the progress being made with, AUBMC's 2020 vision to provide world-class healthcare to the people of Lebanon.

We also speak to Dr Asem Mansour, the CEO and Director General of King Hussein Cancer Center in Amman about the large expansion currently underway at of one of the region's leading cancer facilities.

In the news, the World Bank launched a Pandemic Emergency Financing Facility (PEF), an innovative, fast-disbursing global financing mechanism designed to protect the world against deadly pandemics. Positive results from an early trial for an HIV vaccine, provides hope for an effective vaccine for HIV. It will now be tested in a larger trial. And a novel malaria vaccine has been shown to protect a small number of healthy adults in a phase 1 trial. This promising vaccine will also be tested in larger trials.

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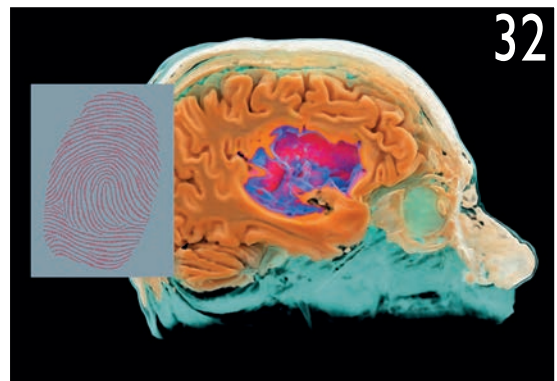
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Distinguished Professor of Paediatrics
and Infectious Disease, **University of
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Conference Highlights

- Review the latest evidence for the management and treatment of different children health problems including respiratory infections, autistic spectrum disorder, sickle cell diseases, congenital heart diseases and much more
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SHARING OUR EXPERIENCE WITH THE WORLD

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

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

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Update from around the region



(Left to Right): Dr Tomislav Mihaljevic, Cleveland Clinic Abu Dhabi CEO, Waleed Al Mokarrab Al Muhairi, Mubadala Deputy Group CEO & Chief Executive Officer, Emerging Sectors, and Chairman, Cleveland Clinic Abu Dhabi, and Dr Fabio Piano, Provost, NYU Abu Dhabi sign a Memorandum of Understanding between Cleveland Clinic Abu Dhabi and NYU Abu Dhabi to collaborate on research, knowledge-sharing, and education and training programs.

Cleveland Clinic Abu Dhabi and New York University Abu Dhabi sign collaboration MoU

Cleveland Clinic Abu Dhabi and New York University Abu Dhabi (NYUAD) have signed a Memorandum of Understanding to collaborate on research, knowledge-sharing, and education and training programs.

The partnership seeks to leverage the organizations' respective expertise in medicine and higher education to improve health and foster knowledge transfer within the UAE community. Potential areas of focus include:

- Research – partnering on clinical research and innovation, and, through NYUAD's Public Health Research Center and Cleveland Clinic Abu Dhabi's clinical investigation capability, research on key regional health issues
- Knowledge-sharing events – collaborating on conferences and workshop series
- Training and education – exploring undergraduate, continuing education and professional development opportunities

Dr Fabio Piano, NYUAD Provost, said: "Our partnership with Cleveland Clinic Abu Dhabi is rooted in our respective shared contributions to Abu Dhabi and beyond in education, research and healthcare. This partnership will open up new pathways of discovery for our fac-

ulty and students as the Cleveland Clinic Abu Dhabi look to deliver research and education that not only pushes the boundaries of discovery but also deepens our connections and understanding of medicine on a local and global level. By combining our collective expertise, Cleveland Clinic Abu Dhabi and NYUAD will engage in education, research and knowledge sharing that will have the potential to improve lives across the globe."

Dr E. Murat Tuzcu, Chief Academic Officer and Chief, Cardiovascular Medicine, Heart & Vascular Institute, at Cleveland Clinic Abu Dhabi, is responsible for implementing an innovative, creative and state-of-the art medical research function and education strategic plan at the medical campus. Commenting on the MoU, he said: "Healthcare is a fast-growing and evolving industry, so knowledge sharing and transfer is absolutely essential to ensure sustainability. NYUAD shares our commitment to innovation, research, and developing the next generation of leaders, making them an ideal partner to help deliver tangible programs which can positively impact our community in the years to come."



Dr Ala Alwan, the Regional Director WHO Eastern Mediterranean Region

Call to protect health workers in conflict zones

In a statement issued ahead of the World Humanitarian Summit that took place in Istanbul at the end of May, Dr Ala Alwan, the Regional Director WHO Eastern Mediterranean Region, condemns attacks on healthcare workers and facilities – and calls for a strengthened commitment by

world leaders to protect healthcare in conflict zones.

Dr Alwan says: Escalating conflict and humanitarian crises continue to place health care workers at great risk. Attacks against health workers and facilities in Afghanistan increased by 50% in 2015. Syria is now the deadliest place in the world for health workers, reducing the availability of an already limited number of health care workers.

Direct violence isn't the only way health care is under assault. Health workers, facilities and patients all suffer when medication and treatment is withheld from besieged populations, or water and power supplies are deliberately interrupted.

Clear laws and conventions prohibit attacks on health workers and facilities, yet in many places, they are being ignored. Despite repeated calls for the respect and protection of health care by the United Nations and the International Committee of the Red Cross, these attacks continue, depriving people of their fundamental right to health, severely disrupting humanitarian operations and undermining health systems and long-term health development goals. We must not accept this as the status quo.

Even in countries where the number of attacks seems to be decreasing, humanitarian operations may not be any safer. In fact, the reason for the apparent decline may be a decreasing population of health workers who can be targeted, as doctors, nurses, and technicians flee; health facilities shut down; and relief operations by aid agencies are shuttered due to insecurity.

Attacks on health care – whether they are targeted or as a result of large-scale violence – have an impact that goes beyond the risks to health workers' lives. They affect not only victims and their families but also the millions of people who could not be reached: children who did not get vaccinated and patients whose injuries were left untreated. Thousands of people die every year because the environment has become too dangerous for health care to be delivered. These consequences should not be accepted as the unavoidable cost of operating in conflict settings.

Health staff working in already chal-

lenging conditions and with limited resources should not have to live in fear of constant attack, and the populations they reach cannot afford to be deprived of what little they have in terms of health services. In the fragile states that are experiencing severe instability, we cannot allow the thread connecting health workers and people in need to be severed.

A landmark resolution on health care in armed conflict unanimously adopted by the United Nations Security Council on May 3 serves as an important step in highlighting the urgency of this issue. We also need a system for collecting data on attacks on health workers, health facilities, transport and patients in complex emergencies. This can help us identify patterns and find concrete ways to avoid attacks or mitigate disruptions to health care delivery.

As the international community continues to advocate for the protection of health care workers, governments have an equally important role to play in ensuring safe and secure access to health services for all and strengthening accountability for attacks. Civil society, the media and international institutions also have a responsibility to ensure that violations are brought to light. Unless immediate action is taken by all to protect health workers and health facilities, these attacks will continue, threatening to become the norm and sealing the fate of millions of people.

“Respect the rules of war” is one of the five core responsibilities for the global community that U.N. Secretary-General Ban Ki-moon outlines in his Agenda for Humanity – a report to guide discussions and decisions at the first-ever World Humanitarian Summit in Istanbul (that took place 23-24 May).

At the summit, governments, people affected by crisis, Non-Governmental Organizations, the private sector, United Nations agencies and other partners came together and endorsed the Agenda for Humanity and its five Core Responsibilities to improve aid delivery, support refugees, uphold international law, increase financing and prevent the crises generating the largest migration flows in 70 years.

Free, accredited, online CME programme launched in Middle East

mdBriefCase Africa and Middle East has launched a free, accredited, online continuing medical education (CME) programme based on the needs of health care practitioners in Africa and the Middle East. The programme is adapted from its successful Canadian model, with input from local healthcare leaders.

“Building on our positive experiences in Canada and Australia, we wanted to expand our operations to Africa and the Middle East,” says Greg Cook, Founder and CEO of mdBriefCase. “While online CME is in the early stages of development in these regions, the opportunities to make concrete and impactful contributions to clinician education is significant and wide-reaching.”

All mdBriefCase programs are based on established clinical best practices, then tailored to address local demographics and concerns. “Our interactive online CME is change-behaviour focused,” explains Jason Muloongo, Operations Director for mdBriefCase Africa and Middle East. “Our goal is to uplift the standard of education for healthcare practitioners throughout these regions, ultimately allowing our practitioners to deliver the best possible healthcare to patients.”

● To learn more about mdBriefCase Africa and Middle East, visit www.mdbriefcase.net/mea.

Firm launches HEPA filter testing service – a first in the Middle East

In a bid to address a crucial market gap, AESG has launched a new HEPA (high-efficiency particulate air) filter testing and certification service. Although vital to facilities such as operating theatres and pharmaceutical labs, this is the first time that such a service is being offered in the Middle East.

AESG – Alabbar Energy and Sustainability Group, a UAE-based consultancy firm – has made significant investments in the skills and technologies required to deliver the service in accordance with BN EN 14664-1, the most stringent international cleanroom certification standard.

The consultancy firm believes the healthcare sector will benefit substantially

from this service as Gary Williams, Director of Commissioning at AESG, explains: “The industry norm regarding HEPA filters is an install-and-forget approach. Unfortunately, in most installations, due to factors such as rough handling, improper installation and poor maintenance, the likelihood of sub-optimal performance is extremely high. In highly sterile environments such as operating theatres and incubators, even slight contamination can have a negative impact on patient health and so ensuring the effectiveness of HEPA filters is essential.”

AESG has worked closely with local regulatory authorities to ensure that its service can enable clients to achieve the highest level of standards compliance. The DOP (Dispersed Oil Particulate) testing equipment being utilized by the firm exceeds the British, American, European and Australian requirements for filter testing with aerosols. According to Williams, his team can test for a pass rate of less than 0.01% of the most penetrative particles, and accurately uncover not only the inefficiencies but also the ‘difficult to pinpoint’ leaks.

Although it is standard practice to verify the manufacturer’s stated HEPA filter efficiency of 99.997% in situ, the actual performance of these systems is impacted by a number of factors. Therefore, to ensure the most comprehensive approach, AESG is offering testing of not only HEPA filters, but also their housing and installation.

WHO, partners agree initiative to reduce neonatal mortality in the region

The World Health Organization (WHO), UNFPA (the United Nations Population Fund) and UNICEF are joining efforts to support Arab countries, Afghanistan, Iran, and Pakistan to reduce neonatal mortality and improve the quality of healthcare services provided to newborns and mothers. Last year, more than 450,000 newborn children in the first month of life died in these countries, accounting for more than half of all deaths in children under five years old.

More than 100 maternal and child health experts, non-governmental organizations, academics and researchers took part in a three-day joint WHO/UNICEF/



UNFPA meeting in Amman, Jordan in April. Participants discussed the main challenges to the well-being of newborns and plans to provide effective health care to all newborns in accordance with the “Every Newborn Action Plan”.

Between 1990 and 2015, maternal mortality in the region decreased by over half (54%) while under-five mortality decreased by 48%. The largest challenge remains in the period at or around birth, with more than half of under-five deaths occurring in the first 28 days of life. Although deaths in this neonatal period have fallen by 37%, it has been at a slower rate than for older age groups.

At the meeting, the Regional Directors of WHO, UNFPA and UNICEF signed a Joint Statement on Accelerating the Reduction of Neonatal Mortality. They committed their continued support to governments across the region to end preventable maternal, newborn and child deaths by 2030.

In the joint statement, the three organizations pledged to: work with governments to strengthen their leadership and capacity to maintain health services in humanitarian emergencies; build national capacity that enables Member States to mobilize a sufficient and skilled workforce, and provide essential supplies and equipment for maternal and newborn health care; strengthen the skills of the midwifery workforce and community health workers to facilitate better quality of newborn health care; and strengthen management capacity and financial resources to sustain strong health systems for high-quality service delivery.

Qatar Foundation to open pioneering school for children with autism

Qatar Foundation for Education, Science and Community Development (QF) is set to open Renad Academy (RA), a school dedicated to children who have been diagnosed with mild to moderate Autism Spectrum Disorder (ASD). This pioneering educational facility, which aims to inspire acceptance, trust and success, reflects QF’s ongoing commitment to helping students reach their full potential.

The facility will be officially unveiled on 18 September 2016. The academy will provide an optimum learning environment for

young children aged three to five years, and classes will be delivered by highly qualified, specialised faculty and staff.

Buthaina Al Nuaimi, President of Pre-University Education at Qatar Foundation, said: “Autism is the fastest growing developmental disorder in the world. The key to progress is early intervention and creating a solid support structure for children to grow.”

Dr Muhammad Waqar Azeem, Chair Department of Psychiatry Sidra Medical and Research Center, Chair of National Autism Working Group, Vice Chair of WISH Autism Forum, and a member of the committee working on the establishment of the school, said: “Renad Academy will be a state-of-the-art school, serving children with autism and their families. This institution will address a major need in Qatar.

“Furthermore, Renad Academy aims to help children with ASD reach their full potential, so that each child learns the skills needed to integrate into the community and become productive members of society.”

Sherri Miller, Director of the Renad Academy, said: “I am very excited to lead this project in Qatar, and I am certain that this academy will blaze the trail for future schools to support children with Autism further. Not only will we run a dynamic and exciting curriculum, but we will also provide an outreach centre to bring training and awareness to the community. Parents and caretakers will receive intensive training so they are better able to build relationships with their children. We also hope to partner with universities and hospitals in Qatar, like Sidra, to bring support to families and increase the understanding of the condition in Qatar.”

Doctors recommend better screening for retinopathy of prematurity

Moorfields Eye Hospital Dubai, the first overseas branch of the world-renowned Moorfields Eye Hospital in London, has identified premature babies as a special concern in the region when it comes to vision problems, because of their particular vulnerability to retinopathy of prematurity (ROP). ROP is a potentially blinding condition that affects premature babies and is one of the most common causes of

visual loss in childhood.

According to the American Academy of Ophthalmology, some countries in the region (such as Saudi Arabia and Kuwait) have severe incidence of ROP. Worldwide, every year, an estimated 15 million babies are born preterm (before 37 completed weeks of gestation), and this number is rising. Across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born.

According to the World Health Organisation, preterm babies are at increased risk of illness, disability and death. Retinopathy of prematurity is usually more severe in very premature babies and if they are given too-high level of oxygen. If not recognized and treated, this can result in visual impairment or blindness.

With the Middle East’s rising population and the rising standards of neonatal care, an increasing number of babies are at risk of ROP. In the region, Moorfields Dubai conducted an international medical symposium on ROP and called for early screening with an eye examination for all premature babies to detect the condition, before leaving hospital.

Dr Muhammad Irfan Khan, Consultant Ophthalmologist Specialist in Paediatrics, Strabismus and Cataract, Moorfields Eye Hospital Dubai, explains: “Neonatal care in the region is improving and, as a result, we are seeing more premature babies and so more complications of preterm birth, including ROP which remains a serious threat to vision. Visual impairment caused by ROP is potentially preventable and early screening and timely treatment is key to successful management.”

ROP primarily affects premature infants weighing about 1.5 kilograms or less that are born earlier than 31 weeks of gestation. The smaller a baby is at birth, the more likely the baby is to develop ROP, which usually develops in both eyes and if severe, can lead to lifelong visual impairment and blindness.

Infants with ROP are considered to be at higher risk for developing certain eye problems later in life, such as retinal detachment, myopia (nearsightedness), strabismus (crossed eyes), amblyopia (lazy eye), and glaucoma. However, many of these eye problems can be treated or controlled. **MEH**

worldwide monitor

Update from around the globe

World Bank launches groundbreaking insurance to protect poorest countries against pandemics

The World Bank Group has launched a Pandemic Emergency Financing Facility (PEF), an innovative, fast-disbursing global financing mechanism designed to protect the world against deadly pandemics, which will create the first-ever insurance market for pandemic risk. Japan, which holds the G7 Presidency, committed the first \$50 million in funding toward the new initiative.

“Pandemics pose some of the biggest threats in the world to people’s lives and to economies, and for the first time we will have a system that can move funding and teams of experts to the sites of outbreaks before they spin out of control,” said Jim Yong Kim, President of the World Bank Group. “This facility addresses a long, collective failure in dealing with pandemics. The Ebola crisis in Guinea, Liberia and Sierra Leone taught all of us that we must be much more vigilant to outbreaks and respond immediately to save lives and also to protect economic growth.”

The announcement came a week ahead of the May 26-27 Summit of Group of Seven Leaders in Ise-Shima, Japan. G7 leaders had urged the World Bank Group to develop the initiative during their May 2015 summit in Schloss-Elmau, Germany.

“Innovative financing for crisis responses by the PEF, together with financing for preparedness and prevention in peacetime including through IDA, are important to mitigate human and social losses and to help quickly recover in the event of a crisis. It is cost-effective and should be emphasized at all stages of economic development,” said Deputy Prime Minister and Minister of Finance of Japan Taro Aso.

The new facility will accelerate both global and national responses to future outbreaks with pandemic potential. It was built and designed in collaboration with the World Health Organization and the private sector, introducing a new level of rigor into both the financing and the response.

“Recent years have seen a dramatic resurgence of the threat from emerging and re-emerging infectious diseases,” said Margaret Chan, Director-General of the World Health Organization. “WHO fully supports the Pandemic Emergency Financing Facility as a critical contribution to global health security and a crucial line of defence against high-threat pathogens.”

The PEF includes an insurance window, which combines funding from the reinsurance markets with the proceeds of World Bank-issued pandemic (catastrophe, or Cat) bonds, as well as a complementary cash window. This will be the first time World Bank Cat Bonds have been used to combat infectious diseases. In the event of an outbreak, the PEF will release funds quickly to countries and qualified international responding agencies.

The insurance window will provide coverage up to \$500 million for an initial period of three years for outbreaks of infectious diseases most

likely to cause major epidemics, including new Orthomyxoviruses (e.g. new influenza pandemic virus A, B and C), Coronaviridae (e.g. SARS, MERS), Filoviridae (e.g. Ebola, Marburg) and other zoonotic diseases (e.g. Crimean Congo, Rift Valley, Lassa fever). Parametric triggers designed with publicly available data will determine when the money would be released, based on the size, severity and spread of the outbreak.

The complementary cash window will provide more flexible funding to address a larger set of emerging pathogens, which may not yet meet the activation criteria

for the insurance window.

All 77 countries eligible for financing from the International Development Association, the World Bank Group’s fund for the poorest countries, will be eligible to receive coverage from the PEF. The PEF is expected to be operational later this year.

Recent economic analysis suggests that the annual global cost of moderately severe to severe pandemics is roughly \$570 billion, or 0.7% of global GDP. A very severe pandemic like the 1918 Spanish flu could cost as much as 5% of global GDP, or nearly \$4 trillion.

During the past two years alone, pandemic threats have included the devastating Ebola crisis in West Africa – which crippled the economies of Guinea, Liberia and Sierra Leone, and cost them an estimated \$2.8 billion in GDP losses (\$600 million in Guinea, \$300 million in Liberia and \$1.9 billion in Sierra Leone); the MERS outbreak, which took a toll on the South Korean economy; and the Zika virus that is spreading in the Americas and putting thousands of unborn children at risk.

Four global expert panels that were convened over the past year in the wake of the Ebola crisis concluded that the world must urgently step up its capacity for a swift response to outbreaks before they become more deadly and costly pandemics.

The PEF will do a number of important things to prevent another Ebola crisis:

- It will insure the world’s poorest countries against the threat of a pandemic.
- In the event of a severe infectious disease outbreak, it will release funds quickly to the countries and/or to international responders, to accelerate the response – saving lives and reducing human suffering.
- By mobilizing an earlier, faster, better planned and coordinated response, it will reduce the costs to countries and their people for response and recovery.
- It will promote greater global and national investments in preparing for future outbreaks and strengthening national health systems.
- It will combine public and private resources to advance global health security, and create a new insurance market for managing pandemic risk.





HIV vaccine trial to go large-scale after good safety results and immune response

An early-stage HIV vaccine clinical trial in South Africa has determined that an investigational vaccine regimen is safe and generates comparable immune responses to those reported in a landmark 2009 study showing that a vaccine can protect people from HIV infection. Consequently, the US-based National Institute of Allergy and Infectious Diseases (NIAID) and its partners have decided to advance the experimental HIV vaccine regimen into a large clinical trial. This new study, called HVTN 702, is designed to determine whether the regimen is safe, tolerable and effective at preventing HIV infection among South African adults. The trial is slated to begin in November 2016, pending regulatory approval.

“For the first time in seven years, the scientific community is embarking on a large-scale clinical trial of an HIV vaccine, the product of years of study and experimentation,” said Anthony S. Fauci, M.D., director of NIAID, part of the National Institutes of Health and a co-funder of the trial. “A safe and effective HIV vaccine could help bring about a durable end to the HIV/AIDS pandemic and is particularly needed in southern Africa, where HIV is more pervasive than anywhere else in the world.”

The experimental vaccine regimen that will be studied in HVTN 702 is now being tested in the smaller initial trial, named HVTN 100 and is based on the regimen investigated in the U.S. Military HIV Research Program-led RV144 clinical trial in Thailand that delivered landmark results in 2009. The current regimen is designed to provide greater protection than the RV144 regimen and has been adapted to the HIV subtype that predominates in southern Africa.

The experimental vaccine regimen tested in the RV144 trial was found to be 31.2 percent effective at preventing HIV infection during the 3.5 years after vaccination, although the regimen appears to have been 60 percent effective one year after vaccination. In the HVTN 702 study, the design and schedule of the RV144

vaccine regimen have been adjusted to try to increase the magnitude and duration of vaccine-elicited immune responses.

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

Study suggests medical errors now third leading cause of death in the US

Analyzing medical death rate data over an eight-year period, Johns Hopkins patient safety experts have calculated that more than 250,000 deaths per year are due to medical error in the US. Their figure, published May 3 in *The BMJ*, surpasses the US Centers for Disease Control and Prevention’s (CDC’s) third leading cause of death – respiratory disease, which kills close to 150,000 people per year.

The Johns Hopkins team says the CDC’s way of collecting national health statistics fails to classify medical errors separately on the death certificate. The researchers are advocating for updated criteria for classifying deaths on death certificates.

“Incidence rates for deaths directly attributable to medical care gone awry haven’t been recognized in any standardized method for collecting national statistics,” says Martin Makary, M.D., M.P.H., professor of surgery at the Johns Hopkins University School of Medicine and an authority on health reform. “The medical coding system was designed to maximize billing for physician services, not to collect national health statistics, as it is currently being used.”

In 1949, Dr Makary says, the US adopt-

ed an international form that used International Classification of Diseases (ICD) billing codes to tally causes of death.

“At that time, it was under-recognized that diagnostic errors, medical mistakes and the absence of safety nets could result in someone’s death, and because of that, medical errors were unintentionally excluded from national health statistics,” says Dr Makary.

The researchers say that since that time, national mortality statistics have been tabulated using billing codes, which don’t have a built-in way to recognize incidence rates of mortality due to medical care gone wrong.

In their study, the researchers examined four separate studies that analyzed medical death rate data from 2000 to 2008, including one by the US Department of Health and Human Services’ Office of the Inspector General and the Agency for Healthcare Research and Quality. Then, using hospital admission rates from 2013, they extrapolated that based on a total of 35,416,020 hospitalizations, 251,454 deaths stemmed from a medical error, which the researchers say now translates to 9.5% of all deaths each year in the US.

According to the CDC, in 2013, 611,105 people died of heart disease, 584,881 died of cancer and 149,205 died of chronic respiratory disease – the top three causes of death in the US. The newly calculated figure for medical errors puts this cause of death behind cancer but ahead of respiratory disease.

“Top-ranked causes of death as reported by the CDC inform our country’s research funding and public health priorities,” says Makary. “Right now, cancer and heart disease get a ton of attention, but since medical errors don’t appear on the list, the problem doesn’t get the funding and attention it deserves.”

The researchers caution that most of medical errors aren’t due to inherently bad doctors, and that reporting these errors shouldn’t be addressed by punishment or legal action. Rather, they say, most errors represent systemic problems, including poorly coordinated care, fragmented insurance networks, the absence

or underuse of safety nets, and other protocols, in addition to unwarranted variation in physician practice patterns that lack accountability.

“Unwarranted variation is endemic in health care. Developing consensus protocols that streamline the delivery of medicine and reduce variability can improve quality and lower costs in health care. More research on preventing medical errors from occurring is needed to address the problem,” says Dr Makary.

Historic Mexico Declaration calls for collaborative voice to prevent premature deaths from CVD

Global organisations on 5 June 2016 signed *The Mexico Declaration for Circulatory Health*, the first ever global declaration on heart health. The historic declaration is recognition that, health professionals, governments, businesses and the public to must find a common voice to ensure action to prevent an increase in the number of premature deaths as a result of cardiovascular diseases (CVD).


Professor David Wood, President-Elect at the World Heart Federation, said: “*The Mexico Declaration* is an important milestone in the ongoing efforts to tackle what are largely preventable diseases. Cardiovascular diseases continue to place a huge burden on society, not just financially but also in terms of the role they play in maintaining inequalities, particularly in low to middle income countries.”

 The Mexico Declaration for Circulatory Health
<http://tinyurl.com/hmsefpa>

Diabetes Knowledge Portal adds more data, search tools

The AMP Type 2 Diabetes Knowledge Portal online library and discovery engine has greatly expanded data and search capabilities to accelerate the pace of scientific advancement. Customizable and simplified navigation, along with aggregated data from more than 100,000 DNA samples from research supported by NIH and other institutions, encourage new understanding

of diabetes by increasing users’ ability to share and evaluate content.

 AMP Type 2 Diabetes Knowledge Portal
www.type2diabetesgenetics.org

US NIH creates free Atlas of Human Malformation Syndromes

Researchers with the National Human Genome Research Institute (NHGRI), part of the US-based National Institutes of Health, have collaborated with physicians and medical geneticists around the world to create the Atlas of Human Malformation Syndromes in Diverse Populations.

Health care providers can use the new atlas to diagnose diverse patients with inherited diseases by comparing physical traits (phenotypes) and written descriptions of their symptoms with photos and descriptions of people with the same condition and ancestry.

 Atlas of Human Malformation Syndromes in Diverse Populations
www.genome.gov/atlas

WHO issues guidelines on management of health complications of FGM

New WHO recommendations aim to help health workers provide better care to the more than 200 million girls and women worldwide living with female genital mutilation.

Female genital mutilation (FGM) describes all procedures that involve the partial or total removal of external genitalia or other injury to the female genital organs for non-medical reasons. FGM has no health benefits, can cause severe harm, and violates the rights of girls and women. Procedures can cause severe bleeding, problems urinating, and later cysts, infections, and death. FGM can also result in complications in childbirth and increased risk of newborn deaths.

International migration has now made the practice, prevalent in 30 countries in Africa and in a few countries in Asia and the Middle East, a global health issue.

Health workers across the world must be prepared to provide care to girls and women

who have undergone FGM. But, health workers are often unaware of the many negative health consequences of FGM and many remain inadequately trained to recognize and treat them properly. As a result, many women may suffer needlessly from physical and mental health consequences due to FGM.


“Health workers have a crucial role in helping address this global health issue. They must know how to recognize and tackle health complications of FGM,” says Dr Flavia Bustreo, WHO Assistant Director General. “Access to the right information and good training can help prevent new cases and ensure that the millions of women who have undergone FGM get the help they need.”

The WHO guidelines focus on preventing and treating obstetric complications; treatment for depression and anxiety disorders; attention to female sexual health such as counselling, and the provision of information and education.

The guidelines also warn against the so called “medicalization” of FGM, for example when parents ask health providers to conduct FGM on their daughters because they think it will be less harmful.

Recommendations include:

- de-infibulation to prevent and treat obstetric complications, as well as to facilitate childbirth, and prevent and treat problems with the urinary tract system;
- mental health including cognitive behavioural therapy and psychological support to treat depression and anxiety disorders;
- female sexual health covering sexual counselling to prevent or treat female sexual dysfunction;
- information and education for all women and girls who have undergone female genital mutilation, and health education and information on de-infibulation, where appropriate, for both health-care providers and for women and girls.

 WHO guidelines on the management of health complications from FGM
<http://tinyurl.com/jpjkmtt>

the laboratory

Medical research news from around the world



Encouraging results from Phase 1 malaria vaccine trial

An experimental malaria vaccine protected a small number of healthy, malaria-naïve adults in the United States from infection for more than one year after immunization, according to results from a Phase 1 trial described in the May 9 issue of *Nature Medicine*. The vaccine, known as the PfSPZ Vaccine, was developed and produced by Sanaria Inc., of Rockville, Maryland, with support from several Small Business Innovation Research (SBIR) awards from the US National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health. NIAID researchers and collaborators at the University of Maryland School of Medicine in Baltimore, conducted the clinical evaluation of the vaccine, which involved immunization and exposing willing healthy adults to the malaria-causing parasite *Plasmodium falciparum* (*P. falciparum*) in a controlled setting.

The parasites that cause malaria are transmitted to humans through the bite of an infected mosquito. The PfSPZ Vaccine is composed of live, but weakened *P. falciparum* sporozoites – the early developmental form of the parasite. Previous research showed the PfSPZ Vaccine to be highly protective three weeks after immunization. In this trial, researchers assessed if protection could last for five months to a year.

“Malaria remains one of the most devastating diseases in the world, especially among young children in Africa,” said NIAID director Anthony S. Fauci, M.D. “A malaria vaccine that provides long-term

protection is urgently needed to reduce mortality and eliminate transmission. This study is an encouraging step forward in our goal to control and ultimately eradicate malaria.”

The Phase 1 trial took place at the NIH Clinical Center in Bethesda, Maryland, and at the University of Maryland Medical Center and enrolled 101 healthy adults aged 18 to 45 years who had never had malaria. Of these volunteers, 59 received the PfSPZ Vaccine; 32 participants served as controls and were not vaccinated. Vaccine recipients were divided into several groups to assess the roles of the route of administration, dose, and number of immunizations in conferring short- and long-term protection against malaria.

To determine if the number of immunizations influenced protection, vaccinated participants received either three (nine participants) or four (28 participants) intravenous (IV) immunizations of the PfSPZ Vaccine at a higher dose than tested in previous human studies. To compare the protective efficacy of different routes of administration, eight participants received four immunizations via intramuscular injection (IM) at a dose approximately 10-fold higher than the dose administered intravenously. This was done to help the research team assess if IV administration was necessary and more efficient based on the dose required.

To evaluate how well the PfSPZ Vaccine prevented malaria infection, all participants – including the control participants who were not vaccinated – were exposed at varying times to the bites of mosquitoes carrying the same *P. falciparum* strain from which the PfSPZ Vaccine was derived. The Walter Reed Army Institute of Research in Silver Spring, Maryland, carried out this controlled human malaria infection procedure – a standard process in early phase malaria vaccine trials.

To assess short-term protection, participants were exposed to the bites of parasite-infected mosquitoes three weeks after receiving their final vaccination. Scientists then took blood samples from each participant to measure parasite levels for evi-

dence of protection. For nine participants who received three IV doses, three were protected, or had no detectable parasites in their blood. For the nine participants who received four IV doses, seven were protected. Only three of the eight participants who received four IM doses were protected, indicating that IV administration afforded higher levels of protection at a lower dose.

To assess long-term protection, an additional group of 11 participants received four IV doses of the investigational vaccine and were exposed to the bites of malaria parasite-infected mosquitoes 21 weeks after their final vaccination. Scientists found that six of 11 participants (55%) had no detectable parasites in their blood after this exposure. Four of these six participants, plus one of the participants who received the same four doses via IV and had no parasites in the blood after exposures at three weeks and 21 weeks, were exposed to mosquito bites again at 59 weeks after their final vaccination. All five participants exposed at 59 weeks did not develop parasites in their blood, while all six unvaccinated control participants became infected with malaria parasites.

Collectively, the data showed that the PfSPZ Vaccine provided malaria protection for more than one year in 55% of people without prior malaria infection. In those individuals, the PfSPZ Vaccine appeared to confer sterile protection, meaning the individuals would be protected against disease and could not further transmit malaria. The vaccinations were also well-tolerated among participants, and there were no serious adverse events attributed to vaccination.

“It is now clear that administering the PfSPZ Vaccine intravenously confers long-term, sterile protection in a small number of participants, which has not been achieved with other current vaccine approaches,” said Robert A. Seder, M.D., chief of the Cellular Immunology Section of NIAID’s Vaccine Research Center and principal investigator of the trial. “Based on the favourable safety profile, we’re testing higher doses in larger trials to see if



even greater protection can be achieved long-term against other *P. falciparum* strains different than the vaccine strain.”

High-risk treatment for MS shown to fully halt clinical relapses over long term

A new use of chemotherapy followed by autologous haematopoietic stem cell transplantation (aHSCT) has fully halted clinical relapses and development of new brain lesions in 23 of 24 patients with multiple sclerosis (MS) for a prolonged period without the need for ongoing medication, according to a new phase 2 clinical trial, published in *The Lancet*. Eight of the 23 patients had a sustained improvement in their disability 7.5 years after treatment. This is the first treatment to produce this level of disease control or neurological recovery from MS, but treatment-related risks limit its widespread use.

MS is among the most common chronic inflammatory diseases of the central nervous system, with around 2 million people affected worldwide. It is caused when the immune system attacks the body, known as autoimmunity. Some specialist centres offer aHSCT for MS, which involves harvesting bone marrow stem cells from the patient, using chemotherapy to suppress the patient’s immune system, and reintroducing the stem cells into the blood stream to “reset” the immune system to stop it attacking the body. However, many patients relapse after these treatments, so more reliable and effective methods are needed.

Dr Harold L Atkins and Dr Mark S Freedman from The Ottawa Hospital and the University of Ottawa, Ottawa, Canada, and colleagues tested whether complete destruction, rather than suppression, of the immune system during aHSCT would reduce the relapse rate in patients and increase long-term disease remission. They enrolled 24 patients aged 18-50 from three Canadian hospitals who had all previously undergone standard immunosuppressive therapy which did not control the MS. All patients had poor prognosis and their disability ranged from moderate to requiring a walking aid to walk 100m, according to their Expanded Disability Status Scale (EDSS) scores [The Expanded Disability Status Scale is a method of quantifying disability in multiple sclerosis and monitoring changes in the level of disability over time].

The researchers used a similar method of aHSCT as is currently used, but instead of only suppressing the immune system before transplantation, they destroyed it completely using a chemotherapy regimen of busulfan, cyclophosphamide and rabbit anti-thymocyte globulin. Dr Atkins explains that this treatment is “similar to that used in other trials, except our protocol uses stronger chemotherapy and removes immune cells from the stem cell graft product. The chemotherapy we use is very effective at crossing the blood-brain barrier and this could help eliminate the damaging immune cells from the central nervous system.”

The primary outcome of the study was multiple sclerosis activity-free survival at 3 years (as measured by relapses of MS symptoms, new brain lesions, and sustained progression of EDSS

scores) which occurred in 69.6% of patients after transplantation.

Out of the 24 patients, one (4%) died from hepatic necrosis and sepsis caused by the chemotherapy. Prior to the treatment, patients experienced 1.2 relapses per year on average. After treatment, no relapses occurred during the follow up period (between 4 and 13 years) in the surviving 23 patients. These clinical outcomes were mirrored by freedom from detectable new disease activity on MRI images taken after the treatment. The initial 24 MRI scans revealed 93 brain lesions, and after the treatment only one of the 327 scans showed a new lesion.

Furthermore, progressive brain deterioration typical of MS slowed to a rate associated with normal aging in 9 patients with the longest follow-up, and 8 (35%) of 23 patients had a sustained improvement in their EDSS score at 7.5 years after treatment. At 3 years, 6 patients (37%) were able to reduce or stop receiving disability insurance and return to work or school. Eight (33%) of the 24 patients had a moderate toxic effect and 14 (58%) patients had only a mild toxic effect related to transplantation.

Dr Freedman highlights the need to interpret the results with

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caution: “The sample size of 24 patients is very small, and no control group was used for comparison with the treatment group. Larger clinical trials will be important to confirm these results. Since this is an aggressive treatment, the potential benefits should be weighed against the risks of serious complications associated with aHSCT, and this treatment should only be offered in specialist centres experienced both in multiple sclerosis treatment and stem cell therapy, or as part of a clinical trial. Future research will be directed at reducing the risks of this treatment as well as understanding which patients would best benefit from the treatment.”

Writing in a linked Comment, Dr Jan Dörr, from the NeuroCure Clinical Research Center, Charité-Universitätsmedizin, Berlin, Germany, says: “These results are impressive and seem to outbalance any other available treatment for multiple sclerosis. This trial is the first to show complete suppression of any inflammatory disease activity in every patient for a long period...However, aHSCT has a poor safety profile, especially with regards to treatment-related mortality.”

He adds: “So, will this study change our approach to treatment of multiple sclerosis? Probably not in the short term, mainly because the mortality rate will still be considered unacceptably high. Over the longer term (and) in view of the increasing popularity of using early aggressive treatment, there may be support for considering aHSCT less as a rescue therapy and more as a general treatment option, provided the different protocols are harmonised and optimised, the tolerability and safety profile can be further improved, and prognostic markers become available to identify patients at risk of poor prognosis in whom a potentially more hazardous treatment might be justified.”

● doi: 10.1016/S0140-6736(16)30169-6

Bariatric surgery significantly improves lipid profile in obese patients

Fifty years after the first reported partial-ileal bypass, metabolic surgery has an established role in achieving weight loss and reducing cardiovascular death in obese patients. Scientists have now dem-

onstrated that it can significantly benefit the lipid profiles of these patients a year and more after surgery, according to a new report published in *The American Journal of Medicine*.

Bariatric surgery has evolved into four dominant procedures ranging from largely malabsorptive to completely restrictive: Bilio-pancreatic Diversion (BPD), Roux-en-Y Gastric Bypass (RYGBP), Adjustable Gastric Banding, and Sleeve Gastrectomy. These are regarded as the most effective therapies for treating obesity.

Investigators undertook a meta-analysis of studies on contemporary bariatric surgery outcomes to describe the effects of these procedures on serum lipids of obese patients at one year and more after surgery.

“These procedures have shown significant benefits beyond weight reduction, including improvements in serum lipids. However, changes in serum lipids beyond the period of early, rapid weight loss are not well characterized,” explained lead investigator Sean Heffron, MD, of the Division of Cardiology at NYU Langone Medical Center.

Investigators identified 178 studies that fit the criteria for inclusion in this analysis. Each study needed to involve 20 or more obese adults undergoing RYGBP, Adjustable Gastric Banding, Sleeve Gastrectomy, or BPD, report lipid profile at baseline, and provide follow-up data for at least one year. More than 25,000 patients were included. At the time of surgery, patients were generally between 35 and 45 years old with body mass index (BMI) of between 40 and 50. The mean follow-up across all studies was 27.9 months.

In patients undergoing any form of bariatric surgery, compared to baseline, there were significant reductions in total cholesterol, low density lipoprotein cholesterol, and triglycerides, and a significant increase in high density lipoprotein cholesterol. The magnitude of this change was significantly greater than that observed in non-surgical control patients.

When assessed separately, the magnitude of changes varied greatly by surgical type. Only RYGBP showed improvements in each lipid parameter relative to controls

at both one year and last follow-up beyond one year. In the cases of Adjustable Gastric Banding and Sleeve Gastrectomy the response at one year following surgery was not significantly different from non-surgical control patients.

“Differences in triglyceride reduction among procedures were most evident at more than one year after surgery, when reductions in subjects undergoing RYGBP and BPD were nearly 50% greater than in Adjustable Gastric Banding and Sleeve Gastrectomy, despite similar baseline BMI in RYGBP and Adjustable Gastric Banding cohorts,” observed Dr Heffron. “Part of this difference may be secondary to greater weight loss and improvements in insulin sensitivity achieved following RYGBP and BPD versus restrictive procedures. However, the anatomic alterations of RYGBP and BPD may also play important roles. These differences may be relevant in deciding the most appropriate technique for a given patient.”

● doi: 10.1016/j.amjmed.2016.02.004

Anti-epileptic drug may be linked to birth defects when taken with other drugs

In an analysis of pregnancies in Australia from 1999 to 2014 in which women were taking anti-epileptic drugs, foetal malformation rates fell over time in pregnancies where only one drug was taken, but rates increased in pregnancies where multiple drugs were taken.

The rise in such “polytherapy” malformation rates began around 2005 when levetiracetam and topiramate use began to increase.

Malformation rates were similar in polytherapy pregnancies whether or not levetiracetam was included (7.14% versus 8.38%), but were higher in polytherapy pregnancies involving topiramate (14.94% versus 6.55%).

The findings suggest that use of topiramate in conjunction with other anti-epileptic drugs may enhance its propensity to cause foetal malformations. The mechanisms involved are currently unclear.

“Although the results are based on small numbers of patients in pregnancy, we suggest that the use of topiramate, at



least in combination with other anti-epileptic medications, ought to be used with caution in women who plan to become pregnant,” said Dr Frank Vajda, lead author of the Epilepsia analysis.

● doi: 10.1111/epi.13415

Study shows how changes in gut microbes cause obesity

Obesity is linked to changes in our gut microbes – the trillions of tiny organisms that inhabit our intestines. But the mechanism has not been clear. In a new study published in *Nature* (9 June 2016), a Yale-led team of researchers has identified how an altered gut microbiota causes obesity.

In an earlier study, Dr Gerald I. Shulman, the George R. Cowgill Professor of Medicine, observed that acetate, a short-chain fatty acid, stimulated the secretion of insulin in rodents. To learn more about acetate’s role, Shulman, who is also an investigator of the Howard Hughes Medical Institute, and a team of Yale researchers conducted a series of experiments in rodent models of obesity.

The research team compared acetate to other short-chain fatty acids and found higher levels of acetate in animals that consumed a high-fat diet. They also observed that infusions of acetate stimulated insulin secretion by beta cells in the pancreas, but it was unclear how.

Next, the researchers determined that when acetate was injected directly into the brain, it triggered increased insulin by activating the parasympathetic nervous system. “Acetate stimulates beta cells to secrete more insulin in response to glucose through a centrally mediated mechanism,” said Shulman. “It also stimulates secretion of the hormones gastrin and ghrelin, which lead to increased food intake.”

Finally, the research team sought to establish a causal relationship between the gut microbiota and increased insulin. After transferring faecal matter from one group of rodents to another, they observed similar changes in the gut microbiota, acetate levels, and insulin.

“Taken together these experiments demonstrate a causal link between alterations in the gut microbiota in response to changes in the diet and increased acetate production,” said Shulman. The increased acetate in turn leads to increased food intake, setting off a positive feedback loop that drives obesity and insulin resistance, he explained.

The study authors suggest that this positive feedback loop may have served an important role in evolution, by prompting animals to fatten up when they stumbled across calorically dense food in times of food scarcity.

“Alterations in the gut microbiota are associated with obesity and the metabolic syndrome in both humans and rodents,” Shulman noted. “In this study we provide a novel mechanism to explain this biological phenomenon in rodents, and we are now examining whether this mechanism translates to humans.”

● doi: 10.1038/nature18309

Stem cells from umbilical cord blood may help treat eczema

A new study suggests that treatment with stem cells from umbilical cord blood might be an effective therapy for patients with moderate-to-severe eczema, or atopic dermatitis.

For the clinical trial, 34 patients were randomly assigned to receive a low dose or high dose of the cells subcutaneously. Fifty-five percent of patients who received the high dose showed a 50% reduction in what’s known as the Eczema Area and Severity Index score at week 12. Immune-related markers of atopic dermatitis also decreased significantly.

“This study is a first-in-class study demonstrating that adults with moderate-to-severe atopic dermatitis responded to a treatment of stem cells derived from umbilical cord blood,” said Dr Tae-Yoon Kim, senior author of the Stem Cells study. “The single treatment of stem cells in patients resulted in the significant and persistent improvement in disease symptoms throughout the follow-up period of 12 weeks.”

The study was conducted at Seoul St. Mary’s Hospital in collaboration with Seoul National University.

● doi: 10.1002/stem.2401 MEH



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Security Council demands protection for hospitals and health workers in conflict zones



A nurse takes care of an infant child in an incubator at the Al-Sabeen Hospital in Sana'a. Hospitals and clinics in Yemen have been paralyzed by the war: they have either been attacked, run out of medical supplies and fuel or the medical staff have been forced to flee.

With increasing wartime assaults on and patterns of systematic destruction of health facilities in countries affected by conflict, the United Nations Security Council unanimously adopted a resolution on 3 May 2016 to strengthen protection for healthcare workers, the sick and wounded, hospitals and clinics, in war zones.

Speaking to the 15-member body, Secretary-General Ban Ki-moon reiterated that denying people access to essential health care is a serious violation of international humanitarian law.

"All too often, attacks on health facilities and medical workers are not just isolated or incidental battlefield fallout, but rather the intended objective of the combatants. This is shameful and inexcusable," Ban told Council members.

In Syria and elsewhere, he noted that Governments impose "cumbersome procedures" that restrict access to healthcare: "This is strangulation by red tape. It is violence by bureaucratic means rather than force of arms, but it is just as devastating," he said.

The UN chief urged all Member States, parties to conflict and other relevant actors to heed the Council's demands by:

- Facilitating humanitarian access
- Developing domestic legal frameworks that protect health facilities and medical workers
- Training armed forces so they understand their obligations
- Prosecuting those responsible for such attacks and other violations

Also in attendance were Peter Maurer,

the President of the International Committee of the Red Cross (ICRC), and Dr Joanne Liu, the International President of Médecins Sans Frontières (MSF).

Aleppo was recently hit by an air strike, which Ban said was "by all accounts by the Government of Syria". It destroyed a hospital and killed at least 20 people, including three children and the area's one and only paediatrician, Dr Mohammad Wasim Maaz.

"Yet this appalling act was only the latest wartime assault on health care in Syria," the UN chief warned. "Since the beginning of the conflict, Physicians for Human Rights has documented more than 360 attacks on some 250 medical facilities. More than 730 medical personnel have been killed."

He added that a similar pattern of systematic destruction of health facilities is evident in Yemen, with more than 600 medical facilities having closed because of damage sustained in the conflict and shortages of supplies and medical workers.

"Last year, the United Nations verified 59 attacks against 34 hospitals. In January this year, Coalition air strikes hit the Shira Hospital, which serves around 120,000 people in Sa'ada Governorate," he said. "And last October in Kunduz, Afghanistan, a bombing by United States military destroyed another MSF hospital and killed dozens, as patients were burned alive in their beds."

The ICRC's Peter Maurer said: "Attacking a hospital, threatening a doctor, coercing a nurse to give preferential treatment

to armed fighters, hijacking ambulances, using patients as human shields – these are not collateral damage. These are not sad realities we have to get used to. They are abominations to fight and trends to roll back," he said.

"This resolution marks a momentous step in the international community's efforts to draw attention to a problem that we otherwise risk getting used to through the sheer frequency of its occurrence," he added.

MSF's Joanne Liu told Council members that while the nature of warfare may have changed, the rules of war have not.

"You are charged with protecting peace and security. Yet four of the five permanent members of this Council have to varying degrees, been associated with coalitions responsible for attacks on health structures over the last year. These include the NATO-led coalition in Afghanistan, the Saudi-led coalition in Yemen, the Russia-backed, Syrian-led coalition. You therefore must live up to your extraordinary responsibilities, and set an example for all States," she stated.

"This resolution must lead to all states and non-state actors stopping the carnage. You must also pressure your allies to end attacks on healthcare and populations in conflict areas. We will not leave patients behind. And we will not be silent. Seeking or providing healthcare must not be a death sentence. You will be judged not on your words today, but on your actions. Your work has only begun. Make this resolution save lives," she concluded. **MEH**

Researchers warn of leishmaniasis epidemic in Middle East



The Syrian refugee crisis has precipitated a catastrophic outbreak of Old World cutaneous leishmaniasis now affecting hundreds of thousands of people living in refugee camps or trapped in conflict zones. A similar situation may also be unfolding in eastern Libya, Iraq and Yemen, say the authors of a recently published report on the crisis.

They warn that “we may be witnessing an epidemic of historic and unprecedented proportions, but it has largely been hidden due to lack of specific information”.

The report: “Old World Cutaneous Leishmaniasis and Refugee Crises in the Middle East and North Africa” published 26 May 2016 in *PLoS Neglected Tropical Diseases* – doi: 10.1371/journal.pntd.0004545 – notes that leishmaniasis has been endemic in Syria for over two centuries, with the first case ever reported being as early as 1745, when it was known as the “Aleppo boil”. Old World cutaneous leishmaniasis (CL) is characterized most notably by disfiguring skin lesions, nodules, or papules, and in the Middle East and North Africa (MENA) region it is primarily caused either by the parasite *Leishmania tropica* (anthroponotic) or *L. major* (zoonotic).

Although Leishmaniasis is generally not fatal, clinical symptoms can lead to disfiguring scars that result in social stigmatization with psychological consequences, such as anxiety, depression, and decreased quality of life.

The authors say that while CL is by no means new to Syria, the war in Syria has greatly increased the risk for CL and reports have indicated sharp increases in the number of CL cases in Syria and in surrounding areas of the Middle East.

Within Syria, a 2013 study published by the Ministry of Health reported an incidence rate more than twice as high as the incidence rate reported in Syria between 2004 and 2008 by the WHO. The annual incidence of CL in Syria between 2004 and 2008 was estimated to be 23,000 cases per

year. In 2012, 53,000 cases were reported, and in the first half of 2013 alone, 41,000 cases were reported.

The authors state that the number of cases of CL has most likely been severely underreported; the WHO estimated that the actual incidence of CL in Syria between 2004 and 2008 was three to five times higher than the reported incidence. The true number of annual incident and prevalent cases in Syria may therefore exceed 100,000.

They highlight that few countries have mandated reporting of CL, and the resultant weak reporting system promotes a lack of disease awareness and public policies for treatment and prevention. Compounding this problem is the absence of rapid diagnostics and the requirement to have highly skilled dermatologists and pathologists establish a diagnosis on the basis of clinical presentation and confirmatory microscopy.

They say that with the influx of Syrian

refugees into Turkey, Lebanon and Jordan all these countries have shown indications of increased prevalence of CL. They point out that in the countries that have observed new cases of CL, younger age groups, due to their lack of previous exposure to the disease, have been the most affected.

“Knowledge of Old World CL in Syria and among its refugees is limited; however, we know even less about the situation in areas of Libya now controlled by the self-proclaimed Islamic State,” the authors say. They add: “Leishmaniasis is a hidden NTD in Yemen as well. Approximately 10,000 new cases are reported annually.

Among a number of recommendations, they say “a multifaceted, collaborative approach must be taken to control the incidence of CL, with priority given to initiatives that will not only aid in the prevention and control of CL but also improve the living conditions and survival of refugee populations”. **MEH**

What is leishmaniasis

Leishmaniasis is caused by a protozoa parasite from over 20 *Leishmania* species and is transmitted to humans by the bite of infected female phlebotomine sandflies. Over 90 sandfly species are known to transmit *Leishmania* parasites. There are 3 main forms of the disease:

- **Visceral leishmaniasis (VL)**, also known as kala-azar is fatal if left untreated in over 95% of cases. It is characterized by irregular bouts of fever, weight loss, enlargement of the spleen and liver, and anaemia. It is highly endemic in the Indian subcontinent and in East Africa. An estimated 200,000 to 400,000 new cases of VL occur worldwide each year. Over 90% of new cases occur in 6 countries: Bangladesh, Brazil, Ethiopia, India, South Sudan and Sudan.

- **Cutaneous leishmaniasis (CL)** is the most common form of leishmaniasis and causes skin lesions, mainly ulcers, on exposed parts of the body, leaving life-long scars and serious disability. About 95% of CL cases occur in the Americas, the Mediterranean basin, the Middle East and Central Asia. Over two thirds of new CL cases occur in 6 countries: Afghanistan, Algeria, Brazil, Colombia, Iran (Islamic Republic of) and the Syrian Arab Republic. An estimated 0.7 million to 1.3 million new cases occur worldwide annually.

- **Mucocutaneous leishmaniasis** leads to partial or total destruction of mucous membranes of the nose, mouth and throat. Almost 90% of mucocutaneous leishmaniasis cases occur in Bolivia, Brazil and Peru. – WHO

Hepatocyte transplantation



By Dr Rajeev Tomar

Introduction

At present, Orthotopic Liver Transplantation (OLT) is the only intervention with proven benefit for treatment of the advanced stages of chronic and acute liver diseases as well as metabolic diseases of the liver. Hepatocyte Transplantation (HT) is a promising alternative to OLT for the treatment of some liver-based metabolic disorders or acute liver failure. Many of the disorders treated by liver transplantation are caused by hepatocyte dysfunction, and it therefore seems unnecessary to replace the entire organ. This is especially true for metabolic liver diseases in which it is clear that selective replacement of a small fraction of the liver cell mass would be therapeutic.

World-wide, there are reports of more than 30 patients, including 10 children at

King's College Hospital London, who have been treated by HT, with the main cause to date being children with urea cycle defects. The number of cells transplanted usually represents approximately 5% of theoretical liver mass, and either fresh or cryopreserved cells have been used. However, cell function often declines after about 9 months, with the result that patients then undergo OLT. Problems with immunosuppression and rejection may be an important factor in this. Patients with acute liver failure (ALF) are another group in which HT has been used, where the aim is to maintain liver function as a bridge to OLT or until regeneration of the native liver occurs.

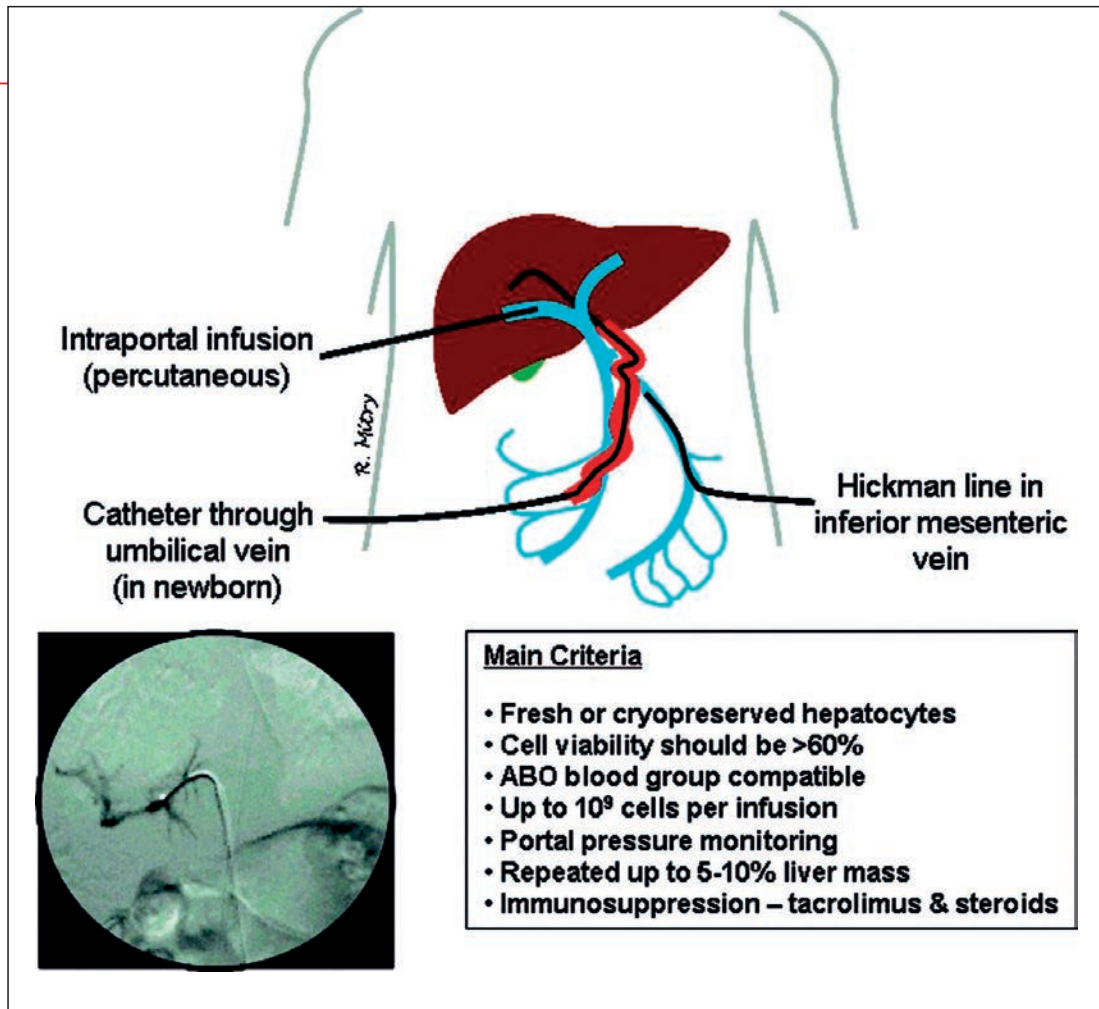
Isolation of hepatocytes from donor liver

Human hepatocytes are isolated from liver tissues rejected/unused for transplan-

tation, including livers from non-heart-beating donors. A collagenase perfusion technique is used to digest donor liver tissue, and the cells are purified by centrifugation. Donor livers can be contaminated with microorganisms as a result of their coming from patients in the intensive care unit, but this is usually eliminated from the final cell product during processing. The addition of the antioxidant N-acetylcysteine to the perfusion solution, when isolating hepatocytes from fatty liver, gave significant improvement in cell viability and metabolic function. This is now used routinely for isolation of hepatocytes for clinical use. The quality of the isolated hepatocytes is assessed (cell number, viability, microbiology). Cells are either transplanted immediately after isolation, or cryopreserved and banked for future use.

Procedure – route and criteria

- Intraportal injection is the main cell delivery route
- Percutaneous transhepatic puncture
- Inferior mesenteric vein catheterization. In newborn babies, access to the portal vein can be gained by catheterization of the umbilical vein
- Portal pressure should not increase by more than 12 mm Hg
- The peritoneal cavity has been used in patient with ALF. However, the lack of anchorage for hepatocytes and host immune response means they don't survive long. Encapsulated hepatocyte is a relatively new technique to protect from immune response.



Post procedure

Patients receive immunosuppression, usually 10 mg/kg methylprednisolone, as an intravenous bolus with tacrolimus to maintain a 12-hr trough blood level of 10 g/L and a tapering oral dose of prednisolone (2 to 1 mg/kg/day) as given to patients undergoing OLT. Once injected into the liver, hepatocytes become wedged in sinusoids, causing portal hypertension and ischemia – reperfusion injury. Various approaches have been employed in animal models to improve hepatocyte engraftment, such as the use of hepatic sinusoidal vasodilators, disruption of the sinusoidal endothelium by specific drugs, such as cyclophosphamide and doxorubicin, and inhibition of macrophage function. It is difficult to detect cell rejection by the release of liver cytosolic enzymes. New sensitive (bio) markers of hepatocyte rejection after transplantation are needed.

Monitoring cell engraftment

Currently, once hepatocytes have been administered, it is difficult to determine their fate in the recipient liver. Methods to track the transplanted cells are needed; the outcome of HT is limited by

the low efficiency of integration of transplanted cells into the host liver parenchyma. In inborn errors of metabolism, indirect evidence of engraftment after HT can be obtained from levels of metabolic products, but this may not provide reliable information about the location or number of functioning engrafted cells. Liver biopsies have the risk of procedure-related morbidity and likelihood of sampling error. Methods to track the transplanted cells are needed.

New cell sources

One of the main obstacles to the wider clinical application of hepatocyte transplantation is the limited source, and often marginal quality of cells from donor livers. Liver stem and/or progenitor cells, bone-marrow-derived stem cells and embryonic stem cells are showing promising results for future use.

Advantages of HT

Hepatocyte Transplantation has a number of potential advantages compared with whole-organ transplantation. The procedure provides a less invasive surgical approach with lower risk of morbidity and mortality. One donor liver

provides enough hepatocytes for several recipients, thus possibly improving the ratio of donor organs to patients on the waiting list. In contrast to whole organs, cells can be cryopreserved and stored until needed. Patients keep their own liver, allowing it to recover from acute liver failure or providing the necessary liver function in case the graft should fail.

Conclusion

The proof of principle for Hepatocyte Transplantation has been established, and the technique is currently being developed by a number of centres around the world.

The Author

Dr Rajeev Tomar is Medical Director of KCH Clinics Abu Dhabi, Head of Paediatrics, and Consultant Paediatrician and Paediatric Hepatologist at Kings College Hospital Clinics, Abu Dhabi. www.kchclinics.com



Up to Date – Hepatocyte Transplantation
www.uptodate.com/contents/hepatocyte-transplantation

Cerebral palsy – the most common physical disability in children

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

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

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

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



Associated medical problems

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

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

Collaborative approach

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

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

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

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

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

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Researchers discover new disease gene for severe paediatric heart disease

Cardiomyopathy, or a deterioration of the ability of the heart muscle to contract, generally leads to progressive heart failure. It is frequently inherited, and, because approximately 40% of children born with it are likely to die within five years of diagnosis, being able to identify its genetic basis is particularly important. Now, an international team of researchers has identified a new disease gene which is implicated in the development of severe paediatric cardiomyopathies. The gene is probably also involved in a milder, adult-onset form of the condition.

Presenting the results of the study to the annual conference of the European Society of Human Genetics in May, Johanna Herkert, MD, a clinical geneticist at the University Medical Centre of Groningen, The Netherlands, describes how analysis of the exomes (the parts of the genome that produce proteins) of children who were seriously ill with early-onset cardiomyopathies led to the finding that a mutation in the gene alpha-kinase 3 (ALPK3) had been inherited from both their fathers and mothers. In cases where both parents carry the mutation, the risk of having a child with a severe cardiomyopathy is 25%. Since the child does not carry a normal copy of gene the condition will develop at an early age.

“However, several family members who carried only one mutated gene copy also developed cardiac disease, albeit at a later stage in life,” says Dr Herkert. “The identification of these mutations enables us to provide genetic counselling, predictive testing of family members, and prenatal testing in future pregnancies. It also allows us to provide early treatment, and a potential target for drug development in the future.”

The researchers studied five children with cardiomyopathy from three unrelated families of different ethnic backgrounds. The families had previously been screened for mutations in other cardiomyopathy-related genes. Four patients were diagnosed during foetal life, or within hours of birth, and the fifth only developed symptoms at four years old. Three of the children died between 35 weeks of gestation and five days of birth; the other two were still alive at 11 years old, but showed signs of severe cardiomyopathy.

“We knew that mice without a functional ALPK3 gene displayed very similar cardiomyopathy related features to those observed in our paediatric patients,” says Dr Herkert, “but we did not quite know how dramatic its effect would be in humans. Our findings show that we now should include this gene in routine diagnostic screening in order to be able to identify affected children and their family members at risk. This will also give us an insight into the prevalence of ALPK3-related cardiomyopathy in the general population.”

Although the possibility of treating an affected foetus in the womb is still a long way off, the gene could provide a drug development target for a medicine to be administered immediately after birth before the disease has a chance to develop further. Affected family members with only one ALPK3 mutation could also be treated later in life.

“We are currently studying the effect of the ALPK3 mutations on the production of the protein in heart muscle, but also in skeletal muscle, as ALPK3 gene mutations may result in skeletal muscle problems too. Moreover, a large genome study has shown a possible link between ALPK3 and cardiac hypertrophy, or thickening of the

Our findings show that we now should include this gene in routine diagnostic screening in order to be able to identify affected children and their family members at risk.

heart muscle. We would like to explore this finding further as it may well mean that ALPK3 is implicated in other heart diseases in the general population, and once again this could suggest new treatment possibilities.

“Better knowledge of the precise role of the gene in disease development, as well as the elucidation of the molecular pathways involved, should lead us towards improved clinical care from the point of view of screening and surveillance, and to targeted drug development,” Dr Herkert concludes. **MEH**



Great Ormond Street Hospital for Children

Great Ormond Street Hospital for Children (GOSH) in London is a world-class centre of excellence with **over 50 different paediatric specialities and 300 world-leading consultants under one roof**. Through pioneering translational research, GOSH provides cutting-edge treatment for the rarest and most complex paediatric conditions. **GOSH is rated as one of the top five children's hospitals in the world.**

While breakthroughs and medical expertise are essential to the treatment of patients, GOSH also places great emphasis on the support and care provided for children by nurturing an open and supportive atmosphere, ensuring that parents and patients are well informed and closely involved in the treatment process.

Children receive the highest standards of care and attention from the expert team of medical and support staff during their stay at GOSH, and are always treated with respect, trust, concern and openness.

The International and Private Patients Service at GOSH treats over 5,000 children from over 80 different countries each year. The service is tailored to the referral and treatment of international patients and our dedicated, multi-lingual team ensure a smooth and efficient patient experience.

For more information or to refer a patient to Great Ormond Street Hospital for Children, please contact our Gulf Office.

Great Ormond Street Hospital for Children
International and Private Patients Service
Dubai Health Care City, P.O. Box: 505050, Dubai, United Arab Emirates (UAE)
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More than 50 specialties under one roof at Great Ormond Street Hospital for Children

Great Ormond Street Hospital for Children (GOSH) in central London is an international centre of excellence and is recognised as one of the few world-class specialist hospitals for children. With more than 50 paediatric specialties under one roof GOSH is uniquely able to diagnose and pioneer treatments for children – especially those with highly complex, rare or multiple conditions. GOSH has the largest range of paediatric specialties in one institution in the UK, is the third largest centre for children with cancer/leukaemia in the Western world and is a world-leading centre for gene therapy. The hospital's mission is to deliver world-class, high quality clinical care for children from the UK and overseas.

GOSH is also a world-leading research centre, conducting research into areas including rare diseases, cancer, genetics and immunology. In partnership with University College London Institute of Child Health (ICH), GOSH is one of the top five research institutions for children in the world. GOSH is the only academic Biomedical Research Centre in the UK to be dedicated to children's health and between 2010-2014, GOSH/ICH research papers had the highest citation impact of any children's hospital in the world (as reported by Thomson Reuters). GOSH is currently building a new research centre for paediatric rare diseases, opening in 2018.

World-class care

Many of the patients seen at the hospital require expert care from a range of specialties. The hospital's unique multidisciplinary approach means that patients with rare and complex conditions can be treated across a range of specialties in one coordinated care pathway.

GOSH places great emphasis on the support and care provided for children and their families by nurturing an open and supportive atmosphere, ensuring that parents



and patients are well informed and closely involved in the treatment process. Children and families are always treated with respect, trust, concern and openness.

The International and Private Patient Unit is a state-of-the-art unit where world-class facilities embrace the latest technologies to make a real and long-lasting impact on the health of children across the globe. Cutting-edge equipment enables quicker and more accurate diagnoses, meaning treatments can start earlier with a quicker recovery time.

GOSH has a longstanding relationship with the Middle East providing high quality and safe care for patients in a family-centred environment. A dedicated Gulf office ensures that children and families being referred to the hospital receive the very best experience possible as well as providing a local point of contact. The unit is tailored to the referral and treatment of international patients with a dedicated, multi-lingual team ensuring a smooth and efficient patient experience.

Education, Training and Consultancy

GOSH is committed to sharing expertise through the education and training of children's healthcare professionals. The

hospital has a successful record of delivering education and training programmes internationally including in the UAE and Kuwait. The hospital offers a wide range of expertise including clinical consultancy services, paediatric service review and planning, visiting experts and bespoke training modules delivered by a team of GOSH professionals, for both clinical and non-clinical staff. Each programme is tailored specifically for the institute to produce the best results for the staff and children.

GOSH Global app

GOSH Global, available for download on both Apple and Android devices, is a free app that facilitates the easy referral of patients. The app provides an up-to-date consultant list, information on all specialties at the hospital and allows the referral of a patient directly to a specific consultant.

■ Contact the GOSH Gulf office:

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The Portland Hospital
for Women and Children

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Selective Dorsal Rhizotomy service at The Portland helps children with cerebral palsy to walk

The Portland Hospital for Women and Children in London provides Selective Dorsal Rhizotomy (SDR) for children with cerebral palsy. This is the only fully private service of its kind in Europe.

SDR is a surgical procedure offered to children with spastic diplegia as a result of cerebral palsy. It reduces spasticity and therefore improves their ability to balance, walk and participate in normal daily activities and sport.

SDR involves sectioning of some of the sensory nerve fibres that come from the muscles and enter the spinal cord.

Surgery involves a 1 to 2 inch incision along the centre of the lumbar spine. The spinous process and a portion of the lamina are removed at a single level to expose the lower end of the spinal cord and spinal nerves. The sensory nerve roots are identified and exposed. Each root is then divided into 3-5 rootlets. Each rootlet is tested with EMG, which records electrical patterns in muscles. Rootlets are ranked from 1 (mild) to 4 (severe) for spasticity. The severely abnormal rootlets are cut. This technique is repeated for rootlets between spinal nerves L1 and S1/S2.

The advantages of this type of surgery are:

- Reduced risk of spinal deformities in later years
- Shorter-term, less intense back pain
- Early commencement of intensive physiotherapy
- Shorter operating time and therefore reduced risks associated with general anaesthetic

The SDR service at The Portland Hospital is led by Mr Kristian Aquilina, Consultant Paediatric Neurosurgeon (previously at Frenchay Hospital, Bristol and currently at Great Ormond Street Hospital for Children, London). The specialist multidisciplinary team also consists of a consultant paediatrician specialising in neurodisability, a neurophysiologist, specialist physiotherapists and (where appropriate) a paediatric orthopaedic surgeon. Mr Aquilina worked with Dr TS Park at the Center for Cerebral Palsy in St Louis.

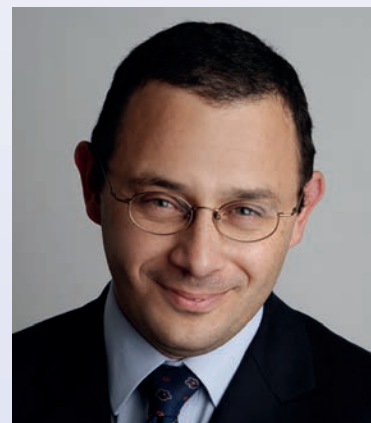
Children are rigorously assessed pre-operatively to ensure that SDR is the best treatment option to maximise their potential.

The selection criteria are:

- Children usually between the ages of 3 and 12 years with a diagnosis of spastic diplegia and significant diffuse spasticity in the lower limbs that involves most of the muscle groups
- There should be no significant injury to the areas of the brain involved in posture or coordination – this is confirmed by an MRI scan
- Children need to demonstrate adequate muscle strength, be able to comply with intensive physiotherapy post-operatively and have a definite plan for post-operative physiotherapy in place

Surgery takes 3 to 4 hours. Post-operatively children spend one night in the hospital's 10-bedded paediatric intensive care unit for close observation and are on bed rest for the first 3 days.

Intensive physiotherapy commences on



Mr Kristian Aquilina, Consultant Paediatric Neurosurgeon

day 3. The reduction in spasticity is often immediate and the focus of treatment sessions is to improve trunk and lower limb strength, improve balance and re-educate walking patterns. Children are discharged home on day 6 but continue a twice daily physiotherapy programme for the next 2 weeks. At this point they can return to their usual routine but research has shown that physiotherapy must continue on a regular basis for a period of 1-2 years to optimise the effects of the surgery and ensure that changes to movement patterns are lasting. **MEH**

The Portland Hospital is the only private hospital in the UK dedicated to the healthcare of women and children. It offers a range of specialties and full diagnostic support. The hospital cares for children with complex needs and those requiring a variety of surgical and medical interventions. The Acute Neurorehabilitation Unit provides intensive rehabilitation programmes for children to optimise recovery and help them reach their potential in life.

iMRI for precision brain surgery

Intraoperative Magnetic Resonance Imaging or iMRI is a process through which images of the brain are created while the surgery is being performed. Images generated by iMRI come to a surgeon's aid while removing a brain tumour or such abnormalities.

The iMRI technology was implemented at Cook Children's Hospital in 2007. Since then, the iMRI has aided Cook Children's to revolutionize neurological surgery for patients from all over the world. The intraoperative MRI (iMRI) has been used to perform over 1,000 diagnostic scans in stereotactic procedures like deep brain stimulation (DBS), laser ablation, and tumour biopsies during surgery that have dramatically changed the lives of so many families.

For ease of convenience, an iMRI suite comprising of a surgical suite and an MRI scanner is available at the hospital. During a surgical procedure the MRI scanner can be moved over a patient and an MRI procedure can be performed during surgery without moving the patient. Surgeons are able to utilize special software that accurately maps areas of the brain to help them remove tumours, seizure spots, and other lesions. By providing timely information, the technology allows better-informed decisions and greater precision, reducing risk and the need for a second surgery.

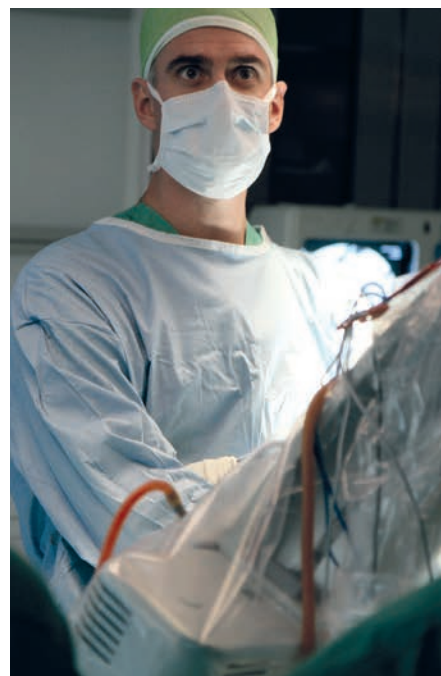
Treating dystonia

Several milestones have been achieved by Cook Children's with the help of iMRI technology. For instance, in September 2007, Cook Children's Medical Center became the first free-standing children's hospital to perform DBS in children with dystonia. Since the first implant, Cook Children's has established itself as one of the elite paediatric DBS programs in United States with more than 113 patients to date. DBS is used to restore normal function in patients with physiological and movement disorders such as essential tremor, Parkinson's disease and dystonia. DBS often provides phenomenal results in reducing muscle tone, improving function and preventing the progression of movement disorders to other areas

of the body. It involves two parts: implanting electrodes into the brain and a pacemaker under the skin of the chest. Surgeons connect these two devices, and the pacemaker sends electrical impulses to the electrodes to disrupt the abnormal signals of the movement disorder. The two surgeries take place about a week apart. Following both procedures, the child is able to return home the next day.

In 2013, Cook Children's Medical Center was declared as the first U.S. children's hospital to offer asleep deep brain stimulation surgery to children suffering from dystonia. Now, intraoperative MRI and real-time intraoperative image guidance technology helps with procedure visualization so patients can remain asleep during surgery. The procedure works by first generating high-resolution images by the MRI scanner and sending them to a guidance workstation for review by the physician. Image guidance software allows the physician to find an optimal path from the surface of the skull down to the neurological target in the brain, identifying specific areas of entry and critical areas to avoid. As the surgeon inserts the interventional device, real-time images ensure no undesirable events take place and the target is reached.

There are less than 30 hospitals worldwide that offer real-time neurosurgical image guidance and procedure visualization technology. While not painful, the procedure has traditionally been performed while the patient is awake to test responses to impulses. However, the idea of being awake during brain surgery is understandably troubling for some patients, and physically impossible for others. Asleep DBS increases patient comfort and decreases patient anxiety during surgery, and also facilitates treatment for patients who would otherwise not make good neurosurgery candidates, such as those with physical restrictions. Now, thanks to enhanced technology, patients can be under anaesthesia and asleep. This change in the treatment's technique came with the addition of an iMRI. The iMRI allows neurosurgeons to have pinpoint accuracy while performing delicate brain surgery.



John Honeycutt, MD, medical director of Neurosurgery at Cook Children's, performs surgery

"With all the technology we have, I know I am in the exact spot I want to be," said John Honeycutt, M.D., medical director of Neurosurgery at Cook Children's "My accuracy for DBS is 0.5 millimetres."

Laser ablation brain surgery

In May 2013, Cook Children's Medical Center became the first children's hospital in North Texas and surrounding states to perform minimally invasive laser ablation brain surgery in an iMRI suite. For many patients, this advanced surgical procedure means that doctors can treat certain areas of the brain that were once considered inoperable. Laser ablation surgery is an iMRI-guided, minimally invasive procedure that allows abnormal tissue to be thermally destroyed in real time. In fact, doctors can target problem brain tissue within a single millimetre, greatly reducing risk to surrounding tissue. Performing this surgery in the iMRI suite, helps doctors see the tumour or lesion and remove all of it in a single surgery. Most patients can go home within 24 hours and with only one stitch.

■ For more information, visit:
cookchildrensinternational.org



Left to right: Jatonne Sterling (brother), Abby Cusack, RN, BSN, William Sterling, Lori Tucker (mother), and Chalongchai Phitsanuwong, MD

Ketogenic diet transforms life for boy with intractable epilepsy

For nine years, William Allan Sterling rode a scary roller coaster of epileptic seizures that left him confined to a wheelchair and barely able to walk or talk. Now, nine months after starting a medical diet prescribed by Chalongchai Phitsanuwong, MD, William is seizure-free and en-

joying a significantly better quality of life.

"I'm getting to know my son for the first time, and I'm starting to see the young man he will become," said his mom, Lori Tucker.

Born prematurely at 26 weeks with cerebral palsy, William's seizures started

when he was three months old, gradually increasing until they occurred constantly day and night. Because he would drop and hit his head during a seizure, he had to wear a soft helmet, was bound to his wheelchair or bed, and needed 24-hour supervision. A paediatric neurologist



Chalongchai Phitsanuwong, MD

prescribed several anti-seizure medications, but none seemed to work. Surgery was out of the question because the boy's seizures were not localized to a particular area of his brain.

In December 2014, after William fell and cut his ear, Tucker learned about the ketogenic diet and was referred to Dr Chalongchai Phitsanuwong, a paediatric neurologist and epileptologist specially trained in this diet. He recently had joined the Level 4 Pediatric Epilepsy Center at the University of Chicago Medicine Comer Children's Hospital -- now one of only three hospitals in Illinois offering the ketogenic diet for children. William became Dr Phitsanuwong's first patient at Comer Children's to try this medical diet.

Tucker said: "Dr Phitsanuwong gave me a lot of information and said he thought William was a good candidate for the diet. Since nothing else had worked to reduce William's seizures, we decided to give it a try. I couldn't keep watching my son deteriorate."

Dr Phitsanuwong said he admired Tucker's attitude even in the darkest times. "She's a fighter, and she believed William would get better one day."

The Pediatric Epilepsy Center offers a variety of ketogenic diets, including the classic ketogenic diet and a Modified Atkins Diet. Ketogenic diets are widely accepted and effective dietary regimens prescribed as a treatment of seizures and

traditionally offered when medication alone fails to control seizures.

"While they may not be effective for every child," Dr Phitsanuwong said, "We do know the diet's high-fat, low-carbohydrate content causes the production of ketone bodies. The process of ketosis is believed to have an anti-seizure effect."

The ketogenic diet consists of a high percentage of calories from fat, with an adequate amount of protein and a low percentage of carbohydrate intake, depending on the type and ratio of the diet. Experts do not fully understand how the ketogenic diet controls seizures.

Customized diet

The diet is customized to each child's calorie requirement and nutritional status. Parents must follow instructions precisely for the best results. For example, if a child consumes too many carbohydrates, his or her body may not produce ketone bodies and the diet will not work.

To help families manage their child's diet, a multidisciplinary team at Comer Children's provides highly specialized care and consultation, offering the combined expertise of paediatric neurologists, paediatric epileptologists, a ketogenic dietitian, paediatric neurology nurses, a social worker and a case manager.

To begin the diet, William stayed in the hospital for five days in January 2015 under the care of Dr Phitsanuwong and his medical team. His seizures were reduced by 50% by the end of the week, and disappeared completely after six weeks on the diet.

While the diet can be challenging at first, Tucker said: "Once we saw the difference in William, it motivated us to keep going. Now the diet is easy and a part of our life."

Today, William is out of the wheelchair for increasing periods of time and is able to walk, run, and speak in sentences -- activities his family never thought he would be able to do.

While they may not be effective for every child. We do know the diet's high-fat, low-carbohydrate content causes the production of ketone bodies. The process of ketosis is believed to have an anti-seizure effect.

"He's a different kid now," Tucker said. "He's happy, energetic and wants to do everything on his own. His goal is to play baseball, just like his older brother. It's almost unbelievable how far he has come in such a short time under the diet."

Dr Phitsanuwong reports the majority of his patients currently on the ketogenic diet have had at least a 50% reduction in seizure frequency. Despite the effectiveness and a relatively low occurrence of serious side effects, the physician cautions parents not to start a child on this medical diet without a neurologist's specific recommendation, instruction and supervision.

"What keeps me going is watching how this diet can change lives," Dr Phitsanuwong said. "It's exciting to see William do things he couldn't do before. He is more alert and engaging, learns more, and has a remarkably better quality of life, which makes his whole family and everyone around him much happier." **MEH**

MR Fingerprinting may offer much improved method of quantitative tissue analysis

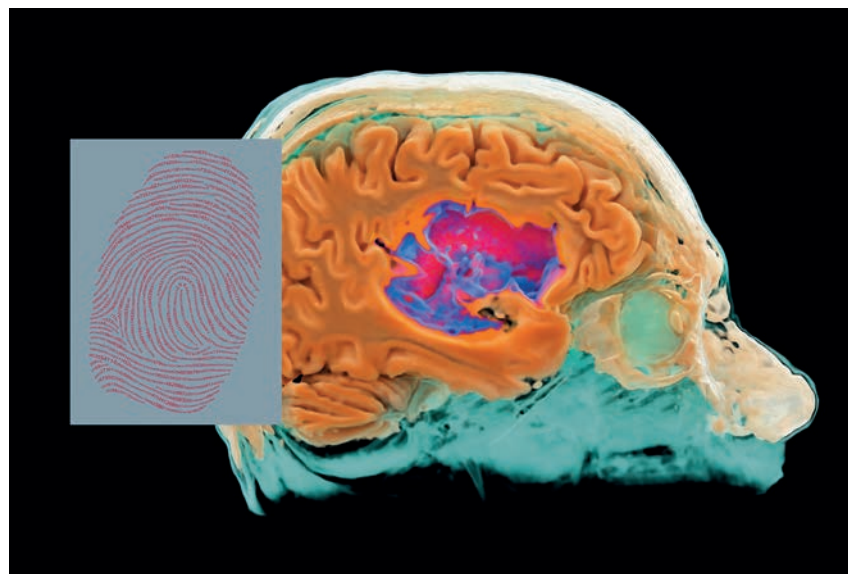
At the 24th Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM) in Singapore, in May this year, Case Western Reserve University and Siemens Healthcare announced an exclusive research partnership to further develop a quantitative imaging method known as Magnetic Resonance Fingerprinting (MRF). Researchers at the Cleveland, Ohio, university and Siemens' developers will further refine this highly promising method of quantitative tissue analysis.

"The most innovative applications can only be brought to life through the collaborative efforts of industry and research," said Dr Christoph Zindel, head of the business line Magnetic Resonance at Siemens Healthcare.

Mark Griswold, PhD, professor of radiology at Case Western Reserve, explained: "The goal of MR Fingerprinting is to specifically identify and characterize individual tissues and diseases. But to try to get there, we've had to rethink a lot of what we do in MRI."

MRF is an innovative, highly versatile and insightful method of measurement, intended to provide non-invasive, user- and scanner-independent quantification of tissue properties. The MRF method is designed to measure a wide range of parameters simultaneously, quantifying many important tissue properties.

Presently, the evaluation of MR images is generally qualitative. In doing so, the properties of the pathology are determined by observing differences in contrast between tissues, instead of being based on absolute measurements of individual tissue properties. Quantitative approaches exist, involving the measurement of diffusion, fat/iron deposits, perfusion or relaxation times, for example. But these sequences often require significant amounts of scan time, and the results vary depending on the scanner and the user. Given the potential low level of variance across a large



MR Fingerprinting is designed to specifically identify individual tissues and diseases, similar to that identify a human fingerprint in forensics. In the forensic case, each fingerprint points to the feature identification of the associated person such as name, height, weight, eye colour, date of birth, etc. In the case of MRF, each fingerprint points to the quantified MR-related identification features of the associated tissue.

number of examinations and its expected reproducibility across scanners and in different institutions, MRF could achieve more accurate monitoring and evaluation of patient treatment.

The MRF technique does not acquire traditional clinical images, but instead is designed to gather tissue information based on the signal evolution from each voxel. Acquisition parameters are varied in a pseudorandom fashion, while the signal evolutions are recorded. These are then compared to a database, or "dictionary", to find the entry that best represents the acquired signal evolution of each voxel.

The signal evolutions equate in many ways to "fingerprints" of tissue properties, which, like the identification of human fingerprints in forensics, can only be analyzed by comparing them with a file containing all known fingerprints. The dictionary is equivalent to the database where all the known fingerprints are stored, to-

gether with all the information relative to each person. In the forensic case, each fingerprint points to the feature identification of the associated person such as name, height, weight, eye colour, date of birth, etc. In the case of MRF, each fingerprint in the dictionary points to the MR related identification features of the associated tissue (such as T1, T2, relative spin density, B0, diffusion, etc.).

The CWRU research team is driving the expansion of this method for a range of different tissue properties. At the same time, the university is working toward expanding the technology to cover additional fields of application. The research team has successfully performed initial tests with brain and prostate tumour patients as well as breast cancer patients with liver metastases. MRF has also been used in cardiac examinations and with patients with multiple sclerosis.

For Siemens, the focus of this collaboration is to improve reproducibility and



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possibly to extend the procedure to different MR scanners and field strengths. Case Western Reserve uses numerous systems from Siemens, and employs the Magnetom Skyra 3-tesla system for the purposes of this research project.

An initial result of this collaborative process launched in September 2015 is a “Work-in-Progress” package, an imaging package for selected Siemens scanners used in research. These WIP pack-

ages have been successfully tested since January 2016 at the University Hospital Essen, Germany, and the Medical University of Vienna, Austria, using further Siemens MRI systems.

“The MR Fingerprint technique lets us see more details than the standard imaging process, and has the potential to redefine MRI,” said Professor Siegfried Trattnig, of the Center of Excellence for High Field Magnetic Resonance at the Medical University

of Vienna, referring to the initial research studies involving patients with malignant brain tumours and low-grade gliomas.

“In this way, MRF could help us, as radiologists, to make the paradigm shift from qualitative to quantitative imaging and to incorporate quantitative data into our daily routine.”

This has the potential to reduce scan times and in turn, bring considerable cost savings in the future. **MEH**

‘Salt’ MRI scans could give a clearer picture of disease

MRI experts at The University of Nottingham have won a £1 million grant to adapt scanning techniques to pick up sodium in the body. The research could lead to much more detailed MRI scans in the future with significant improvements to the diagnosis and treatment of many diseases.

A novel technique to use the body’s natural sodium (salt) content to provide a more detailed picture of tissue health and disease is to be pioneered by MRI experts at The University of Nottingham.

The team at the Sir Peter Mansfield Imaging Centre (SPMIC) will develop the untapped potential of Sodium MRI as an advanced scanning technology.

Current clinical MRI uses hydrogen in the body’s water and fat to produce scans, but this does not provide all the information about tissue health and disease progression stages. Sodium ions naturally occurring in the body are much smaller than water molecules and are involved in many body functions associated with pathology. Sodium MRI has great potential to be a useful new high and ultra-high field scanning target in the future.

Kidney disease will be the main application of the research working in collaboration with the Centre for Kidney Research and Innovation (CKRI), but the team believes that Sodium MRI can also be used for more accurate diagnosis and monitoring of other diseases, and perhaps will give new insights into disease mechanisms as sodium management is important in the brain, lung, liver, and musculoskeletal system.

The grant will allow the researchers to develop sodium MRI on the 3T and 7T

magnetic field scanners at the SPMIC, University Park Campus, Nottingham. The team will use MRI coils for sodium imaging – these are the receivers of radio-frequency signals in the MRI scanner specifically tuned to the resonant frequency of sodium ions. The researchers will develop new pulse sequences so these new coils can image the torso and limbs. The team hopes eventually to take Sodium MRI technology from bespoke research

The technique of using sodium ions in the body as a biomarker for imaging is very challenging because of the lower detectability of the sodium signal in biological tissue by currently available MRI scanners. However, high and ultra-high magnetic field scanners available in the Centre should be able to help to circumvent this obstacle.

into real world healthcare in healthy volunteers and patients.

Translational imaging researcher Dr Galina Pavlovskaya, School of Medicine, SPMIC said: “Sodium MRI is a novel and undeveloped technology which has huge potential for the healthcare of the future. We are delighted to receive the funding to take it forward at Notting-

ham. The technique of using sodium ions in the body as a biomarker for imaging is very challenging because of the lower detectability of the sodium signal in biological tissue by currently available MRI scanners. However, high and ultra-high magnetic field scanners available in the Centre should be able to help to circumvent this obstacle.

“Sodium ions are much smaller than the hydrogen protons bound to oxygen molecules in the water in our bodies which are mapped by conventional MRI. Therefore, sodium has the capacity to give us a much clearer and detailed picture of the structure and health of an organ from deep inside the tissue. Our aim is to refine the technology so we can turn theory into clinical reality.”

Co-researcher Dr Susan Francis, School of Physics, SPMIC added: “The team has a special interest in new types of functional MRI using novel targets like sodium as quantitative biomarkers of disease in the body, in particular in the kidney. The kidney is an ideal target for our project because it is important in the regulation of sodium in the body. If we can image how sodium is distributed in the kidney and how that differs in a diseased kidney, the impact on the diagnosis and treatment of kidney injury or disease is potentially great. The technique also has specific relevance to understanding sodium and water balance in dialysis patients.

The project will end in 2018 with a Sodium MRI Conference for the worldwide MRI research and clinical community. **MEH**

Researchers make breakthrough in new MRI scan technology for lung disease

New scanning technology which will give a much clearer picture of lung disease has taken a major step forward thanks to scientists at The University of Nottingham.

The experts at the Sir Peter Mansfield Imaging Centre have developed a process using specially treated krypton gas as an inhalable contrast agent to make the spaces inside the lungs show up on a Magnetic resonance imaging (MRI) scan. It's hoped the new process will eventually allow doctors to virtually see inside the lungs of patients.

Traditional magnetic resonance imaging uses hydrogen protons in the body as molecular targets to give a picture of tissue but this does not give a detailed picture of the lungs because they are full of air. Recent technological developments have led to a novel imaging methodology called Inhaled Hyperpolarised Gas MRI that uses lasers to 'hyperpolarise' a noble (inert) gas which aligns (polarises) the nuclei of the gas so it shows up on an MRI scan.

The work will make 3D imaging using 'atomic spies' like helium, xenon, or krypton possible in a single breath hold by the patient. Nottingham has pioneered hyperpolarized krypton MRI and is currently ad-

vancing this technology towards the clinical approval processes.

Hyperpolarised MRI research has been trying to overcome a problem with these noble gases retaining their hyperpolarised state for long enough for the gas to be inhaled, held in the lungs and scanned. Now in a paper published in the *Proceedings of the National Academy of Sciences*, the Nottingham team has developed a new technique to generate hyperpolarised krypton gas at high purity, a step that will significantly facilitate the use of this new contrast agent for pulmonary MRI.

Chair in Translational Imaging at the Sir Peter Mansfield Imaging Centre, Professor Thomas Meersmann, said: "It is particularly demanding to retain the hyperpolarized state of krypton during preparation of this contrast agent. We have solved a problem by using a process that is usually associated with clean energy related sciences. It's called catalytic hydrogen combustion. To hyperpolarise the krypton-83 gas we diluted it in molecular hydrogen gas for the laser pumping process. After successful laser treatment the hydrogen gas is mixed with molecular oxygen and literally

exploded it away in a safe and controlled fashion through a catalysed combustion reaction.

"Remarkably, the hyperpolarized state of krypton-83 'survives' the combustion event. Water vapour, the sole product of the 'clean' hydrogen reaction, is easily removed through condensation, leaving behind the purified laser-polarized krypton-83 gas diluted only by small remaining quantities of harmless water vapour. This development significantly improves the potential usefulness of laser-pumped krypton-83 as MRI contrast agent for clinical applications."

This new technique can also be used to hyperpolarise another useful noble gas, xenon-129, and may lead to a cheaper and easier production of this contrast agent.

As part of a recent Medical Research Council funding award, hyperpolarised krypton-83 is currently being developed for whole body MRI at high magnetic field strength in the Sir Peter Mansfield Imaging Centre's large 7 Tesla scanner. Studies will be carried out first on healthy volunteers before progressing to patient trials at a later phase.

● doi:10.1073/pnas.1600379113 MEH

MRI helps predict preterm birth

MRI of the cervix is more accurate than ultrasound at predicting if some women will have a preterm birth, according to a new study from Italy appearing in *Radiology*.

Early dilation of the cervix, a neck of tissue connecting the uterus with the vagina, during pregnancy can lead to premature delivery. Women in their second trimester of pregnancy with a cervix measuring 15 millimetres or less, as seen on ultrasound, are considered to be at higher risk of preterm birth. However, ultrasound has limitations as a predictor of preterm birth, as it does not provide important information on changes in cervical tissue in the antepartum phase just before childbirth.

"A better understanding of the process of antepartum cervical remodelling, loosely divided in two distinct phases called softening and ripening, is critical to improve the diagnosis of cervical malfunction and anticipate the occurrence of birth," said the

study's lead author, Gabriele Masselli, MD, from the Radiology Department at Sapienza University in Rome.

To learn more, D. Masselli and colleagues used an MRI technique called diffusion-weighted imaging (DWI) to examine pregnant women who had been referred for suspected foetal or placental abnormality. DWI reveals differences in the mobility of water molecules in tissue and the results can be used to create apparent diffusion coefficient (ADC) maps that provide a measure of local cell density. DWI has been increasingly used for abdominal and pelvic diseases, but has not been tested for the evaluation of the uterine cervix in pregnant patients.

Each of the 30 pregnant women in the study had a sonographically short cervix and a positive foetal fibronectin test between 23 and 28 weeks of gestation. Foetal fibronectin is a glue-like protein that helps hold the foetal sac to the uterine lining, and the pres-

ence of it before week 35 of gestation may indicate a higher risk of preterm birth.

Of the 30 women, eight, or 27%, delivered within a week of the MRI examination. The other 22 delivered an average of 55 days later. The researchers compared differences in ADC values at MRI between two areas of the cervix: the inner, subglandular zone and the outer, stromal area. While stromal ADC and sonographic cervical length showed no difference between both groups, the subglandular ADC was higher in patients with impending delivery, suggesting an increased mobility of water molecules in that area consistent with cervical ripening.

"Our results indicate that a high ADC value recorded at the level of the subglandular area of the cervix is associated with the imminent delivery of asymptomatic patients with a short cervix," Dr Masselli said. MEH



Interview

King Hussein Cancer Center expansion to house state-of-the-art facilities



King Hussein Cancer Center in Amman, one of the region's leading cancer hospitals, is in the process of expanding its facilities to accommodate the high demand for its sought after services. *Middle East Health* speaks to **Dr Asem Mansour**, the CEO and Director General of KHCC, about the expansion, what new facilities it will house and the challenges they have faced.

Middle East Health: KHCC is expanding with the construction of two new tower blocks. When are they due to be completed and operational?

Dr Asem Mansour: The new towers are seen to be fully operational by early 2017, after the completion of all needed construction work, equipment installation and testing.

MEH: Why was it decided to expand the cancer centre?

AM: Based on the last Cancer

Incidence Report, Jordan had an average of 132 cancer cases for every 100,000 population. For KHCC, this translates into approximately 60-70% of patients being treated at the centre, between 70% national and 30% international patients. This means that the centre is actually working on full capacity all year round. KHCC receives around 3,800 new cases annually and has to reject many due to full capacity, so the need for the expansion emerged. The capacity needs to be more than double the current

capacity to meet the patients' treatment needs for now and 10 years ahead.

MEH: I understand the expansion will provide 84,000 sq. m. of new space and will be three times bigger than the current area of the centre. How tall will these towers be and what will they house?

AM: The in-patient tower will consist of 12 functional floors and the out-patient tower will consist of 9 functional floors. The in-patient tower will have capacity to take 182 patients and the tower is being



equipped with state-of-the-art medical equipment for diagnostic and therapeutic purposes along with six operating theatres that have the latest technologies. As for the out-patient tower, it will house an endoscopy and bronchoscopy unit, an education and training centre, general oncology clinics as well as dentistry, audiology and speech therapy clinics. Additionally, it will house a women's centre, which is a comprehensive floor that consists not only of breast clinics, but also a Breast Imaging Unit which includes ultrasound and mammography services. Moreover, and since we have a holistic approach, we don't only focus on the medical side, but also provide psycho-social and spiritual support as well, in addition to a beauty salon. The tower also includes Bone Marrow Transplant (BMT) clinics for adults and paediatrics along with an Applied Genomics lab.

In addition, the KHCC will establish a healing garden within its premises in line with the centre's initiative to provide a comprehensive care experience for patients. The garden will be built with the highest safety measures to insure a secure

space for kids to play with one another. It also serves as a safe haven for kids, their families and KHCC staff to interact and host a variety of outdoor activities such as summer camps, storytelling and more.

MEH: Will you be taking more foreign patients following the expansion?

AM: The centre currently receives around 1000 international patients annually, and we expect the number to increase, considering the high quality care available at KHCC and the increase in the success rates for the majority of cases. Because of this, many patients prefer to choose KHCC as their destination for cancer care, and with the expansion, it will become possible to accommodate more foreign patients.

MEH: Will you be moving some departments across to the new towers or will they mostly house completely new departments?

AM: Some departments will be moved across and completely new departments will be established, so it is a mixture of both. As it was highlighted earlier, one of the towers will be dedicated for clinics, as the current

out-patient building will no longer exist. Also, the diagnostic radiology and radiation therapy will be among the departments that will be moved across the bridge.

MEH: Which new specialties / departments will you be introducing?

AM: The new facilities will feature a cutting-edge Cell Therapy and Applied Genomics Floor, including the first public cord-blood bank in Jordan, and state-of-the-art stem cell labs. 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. Moreover, among the new services that will be available at the towers is a Brain Suite, which will offer state-of-the-art intraoperative navigation techniques accompanied with functional magnetic resonance imaging (fMRI), which will improve precision during neurosurgery.

MEH: Moving across to the new towers will pose some major challenges – could you tell us about some of the challenges you expect and how you plan to resolve them?

AM: One of the most important



challenges that we are facing right now is determining the opening date for the new tower considering that there have been delays on the part of the contractor. This has become very challenging as we have to start the employment cycle for most positions at least 6 months prior to opening. In case of unanticipated delays, there would be significant financial loss to the centre if we hired all the needed staff. Conversely, delaying staff and equipment beyond the handover date, would also cause significant revenue losses to the centre.

Another challenge that the new towers pose will be the duplication of some of our services such as radiology, radiation oncology, pharmacy and operating theatres. When services are provided in more than one location, quality assurance becomes more difficult. Therefore, the new building contains some new systems, such as an advanced nurse call system and pneumatic tube system, which will assist in maintaining quality assurance. Moreover, patients may develop a certain preference for wanting to be treated in the “new” building when schedules of certain resources may mean that patients will have to go to the “old” building.

KHCC now has a “campus” composed of multiple buildings, facilities and locations, which will be challenging for departments such as maintenance and security.

MEH: One of the floors in one of the towers will be for gene therapy. What exactly will you be offering here – as I understand much of gene therapy is still in an experimental stage?

AM: The establishment of a Cell Therapy and Applied Genomics (CTAG) Department will enable KHCC to deliver personalized medicine through cellular therapeutic and genomics-based technologies to Jordan and countries throughout the MENA region. The scope of service of this facility which will be hosted on the 9th floor of the out-patient building and includes the following:

1. Cell Therapy (which includes stem cell processing lab, Cryobiology and cryopreservation facility as well as cord blood bank). 2. Genomics / Molecular genetic pathology (which includes



Molecular Oncology, Molecular Infectious Disease, Transplant Immunology, Histocompatibility and Genetic Counselling services). 3. Cytogenetic (Karyotyping, Molecular Cytogenetic and Fluoresce in Situ Hybridization (FISH)). 4. Flow cytometry.

The Cell Therapy division will host a Good Manufacturing Practices (GMP) facility with rooms versatile enough to be used for cell therapy, gene therapy and immunotherapy. All therapeutics modalities offered in this facility will follow approved standard of care protocols. Furthermore, the infrastructure will enable us to conduct clinical trials in this field that are approved by the Institutional Review Board (IRB).

MEH: What new / advanced devices will you be installing in the new towers? And how will they benefit diagnosis and treatment?

AM: As a leading oncology centre, KHCC continues to build upon its technology infrastructure and introduce new technologies that allow effective diagnosis and enhance treatment options. A new service to be introduced is intraoperative neurosurgery; in which magnetic resonance images of the patient’s brain are taken during the operation allowing the neurosurgeon to locate the tumour and observe the progress as it is removed.

Additionally, a new state-of-the-art linear accelerator, equipped with the

The centre currently receives around 1000 international patients annually, and we expect the number to increase, considering the high quality care available at KHCC.

latest technologies, will be installed in the new Radiation Oncology Department. This will increase treatment benefits as radiation beams target tumours with a much higher precision.

A set of advanced and automated genomics lab equipment will also be added to the premises of the new department of Cell Therapy and Applied Genomics. The high precision of this equipment will minimize human error and expedite the testing process.

The expansion will house six new operating theatres with state-of-the-art medical furnishing and video-conferencing, image-sharing, and control integration capabilities.

MEH: One of the towers will have patient rooms – each room with only one bed. Why have you decided to take this route in having only single-bed patient rooms? I understand it will enhance privacy, in what other ways will they benefit the patient?



The establishment of a Cell Therapy and Applied Genomics (CTAG) Department will enable KHCC to deliver personalized medicine through cellular therapeutic and genomics-based technologies.

Artist's impressions of the interiors of the new towers at KHCC

AM: We have always had private rooms even in the old hospital. We have three main reasons for opting to design single-bed rooms: isolation of immune-compromised patients such as BMT and leukaemia patients, social reasons as in the case of paediatric patients who typically have a companion sleeping with them in the hospital. In such instances a 2-bed patient room becomes too crowded and really does not give any privacy for the patient or the companion, and lastly many patients are demanding single occupancy rooms and are willing to upgrade whatever room class their insurance is covering to a private room. So all in all these rooms will have major impact on patient experience.

MEH: The single rooms will presumably be more expensive. Who will cover the extra cost?

AM: This will be a mix of insurers and out-of-pocket expenditure based on the need for such private rooms.

MEH: Can you tell us more about the Khalid Shoman Center for Education and Training? Who is Khalid Shoman? What training will be offered and to whom?

AM: The late Khalid Shoman was one of KHCC's most generous donors. His donations helped in improving the health services available at the centre through the establishment of the Nuclear Medicine Department. In appreciation of

his donations, the education centre was named: The Khalid Shoman Center for Education and Training.

This centre will establish a Training Academy within its premises. The aim of the academy is to train healthcare providers and improve their knowledge and skills in order to enhance their competencies and improve the safety of their practice. Since KHCC believes in the continuous professional development of its employees, it was decided that the best approach will be through providing them with different courses and programs and other educational activities to enrich their knowledge and skills in their field of practice. These training programs include: Nursing Oncology, Respiratory Care training, Clinical Pharmacy and Medical Physics. These training programs have been accredited by the American Nursing Credentialing Center (ANCC).

MEH: Can you tell me a bit about the tissue bank and the research that will be carried out here?

AM: The tissue bank, or rather a bio repository, is a section that collects various specimens from cancer patients that are left over after routine diagnosis is carried out. These specimens may be tissue or blood. Specimens are collected fresh frozen or as paraffin embedded tissue blocks. The idea is to create a collection of various types of cancers that can be used later on by researchers in order to

come up with further understanding of the mechanisms of cancer occurrence and find new therapies.

MEH: KHCC is highly regarded in the region. Will this expansion enhance its recognition as a centre of excellence and as referral centre?

AM: KHCC 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 centre is also recognized by a spectrum of international, regional, and national accreditation bodies including the College of American Pathologists (CAP), the Healthcare Accreditation Council (HCAC) and others. The centre is currently serving patients in Jordan and the Middle East region, and there are continuous referrals to the centre based on its excellent reputation and continuous work to improve the quality of care; through the utilization of a system of key performance indicators to monitor performance in different areas, and emphasizing patient safety and satisfaction. However, and as highlighted above, the full occupancy rate was an obstacle in regards to meeting the rising demands, and this has caused satisfaction rates to be slightly below the target of 90%. Therefore, the expansion will surely solve this problem and we will be able to accommodate more patients and accept more referrals. **MEH**

Interview

AUBMC'S 2020 Vision

Middle East Health speaks to **Dr Mohamed H. Sayegh**, Executive Vice President for Medicine and Global Strategy, Raja N. Khoury Dean of the Faculty of Medicine at American University of Beirut, about AUBMC's 2020 Vision to transform health care in Lebanon.



■ Dr Mohamad Sayegh, Dean of the Faculty of Medicine at American University of Beirut.

Middle East Health: What is the AUBMC 2020 Vision?

Dr Mohamed H. Sayegh: AUBMC 2020 Vision is to transform healthcare and be the leading academic medical centre in Lebanon and the region by delivering excellence in patient-centred care, outstanding education, and innovative research, all within the major strategic commitment by American University of Beirut (AUB) for American University of Beirut Medical Center (AUBMC) and the Faculty of Medicine.

AUBMC is uniquely positioned to play a unique role as the leading academic medical centre in Lebanon and the region. The main themes of the vision integrate leadership, excellence, innovation, partnerships and expansion.

MEH: Can you give some detail why this initiative was launched?

MHS: Launched in 2010, AUBMC 2020 Vision is an ambitious and comprehensive initiative that aims to affirm AUBMC's position as the leading medical centre and healthcare institution in the region. The vision has been set into action based on the need to establish new clinical and research centres of excellence with state-of-the-art equipment and the application of best practices. It redefines service excellence and advanced healthcare while integrating regional and international partnerships.

AUBMC's 2020 Vision has progressed along six main paths 1) Providing patients with the highest standards of patient-centred care, 2) Recruitment of top-calibre, highly specialized, and accomplished faculty (from July 2009 to date over 150 faculty members from leading institutions around the world have joined AUB's Faculty of Medicine), 3) Academic innova-

tion through the creation of clinical and research centres of excellence and the provision of outstanding medical education, 4) Establishment of strategic partnerships and collaborations locally, regionally, and internationally, 5) Investing in and expanding our facilities to meet the needs of the people of Lebanon and the region, and 6) Supporting the health of local and regional patients in need by ensuring their access to care.

MEH: Who is involved in this initiative?

MHS: In short, everyone is involved in this initiative. We are witnessing great changes in medical education and, indeed, in medicine in the broadest sense. A team of top-notch leadership embody the vision and values of the organisation, ensure shared and unwavering approaches to performance management, encourage, enable and reward learning, quality improvement and innovation. In addition to AUBMC leadership, faculty and staff members participate instrumentally in developing a workforce that would yield the most advanced results in health and social care through increased partnerships and collaboration.

MEH: I understand that around 80% of AUBMC 2020 Vision is complete? Can you tell me a bit more about what has



The entrance to American University of Beirut Medical Center.

been completed and what parts are outstanding?

MHS: After years of extensive and relentless work, it gives me great pleasure to highlight the progress we have achieved so far. Multiple services (including centres of excellence, specialized clinical services and units) were established to meet the needs of our patients.

These services target diseases that are important to Lebanon and the region and allow AUBMC to lead the delivery of patient care through a focus on a comprehensive and multidisciplinary approach. In these past years, AUBMC has witnessed the establishment of state-of-the-art buildings like Souad and Wassef Sawwaf Building, Medical Administration Building (MAB), and the Halim and Aida Daniel Academic and Clinical Center (ACC) in addition to centres of excellence in oncology, neuroscience, multiple sclerosis, and child cancer, as well as new clinical programs, services, and units. Moving forward, a new medical complex will also be established to house around 150 new beds. The Faculty of Medicine has also been acclaimed for the recruitment

of over 150 top-calibre, highly specialized and accomplished physicians and scientists; hence, reversing the brain drain. As an academic medical centre, AUBMC has also been able to standardize and improve the ethical standards of human subject research aligned with the improvement of inter-disciplinary and inter-faculty research initiatives.

MEH: What new medical disciplines will be introduced?

MHS: The medical centre will grow from an approximately 350-bed institution to a 550-bed medical complex. AUBMC has so far fully established four unique centres of excellence that carry out three primary missions namely, the provision of clinical services, teaching, and research. These include the Abu Haidar Neuroscience Institute, the Nehme and Therese Tohme Multiple Sclerosis Center, the Children's Cancer Center of Lebanon, and Naef K. Basile Cancer Institute. AUBMC will be opening a Heart and Vascular Center of excellence in 2017 that will help address

We seek to advance cutting-edge technology at AUBMC to become commensurate with healthcare delivery in the best academic centres in the US.

issues essential to reducing the burden of the disease in Lebanon and the region.

MEH: What new technology has / will be introduced?

MHS: We seek to advance cutting-edge technology at AUBMC to become commensurate with healthcare delivery in the best academic centres in the US. To pursue ground-breaking treatment, numerous

clinical centres such as the Special Kids Clinic, the Metabolic and Bariatric Surgery Unit, and Robotic Surgery have been effectively running. To take basic and clinical research at AUB to international standards, five basic and translational research centres of excellence have also been established. These include Cancer Biology, Cardiovascular Sciences, Genetics, Neuroscience, and Therapeutic Stem Cells. To meet the medical needs of the community, various technologies such as the PET/CT have been installed.

Another project under planning at AUBMC is the hybrid OR which will combine advanced imaging capability with a fully functioning operating suite

MEH: What have been the main challenges in implementing the 2020 vision and how have they been resolved?

MHS: Political instability in the country and the region are perhaps amongst the most arduous challenges that we have been trying to accommodate throughout the past years. In that sense and since it is a major leap for the healthcare system in general and for AUBMC in particular, the execution of the AUBMC Vision faced multiple challenges. Chief amongst these were fundraising and recruitment of faculty of high calibre and expertise. In addition, change in healthcare isn't as easy as it may sound. In general, people resist change; and without full buy-in from all faculty and staff, we will not be able to implement the vision. Hence, AUBMC faculty and staff, and by believing in the 2020 Vision, have been the drivers of change.

Training healthcare personnel and delivery of healthcare services, especially to the most complex and financially challenged patients, has been a responsibility increasingly shouldered by AUBMC over the years. Yet, we have managed to successfully raise funds (directly and with several volunteer groups) to support the treatment of needy patients at AUBMC, another major challenge. With that being done, AUBMC has been able to treat hundreds of patients and launch over 40 initiatives across several departments, to provide excellent healthcare to the most vulnerable patients at our medical centre.

MEH: AUBMC 2020 Vision will see the expansion of a number of disciplines. Looking at research specifically, what new research avenues do you foresee opening up at AUBMC?

MHS: Consistent with its pioneering role in delivering cutting-edge research and stemming from its steadfast dedication to enhancing human health, the AUBMC 2020 Vision has signed an agreement to set the ground for establishing numerous first-of-their-kind research and academic centres, the latest and most ground-breaking of which is the Pillar Genomics Institute of Precision Medicine. This institute will transform the way diseases are treated, linking advanced research and next-generation sequencing in the laboratory to the patient's bedside. Using precision medicine will translate research breakthroughs into the most advanced therapies for patients.

MEH: With the increased patient capacity – will AUBMC see more foreign patients, more patients in financial need, more patients from refugee populations?

MHS: AUBMC is committed to improving the health of its entire regional community, particularly those that need it most, the ones with the most limited resources and means to do so. That includes patients with limited financial resources, as well as those that have been most affected by the turmoil that has plagued our region over the past several years.

In addition to needy patients and as leaders of healthcare in the region, we at AUBMC are committed to doing our part by providing refugees, displaced and vulnerable, with the medical care they need. The most recent estimates put the number of refugees in Lebanon at approximately one million. Refugee families living in Lebanon are in dire need of support. AUBMC's community service efforts span across all of Lebanon to provide emergency assistance to patients who arrive from the different Arab countries, specifically Syria and Iraq.

Through its affiliation with the Iraqi government, AUBMC has become a major hub for Iraqi patients whose cases lack adequate local avenues for care. Additional AUBMC community service ac-

The AUBMC has signed an agreement to set the ground for establishing numerous first-of-their-kind research and academic centres, the latest and most ground-breaking of which is the Pillar Genomics Institute of Precision Medicine.

tivities include Palestinian refugee camp visits and free public health screenings.

MEH: Regarding patients in need, I understand there have been considerable fund-raising initiatives to support treatment of this patient sector at AUBMC. Can you tell me more about this?

MHS: Several funds have been established to treat patients using the most advanced facilities, equipped with cutting-edge technology and expertise in various medical disciplines, modalities of treatment and supportive care. Amongst these are the Braveheart Fund, the OpenMinds Fund, the Neonate Fund and many others.

In addition to providing direct medical care to regional patients, AUBMC has assisted our regional neighbours through education to build the capacity to better care for patients in their countries and territories. AUBMC continuously hosts and funds numerous workshops for Iraqi and Palestinian healthcare professionals. One such initiative is the training of healthcare professionals operating in the West Bank. Through the Medical Welfare Trust Fund (MWTF), many successful patient-centred activities have been implemented across the West Bank including numerous health/wellness fairs, and organized interactive awareness sessions across different specialties. **MEH**

LAUMC-RH

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Clemenceau Medical Center cares for patients from Lebanon and the region

Clemenceau Medical Center in affiliation with Johns Hopkins Medicine International is an ultra-modern medical center in Beirut. Its mission is “Caring, Safety, Excellence”, aiming to provide quality healthcare services for patients from Lebanon and the region.

CMC was accredited by JCI in January 2009, reaccredited in January 2012, and again got the triennial Accreditation in January 2015. CMC is proud to adopt the world’s most optimal quality Standards and Ethics for the healthcare industry, and to join the elite group of few hospitals worldwide who really embrace the culture of excellence and relentless commitment for high quality patient care. In September 2014 CMC got the MTQUA certification as a World’s Best Hospital for Medical Tourism.

The hospital, with 158 operating beds, provides all the essential medical services a patient might need from outpatient to inpatient care – doctor’s visits, testing, surgery, laboratory, imaging and hospital care – all under one roof, in a five-star hotel ambiance with first class-service.

CMC also includes 16 ICU/CCU beds and 6 NICU beds, where patients are monitored in private rooms with the most advanced technology, with a one-on-one nurse ratio. CMC provides a ward with 8 beds for patients undergoing ambulatory and day surgeries. Full emergency room services and urgent care are also provided at the hospital.

CMC houses all the specialty branches and offers a completely film-less digital medical imaging environment, and has built and equipped nine of the most modern Operating Theaters complemented by advanced laparoscopy, OR automation systems, which provides real-time video tele-conferencing from any Operating Theater with the main auditorium and the outside world.

CMC was the first facility in Lebanon to



introduce the multi-disciplinary Robotic Surgery program using the Da Vinci Robot and recruited a team of specialized surgeons.

Centers of Excellence

CMC accommodates Centers of Excellence for neuroscience, digestive diseases, bariatric surgery, cardiology and orthopedics. CMC recently opened a Cancer Care Center, which in addition to oncology, surgery and chemotherapy includes a radiotherapy unit that provides comprehensive treatment including radio surgery and stereotactic services as well as advanced chemotherapy.

The Clemenceau Clinic and OPD facilities incorporates 82 consultation clinics: Eye and Laser Vision Correction Center, ENT and Hearing center, Plastic Surgery and Dermatology Center, Women’s Clinic, Dental Clinic, and Aesthetic Medicine clinic and Medical Spa.



Clemenceau Medicine International (CMI), is responsible for the advancement and spread of the Clemenceau Medicine’s mission of patient care regionally and internationally. CMI’s expertise and know how ensures the development of modern institutions in accordance to the highest international quality standards. Being part of the Clemenceau Medicine Network (CMN) enables all members of the network to benefit from the skills and technical expertise. CMI is currently engaged in several healthcare projects in Amman, Riyadh and Dubai. **MEH**

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The region's leading Cancer Center

Clemenceau Medical Center opens the first of its kind Cancer Center in Lebanon and the Middle East. The center is equipped with The Varian Truebeam STX and Bainlab Robotic couch, a state-of-the-art radiotherapy technology that targets cancer cells with high levels of accuracy without harming any healthy tissues. Patients will find a healing and compassionate environment where they will be treated with care and professionalism by an exceptionally skilled and renowned team of staff and physicians from Europe and USA who believe that with high tech and comprehensive treatments come higher hopes of healing. CMC will offer its patients a unique one stop care experience.





Medical tourism – the fastest growing sector in Indian tourism

India's medical tourism market continues to grow. It is an attractive destination for foreign patients because of the low cost of medical procedures and the high quality of treatment offered in several advanced hospitals accredited by the Joint Commission International. *Middle East Health* reports.

The world medical tourism market is projected to reach US\$143.8 billion by 2022, according to a new report published by Big Market Research.

North America and Asia-Pacific are estimated to remain principal revenue-generating regions and collectively accounted for more than 60% of the global medical tourism market in 2015, in terms of revenue.

The Asia-Pacific is the fastest growing region and within this region India and Malaysia are the fastest growing countries.

The report notes that the cancer treatment segment would continue to lead the market throughout the analysis period owing to an increase in the number of cross-border travellers seeking better cancer treatment. In addition, cancer treatment is expensive and prolonged, hence better treatment available at affordable prices

motivates several patients to choose medical tourism.

North America and Asia-Pacific are the major hosts for travellers seeking cancer treatment. In addition, neurological treatment emerged as the fastest growing segment with a compound annual growth rate (CAGR) of 16.2%, in terms of revenue, during the forecast period. Neurological treatment requires a high level of expertise and there are limited personnel with the requisite expertise. An increasing number of people are diagnosed with neurological ailments, owing to their stressful lifestyles and increasing longevity. This is anticipated to increase the number of medical tourists travelling to destinations which



offer advanced neurological treatment.

In India medical tourism is the fastest growing segment of the tourism industry in the country according to a recent report by iGate Research. The report says the Indian medical tourism sector is expected to experience a CAGR of 17% during the period 2015- 2020. The report notes that as medical treatment costs in the developed world increase more patients from Western countries are finding the prospect of international travel for medical care increasingly appealing.

In October 2015, India's medical tourism sector was estimated to be worth \$3 billion. It is projected to grow to \$7-8 billion by 2020.

According to iGate Research, Afghanistan is the leading source country for medical tourism in India, followed by Bangladesh – primarily due to their close proximity with India and poor healthcare infrastructure. Iraq, the Maldives and Nigeria are next on the list. Other important source countries include the United States, United Kingdom and the United Arab

Fortis Hospital in top 10 hospitals for medical tourism worldwide

In 2014 the Medical Travel Quality Alliance ranked the top 10 hospitals in the world for medical tourism.

MTQUA points out that medical tourists are not ordinary patients, and require care beyond standard clinical protocols. Communication, cultural expectations, social practices, ethics, and post-discharge care coordination are some of the factors that affect good care for traveling international patients.

“It's almost impossible for medical tourists to know how to find a good hospital that will truly provide the

treatment and care they are traveling to get. We hope consumers and doctors will pay more attention to non-clinical factors that can significantly impact clinical outcomes and not just ask about hotels and airport pickups,” says Julie Munro, MTQUA president.

Fortis Hospital in Bangalore ranked number 3 on the list and was the only hospital in India to make the top 10.

MTQUA says their criteria for selecting the top 10 hospitals for medical tourism includes communication, transparency, privacy, security, marketing, ethics and leadership.

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Extending over an area of 5,00,000 square feet, easily accessible from all parts of Chennai. Sri Ramachandra Medical Centre has always been a forerunner in the field of healthcare and education - housing 780 beds, equipped with the latest technology and powered by a panel of internationally acclaimed doctors. SRMC holds a lasting commitment to its patients, providing them with the highest quality care, while incorporating the latest healthcare trends. Excellence in over 50 specialities, constant research and a host of achievements make SRMC a leader in Health Care in India.

SPECIALITIES & SUPER SPECIALITIES

- | | | |
|---|---|---|
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|---|---|---|

OTHER SPECIALITY CLINICS INCLUDE

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Aesthetic Surgery • Arthroscopy Clinic • Asthma and Allergy Clinic | <ul style="list-style-type: none"> • Cleft Lip & Palate Clinic • Diabetic Clinic • Epilepsy Clinic • Hypertension Clinic | <ul style="list-style-type: none"> • Immunization & Well Baby Clinic • Ortho/Joint Replacement Clinic • Foot Clinic |
|--|--|--|

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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First teaching hospital in India
to be accredited by JCI



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Emirates. The report notes that Russia is an important emerging source of medical tourists for India and it is expected to grow significantly over the next few years.

According to the Confederation of Indian Industries, the primary reason for foreign patients to go to India for treatment is cost-effectiveness and treatment from accredited facilities on par with developed countries. The *Medical Tourism Market Report: 2015* found that India offered “one of the lowest cost and highest quality of all medical tourism destinations. It offers a wide variety of procedures at about one-tenth the cost of similar procedures in the United States”.

Advantages of medical treatment in India include reduced costs, the availability of the latest medical technologies and a growing compliance with international quality standards. With English widely spoken in India, foreign patients are less likely to face

a language barrier in the country.

To cater to the growing demand, several leading hospitals in India have established ‘International’ desks and foreign concierge services to assist foreigners seeking medical treatment in India.

India has 27 Joint Commission International (JCI) accredited hospitals. The complete list of JCI-accredited hospitals can be found here: <http://tinyurl.com/guabmoz>.

The city of Chennai has been termed “India’s health capital”. Multi- and super-specialty hospitals across the city bring in an estimated 150 international patients every day.

Government assistance

The Indian Government has removed many visa restrictions and introduced a visa-on-arrival scheme for medical tourists – a Medical Visa and Medical Attendant Visa – from selected countries; this allows



foreign patients to stay in India for 30 days for medical reasons which can be extended up to one year depending upon treatment requirements.

According to Dr Mahesh Sharma, Minister of State for Culture and Tourism (Independent Charge) and Minister of State for Civil Aviation, a National Medical and Wellness Tourism Board has been constituted to provide a dedicated institutional framework to take forward the promotion of Medical Tourism, Wellness Tourism and Yoga, Ayurveda Tourism and other formats of the Indian system of medicine covered by Ayurveda, Yoga, Unani, Siddha and Homeopathy (AYUSH).

This Board works as an umbrella organization that governs and promotes this segment of tourism in an organized manner. It has representatives from AYUSH, Quality Council of India, and the National Accreditation Board for Hospitals and Healthcare Providers (NABH). **MEH**

Omani toddler undergoes cardiac and tracheal surgery at Apollo Children’s Hospital

Earlier this year Apollo Children’s Hospital in Chennai successfully performed for the first time in India a high-risk combined cardiac and tracheal surgery on a 11-month-old Omani patient.

Yaseen Essa Salim Saleem Al Ruqai-shi, a Down’s syndrome patient, was diagnosed with congenital heart problems and life-threatening narrowing of the airway passages. These conditions caused repeated respiratory infections and increased risk of cardiac arrest for Yaseen. Omani doctors, realizing the need for a multi-disciplinary approach along with effective pre and post-operative care, referred Yaseen to Apollo Children’s Hospital, Chennai.

The Omani infant with large VSD (Ventricular Septal Defect) and PDA (Patent Ductus Arteriosus) was kept on a ventilator for two months with congenital tracheal stenosis. The team at Apollo Children’s Hospital coordinated the transfer of the patient from Oman and took care of the preoperative procedures.

The combined cardiac and thoracic surgery lasted six hours, with cardiac,

thoracic, anaesthesia and critical care teams working hand in hand to correct Yaseen’s heart defect and rectify his narrow airway passage.

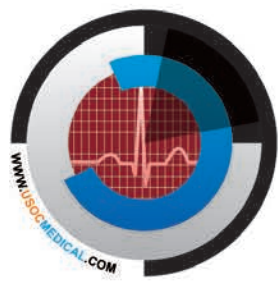
Commenting on the risk involved in the procedure, Dr Rajan Santosham, Thoracic Surgeon, said: “It was a very challenging procedure considering the infant’s age and the fragile condition of both his heart and windpipe. But thanks to the careful planning of our multi-disciplinary team we were able to successfully perform the surgery.”

Dr Neville Solomon, Pediatric Cardio Thoracic Surgeon, Apollo Children’s Hospital, Chennai, said: “The success of the procedure confirms the potential for safe and effective access to combined cardiac and tracheal surgeries to be performed in India. Yaseen is breathing naturally for the first time in two months of being on a ventilator.”

Post-surgery, Yaseen was moved to the CTICU (Cardiothoracic Intensive Care Unit) and was managed by the Critical Care Unit of Apollo Children’s Hospital.

Apollo Hospitals wins IMTJ award

The IMTJ Medical Travel Awards 2016 celebrate outstanding achievement in the medical travel, medical tourism and health tourism industry worldwide. At the awards Apollo Hospitals in India won the IMTJ Medical Travel Award 2016 for ‘International stem cell treatment centre of the year’.



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Excellent cancer care at Jaslok Hospital

The Jaslok Hospital is a multi-specialty hospital and research centre in Mumbai. The hospital is committed to treating patients with medical excellence, care, compassion and tenderness. It offers support to patients and their family members, who find themselves in such environment where they have to interact with new people, new places, new doctors and other personnel.

Jaslok Hospital provides healthcare that includes prevention, excellent treatment, rehabilitation and health education for patients and their families. The hospital is famous for the pleasant, comfortable, air-conditioned patient rooms equipped with nurse call systems, television, refrigerator and telephone facility during their treatment.

Oncology

Cancer is no longer a dreadful word. It is a potentially curable disease today, if diagnosed at an early stage. When the cure is not possible, the patient can be treated to have a good quality of life. Early detection, correct diagnosis and a correct treatment plan is the key for successful treatment.

Right from its inception, the Oncology Department at Jaslok Hospital has been comprehensive, modern and equipped with state-of-the-art facilities, making it one of the best cancer hospitals in Mumbai, India. The facilities have been upgraded over a period time. In order to ensure the best treatment and care to our cancer patients, the management and trustees of our hospital have been constant visionaries and are always providing their full support.

Department of Medical Oncology

Chemotherapy is the use of medicines to treat cancer. These medicines prevent cancer cells from spreading by destroying them, thereby halting the growth of

cancer. Our Medical Oncology Unit is well-equipped with specially trained chemotherapy nurses, facilities of day-care chemotherapy (for outpatients) and inpatient chemotherapy. The chemotherapy nurses are trained for handling special central venous access devices (CVADs) including peripherally inserted central catheters (PICCs), port and Hickman catheter. We have a team of medical oncologists who are trained in managing cancer patients in every way.

Bone Marrow and Stem Cell Transplant Unit

Three-bedded Bone Marrow and Stem Cell Transplant Unit has been established since 2001. So far, we have performed 300 allogeneic and autologous stem cell transplants for both adult and paediatric patients.

Our success rates have been good. Transplants are being performed for all diseases including thalassaemia, multiple myeloma, acute leukaemia, lymphoma and aplastic anaemia.

Department of Radiation Oncology

Our Radiation Therapy Department is one of the oldest centres (in private sector) of the country and was started in the year 1998. It has been upgraded with state-of-the-art technologies. It presently functions with two linear accelerators, one telecobalt, one brachytherapy unit, one simulator and treatment-planning computers.

The latest technology of conformal radiotherapy, without intensity modulated radiation therapy (IMRT) or image guided radiotherapy (IGRT), are carried out under experienced personnel. The facilities are available for all sectors of the society with the support of social workers for needy patients. On an average, over 100

patients receive radiotherapy daily in our excellent facility.

Department of Surgical Oncology

Surgical expertise is available for all cancer types cancers with a dedicated team.

The Department of Surgical Oncology has dedicated surgical specialists (that were formerly at the Tata Memorial Hospital) for management of cancers of the head, neck, breast, thorax, gastrointestinal tract, female reproductive system and genitourinary tract. This team of specialists is complemented by a reconstructive surgeon (for complex reconstruction including microvascular free flaps after ablative surgery, for oral and other cancers), radiologists (for accurate imaging with the latest machines), a nuclear-medicine specialist (for PET-CT and nuclear scans), onco-pathologists (for tissue diagnosis and staging), intensivists and other medical and rehabilitation specialists within the hospital.

Department for Cancer Support

This department is complemented by physical infrastructure as well as human resources for providing complete service to patients. We also have facilities for post-therapy rehabilitation, counselling regarding care during chemotherapy, diet, patient support group, pain-management support group and medical social worker

Lectures are being conducted by our team of oncologists for spreading cancer awareness in the society.

Our motto for treating cancer patients is complete well-being of their physical, mental and psychological health and to offer a good quality life.

■ For more information about the hospital and information for international patients, visit: www.jaslokhospital.net **MEH**

BE CANCER FREE

●●● Stay positive. In modern times, Cancer is neither the end of the world nor the end of life if diagnosed early, treated correctly and a plan put in place. At Jaslok Hospital we can diagnose exactly what you need, provide every form of solution as well as possess the experienced doctors and technology to deliver it. We are the premier Centre of Excellence, when it comes to our Oncology Department.

Comprehensive solutions across the spectrum

From precise diagnosis and exact therapies to advanced stage care.



Department of Medical Oncology

Our Chemotherapy centres can handle outpatients and inpatients across a wide variety of devices.



Department of Nuclear medicine & PET CT

The department has several machines and technology to diagnose various cancers.



Bone marrow and stem cell transplant unit

We have performed 300 Allogeneic and Autologous stem cell transplants till date.



Department of Surgical Oncology

When surgery is the only option, you're in the best hands, both human and robotic.



Department of Radiation Oncology

The highest technology to treat the diseased area while protecting healthy organs.



Department of Cancer Support (Palliative Care)

The best facilities for post-therapy rehabilitation and a patient support group among others.



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India Report

Health Travellers Worldwide

Health Travellers Worldwide (HTW) is an Independent Health Advisory Services Company catering to discerning patients seeking quality healthcare abroad.

"Let's get you better" is our motto and we aim for this by finding our patients the Right Doctors and Right Hospitals in various parts of the world. We are driven by empathy, honesty, experience and trust in all our dealings.

Presently, our Pan India presence includes our own fully trained, multilingual International Patient Services staff stationed at our Preferred Network Hospitals in Chennai, Bengaluru, Mumbai, Hyderabad and New Delhi. We also have a strategic tie-up for ground handling of our patients to Singapore.

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Mr Zakariah Ahmed, Founder & Chief Mentor, HTW has a cumulative experience of 19 years in International Patient Management having handled over 6000 patients to India in 2015 itself primarily from Middle East and Africa especially for the most critical and complex cases with high patient satisfaction. He has worked with leading Hospital Groups in North & South India and is well networked with key stakeholders in the healthcare sector worldwide especially in SAARC, Middle East and the African continent.

■ For more information, visit: www.HealthTravellersWorldwide.com



Zakariah Ahmed, Founder & Chief Mentor, HTW

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Dr Margaret Chan, Director-General of the World Health Organization, at the 69th World Health Assembly.

An ambitious new era for health development

Director-General of the World Health Organization, Dr Margaret Chan's speech at the opening of the 69th World Health Assembly in Geneva on 23 May, is clearly pertinent to the current state of worldwide health. It deserves publishing it in full. She puts into context what remarkable feats have been achieved and warns of the challenges we face. What's abundantly clear, is that all countries, now more than ever, need to work collectively to protect all people from the threat of pandemic disease and other health disasters. As she says, 'we have entered an ambitious new era for health development ... and we have a solid foundation of success to build on.'

Mister President, Excellencies, honourable ministers, ambassadors, distinguished delegates, colleagues, ladies and gentlemen,

Public health constantly struggles to hold infectious diseases at bay, to change lifestyle behaviours, and to find enough money to do these and many other jobs.

But sometimes we need to step back and celebrate.

Commitment to the Millennium Development Goals brought focus, energy, creative innovation, and above all money to bear on some of the biggest health challenges that marred the start of this century.

We can celebrate the 19,000 fewer children dying every day, the 44% drop in maternal mortality, and the 85% of tuberculosis cases that are successfully cured.

Africa in particular can celebrate the 60% decline in malaria mortality, especially since the African Leaders Malaria Alliance, supported by partners, did so much to make this happen.

We can celebrate the fastest scale-up of a life-saving treatment in history. More than 15 million people living with HIV are now receiving antiretroviral therapy, up from just 690,000 in 2000.

A culture of measurement and accountability evolved to make aid more effective. Greater transparency brought the voice of civil society to bear in holding governments and donors accountable for their promises.

The profile of health changed, from a drain on resources to an investment that builds sta-

ble, prosperous, and equitable societies.

Everyone in this room can be proud of these achievements.

You have saved many millions of lives. Your strategic and technical innovations have left us well-prepared to set our sights even higher. You deserve an applause.

Ladies and gentlemen,

In an interconnected world characterized by profound mobility of people and goods, few threats to health are local anymore.

Air pollution is a transboundary hazard that affects the global atmosphere and contributes to climate change.

Drug-resistant pathogens, including the growing number of "superbugs", travel well internationally in people, animals, and food.

The marketing of unhealthy foods and

Outbreaks that become emergencies always reveal specific weaknesses in affected countries and illuminate the fault lines in our collective preparedness.

beverages, especially to children, is now a global phenomenon.

Safeguarding the quality of pharmaceutical products has become much harder, with complex manufacturing procedures and supply chains spanning multiple companies and countries.

Ensuring the quality of the food supply is also much harder when a single meal can contain ingredients from all around the world, including some potentially contaminated with exotic pathogens.

The refugee crisis in Europe taught the world that armed conflicts in faraway places will not stay remote.

The Ebola outbreak in 3 small countries paralyzed the world with fear and travel constraints.

Last year, a business traveller returning home to the Republic of Korea, infected with the MERS coronavirus, disrupted the country's economy as well as its health system.

The rapidly evolving outbreak of Zika warns us that an old disease that slumbered for 6 decades in Africa and Asia can suddenly wake up on a new continent to cause a global health emergency.

This year's appearance of urban yellow fever in Africa, now confirmed in the capital cities of Angola and the Democratic Republic of Congo, is yet another serious event with potential for further international spread.

Ladies and gentlemen,

For infectious diseases, you cannot trust the past when planning for the future.

Changes in the way humanity inhabits the planet have given the volatile microbial world multiple new opportunities to exploit. There will always be surprises.

The possibility that a mosquito bite during pregnancy could be linked to severe brain abnormalities in newborns alarmed the public and astonished scientists.

Confirmation of a causal link between infection and microcephaly has transformed the profile of Zika from a mild



disease to a devastating diagnosis for pregnant women and a significant threat to global health.

Outbreaks that become emergencies always reveal specific weaknesses in affected countries and illuminate the fault lines in our collective preparedness.

For Ebola, it was the absence of even the most basic infrastructures and capacities for surveillance, diagnosis, infection control, and clinical care, unaided by any vaccines or specific treatments.

For Zika, we are again taken by surprise, with no vaccines and no reliable and widely available diagnostic tests. To protect women of childbearing age, all we can offer is advice. Avoid mosquito bites. Delay pregnancy. Do not travel to areas with ongoing transmission.

Zika reveals an extreme consequence of the failure to provide universal access to sexual and family planning services. Latin America and the Caribbean have the highest proportion of unintended pregnancies anywhere in the world.

Above all, the spread of Zika, the resurgence of dengue, and the emerging threat from chikungunya are the price being paid for a massive policy failure that dropped the ball on mosquito control in the 1970s.

The lesson from yellow fever is espe-

Unchecked, these slow-motion disasters will eventually reach a tipping point where the harm done is irreversible. The 2030 agenda for sustainable development wants to make sure these [health disasters] and many other disasters are averted. The agenda aims to do nothing less than transform the way the world, and the international systems that govern it, work.

cially brutal. The world failed to use an excellent preventive tool to its full strategic advantage.

For more than a decade, WHO has been warning that changes in demography and land use patterns in Africa have created ideal conditions for explosive outbreaks of urban yellow fever. Africa's urbanization has been rapid and rampant, showing the fastest growth rates anywhere in the world.

Migrants from rural areas, and workers from mining and construction sites, can

now carry the virus into urban areas with powder-keg conditions: dense populations of non-immune people, heavy infestations with mosquitoes exquisitely adapted to urban life, and the flimsy infrastructures that make mosquito control nearly impossible.

The world has had a safe, low-cost, and effective vaccine that confers life-long protection against yellow fever since 1937. That's nearly 80 years. Yellow fever vaccines should be and must be used more widely to protect people living in endemic countries. Yellow fever is not a mild disease.

Let me give you a stern warning. What we are seeing now looks more and more like a dramatic resurgence of the threat from emerging and re-emerging infectious diseases. The world is not prepared to cope.

High-level assessments of the Ebola response have consistently called for more resilient health systems as a first line of defence. This is also the position taken at the G7 summit being held later this week in Japan.

I welcome the current joint external evaluations that are looking at preparedness and response capacities in several countries. The evaluations need to continue with the utmost urgency, as a tool under WHO authority and coordination.

WHO is the organization with universal legitimacy to implement the International Health Regulations. The evaluations must be accompanied by well-resourced efforts to fill the gaps. Many generous countries have promised to support 76 countries to build IHR core capacities. I urge you to keep this promise.

Given what we face right now, and the next surprises that are sure to come, the item on your agenda with the most sweeping consequences, for a danger that can quickly sweep around the world, is the one on the reform of WHO's work in health emergency management.

The Secretariat's report gives you an overview of the design, oversight, implementation plan, and financing requirements of the new health emergencies programme.

Setting this up marks a fundamental change for WHO, in which our traditional technical and normative functions are augmented by operational capacities needed to respond to outbreaks and humanitarian emergencies. Implementation of this change has moved forward quickly.

The programme's design is aligned with

How the World Health Assembly works

WHO was established 68 years ago to promote health and ease the burden of disease worldwide. The Organization takes direction for its goals and priorities from the 194 Member States it is designed to serve. Each year, senior health officials from Member States come to Geneva to participate in the World Health Assembly. It is at the Health Assembly that WHO's work is reviewed, new goals are set, and new tasks assigned.

The Sixty-ninth World Health Assembly this year has a long and complex list of health challenges and responses to review.

The process at the annual World Health Assembly

At the Health Assembly 2 main types of meetings are held, each with a dif-

ferent purpose:

- **Committees** meet to debate technical and health matters (Committee A), and financial and management issues (Committee B), and approve the texts of resolutions, which are then submitted to the plenary meeting.

- **Plenary** is the meeting of all delegates to the World Health Assembly. The Health Assembly meets in plenary several times in order to listen to reports and adopt the resolutions transmitted by the committees. The Director-General and Member States also address the delegates at the plenary.

In addition, **technical briefings** are organized separately on specific public health topics to present new developments in the area, provide a forum for debate and to allow for information sharing.

the principles of a single programme, with one clear line of authority, one workforce, one budget, one set of rules and processes, and one set of standard performance metrics.

In March, I established an Independent Oversight and Advisory Committee. This 8-member committee is monitoring the development and performance of the programme. The Committee will report its findings through the Executive Board to the Health Assembly.

I urge you to give this item the serious consideration it deserves. Anything short of full political and financial support for the programme will handicap the WHO response, right now and into the future.

Ladies and gentlemen,

Few health threats are local anymore. And few health threats can be managed by the health sector acting alone.

As the international community enters the era of sustainable development, the global health landscape is being shaped by 3 slow-motion disasters: a changing climate, the failure of more and more mainstay antimicrobials, and the rise of chronic noncommunicable diseases as the leading killers worldwide.

These are not natural disasters. They are man-made disasters created by policies that place economic interests above con-

Innovations help, but ambitious goals are feasible and affordable only if we cut out waste and inefficiency. We do so through integrated, people-centred care that spans the life course, from pre-conception through ageing, and brings prevention to the fore. The target for universal health coverage moves us in that direction.

cerns about the well-being of human lives and the planet that sustains them.

This is the way the world works. The burning of fossil fuels powers economies.

Medicines for treating chronic conditions are more profitable than a short course of antibiotics. Highly processed foods that are cheap, convenient, and tasty gain a bigger market share than fresh fruits and vegetables.

Unchecked, these slow-motion disasters will eventually reach a tipping point where the harm done is irreversible.

This is best documented by the 2° C limit for catastrophic climate change. For antimicrobial resistance, we are on the verge

We have entered an ambitious new era for health development. We have a solid foundation of success to build on.

of a post-antibiotic era in which common infectious diseases will once again kill. If you want to know the future consequences of markets saturated with unhealthy foods and beverages, read the report of the Commission on Ending Childhood Obesity.

The 2030 agenda for sustainable development wants to make sure these and many other disasters are averted. The agenda aims to do nothing less than transform the

way the world, and the international systems that govern it, work.

The goals and targets are broad, visionary, and supremely ambitious. They have been criticized by some as utopian, unaffordable, out of touch, and out of reach.

I disagree. The vision inspires optimism and hope, but it is also firmly anchored in the realities of a world that desperately needs to change.

The ambition of the agenda is to tackle the root causes of the world's many woes, from the degrading misery of poverty to the consequences of terrorism and violence, in an integrated and interactive way.

The agenda puts the people left behind first. We know what this implies.

R&D market failures punish the poor. User fees punish the poor. User fees discourage people from seeking care until a condition is severe and far more difficult and costly to manage. Diabetes is a prime example. User fees waste resources as well as human lives.

The agenda is indeed broad, but so are the social, economic, and environmental determinants of health. The advantage of addressing these broad determinants is well-reflected in the operational framework for implementing the Global strategy for women's, children's and adolescents' health.

Health holds a prominent and central place that benefits the entire agenda. In the final analysis, the ultimate objective of all development activities, whether concern-

Resolutions on air pollution, childhood obesity among decisions adopted at WHA

Delegates at the World Health Assembly agreed resolutions and decisions on air pollution, chemicals, the health workforce, childhood obesity, violence and noncommunicable diseases. They also agreed to implement two new health strategies that are closely aligned with the Sustainable Development Goals. One relates to women's children's and adolescents' health; the other to healthy ageing. In summary:

Air pollution

Delegates welcomed a new road map for responding to the adverse health effects of air pollution. Every year, 4.3 million deaths occur from exposure to indoor air pollution and 3.7 million deaths are attributable to outdoor air pollution. The road map outlines actions to be taken between 2016 and 2019, and is organized into four categories.

It sets out to expand the knowledge base, by building and disseminating global evidence and knowledge impacts of air pollution of health and the effectiveness of interventions and policies to address it. The road map also aims to enhance systems to monitor and report on health trends and progress towards the air pollution-related targets of the Sustainable Development Goals. It focuses on leveraging health sector leadership and coordinated action at all levels – local, national, regional and global – to raise awareness of air pollution. Lastly, it will enhance the health sector's

capacity to address the adverse health effects from air pollution through training, guidelines and national action plans.

Chemicals

The Health Assembly also approved a resolution on the health sector's role in the sound management of chemicals. Chemicals contribute significantly to the global economy, living standards and health, but poor management also contributes significantly to the global burden of disease and death, particularly in developing countries. Worldwide, 1.3 million lives are lost every year due to exposures to chemicals, such as lead and pesticides.

Delegates reconfirmed their commitment to ensuring chemicals are used and produced in ways that minimize significant adverse effects on human health and the environment by 2020. The resolution urges Member States to strengthen international cooperation, through transferring expertise, technologies and scientific

data, as well as exchanging good practices to manage chemicals and waste.

The resolution asks the WHO Secretariat to develop and to present to the Seventieth World Health Assembly a road map outlining concrete actions to enhance the health sector engagement towards meeting the 2020 goal and associated targets of the 2030 Agenda for Sustainable Development. It also requests the Secretariat to develop a report on the impacts of waste on health and actions the health sector could take to protect it.

Health Workforce

Delegates agreed today to adopt the Global Strategy on Human Resources for Health: Workforce 2030, which aims to accelerate progress towards universal health coverage and the achievement of the Sustainable Development Goals (SDGs) by ensuring equitable access to health workers in every country. Today's resolution calls on countries to take steps to strengthen their

ing the design of urban environments or the provision of modern energy to rural areas, is to sustain human lives in good health.

In an interactive agenda, the broad determinants of health, coupled with methodologies that let us track progress with confidence, make improvements in health a reliable marker of overall progress.

Member States have approved roadmaps of strategic actions for taking forward work on individual health targets. Nearly all these strategies and plans map out priority R&D innovations that will boost the prospects of reaching ambitious goals.

Innovations help, but ambitious goals are feasible and affordable only if we cut out waste and inefficiency.

We do so through integrated, people-centred care that spans the life course, from pre-conception through ageing, and brings prevention to the fore. The target for universal health coverage moves us in that direction.

UHC is the target that underpins all others. It is the ultimate expression of fairness that leaves no one behind. It also has the best chance of meeting people's expectations for comprehensive care that does not drive them below the poverty line.

And we have other resources to tap. The Women Deliver conference, held last week in Copenhagen, provides evidence of the energy unleashed when women are freed from the constraints of violence, discrimination, and unintended pregnancies.

It also falls to the health sector to show some principled ethical backbone in a world that, for all practical appearances, has lost its moral compass. We must express outrage at the recent bombings of hospitals and refugee camps in Syria and Yemen, the use of rape and starvation as weapons of war, and the killing of innocent civilians in the pursuit of terrorist goals.

Ladies and gentlemen,

We need to celebrate not only the wealth of achievements and lessons learned during the MDG era, but also every victory that permanently eliminates a health threat.

Earlier this month, WHO declared that India has eliminated yaws from its vast population. Last year, human cases of sleeping sickness reached the lowest level seen since data collection began 75 years ago. This year, only 2 cases of guinea worm

New Health Emergencies Programme

WHO Member States agreed to one of the most profound transformations in the Organization's history, establishing a new Health Emergencies Programme. The programme adds operational capabilities for outbreaks and humanitarian emergencies to complement its traditional technical and normative roles.

The new programme is designed to deliver rapid, predictable, and comprehensive support to countries and communities as they prepare for, face or recover from emergencies caused by any type of hazard to human health, whether disease outbreaks, natural or

man-made disasters or conflicts.

WHO will provide leadership within the context of the International Health Regulations and health, in relation to the broader humanitarian and disaster-management system. As health cluster lead, it will draw on the respective strengths and expertise of a wide range of partners and Member States.

In order to fulfil these new responsibilities, delegates agreed a budget of US\$494 million for the Programme for 2016–2017. This is an increase of US\$160 million to the existing Programme Budget for WHO's work in emergencies.

disease have been detected, both in Chad.

After Cuba was validated as the first country in the world to eliminate mother-to-child transmission of HIV and syphilis, a second wave of countries will be considered by the global validation committee this week.

Polio eradication has never been so close to the finish line, with Africa now free of wild poliovirus for nearly 2 years.

During the short span of 2 weeks in April, 155 countries successfully switched from trivalent to bivalent oral polio vaccine, marking the largest coordinated vaccine withdrawal in history. I thank you and your country teams for this marvellous feat. This is another milestone towards a world permanently free of a crippling disease.

We have victories on other fronts. More countries are exercising their legal right to mandate plain packaging for tobacco products, with the UK being the latest on the list. One tobacco giant has decided not to appeal, adding to the victory.

These are critical victories. No country can hope to bring down the burden of noncommunicable diseases in the absence of strong legislation for tobacco control in line with the WHO Framework Convention on Tobacco Control.

World leaders are fully aware of the major challenges affecting health in general and this Organization in particular.

Many recent meetings have focused on the crisis caused by antimicrobial resistance. I thank Member States for taking this crisis so seriously, including the pressing need for incentives to get new products into the pipeline.

World leaders are concerned about the world drug problem and the need to broaden and balance the response by adopting a public health approach.

They are concerned about a humanitarian system that is overwhelmed and badly needs reform. This concern is reflected in the first-ever World Humanitarian Summit being held this week in Istanbul.

They are concerned about the costs, to economies as well as to health, incurred by noncommunicable diseases. Thanks to last year's successful event in Paris, the world now has a climate treaty.

I thank Member States for recognizing the critical importance of strengthening health systems and embracing the vision of universal health coverage. You have approved many resolutions that contribute to this end. We are well-poised to implement the SDGs.

You are also on the verge of delivering a solid framework for engagement with non-state actors that will mainstream a major area of reform.

This Health Assembly, with its record-breaking number of agenda items and participants, tells me how much you expect from WHO.

We have entered an ambitious new era for health development. We have a solid foundation of success to build on.

WHO, together with its multiple partners, is poised to save many more millions of lives. I ask you to remember this purpose as we go through an agenda that can mean so much for the future.

Thank you. **MEH**

WHA resolutions... (from page 57)

health workforces, including actively forecasting gaps between needs for and supply of health workers, collecting and reporting better data, and ensuring adequate funding for the health workforce.

Population growth, ageing societies, and changing disease patterns are expected to drive greater demand for well-trained health workers in the next 15 years. The global economy is projected to create around 40 million new health sector jobs by 2030; mostly in middle- and high-income countries. But despite that anticipated growth, there will be a projected shortage of 18 million health workers needed to achieve the SDGs in low- and lower-middle income countries, fuelled in part by labour mobility, both within and between nations.

Ending Childhood Obesity

Delegates considered the report of the Commission on Ending Childhood Obesity which sets out the approaches and combinations of interventions that are likely to be most effective in tackling childhood and adolescent obesity in different contexts around the world. In 2014, an estimated 41 million children under 5 years of age were affected by overweight or obesity, and 48% of these lived in Asia and 25% in Africa. Under-nutrition in early childhood places children at an especially high risk of developing obesity later in life when food and physical activity patterns change.

Member States welcomed the six recommendations detailed in the Commission's report. These include strategies to tackle environmental norms that foster obesity, reduce the risk of obesity through the life-course and treat children who are already obese to improve their current and future health. The Health Assembly calls on the WHO Secretariat to develop an implementation plan to guide further action, in consultation with Member States, and invited stakeholders to work towards implementation of the actions. The Assembly also recommended Member States develop national responses to end childhood and adolescent obesity, in line with the report's recommendations.

Global plan of action on violence

Delegates agreed a resolution on the WHO global plan of action on violence. Non-fatal acts of violence take a particular toll on women and children. One-in-four children has been physically abused; one-in-five girls has been sexually abused; and one-in-three

women has experienced physical and/or sexual intimate partner violence at some point in her lifetime.

The plan is designed to help countries strengthen action to address interpersonal violence, in particular violence against women and girls, and children. The resolution encourages countries to strengthen the role of the health system in responding to violence. It invites partners to take steps to accomplish the plan's four strategic directions: strengthen health system leadership and governance; enhance health service delivery and the capacity of health workers and providers to respond to the needs of people who have experienced violence; boost programming to prevent interpersonal violence; and improve information and evidence.

Prevention and control of noncommunicable diseases

Member States reviewed the progress made by countries in addressing non-communicable diseases (NCDs), including heart and lung diseases, cancers and diabetes, since the first UN High-level Meeting on NCDs in 2011.

There has been a significant increase in the number of countries with a national multisectoral NCD action plan (from 18% of countries in 2010 to 37% in 2015) and a NCD department within national ministries of health (from 53% to 66%). Globally, the probability of dying between the ages of 30 and 70 from a major NCD has dropped slightly, as well as alcohol per capita consumption, and the prevalence of raised blood pressure. However, significant global increases are witnessed in the prevalence of obesity and overweight.

In preparation for the third UN High-level Meeting on NCDs in 2018, Member States requested WHO update a set of very cost-effective and affordable NCD interventions that can be implemented by all Member States, as well as to develop an approach to register and publish contributions of the private sector to achieving global NCD targets.

Global Strategy for Women's, Children's and Adolescents' Health

Delegates committed to take forward the implementation of Global Strategy for Women's, Children's and Adolescents' Health (2016-2030).

The strategy sets out to ensure every woman, child and adolescent, in any setting, anywhere in the world, is able to

both survive and thrive by 2030.

The strategy, and the new operational framework, place a strong emphasis on country leadership. They highlight the need to strengthen accountability at all levels through monitoring national progress and increasing capacity to collect and analyse data. They underscore the importance of developing a sustainable evidence-informed health financing strategy, as well as strengthening health systems and building partnerships with a wide range of actors across different sectors.

Today's resolution calls on the WHO Secretariat to provide technical support to Member States in updating and implementing their national plans and to report regularly to the World Health Assembly on progress towards women's, children's and adolescents' health. It also requests the Secretariat to continue to collaborate with other UN agencies and partners to advocate and leverage assistance so that national plans can be implemented.

Global strategy on ageing and health

Delegates also approved a resolution on the global strategy and action plan on ageing and health 2016-2020. In May 2014 the World Health Assembly asked the Director-General to develop a comprehensive global strategy and plan of action, to address the world's rapidly ageing populations.

The proportion of the world's population aged 60 years or over is predicted to double between 2000 and 2050, rising to 22%. A WHO report released in October 2015 revealed little evidence that older people today are experiencing better health than their parents did at the same age. Moreover, good health in older age is unequally distributed, both within and between countries. Most health problems are linked to chronic conditions, particularly noncommunicable diseases that can be prevented or delayed by healthy behaviours across the life-course.

The aim of the strategy is for every country to commit to action on healthy ageing. It calls for the development of age-friendly environments and the alignment of health systems to the needs of older populations. It envisages the development of sustainable and equitable systems of long-term care, and improved measurement, monitoring and research. It emphasizes equity and human rights, including the important role of involving older adults in all decisions that concern them. MEH

Spotlight on the global rise of diabetes

Did you know there are now more than 422 million people living with diabetes around the world? In the Middle East alone, it is estimated that the number of people with diabetes will double to 72.1 million by 2040 with the highest prevalence in Saudi Arabia and Kuwait at 17.6% and 14.3% respectively. What is surprising is that this pandemic, to a large extent, can be prevented with the promotion of a healthy lifestyle.

The number of adults with diabetes has been rising since the 1980s and shows no signs of slowing down. Diabetes now affects 1 in every 11 adults worldwide. In 2015, an estimated 5 million people died due to diabetes-related complications, with more than 80 percent of deaths occurring in developing countries. Without effective prevention and control, diabetes will become the seventh leading cause of death globally by 2030. This health crisis comes with a heavy price tag as the complications of diabetes often include heart problems, kidney failure, blindness or lower limb amputation.

Diabetes affects the body's insulin production which regulates the blood's glucose concentration. There are three forms of the disease: type 1 which is the complete lack of insulin production, type 2 is characterized by the body's inability to effectively use insulin and type 3 occurs during pregnancy.

In reality, diabetes is manageable. With over 40 years of innovation and expertise in the field, Roche continues to support patients by empowering them with self-management solutions to improve therapy and outcomes, and reduce the human and economic burden of diabetes. These innovative solutions are providing accurate, safe diabetes management – at home or on the go.



Today, daily injections throughout the day are replaced with small and sophisticated blood glucose monitoring devices, where meters and insulin pumps connect seamlessly via bluetooth. Applications transmit blood glucose data from the meter via a smartphone directly to the healthcare provider through cloud-based platforms. It is through this regular self-monitoring that people with diabetes and their doctors can tackle this disease head on.

Taking a structured approach to personalize diabetes management gives peace of mind to patients by providing them with a better understanding of their disease and how their body is responding. Roche has consistently invested in high-quality solutions for patients, giving them the tools they need to stay in control of their health and live full, active and unrestricted lives.

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With over 40 years of innovation and expertise in the field, Roche continues to support patients by empowering them with self-management solutions to improve therapy and outcomes, and reduce the human and economic burden of diabetes.

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Increasing awareness of need for organ donation



By **Leslie Morgan**, OBE DL
CEO, Durbin PLC

Leslie Morgan is a Fellow of the Royal Pharmaceutical Society of Great Britain

Durbin is often called upon to supply the fluids that live organs are transported in. From the first successful kidney transplant in 1954, organ donation became a phenomenon of the 20th century and today it is able to extend and enhance the lives of hundreds of thousands of people worldwide. However, many more lives around the world continue to be lost due to chronic diseases because patients are unsuccessful in finding essential matching donors or because the cost of transplantation is simply too expensive.

Figures show that one registered organ donor can save approximately eight lives and can on average increase the lives of a hundred people by means of tissue donation. In the Middle East, even though there have been positive improvements over the years, figures show there is still room for growth, particularly in encouraging more people to join organ donor registers now that awareness is increasing.

Whilst transplants enjoy a high success rate, doctors still face the battle of tackling organ rejection, infections and a lack of matching donors. Patients meanwhile similarly struggle with the shortage of donors along with long surgery waiting times.

The World Health Organisation (WHO)

has identified Oman, one of the oldest independent states in the Arab World, as one of six countries who are major organ importers in the world. Local sources also reveal that it is common for Omani patients to be exploited by corrupt dealers who can demand over \$50,000 for the illegal purchase of organs such as kidneys from countries such as Pakistan and China. Nonetheless, sympathy must be shown to the circumstances of these individuals as it can take months or even years to find a matching donor and yet many are not fully aware of the adverse effects an illegally sourced organ can have on their lives.

In many cases, surgeons involved in the transplantation of organs bought on the black market, are inexperienced individuals carrying out operations in improper environments. Patients are openly putting their lives at risk by exposing themselves to surgical complications and infections that can lead to death. It is also believed that the shortage of organs in the Middle East is partly due to religious views with Oman being one of the more traditional countries in the region. Omanis consider that the body of a deceased is sacred in Islam and these views are replicated in neighbouring countries such as Saudi Arabia. There are also many misconceptions regarding the procedures of organ donation. A large number of families of potential organ donors think that the body of the donor will be left disfigured despite organs being removed surgically in a manner that is similar to any other procedure that an individual

may undergo. Doctors are of course always committed to respect an individual's body even after death.

The main obstacles that are apparent in the Middle East surrounding organ transplantation are: the need for matching donors, a general lack of knowledge by many people on the topic and religious beliefs about a deceased body. That said, it is clear that over recent developments in educating people about organ donation have made an impact. This has been mainly led by a number of organisations, such as The Middle East Society for Organ Transplantation (MESOT), which aims to promote and encourage education in the Middle East.

In the UAE, Federal Law on organ transplantation formulated by the National Organ Transplant Committee (NOTC) incorporates global best practice in the field of organ donation and transplantation that is fully compliant with Shariah principles.

Furthermore, Saudi Arabia aims to take the lead in making human organ donations easier by declaring on new driving licenses whether the driver accepts or refuses to donate organs after death, and Oman is launching a new organ donor card campaign for patients. Hopefully other campaigns will also be launched and further progress made to encourage more organ donors to come forward and register across the wider region.

Any actions that can increase legitimate organ donation and eliminate purchasing from the black market can only be a good thing. MEH

Durbin PLC is a British company based in South Harrow, London. Established for over 50 years, Durbin is a global specialist distributor operating in niche areas of pharmaceutical and medical distribution. Comprising of nine specialist divisions, Durbin prides itself on being a trusted global partner to healthcare manufacturers. The company is fully licensed by the UK MHRA, USA Pharmacy Authorities and DEA. Durbin has offices in the UK and in the USA and so can provide US, UK and European products directly from source.

- Web address: www.durbinglobal.com
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Philips unveils the industry's first MRI-guided user interface to simplify imaging of MR-Conditional implants

Magnetic Resonance Imaging (MRI) is a modality of choice for diagnosing conditions such as neurological disorders, cancer, and muscle, joint and back pain. These conditions are most prevalent in older patient populations, and the population with large joint replacements and implanted cardiac devices is expected to increase by about 70% over the next five years.

The Philips ScanWise Implant, the industry's first MRI-guided user interface and automatic scan parameter selection to help simplify the scanning of patients with MR-Conditional implants, such as knee and hip replacements, spine implants and pacemakers. The new software helps users streamline exams and supports diagnostic confidence of this growing patient population.

ScanWise Implant adds to Philips' suite of diagnostic imaging solutions designed to support healthcare professionals' first-time-right imaging, helping to improve hospital workflow, diagnostic confidence and, ultimately, patient experience.

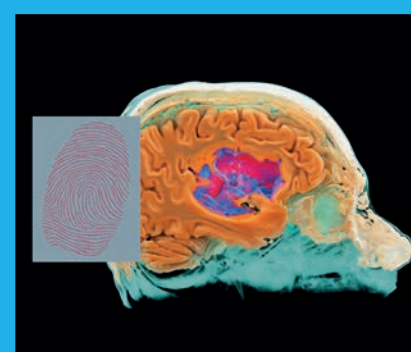
● For more information, visit: www.me.philips.com/healthcare/solutions/magnetic-resonance



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ August 2016		
International Conference on Hypertension 2016	10 – 11 August, 2016 Dubai, UAE	www.thescienceone.com/ich
2nd World Summit on Cancer Science and Therapy 2016	31 August - 2nd September, 2016 Dubai, UAE,	www.bioleagues.com/conference/cancer-conferences
■ September 2016		
State of the Art Gynaecological Oncology Conference 2016	September 8, 2016 Antalya, Turkey	www.soaconference.esgo.org
MMHS-2016 Dubai, UAE	9 – 10 September, 2016 Dubai, UAE	www.academicfora.com/mmhs-september-09-10-2016-dubai-uae
The 12th International Scientific Conference on Sport, Medical and Health Sciences	10-11 September, 2016 Dubai, UAE	www.scihost.org/?ic=details&id=25
International Congress on Antiphospholipid Antibodies 2016	21 – 24 September, 2016 Antalya, Turkey	www.apsistanbul2016.org
Surgery and Anesthesia Summit	24 -26 September, 2016 Dubai, UAE	www.bioleagues.com/conference/surgery-anesthesia-conference
World Congress on Otolaryngology and Rhinology	24 -26 September, 2016 Dubai, UAE	www.bioleagues.com/conference/otorhinolaryngology-meetings-dubai
The Middle East Health Care Facility Design Projects Conference	25 – 27 September, 2016 Dubai, UAE	www.healthcarefacilityprojects.com
Oman Health 2016	26 – 28 September, 2016 Muscat, Oman	info@omanexpo.com www.omanhealthexpo.com
6th International Arab Neonatal Care Conference	29 September – 1 October 2016 Dubai, UAE	www.ancc2016.com
Contemporary Diagnosis and Management of Cardiovascular Diseases	30 September – 1 October 2016 Dubai, UAE	www.bit.ly/28ShWXd
■ October 2016		
Dubai Health Regulation & Medical Tourism Conference	4 – 5 October, 2016 Dubai, UAE	www.dhrc.ae
MEHIS — Middle East Healthcare Informatics Summit	4 – 6 October, 2016 Dubai, UAE	www.mehisummit.com
International Conference on Molecular Biology	10 – 11 October, 2016 Dubai, UAE	www.molecularbiology.conferenceseries.com
8th Annual Pharma Middle East Congress	10 – 12 October, 2016 Dubai, UE	www.middleeast.pharmaceuticalconferences.com
3rd World Congress on Hepatitis and Liver Diseases	10 – 12 October, 2016 Dubai, UAE	www.hepatitis.omicsgroup.com



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
MENA Physical Medicine and Rehabilitation Congress	13-15 October, 2016 Dubai, UAE	www.menaphysicalrehab.com
Dubai Otolaryngology, Neurotology & Skull Base Surgery Conference	12 – 14 October, 2016 Dubai, UAE	http://dubaioto.com
Men's Health Exhibition & Conference	15 – 16 October, 2016 Dubai, UAE	www.menshealthexhibition.com
8th Annual UAE Cancer Congress	20 – 22 October, 2016 Dubai, UAE	www.uaecancercongress.ae
International Psychology Conference Dubai 2016	21 – 22 October, 2016 Dubai, UAE	www.psych-me.com
The 2nd International Conference of the Kurdistan-Iraq Society of Obstetricians and Gynecologists	26 – 28 October, 2016 Erbil, Kurdistan, Iraq	toc@theorganizers-iraq.com www.kisogconference.com
■ November 2016		
International Nursing and Healthcare Conference 2016	1 – 3 November, 2016 Dubai, UAE	www.nursing.conferencesus.com
World Congress On Neurology and Brain Disorders 2016	1 – 3 November, 2016 Dubai, UAE	www.neurology.conferencesus.com
Pathology Update 2016	3 – 4 November, 2016 Abu Dhabi, UAE	www.ascpme.org/index.php
5th International Congress for Joint Reconstruction - Middle East	3 – 5 November, 2016 Dubai, UAE	www.icjr.net/2016middleeast
5th International Society for Evidence-Based Healthcare Congress	7 – 9 December, 2016 Kish Island, Iran	www.isehc2016.com
13th Global Vaccines & Vaccination Summit and Expo	8-9 November, 2016 Istanbul, Turkey	www.vaccines.global-summit.com/middleeast
International Conference on General Practice & General Medicine	10-11 November, 2016 Istanbul, Turkey	www.generalpractice.conferenceseries.com
Advanced Medicine Congress	11 – 12 November, 2016 Abu Dhabi, UAE	www.icldc.ae/event/advanced-medicine-congress
8th Global Obesity Meeting	14 – 15 November, 2016 Dubai, UAE	www.obesitymeeting.conferenceseries.com
15th Global Diabetes Summit and Medicare Expo	14 – 16 November, 2016 Dubai, UAE	www.diabetesexpo.com/middleeast
International Conference on Chest	17 – 18 November, 2016 Dubai, UAE	www.chest.conferenceseries.com
8th Global Summit on Healthcare	17 – 19 November, 2016 Dubai, UAE	www.healthcare.global-summit.com/middleeast
Gastro 2016 EGHs-WGO International Congress	17 – 19 November, 2016 Abu Dhabi, UAE	www.gastro2016.com
Arab Diabetes Medical Congress	17 – 20 November, 2016 Doha, Qatar	info@arabdiabetescongress.com www.thedasil.org

List your conference:

If you have upcoming conference/exhibition details which you would like to list in the agenda, please email the details to the editor: editor@MiddleEastHealthMag.com

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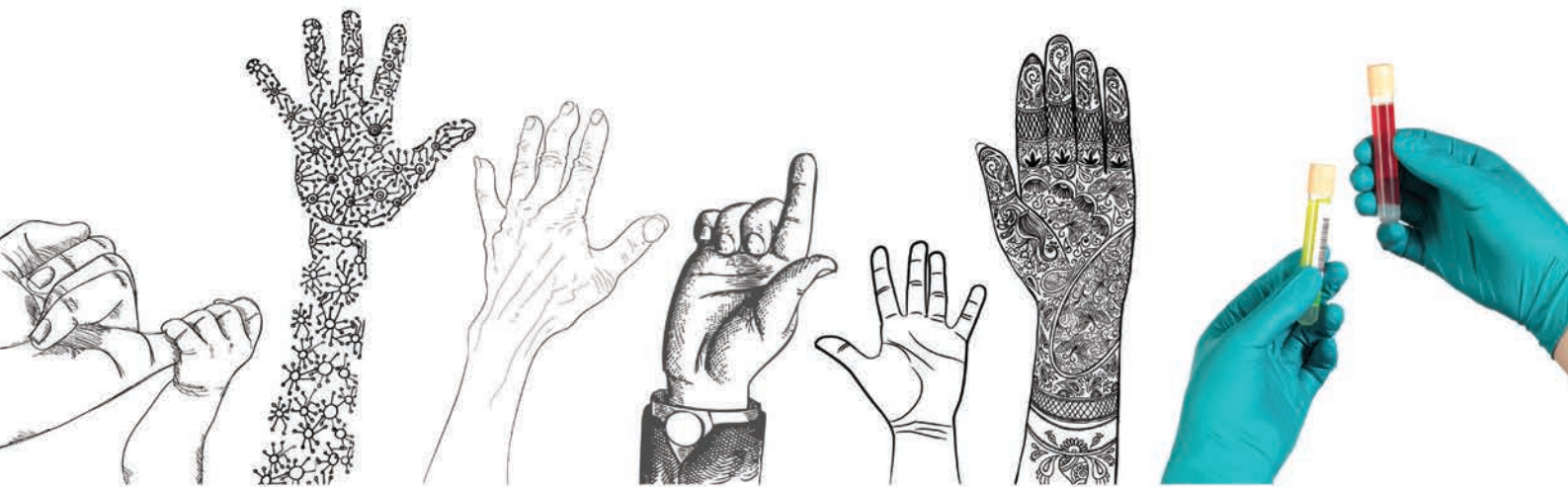
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Giving new hope to children with metabolic disease

Children's Hospital of Pittsburgh of UPMC is a leading international center for liver transplantation as a treatment for metabolic disease.

As one of the top ten pediatric hospitals in the United States, as ranked by *U.S. News & World Report*, Children's Hospital of Pittsburgh of UPMC is a pioneer in the field of liver transplantation, which has proven to be a life-changing solution for patients with metabolic disease.

Liver transplantation can dramatically reduce symptoms, and in cases like maple syrup urine disease (MSUD), can provide a cure.

Liver transplantation is more than a lifesaving procedure; it's also an attractive approach for improving quality of life for many patients with metabolic disease. In 2004, we developed the protocol for liver transplantation for MSUD. Today, we've performed more transplants on patients with MSUD than any other center in the world. That's more than 65 patients with a 100-percent survival rate. All of these patients show normal liver function, have avoided the risk of neurological complications, and enjoy an unrestricted diet.

We've performed more liver transplants for patients with metabolic disease than any other transplant center.

Since the inception of our program in 1981, our world-renowned experts have performed more than 1,700 liver transplants — that's more than any other center in the United States — with survival rates that exceed national averages. Additionally, we've performed more than 320 liver transplants for patients with metabolic disease, which is more than any other center, including adult facilities. Also, we're leaders in living-donor liver transplants, which eliminate wait times for a deceased donor and can provide excellent outcomes.

Find out more about our excellent outcomes and extraordinary care.

Our experience, expertise, and commitment to innovation and compassionate care are reasons why patients and families from around the world travel to Children's Hospital of Pittsburgh of UPMC. For a free phone consultation with one of our experts on liver transplantation as a therapeutic option for metabolic disease, please visit www.chp.edu/metabolic or send an email to international@chp.edu

Sources: Internal data, Hillman Center for Pediatric Transplantation; Scientific Registry of Transplant Recipients (www.srtr.org), December 2015 release.

