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November-December 2014

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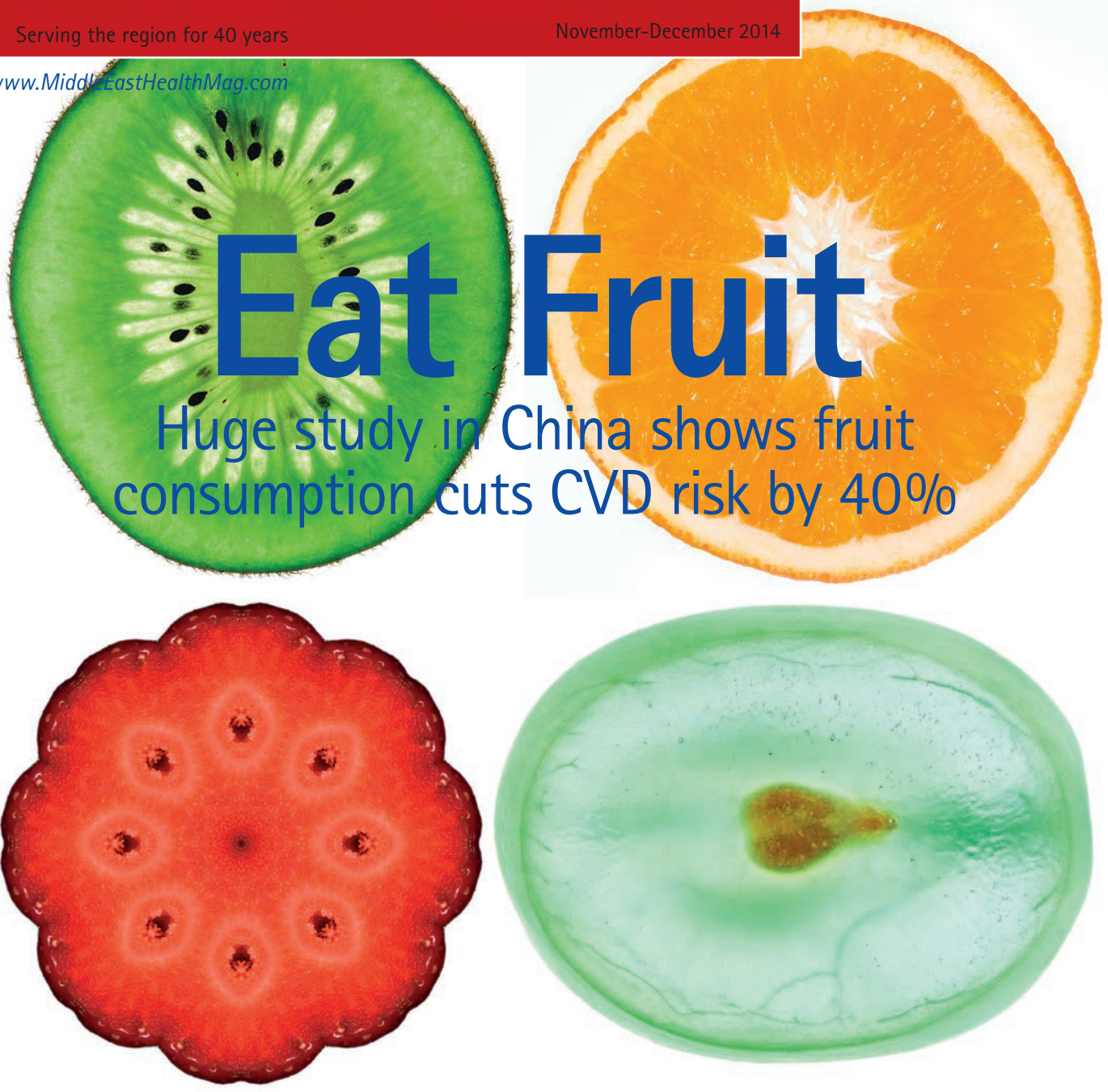

Eat Fruit

Huge study in China shows fruit consumption cuts CVD risk by 40%

Healing Light

Dynamic lighting designed to promote wellbeing in hospital

WHO EMRO 61st Meeting

Call to increase capacity to respond to emerging global health threats

In the News:

- Infertility treatment tops list of medical tourism procedures in Dubai
- Two Egyptian scientists win contest to send their Hep C research to space station
- Landmark decisions at WHO tobacco control convention

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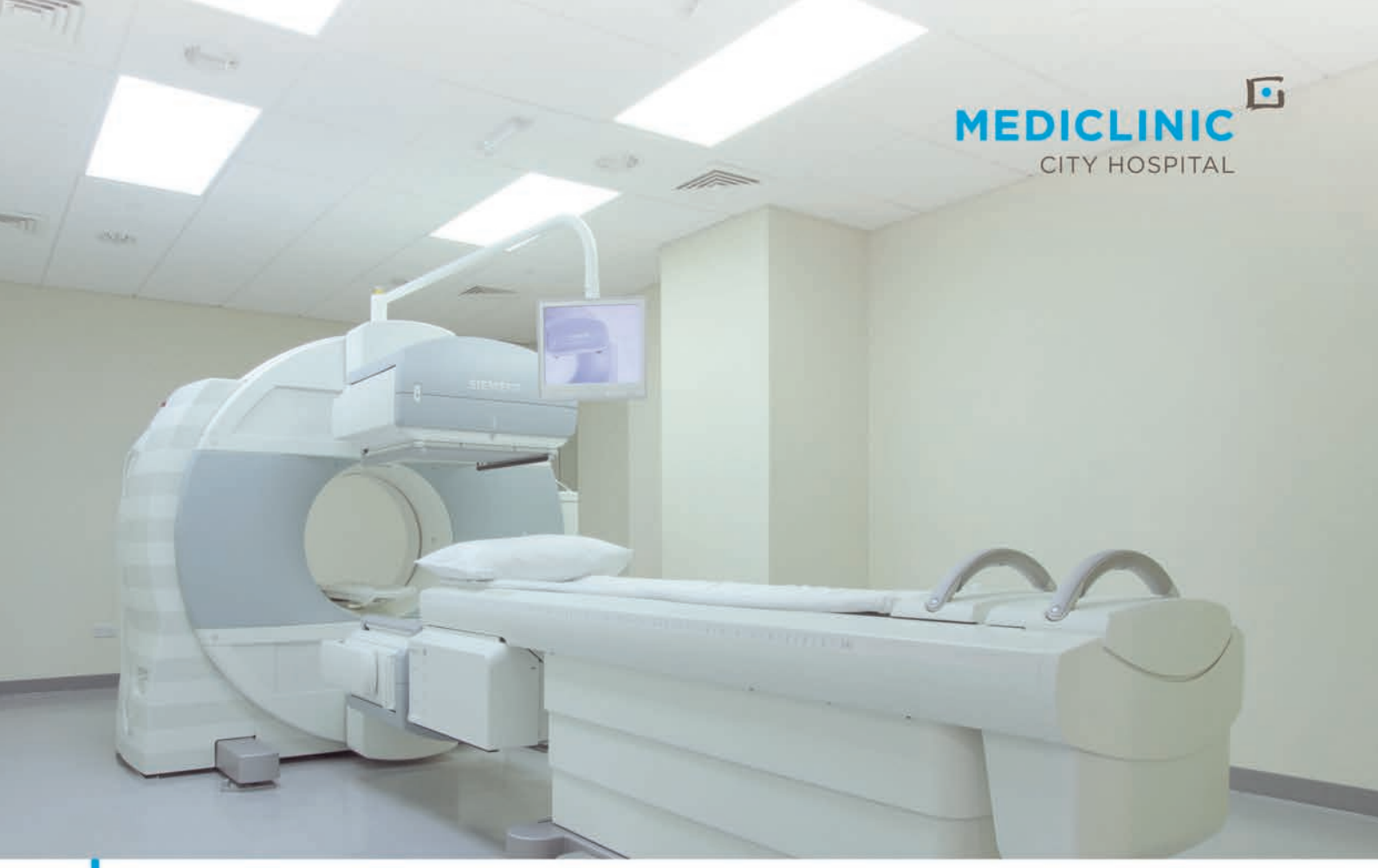

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Prognosis

Natural health

One of the regular topics of our November-December issue is Lifestyle Diseases. It's a major issue around the world encompassing preventable diseases such as cardiovascular disease, diabetes and obesity which are brought on by unhealthy living – smoking, bad diet and lack of physical exercise. I have always been a big fruit eater and advocate of its goodness. Commonsense says that it must be healthy. Now a huge study out of China shows clearly that sustained fruit consumption can decrease cardiovascular disease risk by as much as 40%. Tell your patients to eat more fruit.

Philips has been working with lighting for decades and recently, with the advent of LED lighting and the ability to make lighting dynamic, they have developed HealWell dynamic lighting for the patient room. Based on a range of research, which shows that the more time patients spend in daylight, or artificial light that mimics natural light, the better is their biological response to healing and therapy. Read more about this on page 46.

Also in this issue, we have a report from the 61st session of the WHO Eastern Mediterranean region meeting in Tunis, during which Dr Ala Alwan, the regional director, called for a strengthening of capacity to deal with emerging health threats. Read the report on page 28.

We have several interesting news reports in this issue, including the first successful birth of a baby from a transplanted womb; the two Egyptian researchers based in Munich who won a contest to send their research on Hepatitis C to the International Space Station for zero-gravity tests; a shocking document on suicide published by WHO which notes that on average globally there is a suicide every 40 seconds. It calls for action to prevent this public health issue.

Ahead of the Arab Health exhibition in Dubai in January – we have an extended Product News section. As usual you will find a wealth of news, reviews and interviews in *Middle East Health*.

Callan Emery
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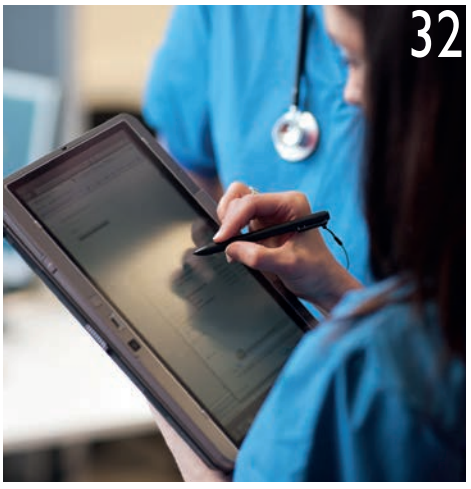

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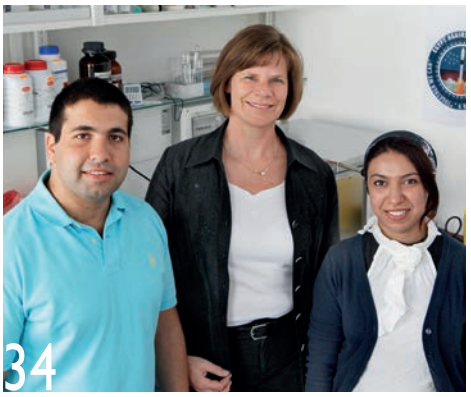

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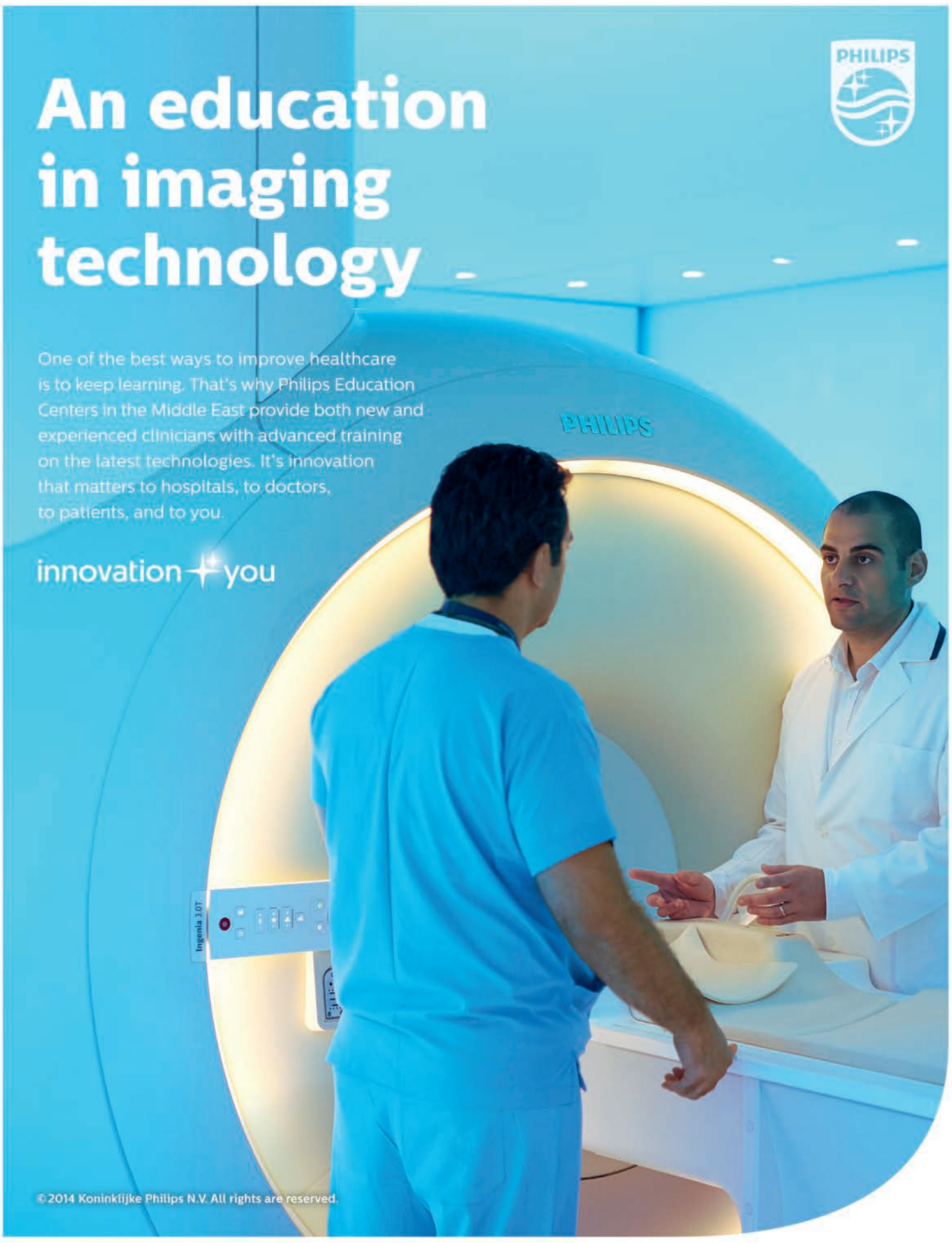

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Update from around the region

WHO: Urgent work is needed to rehabilitate the health system in Gaza to prevent loss of lives

Urgent work is needed to rehabilitate the damaged health system in Gaza to prevent further loss of life after the recent conflict, according to a World Health Organization led joint assessment of health needs and services in Gaza, released 12 October 2014.

During the conflict more than half of existing hospitals and health centres were damaged or destroyed, and over 11,000 people were injured, putting immense strain on remaining facilities. The assessment found critical shortages of essential medicines and other supplies, medical equipment out-dated or in need of repair, health staff unpaid and in need of targeted trainings, and an urgent need to ensure sufficient fuel supply for generators at health facilities.

"The health system in Gaza was already on the brink of collapse after decades of occupation, and years of blockade and conflict," Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, said. "We need sustained interventions to repair and rehabilitate the damage done during the conflict, and to strengthen the health system for the future. Without this, more unnecessary loss of life will inevitably occur."

Beyond those injured by violence, the assessment showed that during and after the conflict people with chronic health conditions such as cardiovascular disease, cancer and diabetes suffered from inaccessibility of services, shortage of drugs, and an increase in the demand for referrals outside of Gaza for patients who cannot receive adequate services in the Strip.

The assessment also warned of long-term increased demands on health services by more than 1,000 patients who acquired long-term or permanent injuries in the conflict, and the anticipated increase in mental health needs such as PTSD and depression. (WHO estimates 20% of the population in emergency-affected areas will require some form of mental health intervention.)

"WHO is working closely with the Palestinian Ministry of Health to provide patients in Gaza with access to high quality health care. This will require sustained support from donors, and unimpeded access for medicines, essential supplies and medical equipment and reconstruction materials to enter Gaza," said Dr Alwan.

WHO is supporting the following activities: repair and rehabilitation of 67 damaged hospitals and primary health centres; provision of quality essential public health services, including mental health; provision of essential medicines, especially for chronic illnesses; rehabilitation of the disease early warning system; coordination of the health sector and management of health information; facilitation of 2,000 referral patients per month for specialized medical treatment outside of Gaza.

The Gaza Strip Joint Health Sector Assessment Report is the result of quantitative and qualitative data collection undertaken at the beginning of September 2014, with the support of 23 partner organizations working in response the conflict in Gaza.

on the WEB The Gaza Strip Joint Health Sector Assessment Report
http://tinyurl.com/kvoocxb

WISH appoints chair for Cancer Care forum

The World Innovation Summit for Health (WISH), a global initiative of Qatar Foundation for Education, Science and Community Development (QF), has appointed Professor Robert J S Thomas OAM, Chief Cancer Advisor at the Department of Health, Victoria, Australia, to chair its Delivering Affordable Cancer Care Forum.

Professor Thomas will lead a team of international experts to prepare an evidence-based report that focuses on the key issues surrounding affordable cancer care provision, including:

- Understanding cost issues along the pathway of clinical care
- The design of innovative approaches for affordable delivery models for cancer care both in the developing world and in high resource countries
- Innovations around pricing and incentive structures for drugs and high cost treatments

Professor Robert J S Thomas

- Assessing better use of technology advances to add value to current cancer care methods

The Forum will then present its findings and recommendations for discussion at the next WISH Summit taking place on 17 – 18 February 2015 in Doha, Qatar.

Professor Thomas said: "This is an exciting opportunity to collaborate with a team of internationally-renowned experts and produce recommendations that will help policy-makers design, deliver and maintain affordable cancer care services while improving patient experience. This is a multidisciplinary group, and it is my hope that we will be able to discover new evidence-based insights and perspectives on an urgent healthcare challenge which affects the lives of almost everyone."

Professor the Lord Darzi of Denham, Executive Chair of WISH and Director of the Institute of Global Health Innovation at Imperial College of London, said: "The human, social and economic implications of cancer are immense. At a time when both the incidence and costs of treating cancer are increasing rapidly - especially in lower and middle income countries - it is undoubtedly one of the most important global health priorities.

"I am therefore delighted that Professor Thomas, who is well renowned for work he has undertaken with policymakers in Australia to develop new approaches to cancer care, will lead this important work on behalf of WISH. The Forum will provide a framework to enable policy and decision

makers to tackle some of the obstacles to sustainable treatment and care, and create tangible benefits for those affected by cancer around the world."

With the appointment of Professor Thomas, WISH aims to improve understanding of the multitude of factors that are driving unsustainable and dramatic cost inflation with cancer care services. The aim of the Forum will be to make practical recommendations that might enable policy makers to minimize the economic challenges and ensure sustainable access for patients to high quality cancer care services.

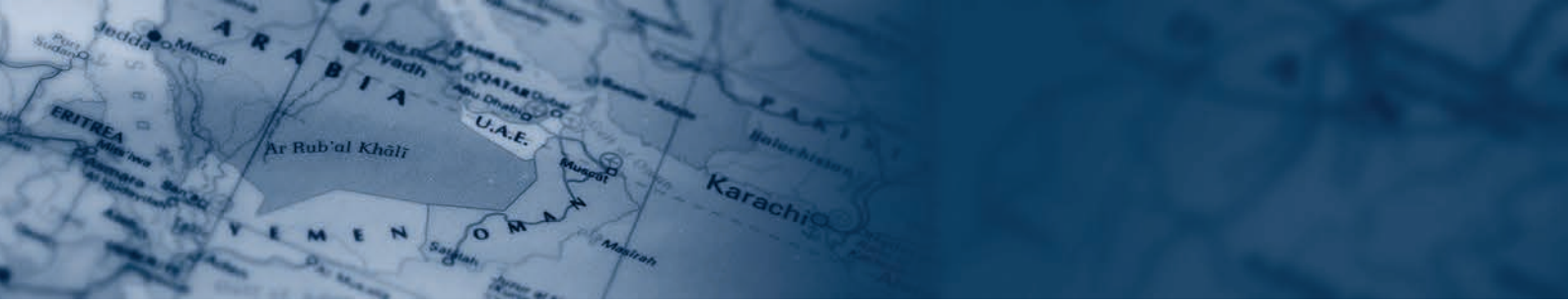
Professor Thomas is Chief Cancer Advisor to the Victorian Government in Australia and Chair of the Victorian Cancer Agency with responsibility for the translational research and funding of cancer research in Victoria. He is also Chair of the National Cancer Expert Reference Group for the Australian Government, Research Director for Global Health Delivery, International Prevention Research Institute and Distinguished Fellow, Surgical Oncology, Peter MacCallum Cancer Centre, Melbourne.

Delivering Affordable Cancer Care is one of seven research streams to be presented at the 2015 WISH Summit, where world leading experts will join an influential community of heads of state, government ministers, academics, clinicians, policy makers and business leaders to discuss innovative solutions to some of the most pressing global health challenges. As well as Delivering Affordable Cancer Care, WISH will publish reports on Communicating Complex Health Messages, Diabetes, Dementia, Universal Health Coverage, Mental Health and Well-being in Children and Young People, and Patient Safety.

DHCC introduces Appeals Board

The Appeals Board, which provides healthcare professionals and healthcare operators with an independent system to appeal against decisions relating to licensing or complaints, was formally introduced at Dubai Healthcare City (DHCC) on September 15, 2014.

The members are Dr Guy Fish, Senior Vice President at Fletcher Spaght, US, who is the current Chairman of the Board; Melanie Ho, Sales Consultant, TB&C, Singapore; Dr Alawi Al-Shaikh, Chairman, Institute of Cardiac Sciences at Sheikh Khalifa Medical City, Abu Dhabi, UAE; and Dr Matthew Lohn, Managing Partner, Field Fisher Waterhouse, UK.



Each member was carefully considered and vetted before appointment by DHCC, and will serve for an initial term of two years.

The introduction of the Appeals Board marks a significant juncture by DHCC, allowing a healthcare professional or a healthcare operator in the Dubai Healthcare City to appeal against decisions relating to licensing of healthcare professionals, including Complementary and Alternative Medicine (CAM) professionals and healthcare operators, and to appeal against complaints in relation to activities carried out in DHCC.

Marwan Abedin, CEO, DHCC, said: "The Appeals Board is part of a much broader regulatory framework that is in place to instil confidence in DHCC's healthcare standards and our governance structure. Effective and transparent regulation is a crucial factor for any medical city. As DHCC rolls out its expansion plans – against the backdrop of a growing population, medical tourism initiatives and our Phase 2 wellness concept – we are cognizant of regulation as an important driver to support long-term growth and ensure an optimum environment of care."

Regulation and licensure of all healthcare professionals and healthcare operators together with the handling of any complaints arising from the provision of clinical services is handled by the Center for Healthcare Planning and Quality (CPQ), an independent regulator overseen by Dubai Healthcare City Authority (DHCA), the governing body and regulator of Dubai Healthcare City.

Earlier this year, CPQ received the 2nd Edition of the Outpatient Clinic Quality Standards accreditation, valid from May 2013 to April 2017 from The International Society for Quality in Health Care (ISQua), a global leader in assessing the standards in healthcare safety and quality.

India attracting increasing numbers of patients from GCC

Apollo Hospitals, one of Asia's leading healthcare providers, said it has seen growing interest from patients from GCC and the greater Middle Eastern region. In a statement it notes that the Indian medical tourism industry is projected to reach US$2 billion with an estimated 3,200,000 medical travellers arriving in India by 2015 growing at an annual rate of 30%.

Apollo Hospitals noted that it recently teamed up with Dubai-based Emirates airline to connect international patients with quality healthcare services in India. As part of the joint venture with Emirates, the patients and their attendants from 19 countries across Middle East and Africa can visit the hospital's flagship locations in Chennai, Hyderabad, New Delhi, Kolkata, Ahmadabad and Bangalore to avail specially formulated fares for round-trip flights on the airline.

Dr. K. Hariprasad, CEO, Apollo Hospitals, said: "The proven Indian clinical competencies give India a huge competitive advantage. We have seen the number of patients visiting us from GCC region growing at a rapid pace. In the last few quarters we have seen a remarkable increase from UAE, Qatar and Oman. Comparing global prices for medical treatment, India leads in the race for providing quality healthcare services at affordable prices. A heart bypass surgery in India costs US$ 6,500, while in the US it costs between $30,000 and $80,000. This is a huge, untapped market, not just for therapeutic medical tourism like Ayurveda, but also for curative treatment."

Infertility treatment tops list of medical tourism procedures

Infertility treatment tops the list of medical tourism procedures, according to a new survey conducted by Dubai Healthcare City (DHCC).

The global trend points to cosmetic surgery, dentistry, orthopaedic and heart surgery as the most common procedures people undergo on medical tourism trips according to US-based public health institute Centres for Disease Control and Prevention (CDC) and Deloitte Centre for Health Solutions.

Infertility treatment topping the list of procedures medical tourists undergo at DHCC bucks the global trend of common medical tourism procedures.

Following infertility treatment, the survey findings point that medical tourists opt for cosmetic, dental, cardiac, and orthopaedic procedures, treatments or tests.

The survey was commissioned by Dubai Healthcare City using respondents from its 120 medical facilities. The data collected represents a six-month period, beginning January 2014. The sample size was weighted for facilities that offer clinical services so that it was representative of medical tourism profile.

Key findings state 48% medical tourists come primarily from the GCC; 32% from the wider Arab World; 26% from Eastern and Western Europe; and 23% from Asia.

Lebanon sets out National Polio Immunization Campaign

The Lebanese Paediatric Society (LPS) and the Ministry of Public Health held a national meeting to set the foundation of the National Polio Immunization Campaign that was due to be launched in October. The meeting was held at the Lebanese Order of Physicians; with the collaboration of UNICEF, WHO, the Lebanese Society of Physicians, the National Certification Committee (NCC) and the Expanded Programme on Immunisation (EPI) committee and was attended by paediatricians and physicians from the private and public hospitals.

The meeting marked the start of the national drive to stop polio from regaining a foothold in Lebanon after its resurgence in the region. Lebanon has been free of the highly infectious disease for the past 11 years.

Since the beginning of 2014, four immunisation rounds have been held. These started in March, and include immunisation weeks in high-risk areas across Lebanon over the summer months.

"Children need the strong immunity delivered by the oral polio drops and they need multiple doses," said Dr. Imad Chokr President of LPS. "Our message to families is clear: every child must participate in every round to prevent lifelong paralysis and keep Lebanon polio-free. Even one unvaccinated child puts all other children in Lebanon at risk."

WHO polio-prevention representatives meet in Muscat

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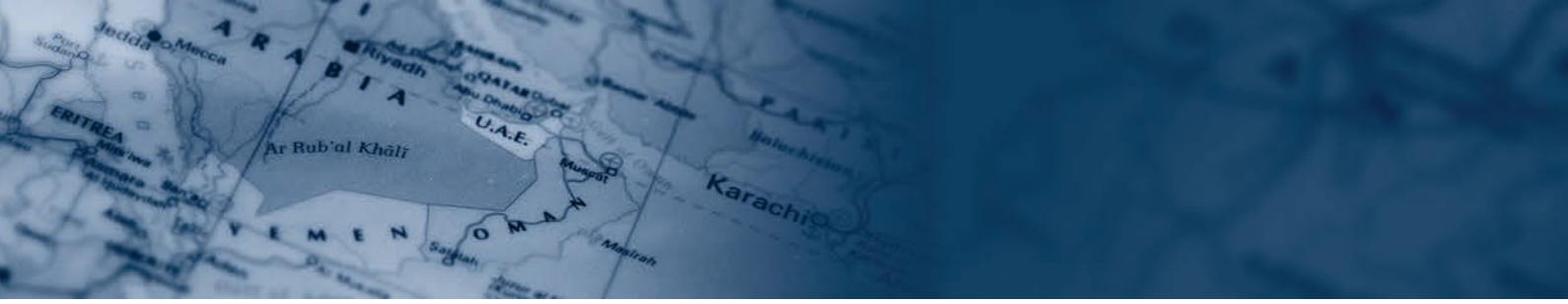

representatives dedicated to the global fight to eradicate polio met in Muscat in September to discuss plans to prevent outbreaks of polio in the Middle East and the Horn of Africa and to stop transmission of the crippling and potentially deadly disease in the endemic countries Afghanistan and Pakistan.

Representatives from across the Eastern Mediterranean Region acknowledged the difficulties faced at the level of individual countries in delivering programs and identified new tactics to focus efforts on stopping transmission in the coming months, including outbreak countries Somalia, Syria and Iraq.

"We are facing a nine-month period of intensified activity and in all of our zones of operation we are planning how best we can support the implementation of programs to effectively put a stop to polio," said Chris Maher, WHO's Manager of Polio Eradication and Emergency Support in the region.

The group of more than 40 WHO officials, mostly medical staff, identified a number of actions to prioritize operational activities targeting high-risk populations in infected and at-risk countries. The WHO experts also discussed such issues as strengthening routine immunization, the introduction of the injectable polio vaccine (IPV), surveillance and data, risk assessment, access to hard-to-reach areas and populations, communications and advocacy, among other topics.

$1 million allocated for UAE-based medical research centre

UAE-based Integrated medical services provider VPS Healthcare has allocated US$1 million for research and development in several key areas of medicine and treatment, focusing on chronic diseases and illnesses associated with old age.

VPS Healthcare has outlined a plan for its Research Centre of Excellence, a state-of-the-art R&D practice dedicated to expanding our knowledge of chronic diseases and to provide innovative treatment solutions to help the medical community combat a variety of illnesses.

"The first comprehensive project the Centre will undertake will be the study of Vitamin D-related ailments," explained Dr. Shamsheer Vayalil, VPS Healthcare's Managing Director.

The research will address key issues such as the causes and consequences of Vitamin D deficiencies, and the effect deficiency has on pregnancy within the UAE.

To lead this effort, VPS Healthcare has appointed Dr. Afrozul Haq, a renowned expert in the field of Vitamin D research, to act as the principle scientist for the Centre's inaugural project. Dr. Haq, who pioneered Vitamin D research in the UAE in 2006 at SKMC, will work to establish a solid R&D platform within the rapidly expanding VPS Healthcare infrastructure. This is something Dr. Haq views as essential to the future of preventative medicine.

"Our research will explore the link between dental caries in children, maternal Vitamin D concentrations at term, and the link between maternal Vitamin D levels with birth weight of the newborn," said Dr. Haq. "We will also study the impact of Vitamin D deficiency on chronic kidney disease patients requiring dialysis."

"Medical services cannot evolve without a commitment to research and development," Dr. Shamsheer explained. "We all know that innovation is a key driver of sustained healthcare improvement, and that no new technologies or medications have ever been introduced without breakthroughs brought from purposeful research."

The Research Centre of Excellence will work closely with a variety of partners in the UAE in the pursuit of medical innovation. The Centre will be able to leverage the research abilities of entities such as Khalifa University, Zayed University and Sheikh Khalifa Medical City, as well as VPS Healthcare's many international partners.

Young healthcare innovators called to participate

The World Innovation Summit for Health (WISH), a global initiative of Qatar Foundation for Education, Science and Community Development, is seeking talented, young healthcare innovators from around the world to participate in its Young Innovators program.

The program will offer young people aged up to 30 years the opportunity to showcase their healthcare innovations at the 2015 WISH Summit taking place on 17-18 February 2015, in Doha, Qatar. The program will also offer young innovators a unique opportunity to meet many leading health experts, policy and decision makers from around the world and provide a platform to develop and promote their ideas.

Some successful applicants may also be asked to contribute to a range of activities focusing on innovation in healthcare at the Summit. This may include taking part in panel discussions with senior delegates, explaining their own work and debating the challenges and opportunities experienced by young innovators seeking to make a difference in healthcare. Their contribution will be recorded in the Summit's official record and made available on the WISH website.

WISH is seeking applications from young people who study at Qatar-based universities and colleges. Successful applicants will be those who can demonstrate:

- Significant achievement innovating in a health-related field
- A proven track record of leadership and creating change for the benefit of their targeted community
- A commitment to innovation in healthcare and its outcomes

Entries will be reviewed by the Professor the Lord Darzi of Denham, Executive Chair of WISH and Director of the Institute of Global Health Innovation at Imperial College London, as well as a team of experts convened by WISH.

Lord Darzi, said: "Innovation and collaboration are the keys to tackling many of the most pressing international healthcare challenges. This is a once-in-a-lifetime opportunity for a limited number of young innovators from around the world, to meet and share their ideas with senior global healthcare experts and decision makers. We hope to receive applications about innovations that may very well shape the future of healthcare."

Applications should be submitted by 15 October 2014.

- Further details on the entry process, including the application form, can be found at: *www.wish.org.qa/2015-summit/young-innovators*

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Update from around the globe

New data show child mortality rates falling

New data released 16 September 2014 by the United Nations show that under-five mortality rates have dropped by 49% between 1990 and 2013. The average annual reduction has accelerated – in some countries it has even tripled – but overall progress is still short of meeting the global target of a two-thirds decrease in under-five mortality by 2015.

New estimates in the *'Levels and Trends in Child Mortality 2014'* report show that in 2013, 6.3 million children under five died from mostly preventable causes, around 200,000 fewer than in 2012, but still equal to nearly 17,000 child deaths each day.

"There has been dramatic and accelerating progress in reducing mortality among children, and the data prove that success is possible even for poorly resourced countries," said Mickey Chopra, head UNICEF's of global health programmes. "There is now a gathering momentum from countries in every part of the world to make sure proven, cost-effective interventions are applied where they will save the most lives."

In 2013, 2.8 million babies died within the first month of life, which represents about 44% of all under-five deaths. About two-thirds of these deaths occurred in just 10 countries. While the number of neo-natal deaths have declined, progress has been slower than for the overall under-five mortality rate.

In June this year, WHO, UNICEF and partners issued the first-ever global plan to end preventable newborn deaths and stillbirths by 2035. The Every Newborn Action Plan calls for all countries to take steps to provide basic, cost-effective health services – in particular around the time of childbirth, as well as for small and sick babies – and to improve the quality of care.

"The global community is poised to end preventable maternal, newborn and child deaths within a generation," said Dr Flavia Bustreo, Assistant Director General at WHO. "We know what to do and we know how to do it. The challenge now is to move from plan to action – we are pleased to see countries like India beginning to lead the way."

Among the report's other major findings:

- Eight of the 60 countries identified as 'high mortality countries' – with at least 40 under-five deaths for every 1000 live births – have already reached or surpassed the MDG target (67% reduction). The countries are Malawi (72%), Bangladesh (71%), Liberia (71%), Tanzania (69%), Ethiopia (69%), Timor-Leste (68%), Niger (68%) and Eritrea (67%).
- Eastern Asia, Latin America and the Caribbean and Northern Africa, have already reduced the under-five mortality rate by more than two-thirds since 1990.
- Two countries, India (21%) and Nigeria (13%), together account for more than one-third of deaths among children below 5 years of age.
- While Sub-Saharan Africa has cut under-five mortality rates by 48% since 1990, it still has the world's highest rate – 92 deaths per 1000 live births – nearly 15 times the average in high-income countries.

The leading causes of under-five deaths are pre-term birth complications (17%); pneumonia (15%); complications during labour and delivery (11%); diarrhoea (9%); and malaria (7%). Under-nutrition contributes to nearly half of all under-five deaths.

"For continued progress, it is essential to invest more in health systems that deliver high-quality, affordable services to all women and children who need them," said Olusoji Adeyi, Director of Health, Nutrition and Population at the World Bank Group.

The report notes that major improvements in child survival are in part due to affordable, evidence-based interventions against the leading infectious diseases, such as immunization, insecticide-treated mosquito nets, rehydration treatment for diarrhoea, nutritional supplements and therapeutic foods. The major causes of neonatal mortality – pre-term birth complications (35%) or problems during delivery or birth (24%) – require health interventions closely linked with protecting maternal health.

GAVI introduces Inactivated Polio Vaccine for Endgame Strategic Plan

Nepal has becomes the first country in the world to use support from Gavi, the Vaccine Alliance to begin protecting its children with Inactivated Polio Vaccine (IPV). The introduction is part of a plan to ensure that IPV will be available to millions of children in Gavi-supported countries through the introduction of the vaccine into routine immunisation systems.

Inactivated Polio Vaccine (IPV) was licensed in 1955 and underwent early reformulations to enhance potency and ensure safety in standalone and combination vaccines. According to the WHO, IPV is one of the safest vaccines in humans, whether used alone or in combination vaccines. No serious adverse events have been reported.

While the oral polio vaccine has successfully reduced polio cases by 99% worldwide, adding IPV to routine immunisation programmes will improve immunity and help prevent new vaccine-associated outbreaks from emerging. In May 2013, the World Health Assembly endorsed the Polio Eradication & Endgame Strategic Plan 2013-2018, calling on countries to strengthen routine immunisation programmes and introduce at least one dose of IPV as a lead up to the phased removal of oral polio vaccines.

Children in Afghanistan and Pakistan – two of the final three countries where polio remains endemic – are also set to begin receiving inactivated polio vaccine (IPV) by the end of next year as part of the planned 'endgame' for eradicating the crippling disease. Nigeria, the third country where polio remains endemic, has also applied to introduce IPV, with approval expected shortly.

Afghanistan, Nepal and Pakistan are among 25 countries who have received approval to begin using IPV with support from Gavi, while gradually phasing out the oral polio vaccine (OPV) which is currently used in most developing countries.

"Nepal's introduction of IPV with Gavi support marks an important moment in the global effort to secure a polio-free future," said Dr Seth Berkley, CEO of Gavi, the Vaccine Alliance. "Gavi is working with partners to ensure that millions of children in the world's poorest countries are protected with IPV through routine immunisation as

an important step towards achieving global polio eradication."

Last year more than 400 cases of wild polio virus were recorded, mostly in endemic countries and since the beginning of this year more than 150 cases have been reported, mainly in Pakistan but also in non-endemic countries such as Equatorial Guinea, Iraq, Cameroon, Syria and Ethiopia.

Ban Ki-moon says improving health of women, children a 'moral imperative'

Lauding the gains made in improving the health of women and children worldwide, UN Secretary-General Ban Ki-moon called for renewed commitment and action to sustain the unprecedented progress made in this area in partnership with governments, civil society, the private sector, philanthropists and international organizations.

"For the first time ever, we have the opportunity to end all preventable deaths of women and children within a generation," Ban said at the 'Every Woman Every Child' event held 25 September 2014 at UN Headquarters on the margins of the General Assembly's high-level debate.

"Let us seize this historic opportunity as a moral imperative. It is also one of the smartest investments we can make."

Launched by the Secretary-General in September 2010, Every Woman Every Child aims to save the lives of 16 million women and children by 2015.

The initiative has catalysed unprecedented progress in reducing maternal and child mortality, doing so through a pioneering model of multi-stakeholder partnership involving governments, civil society, the private sector, philanthropists and international organizations. To date, over 400 partners have made commitments under Every Woman Every Child.

Ban noted that efforts have led to the reduction in deaths of children under the age of five faster than at any time in the past two decades. Each day, some 17,000 more children survive. Deaths of mothers have been cut by almost half since 1990.

"These are impressive numbers in conference rooms in New York. They are even more meaningful in hospitals, health posts and homes," he noted.

"In today's troubled world, our progress in this area shines brightly. It demonstrates what can be achieved when we come together as a community in partnership.

"As we advance, we will have to protect these fragile gains – and cope with emerging challenges. Climate change, water, education, sanitation, nutrition and human rights all affect women and children's health."

"I call on all of you to renew your commitments, boost financing, keep insisting on accountability for resources and results, and reach every woman and every child," said the Secretary-General. "Together, we can make history."

IBA, Philips join forces to advance diagnosis, treatment of cancer

IBA (Ion Beam Applications S.A.), a leading provider of proton therapy and radiopharmacy solutions, and Royal Philips have signed of a global collaboration agreement to provide advanced diagnostic and therapeutic solutions for the treatment of cancer.

The collaboration covers sales, marketing, research and development (R&D) of imaging and therapy solutions in oncology.

In a joint statement, the companies said that leveraging high quality imaging and proton therapy offers the potential to increase confidence in the diagnosis and treatment of cancer, reduce short- and long-term side-effects and potentially enhance the quality of life of the patient before, during and after treatment, while reducing the cost of treatment for the healthcare system.

IBA will benefit from Philips diagnostic imaging products offered to oncology care centres, while Philips will leverage IBA proton therapy solutions within its offering for customers in select markets around the world. The commercial collaboration also includes an integrated offering for Molecular Imaging Centres, combining IBA's expertise in PET radioisotope production centres with Philips imaging and diagnostics expertise.

Commenting on the collaboration, Olivier Legrain, Chief Executive Officer of IBA, said: "This is an exciting and important step for IBA. A closer collaboration with a company of Philips' caliber and global reach, where we are able to combine both companies' expertise and excellence in oncology care, will accelerate innovation and provide more efficient and effective solutions in molecular imaging and treatment solutions. This collaboration is an important step toward adaptive treatment of cancer and a personalized treatment approach to enable the best possible result for cancer patients across the globe."

Gene Saragnese, Executive Vice President and CEO, Imaging Systems, Philips added: "Proton therapy is one of the most exciting technological advancements in the oncology field. We look forward to collaborating with IBA to enhance access to best-in-class technology for both Proton Centres and Molecular Imaging Centres, as well as to accelerate the development of our informed therapy guidance vision in ways that can change the future of care, and improve the quality of life for patients."

IBA's Proton Therapy Specific Cone Beam CT successfully used for the first time

IBA (Ion Beam Applications SA), a leading provider of proton therapy solutions for the treatment of cancer, and Université Catholique de Louvain announced September 15 that the first patient treatment with IBA's Proton Therapy Specific Cone Beam CT (CBCT) was successfully completed at Penn Medicine's Roberts Proton Therapy Center.

As a component of IBA's Image Guided Proton Therapy (IGPT) solution, CBCT provides 3D imaging for increased accuracy in patient treatment. It is fully integrated with IBA's imaging platform adaPTinsight, developed in partnership with the Université catholique de Louvain (UCL), to offer fast 6D corrections of patient positioning for IBA's ProteusPLUS and ProteusONE proton therapy solutions.

Dr. James M. Metz, MD, Professor and Vice Chair, Radiation Oncology, Penn Medicine commented: "CBCT is a great tool for highly accurate patient positioning. It also enables the clinicians to assess the patient anatomical change over the treatment course regularly and to adapt the treatment plan whenever needed. The end results significantly benefit the patients, with enhanced precision and accuracy of the proton therapy delivery. We believe that this is another significant step in improving our ability to help patients achieve their goals of beating their cancer with as few side effects as possible."

Frederic Genin, Executive VP Product Management at IBA added: "IBA's significant experience and successful collaborations with key users make it possible to achieve this important milestone in the development of specific imaging solutions for proton therapy. The applications of image guidance and image monitoring are of paramount importance to benefit from the superior dose distribution of proton therapy. By adding Cone Beam CT as one of IBA's Image Guided Proton Therapy solutions, we are accelerating the development of Adaptive Proton Therapy."

WHO calls on countries to implement salt reduction measures

On World Heart Day, 29 September, the World Health Organization (WHO) called on countries to implement population salt reduction measures, on communities to support public health efforts to reduce salt intake, and on individuals to consume less salt to avoid high blood pressure and heart disease.

High salt intake is a key contributor to the increase in noncommunicable diseases (NCDs) worldwide. NCDs account for over 2.2 million deaths, or over 57% of mortality, in the Eastern Mediterranean Region annually. Cardiovascular diseases alone, in which high salt intake plays a major role, cause almost half of these deaths.

The scientific evidence linking high blood pressure to high salt intake, and conversely reduced salt intake to improve health outcomes, is conclusive. In countries where salt intake was reduced by 1 gram per person per day, deaths from stroke and heart attack are expected to be reduced by more than 7%.

"Data from the Eastern Mediterranean Region shows that the average salt consumption in most countries is around 10 grams per person per day," said Dr Ala Alwan, the WHO Regional Director for the Eastern Mediterranean. "This is double the amount recommended by WHO."

Dr Alwan added: "Reducing salt intake to less than 5 grams per person per day can prevent cardiovascular disease, which is the number one killer in the Eastern Mediterranean Region and in the world.

"Salt reduction is one of the strategic interventions in the regional framework for action on noncommunicable diseases , endorsed by ministers of health in this region," explained Dr Alwan. "Implementing salt reduction programmes can help countries achieve the global target for salt reduction," he said, referring to the global voluntary target, endorsed by the World Health Assembly in May 2013, to reduce salt intake by 30% by the year 2025.

Salt reduction is a proven measure "best buy" for combating noncommunicable diseases, with a cost of about US$ 0.40-0.50 per person per year. Best buys are interventions that are very cost-effective, cheap, culturally acceptable and feasible to implement in all countries.

This World Heart Day, governments, the food industry, civil society groups, families and individuals are urged to take action to reduce salt intake and improve heart-health.

In consultation with Member States and international experts, WHO has developed policy guidance and recommended actions to reduce salt intake; several countries are in the process of implementing this guidance. A key measure is setting national standards for the amount of salt in various food items. Bread is the first priority for action since more than 25% of people's salt intake in the region comes from salt in bread. Cheese, processed tomato products and meats, and the salt added during cooking or at the table are the next targets.

WHO calls for stronger action on climate-related health risks

"The evidence is overwhelming: climate change endangers human health. Solu-

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tions exist and we need to act decisively to change this trajectory," Dr Margaret Chan, WHO Director-General said at the first-ever global conference on health and climate, held late August in Geneva.

Previously unrecognized health benefits could be realized from fast action to reduce climate change and its consequences. For example, changes in energy and transport policies could save millions of lives annually from diseases caused by high levels of air pollution. The right energy and transport policies could also reduce the burden of disease associated with physical inactivity and traffic injury.

Measures to adapt to climate change could also save lives around the world by ensuring that communities are better prepared to deal with the impact of heat, extreme weather, infectious disease and food insecurity.

These are two key messages discussed at the conference.

The health sector needs to act quickly and assertively to promote climate-smart strategies, climate and health experts warned.

WHO and its partners highlighted the importance of acting now to help protect health in the present as well as the future. The health community is working hard to improve its capacity for surveillance and control of infectious diseases such as cholera, malaria and dengue, which are highly sensitive to weather and climate.

Climate change is already causing tens of thousands of deaths every year from shifting patterns of disease, from extreme weather events, such as heat-waves and floods, and from the degradation of water supplies, sanitation, and impacts on agriculture, according to the most recent WHO data.

"Vulnerable populations, the poor, the disadvantaged and children are among those suffering the greatest burden of climate-related impacts and consequent diseases, such as malaria, diarrhoea and malnutrition, which already kill millions every year," noted Dr Flavia Bustreo, WHO Assistant Director-General, Family, Women's and Children's Health. "Without effective action to mitigate and adapt to the adverse effects of climate change on health, society will face one of its most serious health challenges," she said. MEH

World first: Healthy baby born from transplanted uterus

In a ground-breaking research project at the University of Gothenburg, seven Swedish women have had embryos reintroduced after receiving wombs from living donors. Now the first transplanted woman has delivered a baby – a healthy and normally developed boy. The world-first birth was acknowledged in The Lancet on 5 October.

The uterus transplantation research project at the University of Gothenburg started in 1999 and has been evaluated in over 40 scientific articles. The goal of the Gothenburg project is to enable women who were born without a womb or who have lost their wombs in cancer surgery to give birth to their own children.

Nine women in the project have received a womb from live donors – in most cases the recipient's mother but also other family members and close friends. The transplanted uterus was removed in two cases, in one case due to a serious infection and in the other due to blood clots in the transplanted blood vessels.

The seven remaining women have in 2014 tried to become pregnant through a process where their own embryos, produced through IVF, are reintroduced to the transplanted uterus.

The first early pregnancy was confirmed in the spring after a successful first pregnancy attempt in a woman in her mid-30s, a little over a year after her transplantation.

In early September, the woman successfully delivered a baby by caesarean section, making her the first woman in the world to deliver a child from a transplanted uterus. Her uterus was donated by a 61-year-old unrelated woman.

The caesarean section had to be performed earlier than planned: the woman developed preeclampsia in week 32 of her pregnancy the CTG indicated that the baby was under stress. A caesarean section was performed in accordance with normal clinical routines so as not to risk the health of the mother and child.

Developing normally

According to Professor Mats Brännström, who performed the caesarean section, the perfectly healthy newborn boy is devel-

The uterus transplantation research project

The uterus transplantation research project at the University of Gothenburg is the world's first systematic and scientifically based study aimed to find a treatment for women suffering from uterine factor infertility.

The researchers in the project are carefully monitoring several medical, psychological and quality of life-related parameters.

Uterine infertility is the only form of female infertility that until now has lacked effective treatment.

Two previous experiments with uterine transplants have been performed, in Saudi Arabia in 2000 and in Turkey in 2011. In the first case, the womb from a living donor, had to be removed shortly after the transplant. In the second case, the donor was a brain-dead heart beating young woman. In 2013, the research team in Turkey reported several attempts to reintroduce embryos and two very early pregnancies that ended in miscarriage.

Mats Brännström, professor and team leader, uterus transplantation team, University of Gothenburg, speaks to the media about the groundbreaking transplant.

oping normally. The baby weighed 1,775 grams at birth, which is normal size considering the gestational age at delivery.

"The baby screamed right away and has not required any other care than normal clinical observation at the neonatal unit. The mother and child are both doing well and have returned home. The new parents are of course very happy and thankful," says Professor Mats Brännström, who is leading the research project.

"The reason for the woman's preeclampsia is unknown, but it may be due to her immunosuppressive treatment combined with the fact that she is missing one kidney. The age of the donated womb may also be a factor. Also, preeclampsia is generally more common among women who have become pregnant through IVF treatment."

Mild rejection episodes

The woman has had three mild rejection episodes since the transplant, one of which occurred during the pregnancy. The rejection episodes, which are often seen also in other types of transplants, could be stopped with immunosuppressive treatment.

The research team followed the pregnancy closely, carefully monitoring the growth and development of the foetus with a special focus on the blood supply to the uterus and umbilical cord.

"There were concerns that the blood supply may be compromised since we had reattached the blood vessels to the womb. But we did not notice anything unusual concerning the function of the uterus and the foetus, and the pregnancy followed all normal curves," says Brännström.

The successful delivery is considered a major step forward.

"It gives us scientific evidence that the concept of uterus transplantation can be used to treat uterine factor infertility, which up to now has remained the last untreatable form of female infertility. It also shows that transplants with a live donor are possible, including if the donor is past menopause," says Brännström.

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Several research teams around the world have been awaiting the results of the Gothenburg study in order to launch similar observational studies. The pregnancy attempts are ongoing with the other six women in the project.

on the WEB The research team discuss the successful birth *http://tinyurl.com/oxarny5*

the laboratory

Medical research news from around the world

Study shows promise of combined immunotherapy-radiation treatment

A study in mice implanted with breast and melanoma cancers adds to a growing body of evidence that highly focused radiation – long thought to suppress immunity – can actually help boost the immune system's fight against cancer when combined with a new kind of immune-enhancing drug.

The study, led by Johns Hopkins Kimmel Cancer Center researchers, shows how in principle, radiation may specifically activate immune system cells responsible for attacking cancer cells, leading immune cells to "remember" how to fight cancer long after the cancer is gone.

Andrew Sharabi, M.D., Ph.D., a resident in the Department of Radiation Oncology and Molecular Radiation Science at Johns Hopkins, was expected to present details of the study at the 2014 annual meeting of the American Society of Radiation Oncology (ASTRO) in San Francisco September 15.

The study made use of a relatively new class of anticancer agent that interferes with a tumor's ability to dampen the immune system's cancer recognition process. With the U.S. Food and Drug Administration's recent approval of one such "checkpoint inhibitor" (pembrolizumab) and more in the pipeline, Sharabi says, tumors once hidden from the immune system may now be found and destroyed. But scientists, he added, have only begun to explore how standard therapies like radiation could be combined with the new immunotherapies.

"The immune system has powerful brakes, and removing those brakes with checkpoint inhibitors may be key to unleashing the full potential of the immune system against cancer," says Sharabi. "Adding radiation therapy to this mix may provide an additional boost by increasing tumor cell death and releasing targets for the immune system."

"We found that focused radiation therapy, once thought to suppress the immune system, actually increases specific, antitumor responses from the immune system," says Sharabi.

Clinical trial evaluates safety of stem cell transplantation in spine

Researchers at the University of California, San Diego School of Medicine have launched a clinical trial to investigate the safety of neural stem cell transplantation in patients with chronic spinal cord injuries.

"The goal of this study is to evaluate the safety of transplanting neural stem cells into the spine for what one day could be a treatment for spinal cord injuries," said Joseph Ciacci, MD, principal investigator and neurosurgeon at UC San Diego Health System. "The study's immediate goal, however, is to determine whether injecting these neural stem cells into the spine of patients with spinal cord injury is safe."

Related goals of the clinical trial include evaluating the stem cell graft's survival and the effectiveness of immunosuppression drugs to prevent rejection. The researchers will also look for possible therapeutic benefits such as changes in motor and sensory function, bowel and bladder function, and pain levels.

Patients who are accepted for the study will have spinal cord injury to the T7-T12 level of the spine's vertebrae and will have incurred their injury between one and two years ago.

All participants will receive the stem cell injection. The scientists will use a line of human stem cells approved by the U.S. FDA for human trials in patients with chronic traumatic spinal injuries. These cells were previously tested for safety in patients with amyotrophic lateral sclerosis (ALS).

Since stem cell transplantation for spinal cord injury is just beginning clinical tests, unforeseen risks, complications or unpredictable outcomes are possible. Careful clinical testing is essential to ensure that this type of therapy is developed responsibly with appropriate management of the risks that all medical therapies may present.

Pre-clinical studies of these cells by Ciacci and Martin Marsala, MD, at the UC San Diego School of Medicine, showed that these grafted neural stem cells improved motor function in spinal cord injured rats with minimal side effects indicating that human clinical trials are now warranted.

This clinical trial at UC San Diego Health System is funded by Neuralstem, Inc. and was launched and supported by the UC San Diego Sanford Stem Cell Clinical Center. The Center was recently created to advance leading-edge stem cell medicine and science, protect and counsel patients, and accelerate innovative stem cell research into patient diagnostics and therapy.

Researchers find new way to combat antibiotic resistance

In recent years, new strains of bacteria have emerged that resist even the most powerful antibiotics. Each year, these superbugs, including drug-resistant forms of tuberculosis and staphylococcus, infect more than 2 million people nationwide, and kill at least 23,000. Despite the urgent need for new treatments, scientists have discovered very few new classes of antibiotics in the past decade.

MIT engineers have now turned a powerful new weapon on these superbugs. Using a gene-editing system that can disable any target gene, they have shown that they can selectively kill bacteria carrying harmful genes that confer antibiotic resistance or cause disease.

Led by Timothy Lu, an associate professor of biological engineering and electrical engineering and computer science, the researchers described their findings in the September 21, 2014 issue of *Nature Biotechnology*. In August 2014, Lu's lab reported a different approach to combating resistant bacteria by identifying combinations of genes that work together to make bacteria more susceptible to antibiotics.

Lu hopes that both technologies will lead to new drugs to help fight the growing crisis posed by drug-resistant bacteria.

"This is a pretty crucial moment when there are fewer and fewer new antibiotics available, but more and more antibiotic resistance evolving," he says. "We've been interested in finding new ways to combat antibiotic resistance, and these papers offer two different strategies for doing that."

Most antibiotics work by interfering

with crucial functions such as cell division or protein synthesis. However, some bacteria, including the formidable MRSA (methicillin-resistant *Staphylococcus aureus*) and CRE (carbapenem-resistant Enterobacteriaceae) organisms, have evolved to become virtually untreatable with existing drugs.

In the new *Nature Biotechnology* study, graduate students Robert Citorik and Mark Mimee worked with Lu to target specific genes that allow bacteria to survive antibiotic treatment. The CRISPR genome-editing system presented the perfect strategy to go after those genes.

CRISPR, originally discovered by biologists studying the bacterial immune system, involves a set of proteins that bacteria use to defend themselves against bacteriophages (viruses that infect bacteria). One of these proteins, a DNA-cutting enzyme called Cas9, binds to short RNA guide strands that target specific sequences, telling Cas9 where to make its cuts.

Lu and colleagues decided to turn bacteria's own weapons against them. They designed their RNA guide strands to target genes for antibiotic resistance, including the enzyme NDM-1, which allows bacteria to resist a broad range of beta-lactam antibiotics, including carbapenems. The genes encoding NDM-1 and other antibiotic resistance factors are usually carried on plasmids – circular strands of DNA separate from the bacterial genome – making it easier for them to spread through populations.

When the researchers turned the CRISPR system against NDM-1, they were able to specifically kill more than 99% of NDM-1-carrying bacteria, while antibiotics to which the bacteria were resistant did not induce any significant killing. They also successfully targeted another antibiotic resistance gene encoding SHV-18, a mutation in the bacterial chromosome providing resistance to quinolone antibiotics, and a virulence factor in enterohemorrhagic *E. coli*.

In addition, the researchers showed that the CRISPR system could be used to selectively remove specific bacteria from diverse bacterial communities based on their genetic signatures, thus opening up the potential for "microbiome editing" beyond antimicrobial applications.

To get the CRISPR components into bacteria, the researchers created two delivery vehicles – engineered bacteria that carry CRISPR genes on plasmids, and bacteriophage particles that bind to the bacteria and inject the genes. Both of these carriers successfully spread the CRISPR genes through the population of drug-resistant bacteria. Delivery of the CRISPR system into waxworm larvae infected with a harmful form of *E. coli* resulted in increased survival of the larvae.

The researchers are now testing this approach in mice, and they envision that eventually the technology could be adapted to deliver the CRISPR components to treat infections or remove other unwanted bacteria in human patients.

Phase 1 human clinical trial to assess the safety and efficacy of a new monoclonal antibody for CLL patients

Researchers at the University of California, San Diego School of Medicine have launched a phase 1 human clinical trial to assess the safety and efficacy of a new monoclonal antibody for patients with chronic lymphocytic leukemia (CLL), the most common form of blood cancer in adults.

The new antibody targets ROR1, a protein used by embryonic cells during early development and exploited by cancer cells to promote tumour growth and metastasis, the latter responsible for 90 percent of all cancer-related deaths.

Because ROR1 is not expressed by normal adult cells, scientists believe it is a biomarker of cancer cells in general and cancer stem cells in particular. Because it appears to drive tumour growth and disease spread, they believe it also presents an excellent target for anti-cancer therapy.

Developed at UC San Diego Moores Cancer Center by Thomas Kipps, MD, PhD, who holds the Evelyn and Edwin Tasch Chair in Cancer Research, and colleagues, the antibody is called cirmtuzumab (also known as UC-961). In previous animal studies, Kipps' team reported that ROR1 is singularly expressed on CLL and also on a variety of different cancers, including cancers of the breast, pancreas, colon, lung and ovary. In mouse models of CLL, ROR1 acts as an accelerant when combined with another oncogene to produce a faster-growing, more aggressive cancer.

Cirmtuzumab was developed under the auspices of the California Institute for Regenerative Medicine's HALT leukemia grant awarded to Dennis Carson, MD, principal investigator, and Catriona Jamieson, MD, PhD, co-principal investigator to develop six distinct therapies against cancer stem cells. Kipps led one of the six projects and generated antibodies against ROR1, leading to the cirmtuzumab trial in patients with CLL.

"The primary goal of this phase I clinical trial is to evaluate whether cirmtuzumab is a safe and well-tolerated cancer stem cell-targeted agent in patients with CLL," said Jamieson, chief of the Division of Regenerative Medicine, associate professor of medicine, director of stem cell research at UC San Diego Moores Cancer Center, deputy director of the Sanford Stem Cell Clinical Center and a principal investigator of the cirmtuzumab clinical trial.

Michael Choi, MD, assistant clinical professor of medicine and co-principal investigator of the clinical trial said: "The trial will involve patients with relapsed or refractory CLL, who will receive an intravenous infusion every 14 days at Moores, followed by regular monitoring and clinic visits to assess efficacy and identify and manage any adverse effects. Initial treatment is planned for two months."

Plasma-based biomaterial reduces infections, speeds healing of bone fractures

Data presented in September at the South African Orthopaedic Association Congress in Cape Town from a recently completed clinical trial with the REPAIR Bone Putty show the blood plasma-based putty reduced infections, sped bone healing, and promoted more rapid wound closure of open tibia fractures. Dr. David North, an orthopaedic surgeon associated

with the University of Cape Town, presented the findings.

"We are very excited about the outcomes of this first clinical trial"

The REPAIR Putty – developed by Carmell Therapeutics – incorporates a novel material made from blood plasma containing a concentration of natural healing factors that bathe the injured tissue as the material degrades. This first study was designed to assess the safety and performance of the Putty in augmenting the healing of fractures.

"We were very pleased and a bit surprised by the results," said Dr. Brian Bernstein, Principal Investigator for the study, Director of the Orthopaedic Trauma Group in Cape Town and Chairman of the South African Orthopaedic Trauma Society. "We are always concerned about infections with open bone fractures, and the idea of using a concentration of natural growth factors to augment healing and reduce infections is especially attractive, particularly if such a product can be offered at a reasonable cost."

Open fractures are problematic to treat as infections, delayed bone healing, and wound closure/sepsis are significant challenges. In this 30 patient trial, 70% of the patients enrolled had more severe type IIIA & IIIB injuries involving comminuted bone, high levels of contamination and severe soft tissue injuries. Additionally, 67% were smokers, a factor known to retard healing, and 70% received external fixation that uses pins to penetrate the skin and stabilize the fracture, with an associated high rate of pin-tract infections.

Patients agreeing to participate in the study were randomly placed into either a control or treatment group. The REPAIR Putty was placed into the fracture site during fracture reduction of the treatment patients, and both groups were followed for one year. No adverse events associated with the use of the Putty were observed for the 20 treatment patients. A statistically significant acceleration of bone healing occurred at 180 days with more rapid wound closure at 30 days approaching significance for the treatment patients compared to the controls.

While the company anticipated that the putty would accelerate bone healing and wound closure, a big surprise was the reduction in infections. Eighty percent of control patients experienced at least 1 infection during the study compared to only 22% of the putty treated injuries, a statistically significant difference.

With the most severe type III injuries, the infection reduction was even more significantly reduced with 100% of controls vs. 25% of treatment patients experiencing at least 1 infection. The relatively high rates of infection for the controls (80% & 100%) were due to the use of external fixation. When pin related infections were removed from the data, the control group had a 43% infection rate for the more severe injuries, which compares well with the reported literature; by contrast, the Putty group in this subset had only a 17% infection rate.

The researchers believe that the infection reduction is largely due to the blood plasma component of the Putty not only eluting natural regenerative factors but also recruiting the body's immune system to the area of the injury over several weeks as it degrades, thereby leveraging the body's own ability to fight off infections. This result is most significant for trauma patients - high doses of antibiotics are typically given prophylactically to prevent infection, but the rise of antibiotic-resistant bacteria is raising new concerns about antibiotic overuse. The REPAIR Bone Putty may become a game changer in the way these fractures are treated.

Two-drug combination accelerates wound healing, reduces scar tissue

A combination of two drugs already approved by the U.S. Food and Drug Administration for different applications reduces wound healing time by one-quarter and significantly decreases scar tissue in mice and rats, Johns Hopkins researchers report. If the findings, reported in the September issue of the *Journal of Investigative Dermatology*, hold true in future human studies, the dual treatment could speed skin healing in people with skin ulcers, extensive burns, surgical wounds and battlefield injuries.

Zhaoli Sun, M.D., Ph.D., director of the Transplant Biology Research Center at the Johns Hopkins University School of Medicine, and his colleagues say the wound healing potential of the two drugs used in the animal study was discovered incidentally while looking for ways to prevent rejection of liver transplants. One of the drugs, AMD3100, is generally used to move stem cells from bone marrow to the bloodstream so the cells can be harvested and stored for patients recovering from cancer chemotherapy. The other, tacrolimus, tamps down the immune response. Sun and his team noticed that in addition to successfully preventing liver graft rejection in their study, the drugs, when used together, seemed to improve wound healing in animals.

Focusing on just the wound healing "side effect" of the drug duo, Sun and his colleagues launched the rodent study to determine how well the combination worked and what the mechanism behind its therapeutic effects might be.

The researchers first divided mice into four groups, each of which received four 5-millimeter circular cuts to remove skin and tissue from their backs. Some of the mice received injections of just AMD3100. Others received injections of tacrolimus in doses just one-tenth of what is usually given to prevent organ and tissue rejection. Another group received injections of both AMD3100 and low-dose tacrolimus. A fourth group, the control animals, received saline injections rather than the drugs.

Animals that received only saline healed completely in 12 days, while those that received both drugs healed in nine days, a reduction of 25%. Those that received either one of the two drugs had only a modest improvement in healing time, cutting it by a single day.

The researchers had similar findings with groups of rats, where the drug combination working slightly better, reducing healing time by 28% compared to saline. Additionally, they found that the wounds in animals that received the drug combination healed with less scar tissue and regrew skin's hair follicles.

"The findings mean that wound healing is not only accelerated, but also that real skin regeneration is occurring," Sun says. "These animals had more perfect skin repair in the wound area."

Further tests showed that the drugs work synergistically, with AMD3100 pushing stem cells from bone marrow into the bloodstream and tacrolimus stimulating cells in wound areas to give off molecules that attract the stem cells.

Though the reported study tested the drug combination only on surgical excisions, Sun and his colleagues say the beneficial effects also apply to burn injuries and excisions in diabetic rats in studies that are currently underway.

Xenon gas protects the brain after head injury

Treatment with xenon gas after a head injury reduces the extent of brain damage, according to a study in mice.

Head injury is the leading cause of death and disability in people aged under 45 in developed countries, mostly resulting from falls and road accidents. The primary injury caused by the initial mechanical force is followed by a secondary injury which develops in the hours and days afterwards.

This secondary injury is largely responsible for patients' mental and physical disabilities, but there are currently no drug treatments that can be given after the accident to stop it from occurring.

Scientists at Imperial College London found that xenon, given within hours of the initial injury, limits brain damage and improves neurological outcomes in mice, both in the short term and long term.

The findings, published in the journal *Critical Care Medicine*, could lead to clinical trials of xenon as a treatment for head injury in humans.

Although xenon is chemically inert, this does not mean it is biologically inactive. Xenon has been known to have general anaesthetic properties since the 1950s. Previous studies at Imperial have found that xenon can protect brain cells from mechanical injury in the lab, but this new study is the first time such an effect has been shown in live animals, a vital step before any new treatments can be tested in humans.

Mice were anaesthetised before having a controlled mechanical force applied to the brain. Some were then treated with xenon at different concentrations and at different times after injury.

Mice treated with xenon performed better in tests assessing their neurological deficits, such as movement and balance problems, in the days after injury and after one month. They also had less brain damage, even if treatment was delayed up to three hours after the injury.

Dr Robert Dickinson from the Department of Surgery and Cancer at Imperial College London, who led the study, said: "After a blow to the head, most of the damage to the brain doesn't occur immediately but in the hours and days afterwards. At present we have no specific drugs to limit the spread of the secondary injury, but we think that is the key to successful treatment.

"This study shows that xenon can prevent brain damage and disability in mice, and crucially it's effective when given up to at least three hours after the injury. It's feasible that someone who hits their head in an accident could be treated in the hospital or in an ambulance in this timeframe.

"These findings provide crucial evidence to support doing clinical trials in humans."

doi: 10.1097/CCM. 0000000000000624

Foetal heart rate monitoring fails to detect brain injury – more precise tool required

Researchers at Johns Hopkins have added to evidence that continuous electronic foetal heart rate monitoring, widely used during maternal labour, has so many false positive readings that it is unable to reliably identify foetal brain injury caused by oxygen deficiency. Results of the new study by a team at the Johns Hopkins University School of Medicine appeared in the September 2014 issue of *Obstetrics & Gynecology*.

"Brain injuries caused by oxygen deprivation in newborns are rare, and our study shows that in most cases, irregularities detected by an electronic heart rate monitor are false alarms," says Ernest Graham, M.D., associate professor of gynaecology and obstetrics at Johns Hopkins. "During the last hour of labour prior to delivery, we see many abnormal patterns in the foetal heart rate, but the vast majority of the babies are born normal."

"Our current standard of care is to monitor the foetal heart rate during labour, but we need a more precise method to identify term babies that are born with hypoxic brain injury," he says.

For the study, the researchers analyzed medical records and monitor readouts for the last hour of labour before delivery of 39 babies with hypoxic-ischemic encephalopathy and 78 babies without such brain injuries at The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center between 2007 and 2013. The investigators found some differences in the foetal heart rate tracings between the groups but report that those differences were not enough to distinguish damaged babies from normal ones. Previous studies have shown that continuous heart rate monitoring is not sensitive enough to definitively pick up specific kinds of brain damage, and the Johns Hopkins research adds further support for the need for more precise detection tools, Graham says.

Hypoxic-ischemic encephalopathy, characterized by restricted blood flow to the brain, is blamed for 23% of neonatal deaths globally, but it occurs at a rate of one to four cases in every 1,000 births. Treating the infant within six hours of birth with whole-body cooling reduces symptoms and mortality.

The monitoring aims to alert physicians if the foetal brain is deprived of oxygen during labour and delivery; data show that if the heartbeat slows, it may signal oxygen deprivation. When that happens, the choice is often a rapid caesarean section to limit or prevent any damage from oxygen loss.

Graham says, however, that his study affirms that electronic foetal monitoring appears not sensitive or specific enough to identify the rare cases of brain injury. He hopes his study leads to the development of new technologies for intrapartum foetal monitoring.

"We were looking for more subtle but definitive changes on the monitor tracings indicative of brain injury to incorporate into our training of young physicians, but we did not find them," he says. "We need a more precise tool." MEH

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Vaccines, convalescent blood plasma in fast-track trials

Keeping pace with the rapid spread of Ebola Virus Disease since its outbreak in West Africa in March this year is difficult in the context of this magazine which is published only every two months. Rather than provide figures of infections and deaths which are growing exponentially in affected countries and will be outdated by the time the magazine reaches readers – we look instead at progress being made to develop vaccines and treatments for the disease.

Nonetheless – as we go to press – Ebola cases have been recorded in Liberia, Sierra Leone, Guinea, Mali, Spain and the United States. Nigeria and Senegal, which had earlier recorded a number of Ebola cases, are now considered Ebola-free, following a period of 42 days with no new infections.

Vaccines

On 23 October WHO convened a meeting with high-ranking government representatives from Ebola-affected countries and development partners, civil society, regulatory agencies, vaccine manufacturers and funding agencies to discuss and agree on how to fast track testing and deployment of vaccines in sufficient numbers to impact the Ebola epidemic.

Key consensus commitments

- Results from phase 1 clinical trials of most advanced vaccines are expected to be available in December 2014 and efficacy trials in affected countries also will begin in this timeframe, with protocols adapted to take into consideration safety and immunogenicity results as they become available.
- Pharmaceutical companies developing the vaccines committed to ramp up production capacity for millions of doses to be available in 2015, with several hundred thousand ready before the end of the first half of the year. Regulatory authorities in countries where the vaccines are manufactured and in Africa committed to supporting this goal by working under extremely short deadlines.

Trials of vaccines have already begun in the US, UK, and Mali, and are beginning in Gabon, Germany, Kenya and Switzerland to determine safety and dose level.

"As we accelerate in a matter of weeks a process that typically takes years, we are ensuring that safety remains the top priority, with production speed and capacity a close second," said Marie-Paule Kieny, WHO Assistant Director-General of Health Systems and Innovation.

Swissmedic, the Swiss regulatory authority for therapeutic products, has given approval for a trial with an experimental Ebola vaccine at the Lausanne University Hospital (CHUV). The vaccine is based on a genetically modified chimpanzee adenovirus ("ChAd-Ebola"; Chimpanzee-Adenovirus chAD3-ZEBOV). The trial will test the safety of the vaccine and its capacity to induce an immune response. Results from the CHUV trial will – together with the results of other centres involved – provide the basis for planning subsequent trials involving several thousand participants, and for choosing vaccine dose-level for efficacy trials.

Developed by the US National Institute of Allergy and Infectious Diseases (NIAID) and pharmaceutical company GlaxoSmithKline, the vaccine consists of a virus that is rendered harmless and used as genetic carrier for one Ebola protein. The application, submitted at the end of September 2014, was handled as a priority, given the dimensions of the Ebola epidemic in West Africa.

The trial is one of two in Switzerland coordinated by WHO. A second vaccine, rVSV-ZEBOV, is to be tested at the Geneva University Hospitals, concurrent to the Lausanne trial. Results are expected in December this year.

"These are dosing and safety trials being held in advance of to Phase II and III trials currently scheduled for late 2014-early 2015," said Kieny.

Blood plasma

Another potential treatment that is being given considerable attention is the assessment of whether the blood or plasma of Ebola survivors can be used to treat Ebola patients in West Africa.

Blood and plasma from recovered Ebola patients has been used in a limited number of patients previously. For example, during the 1995 Ebola outbreak in Kikwit, in the Democratic Republic of the Congo (DRC), seven out of eight patients receiving convalescent whole blood survived.

However, whether this was due to the transfusions or to other factors is unclear. To study this, an international team of researchers has received £2million from the European Union (EU) to evaluate the safety and efficacy of blood and plasma donated by people who have recovered from Ebola.

The use of convalescent blood and plasma will be trialled in Guinea in November by the research consortium led by Dr Calum Semple from the University of Liverpool's Institute of Child Health based at Alder Hey Children's Hospital and Dr Johan van Griensven of the Prince Leopold Institute of Tropical Medicine Antwerp.

Commenting on the research, Dr Semple said: "Convalescent plasma therapy is a medical intervention which has been used for a long time to treat other diseases safely. We want to find out whether the Ebola plasma will work, is safe and can be used to reduce the number of deaths in the present outbreak." MEH

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IHR EC: No evidence of sustained human-to-human transmission

Seventh Meeting of the IHR Emergency Committee

The seventh meeting of the Emergency Committee (EC) convened by the Director-General under the International Health Regulations (IHR 2005) regarding the Middle East respiratory syndrome coronavirus (MERS-CoV) was conducted with members and advisors of the Emergency Committee through electronic correspondence from 26 September 2014 through 30 September 2014.

The Committee noted that:

(i) there have been significant efforts made to strengthen infection prevention and control measures, with an epidemiological situation that has not changed since the 6th meeting of the IHR EC;

(ii) the number of cases has fallen since the April upswing, and cases continues to appear sporadically with no evidence of sustained human-to-human transmission in communities;

(iii) although transmission in healthcare settings is still occurring in small clusters, transmission seems generally contained;

(iv) activities conducted to reduce the international spread of MERS-CoV seem to be effective; and (v) the current data suggest that MERS-CoV transmission could be seasonal, with an upsurge expected next spring.

The National IHR (International Health Regulations) Focal Point of Saudi Arabia reported 7 additional laboratory-confirmed cases – including one death - of infection with Middle East respiratory syndrome coronavirus (MERS-CoV) between 29 September and 11 October 2014 to WHO.

WHO said the tracing of household contacts was ongoing for these cases.

In addition, the deaths of 4 previously reported MERS-CoV cases from Saudi Arabia were also reported.

Cases identified in KSA following a retrospective review

Following a retrospective review of laboratory records in non-Ministry of Health hospitals, the National IHR Focal Point of Saudi Arabia has also reported 19 additional cases of MERS-CoV infection, including 11 deaths. Of the additional cases, 1 occurred in August 2013, 2 occurred in March 2014, 10 occurred in April 2014 and 6 occurred in May 2014.

Of the additional cases reported by Saudi Arabia, 79% (15 people) are Saudi nationals. Sixteen of the reported cases resided in Jeddah, 2 in Kharj and 1 in Dhahran. The median age is 56 years (ranging from 27 to 89), 68% (13/19) were men, and 11% (2/19) of the reported cases were health care workers.

The retrospective identification of these 19 cases does not alter the pattern and dynamic of the epidemic and the global risk assessment remains unchanged, according to WHO.

As of October 18, globally, 877 laboratory-confirmed cases of infection with MERS-CoV including at least 317 related deaths have been reported to WHO.

WHO advice

Based on the current situation and available information, WHO encourages all Member States to continue their surveillance for acute respiratory infections and to carefully review any unusual patterns.

Until more is understood about MERS-CoV, people with diabetes, renal failure, chronic lung disease, and immunocompromised persons are considered to be at high risk of severe disease from MERS-CoV infection. Therefore, these people should avoid close contact with animals, particularly camels, when visiting farms, markets, or barn areas where the virus is known to be potentially circulating.

As of October 18, globally, 877 laboratory-confirmed cases of infection with MERS-CoV including at least 317 related deaths have been reported to WHO.

General hygiene measures such as regular hand washing before and after touching animals and avoiding contact with sick animals, should be adhered to.

Food hygiene practices should be observed. People should avoid drinking raw camel milk or camel urine, or eating meat that has not been properly cooked. MEH

Infection prevention for healthworkers

Infection prevention and control measures are critical to prevent the possible spread of MERS-CoV in healthcare facilities. It is not always possible to identify patients with MERS-CoV early because like other respiratory infections, the early symptoms of MERS-CoV are non-specific. Therefore, healthcare workers should always apply standard precautions consistently with all patients, regardless of their diagnosis. Droplet precautions should be added to the standard precautions when providing care to patients with symptoms of acute respiratory infection; contact precautions and eye protection should be added when caring for probable or confirmed cases of MERS-CoV infection; airborne precautions should be applied when performing aerosol generating procedures.

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Participants of the 61st session of the WHO EMR Committee at the beginning of the first working session

Call to bolster resources in face of emerging health threats

The WHO Regional Committee for the Eastern Mediterranean held its 61st annual meeting in Tunis, Tunisia from 19-22 October. Addressing the opening session, Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, said that WHO was currently facing an unprecedented situation as it responded to five high-level grade 3 emergencies around the world, two of which were in the Eastern Mediterranean Region.

Dr Alwan highlighted the humanitarian crises in Syria and Iraq, and the emergencies in Gaza, Libya and Yemen. He noted that WHO's public health capacity to detect, adjust and respond to emerging health threats needed to be considerably strengthened. He praised Tunisia for the major steps it had taken in the past three years to reform its health system.

The opening session of the meeting was inaugurated by Dr Tawfiq Al Galassi, Minister of Higher Education and Scientific Research of Tunisia, on behalf of Mehdi Jomaa, Prime Minister of Tunisia, who reiterated that the right to health could not be ensured without collective efforts of all countries, especially under the current difficult circumstances.

In his opening remarks, Professor Mohamed El Saleh Ben Ammar, Minister of Health of Tunisia, praised the role of WHO in pushing forward the health agenda in the region resulting in improved health indicators in many areas, such as communicable diseases, as well as reductions in child mortality rates and increased capacity-building of health workers. Prof Ben Ammar also reiterated the importance of coordinated regional efforts to improve the health of affected

Art in the service of health: Well-known composer, Nasseer Shema (right) with Dr Margret Chan, WHO Director General and Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, during the awards ceremony.

Dr Ala Alwan hands the A.T. Shousha award to Dr Abla Sebai, Lebanon for her research focused on the welfare and conditions of older populations in Lebanon and the region.

populations in Palestine, especially in Gaza, as well as in Syria and Iraq.

A press conference on Ebola was held on the sidelines of the pre-Regional Committee technical discussions, in

WHO Director-General addresses the Regional Committee for the Eastern Mediterranean

Dr Margaret Chan, Director-General of the World Health Organization, addressed the opening session of the Regional Committee for the Eastern Mediterranean, Sixty-first Session held in Tunis, Tunisia in October. This is what she had to say:

Mr Chairman, honourable ministers, distinguished delegates, Dr Alwan, ladies and gentlemen,

This is not an easy time for the world, not for any country in any WHO region. Think about the headlines on nearly any given day.

Conflict. Senseless violence. Natural and man-made disasters. A changing climate. More and more antimicrobials failing.

Continuing sporadic cases in this region of MERS. More and more chronic noncommunicable disease claiming lives way too young. And never far away, the constant threat from emerging and re-emerging infectious diseases.

In just the past few days, the volatile microbial world has delivered some sharp reminders of its power. Egypt confirmed a case of H5N1 avian influenza in an infant. Austria reported its first imported case of the MERS coronavirus.

The US confirmed its first Ebola case in a traveller from Liberia and then another case in a nurse who treated him. Infection in a second healthcare worker was confirmed last Wednesday [15 October 2014].

Spain likewise confirmed the first instance of Ebola transmission on its soil.

Meanwhile, at the end of [September], more than 90 Ugandans, most of them hospital staff, were being monitored, in isolation, following the death on 28 September of a radiology technician from yet another horrific killer: Marburg haemorrhagic fever.

But let me begin with something positive.

Ministries of Health in this Region are fortunate. I am absolutely convinced that your Regional Director is leading you along the right paths.

I mean two paths in particular: the strong and consistent emphasis

Dr Khakled Al-Saleh, Kuwait, receives the State of Kuwait Prize for control of Non Communicable Disease and Diabetes in the Eastern Mediterranean Region

which Dr Chan and Dr Alwan briefed the media on the current situation and global efforts to contain the outbreak.

They pointed out that that now that the Ebola virus has reached developed countries, such as the US and Spain, it indicated that the virus could be circulated through international travel despite the high level of preparedness by these countries. They said that many countries had asked for WHO's direct support in assessing their level of preparedness and to assist them in scaling up their readiness measures. WHO said they would assist Morocco and Tunisia in this regard and help guide the countries to step up necessary measures where gaps are identified. WHO would also support countries in training, laboratory diagnosis, risk communication and infection control measures. MEH

> No country has the resilience to withstand the multiple shocks our 21st century societies are delivering with increasing frequency and force, whether caused by extreme weather events in a changing climate, armed conflict or civil unrest, or a deadly and dreaded virus spreading out of control.

on strengthening basic health infrastructures, and the need to complete the job of polio eradication.

As the whole world is seeing right now, without fundamental public health infrastructures in place, no society is stable. No population is safe.

No country has the resilience to withstand the multiple shocks our 21st century societies are delivering with increasing frequency and force, whether caused by extreme weather events in a changing climate, armed conflict or civil unrest, or a deadly and dreaded virus spreading out of control.

The Ebola outbreak that is ravaging parts of West Africa is going to get far worse before it gets any better. Health officials are still racing to catch up with this rapidly evolving outbreak that is constantly delivering surprises.

It has multiple dimensions that have never been seen in the 38-year history of this disease.

But let me tell you one positive story among so many heart-breaking ones.

When the Ebola virus was carried into Lagos, Nigeria, on 20 July, health officials all around the world trembled in anticipation of what was almost certain to be the start of the worst nightmare scenario anyone could imagine.

Lagos is Africa's most populous, fluid, and chaotic city, with a population of 23 million people constantly moving in and out.

Everyone expected a tremendous explosion of cases that would likely prove extremely difficult to control.

That never happened. In fact, tomorrow [20 October 2014] WHO will declare, with full confidence, that the Ebola outbreak in Nigeria is over. The virus is gone. The outbreak was defeated.

What accounts for this great news?

The polio programme. Nigeria is running one of the world's most innovative polio eradication campaigns, using the very latest satellite-based cutting-edge technologies to ensure that no child is missed.

The country is on track to eradicate wild poliovirus from its borders before the end of this year.

When the first Ebola case was confirmed in July, health officials immediately repurposed polio technologies and infrastructures to conduct Ebola case-finding and contact-tracing.

This is a good public health story with an unusual twist at the end.

Several wealthy countries have people right now in Nigeria. They are studying technologies, "made in Nigeria" with WHO support, to boost their contact tracing capacities should an imported case occur.

The story has another very clear message.

If Nigeria, also crippled by serious security problems, can do this – that is, eradicate polio and contain Ebola at the same time – any country in the world can do the same.

I am aware that your Regional Director will give you the latest information about the extremely serious polio situation in Pakistan.

For Ebola, the world is indeed admirably vigilant as witnessed by almost daily false alarms at airports and in emergency rooms, also in countries from this region.

But the world has a long way to go on preparedness.

Again, it is the same failure that concerns your Regional Director so deeply.

When presidents and prime ministers in non-affected countries make statements about Ebola, they rightly attribute the outbreak's unprecedented spread and severity to the "failure to put basic public health infrastructures in place".

I agree. From my first day in office, I have stressed the critical need to strengthen health systems.

Health systems were neglected for decades and decades. Worldwide, population vulnerability to any kind of acute shock, also from a changing climate, is alarmingly high.

Again, let me say how fortunate health ministers in this Region are.

You have leadership that is taking you down exactly the right paths.

Thank you.

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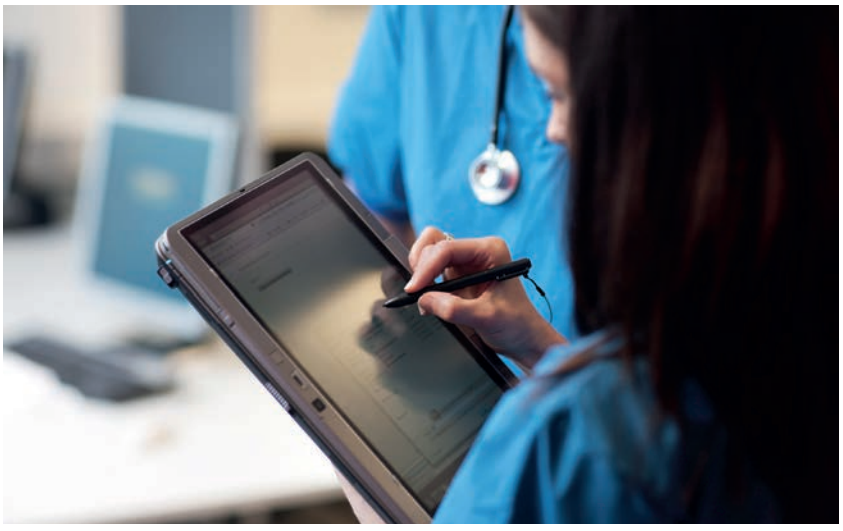
Clinical improvement solutions set to enhance service provision

Abu Dhabi Health Services Company PJSC (SEHA) is currently working with Zynx Health Middle East Inc. (Zynx Health™), the market leader in the provision of evidence- and experience-based clinical improvement solutions. The partnership will result in a transformation of service provision across all the public hospitals and clinics of the Emirate of Abu Dhabi which together make up the SEHA Health System and will impact upon a population of over 900,000 people. **Dr Mehmood Syed**, Clinical Programmes Director for Zynx Health Middle East, provides more detail on the project.

By **Dr Mehmood Syed**
Clinical Programmes Director
for Zynx Health Middle East



Value in healthcare has been defined by the Harvard academic, Michael Porter, as "the outcomes achieved per unit dollar spent on healthcare"[1] and it is the outcomes that patients achieve that should be used to assess the quality of healthcare that is provided, not the inputs. As such the cornerstone of achieving better value from healthcare services, anywhere in the world, is to standardise the care that is delivered, thereby ensuring that patients only receive the best treatments whenever they see a clinician and never receive treatments that either have no effect, or that cause harm.

At present across the world and especially in the Middle East, common experience of healthcare services would suggest that, too often, much of what is delivered is unnecessary and unwarranted by the patient's medical complaint. The end result is large amounts of money being spent on healthcare services and products that make no material difference to the patient's health outcomes, and at times, may even be causing harm. Too often the treatments that are prescribed are based purely on the anecdotal experience of the doctor who happens to see the patient that day and often have no supporting medical evidence to justify their use.

SEHA – the Abu Dhabi Health Services Company – recognised this paradigm and as the public provider of Abu Dhabi and an employer of over 15,000 clinicians from every corner of the world, they understood that standardising the care their clinicians provide was going to be a challenge. In order to address this SEHA recruited the assistance of Zynx Health.

Already working in partnership with over 2000 hospitals in the US, Zynx Health is the international market leader in evidence-based clinical improvement solutions at the point of care and were ranked No. 1 in the KLAS "Clinical Decision Support - Order Sets and Care Plans" report[2]. Zynx Health's principal product – ZynxOrder, predefines for the clinician the most appropriate investigations and management options that a clinician should consider requesting for a given patient, based upon the medical evidence. The net result is that clinicians are directed to order only evidence-based investigations and treatments thereby reducing variation in care delivery and achieving significant improvements in both operational efficiencies and patient health outcomes.

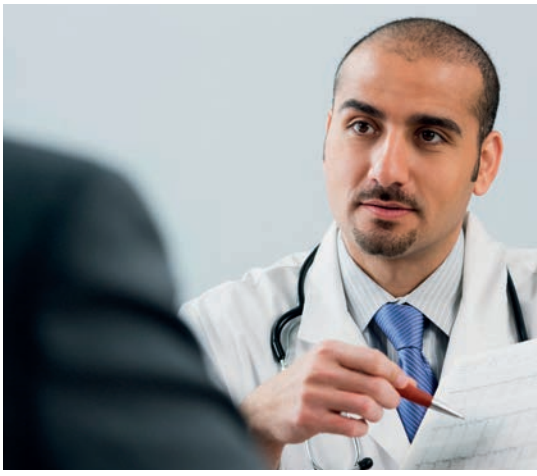
Since 2011, SEHA has been working with ZynxOrder at the Sheikh Khalifa Medical City. Their latest partnership with Zynx Health, expands this programme of quality improvement to develop and release further Order Sets for use in all of SEHA's 12 hospitals and 66

clinics across the Emirate of Abu Dhabi.

The highly rigorous and independent editorial methodology deployed by Zynx Health, as well as their local presence in the UAE, means the SEHA team are receiving the most up to date, highest quality evidence-based Order Sets in the market and are supported by local Zynx Health clinicians to customize the Order Sets to the specific SEHA context. Zynx Health's patented Order Set development tools and the seamless bidirectional integration with SEHA's Cerner-based, hospital information system – 'Malaffi' – make this process significantly easier than would otherwise be the case. By December 2014, a suite of 100 Order Sets across multiple clinical specialties are expected to be in place across all SEHA facilities. Thereafter the organisations will continue to work together in partnership to ensure the Order Sets remain relevant, easy to use and updated, as changes in medical evidence inevitably occur.

Speaking of the partnership with SEHA, Jeff Dienhart, Senior Managing Director of Zynx Health commented: "It is a pleasure and a privilege for Zynx Health to be working with SEHA to help shape the vision of healthcare in Abu Dhabi and drive quality and economic improvement. Hospitals using Zynx Order Sets have achieved statistically significant improvements in financial outcomes such as lower costs per case, and in clinical outcomes such as reduced mortality, decreased hospital length of stay, and improved adherence to quality metrics."

Zynx Health is part of the Hearst Health network, which also includes FDB (First Databank), Map of Medicine, MCG (formerly Milliman Care Guidelines). The mission of the Hearst Health network is to help guide the most important care moments by delivering vital information into the hands of everyone who touches a person's health journey.



● If you would like to learn more about the work Zynx Health is doing in the Middle East, please contact Mazen Sobh on +971 5577 30456.

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Young Egyptian scientists win competition to test Hep C virus on space station

Two Egyptian researchers at Technische Universität München (TUM) have won the "International Space Station (ISS) Research Competition" in the US with their project Egypt Against Hepatitis C Virus (EGAHEP). As their prize, the two scientists will see the ISS crew perform experiments for the project on the space station free of charge. The project involves crystallizing two proteins of the hepatitis C virus (HCV) under microgravity conditions. The shuttle bringing these proteins to the ISS was scheduled to lift off from Cape Canaveral in Florida on September 20.

"The hepatitis C virus is a major problem in our home nation of Egypt," explained Akram Amin Abdellatif, graduate student of "Earth-oriented space science and technology" at TUM and employee at the German Aerospace Center. "We developed this project to learn more about the virus and find its weaknesses." He established the project together with Hanaa Gaber, a doctoral student at the Institute of Virology.

Egypt has one of the highest prevalence rates of hepatitis C infections in the world. According to an estimate by the Egyptian ministry of health in 2008, around 15% of 15 to 59-year-olds are infected. The virus attacks the liver and can cause huge damage to the body including cancer and organ failure.

The ISS Research Competition is organized by Space Florida – the state´s aerospace development organization of Florida – in conjunction with the company NanoRacks. The TUM team submitted their project to the judges in 2012. Just eight projects were chosen to be sent to the ISS from over 600 submissions. EGAHEP was the only project to be chosen from outside the US and will be the first experiment involving Egyptian scientists to be conducted on the ISS.

The researchers want to send hepatitis C virus proteins to the ISS so that protein crystals can be generated in space. Reports with other proteins have shown that crystals produced in space were superior to those grown on earth, where gravity can negatively influence the crystallization. Scientists can then use special x-ray techniques to decode the molecular structure of the proteins from these crystals. "Identifying the precise structures could help us to find new points of attack for medications in the future," explained Prof. Ulrike Protzer, head of the Institute of Virology.

Akram Abdellatif, Prof. Ulrike Protzer and Hanaa Gaber (from left to right) won the "International Space Station (ISS) Research Competition" with their Hepatitis C virus proteins project.

Simultaneous experiments on earth and in space

For their project, the researchers selected two proteins from genotype 4 a specific genotype of HCV that is very predominant in Egypt. The first protein, NS5B, ensures that the genetic material of the virus multiplies in the affected cell during HCV infection. The second protein, NS3, functions as a molecular scissors, cutting a chain of proteins into individual functioning virus proteins during viral replication.

Gaber isolated and purified both proteins in the lab. They were packed in special transport cases called NanoLabs for their journey to the ISS. The finished crystals were due to return to earth late October. At the same time, both proteins will be crystallized in a laboratory on earth to provide results for comparison.

"We hope that the project will be successful and that the crystals produced in space will represent a giant leap forward," said Gaber, who travelled to Florida for the launch. MEH

Discoverers of brain's 'GPS' win 2014 Nobel prize for medicine

The Nobel Assembly at Karolinska Institutet has awarded the 2014 Nobel Prize in Physiology or Medicine with one half to John O´Keefe and the other half jointly to May-Britt Moser and Edvard I. Moser for their discoveries of cells that constitute a positioning system in the brain.

How do we know where we are? How can we find the way from one place to another? And how can we store this information in such a way that we can immediately find the way the next time we trace the same path? This year´s Nobel Laureates have discovered a positioning system, an "inner GPS" in the brain that makes it possible to orient ourselves in space, demonstrating a cellular basis for higher cognitive function.

In 1971, John O´Keefe discovered the first component of this positioning system. He found that a type of nerve cell in an area of the brain called the hippocampus that was always activated when a rat was at a certain place in a room. Other nerve cells were activated when the rat was at other places. O´Keefe concluded that these "place cells" formed a map of the room.

More than three decades later, in 2005, May-Britt and Edvard Moser discovered another key component of the brain's positioning system. They identified another type of nerve cell, which they called "grid cells", that generate a coordinate system and allow for precise positioning and pathfinding. Their subsequent research showed how place and grid cells make it possible to determine position and to navigate.

The discoveries of John O´Keefe, May-Britt Moser and Edvard Moser have solved a problem that has occupied philosophers and scientists for centuries – how does the brain create a map of the space surrounding us and how can we navigate our way through a complex environment?

How do we experience our environment?

The sense of place and the ability to navigate are fundamental to our existence. The sense of place gives a perception of position in the environment. During navigation, it is interlinked with a sense of distance that is based on motion and knowledge of previous positions.

Questions about place and navigation have engaged philosophers and scientists for a long time. More than 200 years ago, the German philosopher Immanuel Kant argued that some mental abilities exist as a priori knowledge, independent of experience. He considered the concept of space as an inbuilt principle of the mind, one through which the world is and must be perceived. With the advent of behavioural psychology in the mid-20th century, these questions could be addressed experimentally. When Edward Tolman examined rats moving through labyrinths, he found that they could learn how to navigate, and proposed that a "cognitive map" formed in the brain allowed them to find their way. But questions still lingered - how would such a map be represented in the brain?

John O'Keefe

Mary-Britt Moser

Edvard I. Moser

John O´Keefe and the place in space

John O´Keefe was fascinated by the problem of how the brain controls behaviour and decided, in the late 1960s, to attack this question with neurophysiological methods. When recording signals from individual nerve cells in a part of the brain called the hippocampus, in rats moving freely in a room, O'Keefe discovered that certain nerve cells were activated when the animal assumed a particular place in the environment. He could demonstrate that these "place cells" were not merely registering visual input, but were building up an inner map of the environment. O'Keefe concluded that the hippocampus generates numerous maps, represented by the collective activity of place cells that are activated in different environments. Therefore, the memory of an environment can be stored as a specific combination of place cell activities in the hippocampus.

May-Britt and Edvard Moser find the coordinates

May-Britt and Edvard Moser were mapping the connections to the hippocampus in rats moving in a room when they discovered an astonishing pattern of activity in a nearby part of the brain called the entorhinal cortex. Here, certain cells were activated when the rat passed multiple locations arranged in a hexagonal grid. Each of these cells was activated in a unique spatial pattern and collectively these "grid cells" constitute a coordinate system that allows for spatial navigation. Together with other cells of the entorhinal cortex that recognize the direction of the head and the border of the room, they form circuits with the place cells in the hippocampus. This circuitry constitutes a comprehensive positioning system, an inner GPS, in the brain.

A place for maps in the human brain

Recent investigations with brain imaging techniques, as well as studies of patients undergoing neurosurgery, have provided evidence that place and grid cells exist also in humans. In patients with Alzheimer´s disease, the hippocampus and entorhinal cortex are frequently affected at an early stage, and these individuals often lose their way and cannot recognize the environment. Knowledge about the brain´s positioning system may, therefore, help us understand the mechanism underpinning the devastating spatial memory loss that affects people with this disease.

The discovery of the brain's positioning system represents a paradigm shift in our understanding of how ensembles of specialized cells work together to execute higher cognitive functions. It has opened new avenues for understanding other cognitive processes, such as memory, thinking and planning. MEH

WHO calls for coordinated action to prevent suicides

More than 800,000 people die by suicide every year – around one person every 40 seconds, according to the World Health Organization's first global report on suicide prevention, published 4 September 2014. Some 75% of suicides occur in low- and middle-income countries.

Pesticide poisoning, hanging and firearms are among the most common methods of suicide globally. Evidence from Australia, Canada, Japan, New Zealand, the United States and a number of European countries reveals that limiting access to these means can help prevent people dying by suicide. Another key to reducing deaths by suicide is a commitment by national governments to the establishment and implementation of a coordinated plan of action. Currently, only 28 countries are known to have national suicide prevention strategies.

Suicide is a global phenomenon

Suicide occurs all over the world and can take place at almost any age. Globally, suicide rates are highest in people aged 70 years and over. In some countries, however, the highest rates are found among the young. Notably, suicide is the second leading cause of death in 15-29 year-olds globally.

"This report is a call for action to address a large public health problem which has been shrouded in taboo for far too long" said Dr Margaret Chan, Director-General of the World Health Organization (WHO).

Generally, more men die by suicide than women. In richer countries, three times as many men die by suicide than women. Men aged 50 years and over are particularly vulnerable.

In low- and middle-income countries, young adults and elderly women have higher rates of suicide than their counterparts in high-income countries. Women over 70 years old are more than twice as likely to die by suicide than women aged 15-29 years.

Suicides are preventable

Reducing access to means of suicide is one way to reduce deaths. Other effective measures include responsible reporting of suicide in the media, such as avoiding language that sensationalizes suicide and avoiding explicit description of methods used, and early identification and management of mental and substance use disorders in communities and by health workers in particular.

Follow-up care by health workers through regular contact, including by phone or home visits, for people who have attempted suicide, together with provision of community support, are essential, because people who have already attempted suicide are at the greatest risk of trying again.

"No matter where a country currently stands in suicide prevention," said Dr Alexandra Fleischmann, Scientist in the Department of Mental Health and Substance Abuse at WHO, "effective measures can be taken, even just starting at local level and on a small-scale".

WHO recommends countries involve a range of government departments in developing a comprehensive coordinated response. High-level commitment is needed not just within the health sector, but also within education, employment, social welfare and judicial departments.

"This report, the first WHO publication of its kind, presents a comprehensive overview of suicide, suicide attempts and successful suicide prevention efforts worldwide. We know what works. Now is the time to act," said Dr Shekhar Saxena, Director of the Department of Mental Health and Substance Abuse at WHO.

The report's launch came a week before World Suicide Prevention Day, observed on 10 September every year. The Day provides an opportunity for joint action to raise awareness about suicide and suicide prevention around the world.

Working towards a global target

In the WHO Mental Health Action Plan 2013-2020, WHO Member States have committed themselves to work towards

> First and foremost, policy and legislative actions are needed. Side-by-side with these, there is a need to raise public and professional awareness of suicide as a public health problem, so that space for rational discussion and action for suicide prevention is enhanced.

the global target of reducing the suicide rate in countries by 10% by 2020. WHO's Mental Health Gap Action Programme, launched in 2008, includes suicide prevention as a priority and provides evidence-based technical guidance to expand service provision in countries.

Suicide in the Eastern Mediterranean Region

Commenting on the report, Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, said that estimated suicide rates are generally lower in the WHO Eastern Mediterranean Region compared to other WHO regions.

"Religious and socio-cultural norms about suicidal behaviour may explain to some extent why reported suicide mortality rates are lower in this region than in other regions," he said.

However, there is evidence that among certain age groups in this region, suicide rates are relatively high, particularly among young women and men aged 15-29 years, and women and men aged 60 years and above.

Dr Alwan pointed out that suicide is often the result of a series of events and factors over the course of a person's life rather than the result of a single event or factor.

He said there was much that could be done to prevent suicide.

"First and foremost, policy and legislative actions are needed," Dr Alwan said. "Side-by-side with these, there is a need to raise public and professional awareness of suicide as a public health problem, so that space for rational discussion and action for suicide prevention is enhanced."

Strategies involving restriction of access to common methods of suicide, such as firearms or toxic substances like pesticides; prevention and treatment of depression and alcohol and substance abuse; and follow-up contact with those who have attempted suicide have proven effective in reducing suicide rates.

"It is essential that we improve the reliability of suicide certification and reporting, to craft the needed strategies and interventions."

The need is especially important now because a number of countries in the region are experiencing acute humanitarian emergencies which can contribute to a surge in suicide rates. This can be due prolonged exposure to adverse living conditions, which increases vulnerability to mental disorders as well as a reduction in the capacity of health and social institutions to provide support when needed most.

on the WEB WHO report: Preventing suicide: a global imperative
www.who.int/suicide

Improved data reveals higher global burden of tuberculosis

Recent intensive efforts to improve collection and reporting of data on tuberculosis (TB) are shedding new light on the epidemic, revealing that there are almost half a million more cases of the disease than previously estimated. The World Health Organization's Global Tuberculosis Report 2014, published 22 October 2014, shows that 9 million people developed TB in 2013, and 1.5 million died, including 360,000 people who were HIV positive.

The report stresses, however, that the mortality rate from TB is still falling and has dropped by 45% since 1990, while the number of people developing the disease is declining by an average 1.5% a year. An estimated 37 million lives have been saved through effective diagnosis and treatment of TB since 2000.

"Following a concerted effort by countries, by WHO and by multiple partners, investment in national surveys and routine surveillance efforts has substantially increased. This is providing us with much more and better data, bringing us closer and closer to understanding the true burden of tuberculosis," says Dr Mario Raviglione, Director of the Global TB Programme, WHO.

Although higher, these revised figures fall within the upper limit of previous WHO estimates. The report, however, underlines that a staggering number of lives are being lost to a curable disease and confirms that TB is the second biggest killer disease from a single infectious agent. In addition, around three million people who fall ill from TB are still being 'missed' by health systems each year either because they are not diagnosed, or because they are diagnosed but not reported.

Insufficient funding is hampering efforts to combat the global epidemic. An estimated US$8 billion is needed each year for a full response, but there is currently an annual shortfall of $2 billion, which must be addressed.

MDR-TB

The multidrug resistant TB (MDR-TB) crisis continues, with an estimated 480,000 new cases in 2013. Worldwide, about 3.5% of all people who developed TB in 2013 had this form of the disease, which is much harder to treat and has significantly poorer cure rates. While the estimated percentage of new TB cases that have MDR-TB globally remains unchanged, there are severe epidemics in some regions, particularly in Eastern Europe and Central Asia. In many settings around the world, the treatment success rate is alarmingly low. Furthermore, extensively drug-resistant TB (XDR-TB), which is even more expensive and difficult to treat than MDR-TB, has now been reported in 100 countries.

Since 2009, with more laboratories rolling out rapid tests, there has been a tripling of MDR-TB cases being diagnosed. In 2013, 136,000 MDR-TB cases were detected and 97,000 people were started on treatment. Although the number of patients treated has increased three-fold since 2009, at least 39,000 patients, diagnosed with this form of TB, were not being treated last year and globally only 48% of patients were cured.

> Extensively drug-resistant TB (XDR-TB), which is even more expensive and difficult to treat than multidrug resistant TB (MDR-TB), has now been reported in 100 countries.

"The progress that has been made in combatting MDR-TB has been hard won and must be intensified. Containing and reversing the epidemic requires immediate and sustained efforts by all stakeholders," says Dr Karin Weyer, WHO Coordinator for Laboratories, Diagnostics and Drug Resistance. "Improved diagnostic tools and access mean that we are detecting and treating more cases. But the gap between detecting and actually getting people started on treatment is widening and we urgently need increased commitment and funding to test and treat every case. In countries such as Estonia and Latvia, where there is universal access to rapid diagnostics and treatment, the number of MDR-TB cases has fallen significantly. This show what can be achieved."

A special supplement to this year's WHO report marks 20 years of anti-TB drug-resistance surveillance. It outlines the MDR-TB response to-date and the priority actions that must now be taken from prevention to cure. Anti-TB drug-resistance surveillance has been a pathfinder in global efforts against antimicrobial resistance (AMR).

HIV-related TB deaths

Another key challenge is the co-epidemic of TB and HIV. An estimated 1.1 million (13%) of the 9 million people who developed TB in 2013 were HIV-positive, with four out of five cases and deaths occurring in the African Region. While the number of TB deaths among HIV-positive people has been falling for almost a decade, from 540,000 in 2004 to 360,000 in 2013, antiretroviral treatment, preventive therapy and other key interventions still need to be further scaled-up.

Research funding urgently required

Research has a crucial role to play in ending the global TB epidemic and efforts to develop new tools to combat the disease have intensified during the past decade. The research and development pipeline has produced several new diagnostics (such as Xpert MTB/RIF) and two new drugs to treat MDR-TB (bedaquiline and delamanid). Additional rapid tests, new drugs and drug regimens, and vaccines are in clinical trials. However, TB research and development is still severely underfunded.

"In addition to the serious underfunding for research, $8 billion a year is required for TB and MDR-TB prevention, diagnosis and treatment. Domestic and international financing needs to step up to prevent millions of unnecessary deaths," says Katherine Floyd, WHO Coordinator for TB Monitoring and Evaluation.

on the WEB Global Tuberculosis Report 2014
www.who.int/tb/publications/global_report

e-Cigarettes came under the spotlight at the WHO FCTC convention.

WHO makes progress despite pressure from tobacco industry

Landmark decisions adopted at Moscow convention

The sixth session of the Conference of the parties (COP6) to the WHO Framework Convention on Tobacco Control (FCTC) concluded 18 October in Moscow. Several landmark decisions were adopted in the course of the six-day session, regarded as one of the most successful in the WHO FCTC's history.

In her opening speech, WHO Director-General Dr Margaret Chan said that "as implementation of the Framework Convention reaches new heights, the tobacco industry fights back, harder and through every possible channel, no matter how devious those channels and practices are."

Despite increased efforts by tobacco industry to undermine the WHO FCTC, important decisions were passed.

"Parties have taken courageous steps forward in a number of areas and I am pleased by the guidance to the Secretariat to scale up our collaboration with international organizations to reduce tobacco use, while continuing to assist Parties in accelerating the implementation of the Treaty," said Dr Vera da Costa e Silva, Head of the Convention Secretariat.

One of the first decisions approved by the Parties was on the Article 6 guidelines, devoted to tax measures to reduce the demand for tobacco. Tobacco taxation is a very effective tool for influencing the prices of tobacco – higher taxes usually lead to higher prices, which in turn lead to lower consumption.

The regulations provide for tax rates to be monitored, increased and adjusted annually, taking into account inflation and income growth. At the same time, all tobacco products should be taxed in a comparable way to prevent substitutions of the use of one product with another.

Several measures aimed at restricting tobacco industry interference were decided by the parties, which concern implementation of Article 5.3 of the WHO FCTC. These include request the Convention Secretariat to continue providing technical support to the Parties, and to engage with international organizations on the matters of tobacco companies' influence.

Another milestone in tobacco control was adoption of the decision on electronic nicotine (and non-nicotine) delivery systems, also known as electronic cigarettes. This rather novel product was first launched by independent companies, but many of them are now being controlled by multinational tobacco companies.

The decision allows Parties to prohibit or regulate these products as they see fit, whether as tobacco, medicinal, consumer or any other product category, and urges Parties to consider banning or restricting promotion, advertising and sponsorship of these products.

COP6 honoured the tradition of the previous conferences and adopted the Moscow Declaration. Noting that the heaviest burden of tobacco related diseases is borne by the most vulnerable population groups, the Declaration calls on the parties to strengthen international collaboration on tobacco control and attain a voluntary global target of 30% prevalence reduction by 2025.

The President of the COP Bureau, Professor Chang Jin Moon, said that many other significant decisions were made and "it is clear that the Parties are supportive of continuing to raise the profile of the WHO FCTC in the international arena and on global health agenda".

> Member countries urged to consider banning or restricting promotion, advertising and sponsorship of electronic cigarettes.

These decisions include:

- Proposals for regulation of smokeless tobacco and water pipe products;
- Recommendations for entry into force of the Protocol to Eliminate Illicit Trade in Tobacco Products;
- Continuing to work on Article 19 on liability of tobacco companies;
- Articles 17 and 18 principles addressing sustainable alternative livelihoods for tobacco growers;
- Trade and investment issues related to FCTC implementation;
- Assessment of the Convention's impact on tobacco epidemic.

Together, these decisions will help move forward the treaty, which entered into force in February 2005. The number of Parties to the Convention is 179 as of 18 October. It is the fastest ratified treaty in the UN history. Conference of the Parties is the governing body of the Convention, which meets regularly to review progress of the Convention and takes the decisions necessary to promote its effective implementation. MEH

Occupational Infections among Health Care Workers in a Secondary Care Hospital Saudi Arabia

Middle East Heath republishes this research paper (originally published in *Occupational Medicine and Health Affairs* – November 13, 2013). The paper deals with exposure to infectious diseases by health workers in the hospital environment. Although it does not deal specifically with MERS-CoV (a more recent issue in Saudi Arabia), it is timely as it shows clearly that nurses are in the firing line when it comes to transmission of infectious diseases in the hospital setting.

By JAssiri AM, Hathout HM, Anwar MM, El Dalatony MM, Abdel Kader NM

ABSTRACT

Introduction:
Healthcare workers (HCWs) are frequently exposed to various infectious agents while performing their duties and many accidental exposures to blood borne and air borne pathogens are preventable if health care workers comply with appropriate precautions.

Objectives:
Assessment of some occupational exposure among health care workers in a secondary care hospital - Najran province - Saudi Arabia during the period (2009-2012).

Subjects and methods:
Retrospective review of health care workers' (HCWs) records from staff health clinic to determine the distribution of occupational infections among different job categories which was confirmed by clinical manifestations, laboratory investigations and reports of needle stick incidents to which HCWs were exposed during period of data collection.

Results:
The most common occupational infection among healthcare workers was chicken pox. There was low Tuberculin skin test (TST) conversion rate among different professional categories and nurses were the most affected occupational category during the study period as regard exposure to sharp injuries and air borne infections.

Conclusions:
Management policy and procedures should be directed and implemented to minimize and prevent occupational infections with emphasis on nurses as being the highly affected risk group.

INTRODUCTION

Health care workers (HCWs) are defined as all paid and unpaid persons working in health-care settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. HCWs might include (but are not limited to) physicians, nurses, nursing assistants, therapists, technicians, emergency medical service personnel, dental personnel, pharmacists, laboratory personnel, autopsy personnel, students and trainees, contractual staff not employed by the healthcare facility, and persons (e.g. clerical, dietary, housekeeping, laundry, security, maintenance, administrative, billing and volunteers) not directly involved in patient care but potentially exposed to infectious agents that can be transmitted to and from HCWs and patients[1,2].

While performing their duties, healthcare workers (HCWs) are frequently exposed to dangerous infectious agents. The risk of transmission of vaccine-preventable infections, both from patients to HCWs and from personnel to patients, other HCWs, and visitors is substantial[3,4]. Measles, rubella, varicella, hepatitis A and hepatitis B (HBV) are all vaccine-preventable diseases that are readily transmitted in healthcare facilities[5-9]. The mortality and morbidity associated with these infections can be significant[5-9]. Additionally, the high cost of controlling transmission and confining nosocomial outbreaks is a significant economic burden[2,3].

At the same time health care workers are at a high risk of exposure to blood and body fluids. Needle stick injuries, cuts and splashes are common occupational accidents exposing health care providers to different blood borne pathogens. Transmission of hepatitis B virus, human immune deficiency virus (HIV), and hepatitis C virus (HCV) has been related to injuries and frequency of exposure. According to world health organization (WHO), 2.5% of HIV cases, 40% of both HBV and HCV cases worldwide are the result of occupational exposure among health care workers[10]. The first report of HIV transmitted to a HCW as a result of a Needle stick Injury (NSI) was published in 1984[11]. Adherence to standard precautions, awareness about post exposure prophylaxis (PEP) is poor in developing countries among HCWs and documentation of exposures is suboptimal[12].

Tuberculosis (T.B) is a potential occupational hazard for health care workers (HCWs)[13]. Unfortunately, prevalence rates of T.B among health care workers in Saudi Arabia are not available, even though it is considered one of the most common chronic infectious diseases in the country[14].

The tuberculin skin test (TST) is one of the few tests developed in the 19th century that still in present use in clinical medicine and it is the recommended tool for T.B screening of health care workers[15]. In several reports, from 4% to 79% of health care workers exposed to mycobacterium tuberculosis develop positive tuberculin skin test[9]. Without known exposure, the yearly conversion rate of tuberculin for health care workers averages 0.1%-5.0%[16].

AIM OF THE STUDY

1. Assessment of some occupational infections among health care workers in a secondary care hospital- Najran province- Saudi Arabia during the period (2009-2012).

2. Study distribution of sharp injury incidents among professional categories during the study period.

3. Review of follow up data of the reported needle stick and sharp incidents for the same study period.

Materials and Methods

Descriptive study involved health care workers (HCWs) in a secondary care hospital with bed capacity of 300 beds in Najran district located in the Southern province-Saudi Arabia to estimate the incidence of occupational infections and sharp injury exposure during the period (2009-2012).

HCWs included in the study were categorized as: physicians, nurses, technicians and housekeepers with average numbers (254, 452, 85 and 209; respectively), during the study period.

METHODS

Retrospective review of the complete electronic medical records for the working medical staff members in different job categories and all facility departments e.g. ICU, ER, OR, Isolation rooms, Infectious diseases, Pediatrics etc, to determine the following:

1. Occupationally acquired infections (droplet and air borne infection) to which HCWs were exposed during the

Table 1: Types of some air borne infections encountered during the study period (2009-2012).

Types of air borne infection	No. (%)
Pulmonary tuberculosis	2 (4.2%)
Chicken Pox	32 (66.7%)
Measles	14 (29.2%)
Total	48 (100%)

Table 2: Rate of TST conversion among professional categories during the period of study (2009-2012).

Professional categories	No. of susceptible health care workers for TST conversion	No. of TST conversion	Rate of TST conversion
Physicians	254	0	0
Nurses	452	2	0.44
Technicians	85	0	0
Housekeepers	209	0	0
Total	1000	2	0.2

Table 3: Frequency and percentage distribution of sharp injury incidents among professional categories during the period from 2009-2012.

Professional categories	No. of susceptible health care workers for needle-stick injuries	No. of sharp injury incidents	Needle stick injury rate
Physicians	254	45	17.7
Nurses	452	143	31.5
Technicians	85	6	7.1
Housekeepers	209	18	8.6
Total	1000	212	21.2

study period including pulmonary tuberculosis, chicken Pox, measles, mumps, rubella, pertussis, and meningococcal meningitis. Diagnosis of previously mentioned infections was confirmed by history, clinical manifestations, and laboratory investigations including serology and tuberculin skin test (TST) conversion for tuberculosis.

2. Number of tuberculin skin test (TST) converted HCWs during the study period were obtained by reviewing baseline and annual TST using Mantoux skin method.

Annual TST was mandatory for all employees, unless there was documentation of a previously positive test. Tuberculin skin testing of HCWs was performed at the hospital via the Mantoux method: a 0.1- mL (5 tuberculin units) solution of purified protein derivative (PPD) was injected intradermal on the volar surface of the forearm and the result was read 48-72 hours later by employee health staff (EHS). Self-reporting of results by HCWs was not permitted. Positive TST result was defined as indurations of 10 mm or more. TST conversion was defined as a documented positive TST result after a documented negative TST result performed by EHS.

3. Incidents of needle stick and sharp injuries during the period of study reported by the HCWs to the staff health clinic as stated by the hospital policy.

4. Review of follow up data of the reported needle stick and sharp object incidents during the study period to detect seroconversion.

Data analysis and interpretation

Collected data of occupational infections and needle stick and sharp object incidents among health care workers during the study period were analyzed using SPSS Program version 13.

Calculation of TST conversion rate

TST Conversion Rate=No of TST converted staff /total screened staff ×100

Ethical considerations

To ensure privacy, dignity and integrity, names of the participant health care workers were kept confidential.

Institutional ethics committee clearance for accessing health worker records was taken.

RESULTS

Total number of air borne infections reported by health care workers during the study period was 48. The most common was chicken pox 32(66.7%), followed by measles 14 (29.2%) and the least prevalent was pulmonary tuberculosis 2(4.2%) (Table 1).

Figure 1 demonstrates that nurses were the most commonly affected category, as about 31 (65%) of all air borne infections during the study period (mainly chicken pox)were reported by nurses (Figure 1).

Most reported cases were during the year 2011 which represents 15 / 48(31.3%) infections during the study period (Figure 2).

N.B: Regards exposure of health care workers to droplet infections, there were no reported exposures to droplet infections as mumps, rubella, pertussis, meningococcal meningitis among health care workers during the period from 2009-2012.

There was very low TST conversion rate among HCWs with only 2 reported cases of TST conversion among nurses' group during the study period (2009-2012) (Table 2).

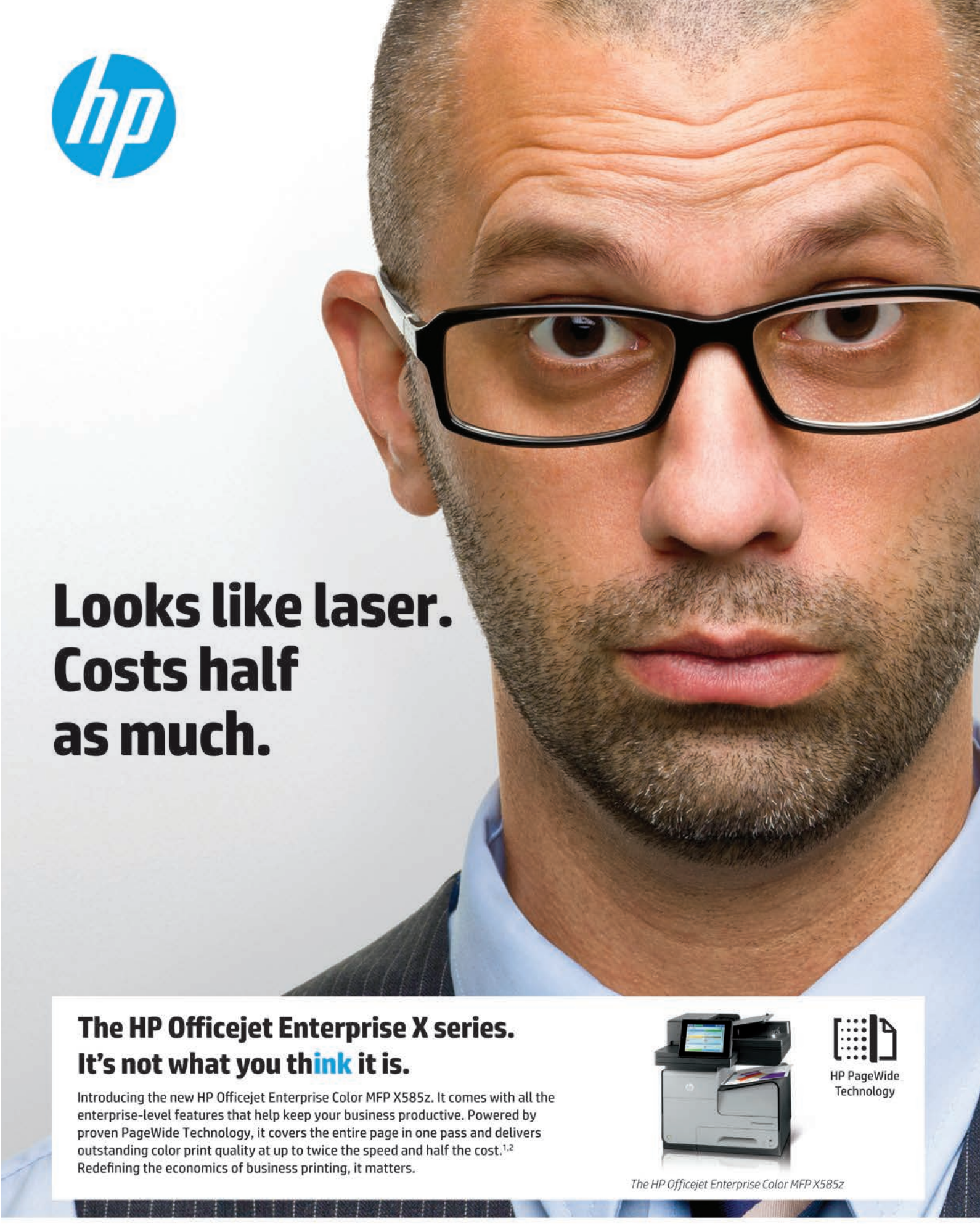
Among the listed professional categories, nurse group was the most common likely to report sharp incidents during the study period as they reported 143 / 212 incidents (67.5%) (Table 3).

N.B: The number of seroconverted cases of blood borne pathogens was zero after 6 months of follow up according to hospital policy.

DISCUSSION

Surveillance data on occupational health risks is a cornerstone in occupational safety and health (OSH) management. Reporting the data on occupational infectious diseases not only highlights the important time trends in work-related health risks, but also stresses on the importance of workplace prevention and hygiene[17].

In this study, chicken pox was the most frequently reported airborne acquired infection among health care workers accounted for 66.7% of all infections. This is consistent with the studies conducted in Saudi Arabia which demonstrated through serological screening higher susceptibility to



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[1]Comparison based on manufacturers' published specifications of fastest available color mode (as of November 2013) and includes color laser MFPs ≤€2500, based on market share as reported by IDC as of Q3 2013 and HP internal testing of printer in fastest available color mode (sample 4-page category documents tested from ISO 24734). For more information, see hp.com/go/printerspeeds
[2]Cost per page (CPP) claim is based on the majority of color laser MFPs ≤€2500 as of December 2013, based on market share as reported by IDC as of Q3 2013. ISO yield is based on continuous printing in default mode. CPP comparisons for laser supplies are based on published specifications of the manufacturers' highest-capacity cartridges. For details, see hp.com/go/officejet. CPP based on HP 980A ink cartridges' estimated street price. For more information, see hp.com/go/learnaboutsupplies

Figure 1: Distribution of some air borne infections in relation to health care workers' job categories.

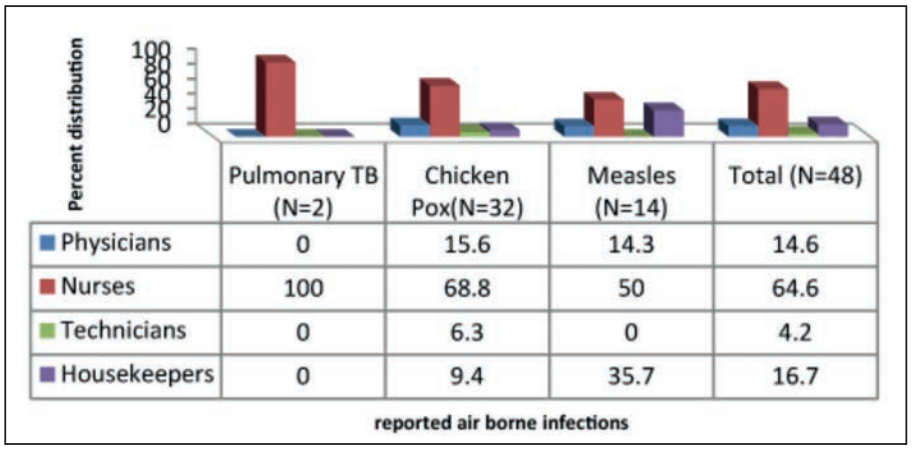
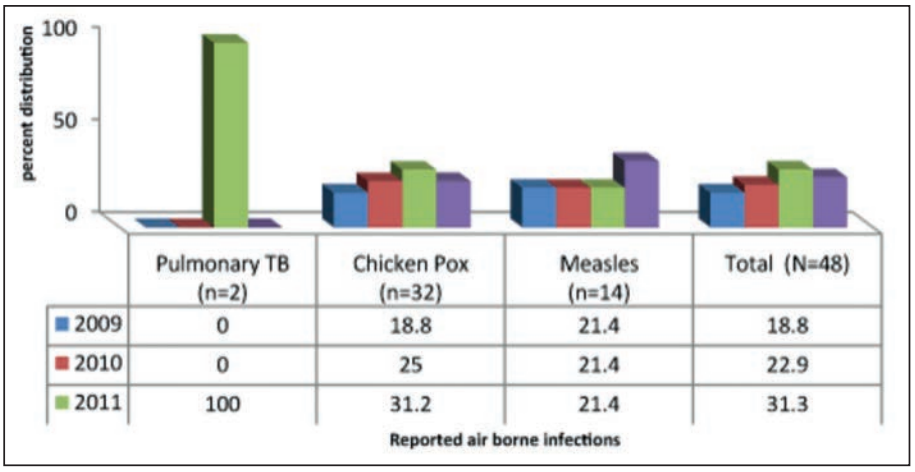


Figure 2: Distribution of air borne infections in relation to years of data collection.



varicella among health care workers (11.3% and 14%; respectively) in comparison to susceptibility to other infectious diseases as measles (13%) and rubella (10%)[4,18]. This may be explained by low response rate for chicken pox vaccination among health care workers as although a vaccine to prevent the disease was approved for health care workers in 2003, the acceptance rates are as low as) 15% (which may be due to worries about side effects, suspicions about vaccines, and a general perception that the natural infection is mild, all contribute to staff ambivalence towards these optional program)[19].

Measles patients potentially expose large number of individuals in the emergency department and health care facility before being placed under air borne precautions. These potential hospital exposures had important employee health and public health implications.

Based on the average number of nurses, 7 cases of measles were reported during the study period represented an annual incidence of 30 cases per 1000 nurses. This represents a much higher attack rate of measles among HCWs who had not been vaccinated against measles or who had received only one dose of measles vaccine[20]. This indicates a high risk of measles transmission in healthcare settings among non-immune persons.

Tuberculosis (TB) is a public health problem estimated as 17/100000 population in 2011 according to WHO[21]. Also, (TB) considered as an occupational infectious disease, occurring in healthcare professionals that could lead to work absenteeism and a negative professional impact. Accurate monitoring of employee tuberculin conversion rates is the cornerstone for revision and reinforcement of tuberculosis control measures[22].

In the current study, pulmonary tuberculosis was the least frequent occupationally acquired infections as it constituted 4.0% (of all reported infections during the period of study with TST conversion rate) 0.2% (consistent with the other studies that demonstrated TST conversion rate (0.38%, 0.1%) respectively)[16,22]. This low TST conversion rate in the current study can be explained by the regular yearly follow up, continuous professional education, and on site job training conducted by the staff clinic in the studied facility and the commitment of the health care workers to the standard precautions of employee health in their health care facility.

On the other hand, other studies based on data of compensated occupational diseases revealed much higher frequency of TB among health care workers with reported frequency, 71.3% and 83.9% of all reported occupational infections respectively[23-25].

In the present study, nurses' group was the most commonly affected professional category (65%) for all reported air borne infections and this is consistent with other studies that reported similar percentages of nurses' affection ranging from 62.5-72%[24,25].

Accidental sharp injuries (SIs) are an occupational hazard for healthcare workers (HCWs) posing a significant risk of occupational transmission of blood borne pathogens such as human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) to healthcare workers[23].

In this study, the majority of HCWs who had NSIs was nurses (67.5%), physicians (21.2%), followed by housekeepers and technicians staff (8.5 & 2.8%) respectively. Nurses were the most commonly affected job category, a finding comparable to most reported data published both locally and internationally, this is owing to the fact that nurses are the persons in direct contact and responsible for most of blood sampling and other I.V access procedures carried out during patient care in hospitals[23,26,27].

Hepatitis viruses (B and C) and HIV laboratory testing did not show any positive seroconversion with similar reported zero seroconversion for HIV following needle stick injury among 296 HCWs reporting NSIs in a tertiary care hospital in

India and another low but not negligible seroconversion rate with HCV seroconversion rate (1.2%) after 6 months follow up of needle stick injuries[28]. These data addresses the success of hepatitis B vaccination implemented for all newly hired employees in the studied health care facility in KSA ensuring high antibodies titer indicating individual immunity; in addition to maintaining high level standard of infection control practices[29].

CONCLUSION

The most common occupational infection among studied healthcare workers was chicken pox. Nurses' group was the most affected occupational category during the study period as regards exposure to sharp injuries and air borne infections so, management policy to prevent occupational infectious diseases must focus on nurses.

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Dynamic lighting designed to promote healing and wellbeing

It has been long known that light affects people's mood and sense of wellbeing. So why not use it effectively in a healthcare setting to enhance the healing environment and promote the wellbeing of patients and staff?

In a major and often cited study – 'The impact of light on outcomes in healthcare settings', Anjali Joseph. PhD. (the Center for Health Design, 2006) – the researchers note in their key findings that "light impacts human health and performance by enabling performance of visual tasks, controlling the body's circadian system, affecting mood and perception, and by enabling critical chemical reactions in the body. Studies show that higher light levels are linked with better performance of complex visual tasks and light requirements increase with age. By controlling the body's circadian system, light impacts outcomes in healthcare settings by reducing depression among patients, decreasing length of stay in hospitals, improving sleep and circadian rhythm, lessening agitation among dementia patients, easing pain, and improving adjustment to night-shift work among staff. The presence of windows in the workplace and access to daylight have been linked with increased satisfaction with the work environment. Further, exposure to light is critical for vitamin D metabolism in the human body. Light exposure also is used as a treatment for neonatal hyperbilirubinaemia.

Research has shown that the more time patients spend in daylight, or artificial light that mimics natural light, the better is their biological response to healing and therapy. The research showed that light can improve patient satisfaction, comfort, mood and quality of sleep – all factors that can speed up recovery from illness or surgery.

The effect of light on a person's biological clock is also important as it influ-

ences many aspects of their physical and emotional wellbeing. This biological clock is regulated by light and darkness, by the daily cycles of night and day and the time a person spends asleep and awake. Those who have to stay indoors for significant parts of their time, like hospital patients, can be particularly at risk of getting insufficient light during the day to set their biological clock properly.

"By controlling the circadian system, light – both natural and artificial – impacts many health outcomes among patients and staff in hospitals such as depression, sleep, circadian rest-activity rhythms, as well as length of stay in the hospital," says Anjali in his research paper.

When looking at the influence of lighting on decreasing the length of stay in hospital, Anjali cites several studies. Beauchemin & Hays (1996) and Benedetti et al. (2001) documented the impact of light on length of stay among depressed patients. A couple of other studies suggest that exposure to light may be linked to length of stay among clinically nondepressed patients as well. A retrospective study of myocardial infarction patients in a cardiac intensive-care unit treated in either sunny rooms or dull rooms found that female patients stayed a shorter time in sunny rooms (2.3 days in sunny rooms, 3.3 days in dull rooms) (Beauchemin & Hays, 1998). Mortality in both sexes was consistently higher in dull rooms (39/335 dull, 21/293 sunny). Another study found that Veterans Health Administration medical centers located in warmer and drier climates had shorter length of stay of patients (Federman, Drebing, Boisvert, & Penk, 2000). Hospitals in colder climates had longest lengths of stay in winter and fall.

HealWell

Building on this research Philips took up the challenge to develop dynamic lighting for the hospital setting in an effort speed up patient recovery and promote patient wellbeing. Of course it was a natural step for Philips to innovate in this field as they could relatively easily combine expertise from two of their major interests – lighting and healthcare.

The HealWell solution features defined pre-sets. These are:

Ambient light

- Atmospheric light
  - LED based coloured light line in cove opposite to bed
- **Accent light**
  - LED spots in ceiling to shine on wall opposite to bed

Dynamic-natural / examination light

- **Dynamic light modules**
  - Like natural daylight ceiling modules provide daylight rhythm, with varying light levels and warmer or cooler light according to the time of day
- **Intelligent light**
  - Daylight rhythm (special protected lighting curve)
  - Central control over all lighting
  - Working light for examinations and emergencies

Reading & orientation light

- **Personal reading light**
  - LED spot, providing dimmable reading light per bed
- **Orientation light**
  - Dimmed soft light line in the cove along the wall at night

Empowerment of patient & staff

- **Patient remote control**
  - Choice of atmosphere light (coloured cove and spots)
  - Reading light
- **Staff working light control**
  - Wall mounted control per bed for examination/emergency light
- **Full room control for staff**
  - Daylight curve
  - Working light
  - Orientation light

HealWell installations in the Middle East

Philips has installed the HealWell solution at the Skilled Nursing Facility of Hamad Medical Corporation in Doha, Qatar. They have found that the lighting solution not only benefits the patients, but is also shown to improve staff performance as the dynamic lighting makes it a more pleasant environment in which to work.

The company proceeded to develop a dynamic lighting solution called HealWell for hospital rooms.

The lighting solution makes use of an intelligent networked control system. It automatically manages a rhythm of dynamic daylight – dynamic shades of warm and cool light – in the patient room to support patients' biorhythms throughout the day. It also allows patients and staff to control settings individually.

HealWell produces lighting levels that change gradually throughout the course of the day, much like the changes in light outdoors on a sunny day, and this affects sleep and mood. In a sense it mimics the natural day/night cycle outdoors.

> By controlling the circadian system, light – both natural and artificial – impacts many health outcomes among patients and staff in hospitals such as depression, sleep, circadian rest-activity rhythms, as well as length of stay in the hospital.

Sleep-wake rhythm

The Maastricht University Medical Center (Maastricht UMC) in the Netherlands has carried out research in partnership with Philips to investigate the effect of

light on the sleep-wake rhythm of cardiac patients. The research shows that after seven days in a patient room fitted with HealWell patients sleep on average 8% longer. After one week in a patient room fitted with standard lighting, on the other hand, patients' sleep duration was in fact slightly shorter than on the first night.

Sleep essential part of recovery process

Existing scientific research has shown that high levels of light during the day help to regulate the human biological clock and the sleep-wake rhythm. If a person's biorhythm is less than optimum, this can disrupt sleep and give rise to a variety of health problems. Philips HealWell combines the positive biological effects of natural daylight with a pleasant atmosphere in the patient room. This has a positive effect on the patient's sleep patterns and that in turn has a positive effect on their biorhythm, which is important for their health and wellbeing.

Improvements

The research has demonstrated some significant improvements: the time it takes a patient to fall asleep is reduced by approximately 30% during the period between the first and the seventh night and at the same time the duration of sleep at night increases by on average 8%. This means that a patient sleeps on average 30 minutes longer.

The research also shows that patients really appreciate being able to select the ambient lighting themselves. The healthcare personnel were also very impressed with the Philips HealWell lighting, partly because of the better light distribution over the entire bed without any annoying shadows.

Maastricht UMC research

The Maastricht UMC, the Clinical Trial Center Maastricht and the University of Maastricht spent more than nine months carrying out research into the effects of the Philips HealWell system on sleep and wellbeing among patients. This dynamic lighting system was installed in a number of patients' rooms in the hospital's Cardiology department. More than 100 cardiac patients took part in the survey, whereby one group was treated in patients rooms fitted with the Philips HealWell system and the other group, the control group, was treated in patient rooms equipped with standard lighting.

The Maastricht UMC research showed that the HealWell lighting solution resulted in:

- Improved patient and staff satisfaction
- Longer sleep duration for patients
- Shorter time to fall asleep for patients
- Enhanced mood of patients, as derived from the HADS (Hospital Anxiety and Depression Scale) depression scores

"We can now tell from the results of the Philips HealWell research that better light during the day enables patients to sleep longer at night," says Dr Petra Kuijpers, cardiologist at the Maastricht UMC. "The patient's mental state is an important factor that influences the prognosis for cardiac patients, and light could have a positive effect on this, as well as on the patient's health in the long term. This is, however, an area in which further research is required. What the positive results of the clinical validation research demonstrate is the valuable role the HealWell lighting solution can play in improving the healing environment and promoting the recovery of our patients."

Commenting on the research, Dr Luc Schlangen, Senior Principal Scientist at Philips Lighting, said: "The research into HealWell at Maastricht UMC ties in with the findings of earlier research, which found that light has a positive effect on health, mood and well-being, not just for people in a care environment but also for healthy people.

"The Maastricht research is the first of a number of research projects that are already in progress or are in preparation in hospitals, such as in the new intensive care unit at the Jeroen Bosch hospital in Den Bosch and in the Hematology department in the Erasmusziekenhuis in Rotterdam. We will use the insights we have gained into the experiences of patients and caregivers to develop meaningful innovations that will improve people's lives."

Hospital lighting survey

In other recent research, which confirms the importance of daylight lighting in the hospital environment – Safaa Alzubaidi, Susan Roaf, P. F. G. Banfill of the School of the Built Environment, Heriot-Watt University, Edinburgh, United Kingdom and Raidh Ali Talib, Abdullah Al-Ansari of the Urology department, Hamad General Hospital, Doha, Qatar, conducted a survey – published in the *International Journal of Energy Engineering* 2013, 3(6). DOI: 10.5923/j.ijee.20130306.02 – to review the subjective judgments of hospital staff lighting needs and satisfaction.

The researchers write that:

Responses obtained from 134 staff showed that 79% of the participants identify daylight in patient's room as a factor helping them do their work more easily, and 77% of the surveyed nurses and doctors claimed that daylight is an important element in patient rooms to aid in reviewing patient recovery through recognizing and interpreting changes in patient skin colour. Seventy eight percent of hospital nurses and all the surveyed doctors believe that daylight has many health benefits including fast recovery and reduced length of stay for patients. Moreover, 92% of the surveyed staff stated that patients preferred to stay in rooms with access to daylight as it makes them feel comfortable.

They point out that these results should be taken on board by hospital designers and regulation makers as an indication of the importance of using good daylight in hospital wards to achieve two important goals of improving both hospital staff working conditions and the patient's healing environment.

Further reading:

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https://www.healthdesign.org/sites/default/files/CHD_Issue_Paper2.pdf
2. "Healthcare design insights – daylighting" – *mahlum.com www.mahlum.com/pdf/MahlumHDIAutumn2009Issue01.pdf* MEH

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UK healthcare consolidates after major structural reform

Kevin Kiely, Medilink Founder and Medilink UK International Executive, outlines the current state of the United Kingdom (UK) Life Sciences sector.

UK Healthcare has been through a period of consolidation over the last 12 months after undergoing a number of major structural changes in 2013.

Many of the changes over the last 12 months have been driven by radical government policies which placed innovation and early technology adoption at the heart of healthcare delivery in the UK.

These changes, designed to foster healthcare innovation, have developed in parallel with a major transformation in the organisation of the NHS, with the commissioning of services moving to the new GP-led Clinical Commissioning Groups (CCGs) supported by Commissioning Support Units.

The drivers for change have been borne out of challenges felt across the globe – the ageing demographic, growth in long term chronic disease, enhanced patient expectations, and of course, the need to contain costs at a time when economies continue to face huge pressures.

And whilst these challenges remain, the NHS has further enhanced its standing as the world's leading healthcare system in a major international survey – matched by a well-supported Life Sciences sector which is thriving in a challenging global market.

Primary care

Arguably the biggest change in UK healthcare service delivery in recent times – the shift in responsibility of primary care in England from Strategic Health Authorities and Primary Care Trusts – is now one year in to its reign.

This change came about from the UK Government's White Paper, 'Equity and Excellence: Liberating the NHS' which outlined radical reform to the way healthcare is delivered in the UK; one of the central principles being that community based General Practitioners (GPs) take responsibility for budgets and commissioning through CCGs.

Transforming innovative ideas and goodwill into operational realities that deliver the outcomes patients and populations need will be critical for CCGs in their second year in order to meet the longer term challenges.

The direction of travel is pointing towards a more patient-centred approach – with a very clear focus on moving from a treatment-based culture, to an agenda of prevention and patient self-management.

NHS leading the way

The NHS has been declared the best healthcare system by an international panel of experts who rated its care superior to countries which spend far more on health.

The report has been produced by the Commonwealth Fund, a Washington-based foundation which is respected around the world for its analysis of the performance of different countries' health systems. It examined evidence about performance in 11 countries, including detailed data from patients, doctors and the World Health Organisation.

The fund's researchers concluded that the United Kingdom ranks first overall, scoring highest on quality, access and efficiency. In the Commonwealth Fund study the UK came first out of the 11 countries

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in eight of the 11 measures of care. It was awarded top place on measures including providing effective care, safe care, co-ordinated care and patient-centred care.

UK Life Sciences

George Freeman, a Conservative MP and former healthcare entrepreneur, was appointed in July as the UK's first Life Sciences minister, an endorsement of the government's desire to promote this thriving sector.

The appointment of George Freeman MP was followed later in the year by the announcement that Britain's life sciences industry is on course to raise its most financing in 2014 for at least seven years, in a sign that government efforts to promote investment in the sector are beginning to pay off.

UK companies raised £734m of capital in the first half of this year, surpassing the £483m raised in the whole of 2013, making it the top European destination for life science fundraising.

The UK Government's 2013 annual Strengths and Opportunities report – which collates information on the medical technology, medical biotechnology industrial biotechnology and pharmaceutical sectors in the UK – provides very encouraging reading.

Based on information in the report, the life sciences sector in the UK consists of 4,980 companies. In total the sector employs 176,000 people in high technology companies across the UK and the industry sells into a global industry with current total market values of £612bn for pharmaceutical and biologics, £223bn for medical technology and £32bn for the rapidly growing industrial biotechnology market. These markets have historical strong growth rates and forecast rates are 8-10% per annum. Life science companies based and operating in the UK generate £52bn in turnover from sales into the UK and overseas and this represents approximately 6% of the world market sales.

These figures provide positive reading against the Government's Strategy for UK Life Sciences. The Government has continued to invest in research in the Life Sciences sector, with the Innovate UK (formally Technology Strategy Board) and Medical Research Councils Biomedical Catalyst Fund, and NHS England SBRI awards supporting new collaborations to deliver solutions to priority unmet clinical needs.

Working in partnership

Government strategies adopted in 2013 have continued to emphasise the importance of partnership working with the private sector. Major initiatives arising from the UK Government's 'Innovation Health and Wealth' policy include the creation of Academic Health Science Networks (AHSNs) and the launch of a new funding mechanism for health technology innovation – the Biomedical Catalyst Fund.

AHSNs are charged with bringing together the NHS, academia, industry and other major stakeholders to improve the identification, uptake and spread of innovation in the NHS, whilst also improving international linkages.

The networks represent a cultural shift in the NHS, with a recognition that service delivery can only be transformed through the rapid adoption of new technologies and that this requires the strategic participation of the UK Life Sciences business community – the focus being on improving the UK's health and wealth.

The Biomedical Catalyst Fund, an Innovate UK and Medical Research Council programme, provides significant funding for the seamless translation of ideas to commercialisation (up to £2.4m for early stage and up to £2.4m for late stage) to de-risk new product propositions making them more attractive to investors.

Another major initiative launched last year and now making real strides is Healthcare UK – a joint initiative between UK Trade & Investment and the Department of Health – to help NHS organisations to do business overseas.

This is being achieved through strategic promotion of the UK healthcare sector to overseas markets and supporting healthcare partnerships between the UK and overseas healthcare providers. The AHSN network has provided a seamless interface between individual NHS trusts and their skills and capabilities, relevant to specific international markets.

The year ahead – Life Sciences taking centre stage

The UK is now arguably better placed to confront the challenges which affect global healthcare systems, addressing the rising costs of healthcare delivery whilst meeting the increased expectations of patients.

The UK General Election in 2015 will see healthcare come into sharp focus – with all of the major political parties recognising this as a key manifesto item.

The future NHS will be characterised as a system and workforce that is focused on outcomes, and a public that takes more responsibility for its own healthcare, no matter who has the political mandate.

With UK political and public will pointing firmly to the issue of improved healthcare delivery, the NHS, alongside its ambitious Life Sciences sector, is well placed to improve the innovation health and wealth of the nation.

- For further information visit:

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Single keyhole surgery for lung cancer

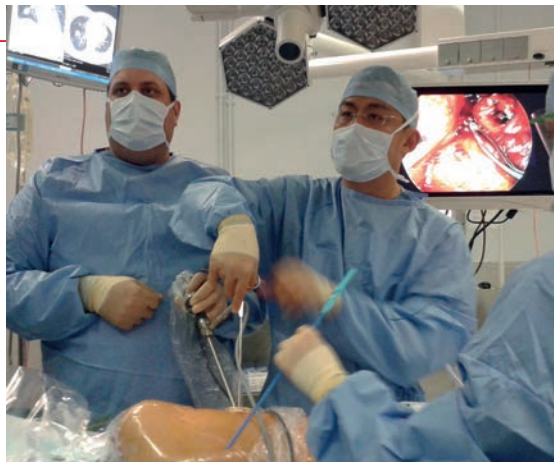
Consultants at Royal Brompton and Harefield Hospitals are using a new form of keyhole surgery for lung cancer, using just one small incision – instead of three or more separate incisions. Our surgical team believes that this may result in less pain, less scarring, reduced recovery time and increased mobility post operation.

Conventional surgery for lung cancer is performed through a fairly large cut in the back of the chest and involves spreading the ribs to remove the diseased section of lung.

The introduction of multiple hole keyhole surgery is already thought to allow for a more rapid recovery and return to normal life in those patients suitable for this technique. Traditionally this type of surgery has involved making three or four small cuts to the chest, through which a telescopic camera and surgical tools are inserted to examine the lungs and remove the affected areas.

An improved technique pioneered by Consultant Thoracic Surgeons, Mr Eric Lim and Mr Simon Jordan at Royal Brompton Hospital, allows surgeons to perform keyhole surgery through just one incision less than three finger breadths. The entire operation is performed through this access alone. Apart from standard lobectomy procedures, more complex operations have also been done with this single port keyhole surgery including segmentectomy, lung resection with chest wall resection, revision surgery and sleeve resection (removing part of the airway and reconstructing the two ends back together to restore airway to minimise loss of lung function).

Although keyhole surgery is gradually gaining in popularity in the UK, it still remains relatively uncommon, accounting for less than 14% of lung cancer operations performed in 2010. In contrast, consultants at Royal Brompton and Harefield Hospitals performed over 133 keyhole procedures between 2010 and 2013 and are performing more each year. Currently the minimally invasive surgeons at the Royal Brompton Hospital are able to perform over 60% of conventional lung cancer resections using this new technique, through a single keyhole.



Cardiac surgeon Dr Eric Lim performing a single incision keyhole lung resection

Next year, Mr Eric Lim will be leading a UK-wide clinical trial that compares keyhole surgery with conventional open chest surgery to further define the relative benefits and answer important questions on outcomes. MEH

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Lurie Children's Case Study: Pediatric Hepatoblastoma & Liver Transplantation

This case study describes the multidisciplinary care provided by the liver transplantation specialists at Ann & Robert H. Lurie Children's Hospital of Chicago. The patient described in the study is a 6-year-old girl who was diagnosed with hepatoblastoma.

Initial diagnosis & treatment

The 6-year-old female was diagnosed with hepatoblastoma in Dubai. Hepatoblastoma is a very rare cancerous tumor that originates in the liver. The liver consists of right and left lobes, and in some children, parts of both lobes can be involved. Hepatoblastoma cancer cells can also spread (metastasize) to other areas of the body. The most common sites of metastasis are the lungs.

The tumor lesions in her liver were in both lobes, and she also presented with metastases to her lungs. According to the PRETEXT classification of hepatoblastoma, she was classified as PRETEXT III P1V1M1, which indicated that the tumor was involved in at least three of the four major parts of the liver. It also meant that she had both portal and hepatic venous involvement and lung metastases. The portal vein and hepatic veins are major blood vessels that bring blood in and out of the liver respectively.

After an initial biopsy done to confirm the diagnosis, she underwent five cycles of chemotherapy in Dubai to shrink the tumor. The chemotherapy successfully cleared the lungs of the tumor and significantly reduced its size in the liver, though it still involved both lobes. The patient's doctors in Dubai were concerned that any surgery to remove the tumor, short of transplantation, would be hazardous.

Lurie Children's second opinion & comprehensive evaluation

While in Dubai, the patient was referred to a center in Germany that recommended liver transplantation. The patient then traveled to our facility in Chicago for a second opinion. Our team reviewed the biopsy slides from Dubai and determined that the tumor was a transitional cell tumor that incorporated both elements of hepatoblastoma and hepatocellular carcinoma (HCC). We decided to attempt to remove the tumor without transplanting the liver.

Lurie Children's hepatobiliary tumor specialists have done studies on the best course of treatment for primary hepatic tumors that had been referred for transplantation from other centers. We've found that aggressive surgical excision (removal) is often the best course of treatment. Not only does excision allow the child to avoid an unnecessary transplant and extensive follow-up care, but it also helps make scarce organs available to children with no other options.

Surgical excision

Lurie Children's surgeon Riccardo Superina, MD, performed the procedure, which began with excision of the right sided tumor under total vascular isolation. A portion of her inferior vena cava was excised and reconstructed. She then also had tumor thrombus invading the main portal and extending up the left portal. This required excision of the vein and primary anastomosis. The left lobe lesion was then removed, making the excision of the tumor complete.

The child is making a good recovery and will continue with the post-surgery chemotherapy at our center before returning to Dubai.

Lurie Children's Transplant Surgery and Liver Transplantation Program

Many children are referred to Lurie Children's for possible liver transplantation, though the majority of these patients undergo corrective surgery that does not require liver replacement. Over the last five years, many children have been referred from abroad for corrective surgery and have been successfully repatriated without needing a transplant.

For children who are in need of transplantation, we have one of the largest and most experienced pediatric liver transplant teams in the country. Our Pediatric Liver Transplantation Program performs more liver transplants in children than any other center in the region, and it ranks in the top 10 in the United States in the number of liver transplants performed each year. As of January 2013, the team had performed more than 300 liver transplants since the program began in 1997. MEH

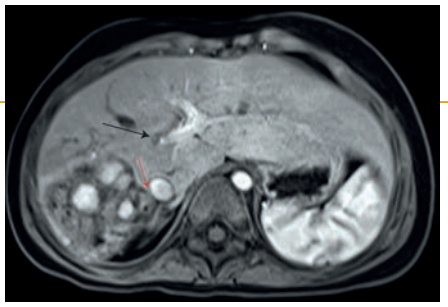

Figure 1: This MRI, done at Lurie Children's after five cycles of neo-aduvant chemotherapy, demonstrates the occluded right portal vein (black arrow) and the tumor in the right lobe in close proximity to the inferior vena cava (red arrow).

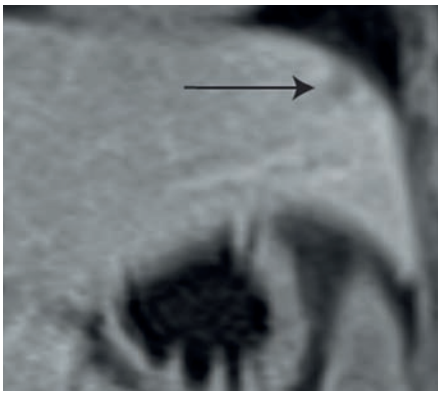

Figure 2: The lesion in the left lobe was still visible after the initial chemotherapy.

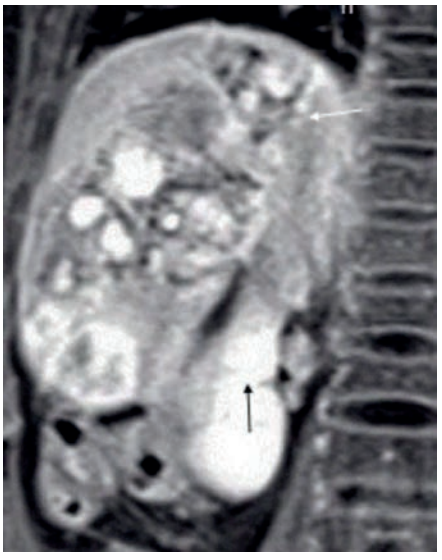

Figure 3: After chemotherapy, the tumor still involved most of the right lobe from the kidney (black arrow) to the dome of the liver all along the inferior vena cava (white arrow).

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BEST CHILDREN'S HOSPITALS
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Ranked in all 10 pediatric specialties.

Drug discovery process will be fundamentally different in the future

By **Michael Kinch**
Associate vice chancellor and director of the Center for Research Innovation in Business, Washington University, St Louis, United States

Before joining Washington University in St. Louis, Michael Kinch, PhD, was managing director of the Center for Molecular Discovery at Yale University. "A few years ago, to motivate the team I gave them what's called a Big Hairy Audacious Goal (a B-HAG)," Kinch says. The B-HAG was many-headed but one of the heads was to make a collection of all FDA-approved drugs. The idea was that the collection would serve as a screening library for drug repurposing.

Kinch thought the first step – pulling a list of drugs – would be easy; they'd go the FDA and get their list. But it turned out the FDA doesn't have a complete list. They had a running list of all prescribable drugs called the Orange Book. But "all prescribable drugs" isn't quite the same thing as all the drugs that have ever been prescribed, since there are drugs that are no longer marketed or have been withdrawn because of concerns about safety or effectiveness.

"So what we did was compile a comprehensive list of drugs approved for use in the U.S.," Kinch said. "By drugs, I mean the actual molecules that do the work, called new molecular entities (NMEs), as opposed to the fillers and the flavors. We went all the way back to morphine, first sold by Merck in Germany in 1827 and shortly thereafter in the U.S., and worked our way forward to 2013, closing the database at the end of that year.

"How many do you think there were?" he asks.

There were 1,453 – only 1,453 drugs for all of the infectious diseases, cancers, cardiovascular diseases, skin conditions, neurodegenerative diseases and other ills the flesh is heir to. "I thought it was rather a small number, myself," Kinch said.

"I'm a bit of a workaholic and a dataholic," Kinch continued, "and this list of 1,400 molecules was irresistible to me because it raised so many questions. I started to ask, 'Who got the approval for the drug, and what was the fate of the company that got the approval for the drug'? 'Who did the clinical trials on the drug, who filed the first patent on the drug, who did the first publication on the drug, who discovered it in the first place'?"

Over weekends and in the evenings the list turned into a database and the database grew and grew. "I would sit on the couch at home after everything calmed down for the night and look at the data. The kids would say, 'Oh, look, Daddy's doing drugs again.' It was the family joke."

"Finally I had this ridiculously large database of information," he said. "And I began to wonder how to mine it for publication." He sold the editor of *Drug Discovery Today* on a long series of peer-reviewed articles before he had even identified the topics of the articles. "It was the stupidest thing I've ever done," he said, but also accidentally brilliant, because it forced him to dig the ore out of his goldmine.

"To begin a paper, I pick a topic or a question and look at a spreadsheet to see

> There really aren't that many independent biotechs left, and there aren't that many entering the field. Where is the drug discovery and early development going to come from?

if there is a story there," Kinch said. "And you know what, every darn time there has been a story."

The *Drug Discovery Today* series has already led to his participation in both *New York Times* articles about the pharmaceutical industry by *Economic Scene* columnist Eduardo Porter and in a two-part BBC Radio special about antibiotics.

Together Kinch's stories add up to one shocking revelation: the R&D infrastructure for drug development is shrinking, perhaps irreversibly, and our ability to discover and develop new medicines is being progressively dismantled.

What is to be done? Kinch has come to Washington University in St. Louis to help find an answer. He regards the clear-eyed recognition of the problem as a first, giant step toward solving it. But he also feels we have no choice but to do the hard work of defining new models for drug discovery and that the role universities play must change, and not necessarily in comfortable ways.

Big Pharma has left the building

Over the past several decades, Kinch said, the pharmaceutical industry has managed to dismantle itself. "It's done a really efficient job of it," he said.

Starting in the mid-1970s, the industry started outsourcing the discovery of new drug targets and then the early stages of drug development. "When you compare the number of drugs that were approved to their R&D costs," Kinch said, "you see that the cost per drug was going through the roof. So they were happy to outsource research."

"As pharma pulled out, biotech pulled in," he said. That continued through the '70s and '80s, but then pharmaceutical companies began to buy out biotechnology companies. The number of biotech companies peaked in 2000, and today they are often acquired

before their first product is approved.

"I used to work for a big biotech company called MedImmune that everyone thought would remain independent indefinitely. It was bought by AstraZeneca in 2007," Kinch said.

He sees two worrying trends. One is that the number of biotech companies has followed a Bell curve. "What's scary to me," he said, "is how symmetrical that curve is. There really aren't that many independent biotechs left, and there aren't that many entering the field. Where is the drug discovery and early development going to come from?"

The second worry is the rise of drug companies with limited R&D capabilities. One example is Valeant Pharmaceuticals, a Canadian company that now controls as many drugs as the more familiar Eli Lilly but has a research budget that is one percent of Eli Lilly's. The only research Valeant does is post-approval trials for the FDA or market research, Kinch said. They don't do new drug research.

"A growing number of drugs," Kinch said, "are now controlled by marketing organizations that have little or no internal drug discovery or development activities.

"We all see it coming," Kinch said. "And no one has an answer for it. The pharmaceutical industry has made rational business decisions. It is unrealistic to expect them to repopulate their labs; they're out of it and they're not going back."

Because of the shrinkage in the pharmaceutical industry, Kinch estimates that we have lost more than 75 percent of the "expertise" that supported drug discovery. By expertise he means scientists with the experience to modify chemical compounds to improve their efficacy and decrease their toxicity, the hard part of drug development.

While Kinch was at Yale he hired three computational chemists who had been laid off from Pfizer's Groton CT labs. One was teaching high school chemistry, one was a 50-something postdoctoral associate, and one was working part-time. "These are not just good people; they are world leaders in their field with decades of experience," Kinch said.

This is the hidden sting in the scorpion's tail because, once gone, there is no quick way to replace these highly skilled people. "They learn their craft through a mentoring relationship and over many years in the lab," Kinch said. "Some of what they know is written down, but most of it is passed on in the lab.

"These guys are getting ready to retire or they've retired, or given up.

"Who's going to train the next generation?" he asked. "I started my professional life as a professor and I can tell you academia doesn't do it. Is academia going to take over this role or are we going to find another way to do it?

"I don't know how this story's going to end," he said, "but right now it's not looking like it ends well."

Starting from scratch

"We need to recognize that this is going to be a completely new game and that means we basically throw out all past assumptions and start from scratch," Kinch said.

Although he is still in the listening phase of his new assignment, he points out the drug landscape is very uneven these days. Pharmaceutical companies still make money in cancer drugs and drugs for "orphan" (rare) diseases such as cystic fibrosis. "Antibiotics and drugs targeting psychiatric, neurological and pain or itch are at the bottom," he said. "Few in the industry want to touch either of those two areas."

Washington University has deep expertise in the microbiome relevant to infectious diseases and in neurological diseases such as Alzheimer's, he said, so there's an opportunity there. But the model for research has to be different than it has been in the past.

University scientists are used to publication being the end-point of a project. We have to take drug candidates further than the peer-reviewed journals and find ways to ferry them across the "Valley of Death" between the university lab and the company lab, Kinch said.

"Keep in mind," he added, "that the majority of the US$1.2 to $1.5 billion it takes to develop a new drug is spent on late-stage clinical trials. We shouldn't be making that kind of bet. But on the front end, you're talking millions, not billions, maybe $10 million to discover a class of drugs and identify a lead candidate."

We need to recognize that this is going to be a completely new game and that means we basically throw out all past assumptions and start from scratch.

The market cannot be the only mechanism by which we meet the need for new drugs, Kinch said, because the common good and the stockholders' good are too often disastrously misaligned. Answers will have to come out of the interaction and coordination of the government, universities, venture capital firms and foundations, as well as the private sector.

This all sounds a bit scary, Kinch said. But remember that the research university itself dates back only to the beginning of the 19th century, and the double-blinded, placebo controlled trial only until the 1950s and 1960s. Research models are not static but rather have continually changed as new challenges have arisen.

The collapse of the pharmaceutical industry's research infrastructure is our challenge, Kinch said, and we will define the future of medicine by the way we address it. MEH

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Fruit consumption cuts CVD risk by up to 40%

Daily fruit consumption cuts the risk of cardiovascular disease (CVD) by up to 40%, according to research presented at ESC Congress in September by Dr Huaidong Du from Oxford, UK. The findings from the seven year follow-up study of nearly 0.5 million people in the China Kadoorie Biobank found that the more fruit people ate, the more their risk of CVD declined.

Dr Du said: "CVD, including ischaemic heart disease (IHD) and stroke, is the leading cause of death worldwide. Improving diet and lifestyle is critical for CVD risk reduction in the general population but the large majority of this evidence has come from western countries and hardly any from China."

She added: "China has a different pattern of CVD, with stroke as the main cause compared to Western countries where IHD is more prevalent. Previous studies have combined ischaemic and haemorrhagic stroke probably due to the limited number of stroke cases in their datasets. Given their different physiology and risk factors, we have conducted the first large prospective study on the association of fruit with subtypes of stroke in Chinese adults from both rural and urban areas."

The current study included 451,681 participants with no history of CVD and not on anti-hypertensive treatment at baseline from the China Kadoorie Biobank[1] conducted in 10 different areas of China, 5 rural and 5 urban. Habitual consumption of fruit was recorded at baseline according to five categories: never, monthly, 1-3 days per week, 4-6 days per week, daily.

Over the seven year follow up period there were 19,300 cases of IHD and 19.689 strokes (14,688 ischaemic and 3562 haemorrhagic). Some 18% of participants consumed fruit daily and 6.3% never consumed fruit. The average amount of fruit eaten by the daily consumers was 1.5 portions (~150g)[2].

The researchers found that compared to people who never ate fruit, those who ate fruit daily cut their CVD risks by 25-40% (around 15% for IHD, around 25% for ischaemic stroke and 40% for haemorrhagic stroke). There was a dose response relationship between the frequency of fruit consumption and the risk of CVD (see figure).

Dr Du said: "Our data clearly shows that eating fresh fruit can reduce the risk of cardiovascular disease, including ischaemic heart disease and stroke (particularly haemorrhagic stroke). And not only that, the more fruit you eat the more your CVD risk goes down. It does suggest that eating more fruit is beneficial compared to less or no fruit."

Our data clearly shows that eating fresh fruit can reduce the risk of cardiovascular disease, including ischaemic heart disease and stroke (particularly haemorrhagic stroke). And not only that, the more fruit you eat the more your CVD risk goes down. It does suggest that eating more fruit is beneficial compared to less or no fruit.

The researchers also found that people who consumed fruit more often had significantly lower blood pressure (BP). Eat-

ing fruit daily was associated with 3.4/4.1 mmHg lower systolic/diastolic BP compared to those who never ate fruit.

Dr Du said: "Our data shows that eating fresh fruit was associated with lower baseline BP. We also found that the beneficial effect of fruit on the risk of CVD was independent of its impact on baseline BP."

In a separate analysis, the researchers examined the association of fruit consumption with total mortality and CV mortality in more than 61,000 patients from the China Kadoorie Biobank who had CVD or hypertension at baseline. They found that compared to those who never ate fruit, daily consumers of fruit cut their overall risk of death by 32%. They also reduced their risks of dying from IHD by 27% and from stroke by around 40%.

Professor Zhengming Chen, the principal investigator of the China Kadoorie Biobank, said: "Patients with CVD and hypertension should also be encouraged to consume more fresh fruit. Many Western populations have experienced a rapid decrease in CVD mortality during the past several decades, especially stroke mortality since the early 1950s, for reasons that are not yet fully explained. Improved access to fresh fruit may well have contributed importantly to that decline."

The researchers concluded: "Our results show the benefit of eating fruit in the healthy general population and in patients with CVD and hypertension. Fruit consumption is an effective way to cut CVD risk and should not only be regarded as 'might be useful'. Policies are needed to promote the availability, affordability and acceptability of fresh fruit through educational and regulatory measures."

References

(1) The China Kadoorie Biobank is a prospective cohort study established jointly by the University of Oxford's Clinical Trial Service Unit and Epidemiological Studies Unit and the Chinese Academy of Medical Sciences. The baseline survey took place during 2004 and 2008 involving 0.5 million people in 10 regions across China including 5 urban and 5 rural. For more information visit here.

(2) The China Kadoorie Biobank conducts a resurvey every 4 or 5 years among about 5% of randomly selected participants who are still alive. A resurvey is ongoing and will be completed by the end of August/beginning of September. Initial data show that the average amount of fruit eaten by the daily consumption group is 1.5 portions (150g). MEH

THE PEP Family Heart Study:
Body fat distribution and elevated blood pressure in 22,051 youths

Obese youths have a nearly six fold risk of hypertension, according to research in more than 22,000 young people from the PEP Family Heart Study presented at ESC Congress in September by Professor Peter Schwandt from Germany.

Professor Schwandt said: "The prevalence of hypertension and obesity in children and adolescents is continuing to rise in most high and middle-income countries. Because adiposity is considered a driving force for cardiovascular disease, we examined whether elevated blood pressure was associated with body fat distribution in young people."

The current study included 22,051 children and adolescents from the PEP (Prevention Education Program) Family Heart Study[1]. In each participant, the researchers measured blood pressure, body mass index (BMI), waist circumference (WC), waist-to-height ratio (WHtR), skinfold thickness (SFT) and percent body fat (%BF).

Professor Schwandt said: "These measures are simple, inexpensive, risk free and can be used in offices, schools and at home. However, they must be performed correctly and age and gender specific cut-off values have to be used in growing children and adolescents."[2]

Prehypertension was defined as a blood pressure reading between the 90th and 95th percentile of the blood pressure curve for children and adolescents, while hypertension was a blood pressure reading over the 95th percentile. The diagnosis was based on several measurements on separate days and on repeated estimations with the child sitting quietly for five minutes. The researchers used an adequate cuff size for the arm in the correct position.

The researchers found that compared with normal weight children and adolescents, the risk of prehypertension was significantly higher in youths with an elevated BMI[3]. Compared to normal-weight, the risk of being prehypertensive was significantly increased in overweight males and females (OR 1.6 and OR 1.8, respectively) and obesity (OR 2.4 and OR 3.3, respectively).

The significant associations with adverse fat patterning were even stronger for the risk of hypertension. In obese boys the odds ratio (OR) was 5.9 and in obese girls 4.3.

Professor Schwandt said: "We found that obese boys had a nearly six fold increased risk of hypertension compared to normal weight boys. In obese girls the risk was more than four times greater than their normal weight counterparts."

The prevalence of elevated blood pressure increased in boys and girls as body weight went up. The prevalence of prehypertension/hypertension in normal weight, overweight and obese youths was 13.2%/5.7%, 18.3/10.4% and 21.9/18.6% in boys and 12.9/5.0% 18.7/9.1% and 24.9/24.4% in girls, respectively.

Professor Schwandt said: "Our study clearly shows that the fatter young people are, the greater their risk of prehypertension and hypertension. Any weight loss they can achieve will help reduce their risk."

The researchers also found increased risk of hypertension with elevated SFT and %BF measurements,[4] and abdominal adiposity[5].

Professor Schwandt concluded: "General and abdominal adiposity, estimated using simple and inexpensive methods, are already significantly associated with prehypertension and hypertension in children and adolescents. This is of great importance because of the ongoing rise in the prevalence of hypertension and overweight/obesity in young people and the tracking of childhood overweight into adulthood."

We found that obese boys had a nearly six fold increased risk of hypertension compared to normal weight boys. In obese girls the risk was more than four times greater than their normal weight counterparts.

References

(1) The PEP (Prevention Education Program) Family Heart Study is a prospective community-based observational study which was performed from 1994 to 2008 in Nuremberg, Germany. The aim of the study is to assess cardiovascular disease (CVD) risk factors, examine whether sustained healthy lifestyles can be implemented in 3 268 healthy families, and evaluate associations between lifestyle change and CVD risk factors in 24 927 parents and their 23 740 children aged 3-18 years.

(2) Schwandt P, von Eckardstein A, Haas GM. Percentiles of percentage body fat in German children and adolescents: an international comparison. Int J Prev Med. 2012 Dec;3(12):846-852.

(3) Normal weight, overweight and obesity were defined using the BMI growth curve for children and adolescents. Normal weight was a BMI less than the 85th percentile, overweight was a BMI between the 85th and 95th percentile, and obesity was a BMI over the 95th percentile.

(4) When the researchers looked at SFT measurements, they found that if the sum of subscapular plus triceps SFT was above 35 mm, the risk of hypertension was 5.8 fold in boys and 3.4 fold in girls. The risk increased to 5.6 fold in boys and 3.4 fold in girls when they also had a %BF above the 95th percentile.

(5) Abdominal adiposity predicted a 3 to 4 fold risk of hypertension. A WC above the 90th percentile increased the risk by 3.5 in boys and 3.1 in girls, while a WHtR greater than 0.5 increased risk by 3.9 in boys and 3.8 in girls. MEH

Gastric bypass better than banding for weight loss, diabetes, high blood pressure, cholesterol control

Gastric bypass surgery has better outcomes than gastric banding for long-term weight loss, controlling type 2 diabetes and high blood pressure, and lowering cholesterol levels, according to a new review by UT Southwestern Medical Center surgeons of nearly 30 long-term studies comparing the two types of bariatric procedures.

The review, appearing in *JAMA*, found that those undergoing gastric bypass operations lost more weight – an average of 66% of their excess weight, compared to 45% average excess weight loss for those undergoing gastric banding procedures.

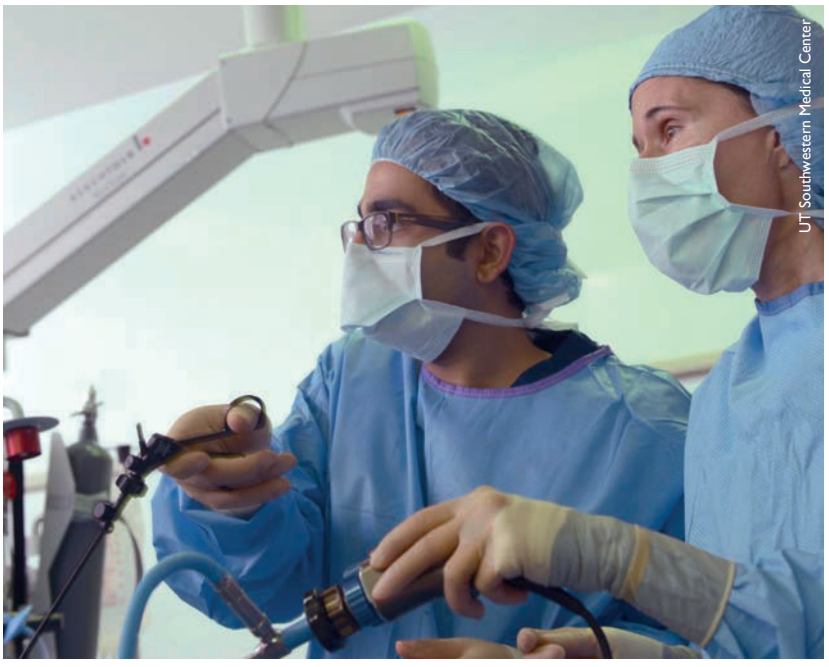
"We know gastric bypass brings more weight loss success and relief of commonly associated illness versus gastric band at one year after surgery. We now have the best evidence available telling us this outcome continues to be true even up to five years after surgery. We also know these procedures maintain their safety profile long-term," said Dr. Nancy Puzziferri, Assistant Professor of Surgery and part of the bariatric surgery team at UT Southwestern.

Worldwide, gastric bypass accounts for about 47% of weight loss procedures, while gastric bands account for about 18%.

Researchers found dramatic differences between the two procedures in controlling diabetes. More than two-thirds of gastric bypass patients with Type 2 diabetes saw remission of the disease, compared to less than a third of gastric band patients.

Gastric bypass surgery also lowered hypertension better than gastric banding. Nearly half of patients (48%) with hypertension reported remission after two years with gastric bypass, compared to less than a fifth (17%) for those undergoing gastric band procedures.

Gastric bypass also improved hyperlipidemia, characterized by high levels of cholesterol, triglycerides, and lipoproteins in the blood. About 60% of gastric bypass patients reported remission in the studies, compared to about 23% of gastric band patients.



Dr. Nancy Puzziferri (right) is an assistant professor of surgery and part of the bariatric surgery team at UT Southwestern.

"The review underscores the importance of thinking about durable treatments, as obesity, type 2 diabetes, hypertension, and elevated cholesterol are chronic illnesses, rather than focusing on short-term results," Dr. Puzziferri said.

Long-term complication rates for the two procedures also favoured gastric bypass, through both were relatively low – less than 3% for bypass surgery and less than 5% for banding procedures.

The review focused only on studies that followed patients for at least two years and in which more than 80% of patients were successfully tracked during that time; 29 studies total. Most – 97% – of weight-loss surgery studies track only a small percent of patients and/or only for up to one year. The researchers suggested more studies are needed to look at long-term outcomes – at least two years past the initial surgery – while maintaining follow-up of at least 80% to be considered reliable. They also concluded there were not a sufficient number of studies meeting these criteria to accurately assess gastric sleeve procedures.

"It is also very important to understand sleeve gastrectomy, which with the evidence we have so far, appears to perform as well as gastric bypass for weight loss. We just don't have as much evidence, in quantity or quality, as we have for the other procedures. The evidence will come in time," Dr. Puzziferri said. "We have not been doing sleeve gastrectomies for as many years as we have been performing gastric bypass or gastric band surgeries." MEH

Interview

Options for dealing with obesity and diabetes

Dubai Healthcare City-based specialists shed light on key issues surrounding obesity and diabetes. *Middle East Health* speaks to **Dr Naji Torbay Khoury**, Specialist in Endocrinology, The Weight Care Clinic, Dubai Healthcare City, and **Dr Alaeddin Saghir**, Consultant Endocrinologist Diabetologist, Abu Hammour Medical Centre.

Dr Naji Torbay Khoury Specialist in Endocrinology The Weight Care Clinic DHCC

***Middle East Health*: What are the most effective strategies to combat obesity?**

Dr Khoury: Calorie-restricted diets are effective in inducing weight loss if the patient is compliant. For more than 60 years the generally accepted principle of "calorie restriction" has directed the methodology when weight loss is intended.

As such, the Basal Metabolic Rate (BMR) of the subject is calculated using one of the available formulas. If the individual is planning to engage in a physical activity programme, the amount of expected extra calories estimated as a result of this activity are added to those in the BMR. To the resulting total, some 500 calories are extracted and the final dietary prescription formulated. Typically calories are distributed among the three macronutrients in a proportion of 50-60% carbohydrates, 20-30% fat and some 20% protein.

The most important disadvantage of this method is that it is unsustainable and from studies done in the 70's we know that once they are discontinued the majority of subjects regain their original weight in a very short period of time.

MEH: Please explain how diet plays a role in controlling weight in a person with diabetes?

Dr Khoury: Over the past 18 years we have been following a challenging principle of 'macronutrient restriction' based on the extensively-tested hypothesis that insulin-resistant patients respond better to a low carbohydrate, non-ketogenic (LCNK) diet; we first diagnose the insulin status of the individual and proceed accordingly to prescribe either a carbohydrate-restricted diet or a fat-restricted diet if insulin dynamics are normal.

Our diets are easy to follow, sustainable and most important, instructing to the patient: the patient learns and tests in his own body the effects of the regulated macronutrient and once he stops dieting, he is able to control his future weight because he knows what in the food is making him gain weight. We generally advise the patient to increase his daily physical activity because it enhances weight loss.

MEH: In your practice, when is bariatric surgery an option?

Dr Khoury: We follow the generally accepted guidelines and indications for bariatric surgery. According to the clinical practice guidelines published by the AACE [American Association of Clinical Endocrinologists] updated 2013, bariatric surgery is advisable for:

- Patients with a BMI ≥40 kg/m2 without coexisting medical problems and for who bariatric surgery would not be associated with excessive risk should be eligible for 1 of the procedures.
- Patients with a BMI ≥35 kg/m2 and 1 or more severe obesity-related co-morbidities, including T2D, hypertension, hyperlipidaemia, obstructive sleep apnea (OSA), obesity-hypoventilation syndrome (OHS), Pickwickian syndrome (a combination of OSA and OHS), non-alcoholic fatty liver disease (NAFLD) or non-alcoholic steatohepatitis (NASH), pseudotumor cerebri, gastroesophageal reflux disease (GERD), asthma, venous stasis disease, severe urinary incontinence, debilitating arthritis, or considerably impaired quality of life, may also be offered a bariatric procedure. Patients with BMI of 30-34.9 kg/m2 with diabetes or metabolic syndrome may also be offered a bariatric procedure, although current evidence is limited by the number of subjects studied and lack of long term data demonstrating net benefit.
- There is insufficient evidence for rec-

ommending a bariatric surgical procedure specifically for glycemic control alone, lipid lowering alone, or cardiovascular disease risk reduction alone, independent of BMI criteria.

MEH: What is a typical medical obesity treatment programme, especially because obesity is frequently accompanied by medical conditions like type 2 diabetes and hypertension, among others?

Dr Khoury: Co-morbid conditions are associated with the obesity state and therefore specific medical therapies are imperative. Obese hypertensive patients are effectively treated with either an ACE (angiotensin-converting enzyme) or an ARB (angiotensin receptor blocker). In severe cases combination therapy with a diuretic or a CCB (calcium channel blockers) is mandatory. As they follow the prescribed diet and lose weight, blood pressure control becomes simpler. Basic to the medical treatment of the obese diabetic is the use of Metformin, an oral antidiabetic drug, along with a specific kind - LCNK (low carbohydrate non ketogenic diet), of diet. If there is a need for further control, further medical advice is given.

The majority of patients get under control especially if they are compliant with the diet. We rarely recur to insulin therapy and try to avoid it because of the substantial weight gain it induces. The obese women with PCO (polycystic ovary syndrome) respond very well to the LCNK diet and metformin therapy, and any concomitant hyperandrogenima or infertility disorder are frequently corrected. The obese with secondary respiratory difficulty and sleep apnea improve significantly as weight loss ensues. Finally the self-image and psychological suffering frequently found in the obese subject is substantially recovered as he loses weight and regains confidence in himself.

MEH: Typically, common health consequences of being overweight and obese are cardiovascular diseases, musculoskeletal disorders and diabetes, but in your practice in the UAE, what are the most prevalent complications?

Dr Saghir: In my opinion, and as far as I have noticed during my experience in Dubai, diabetes is the commonest health consequence of overweight and obesity in

Dr Alaeddin Saghir Consultant Endocrinologist Diabetologist Abu Hammour Medical Centre

UAE. Actually obesity represents a "new health challenge" in the UAE. I would like to mention here the report of the International Diabetes Federation (IDF) in November 2013, which confirmed that UAE is ranked 15th worldwide in the prevalence of diabetes, with 18.98% of the UAE population living with diabetes. This is expected to rise to 21.4% by 2030. These statistics indicate that the region has high risk factors for diabetes, mostly related to rising obesity rates and physical inactivity. Approximately 75% of people in the UAE are obese or overweight, the UAE's population is approximately 3.4 million and of those, around 425,000 people from the ages of 20 to 79 in the UAE are currently diagnosed as having diabetes. That figure is expected to rise to approximately 501,000 in 2030.

MEH: What advances in treatment of obesity-related diabetes has the UAE witnessed over the past several years?

Dr Saghir: During the past decade, many weight management programmes have been proposed in the UAE to resolve the issue of obesity-related diabetes. But these programmes, as well as the medical treatment for obesity have proved ineffective; 95% will regain their excess weight after two years.

During the past two years, two surgical procedures have been proposed to treat obesity, namely, gastric banding and gastric bypass. These procedures provide alternatives for obese patients and are often the only resort for very obese patients complicated with type 2 diabetes. Actually gastric banding can result in a loss of more than 50% of the patient's excess weight, while the gastric bypass procedure can result in the loss of 66% of the excess weight.

MEH: The World Health Organization refers to the global epidemic of overweight and obesity – "globesity"; where does the UAE stand globally with regards obesity?

Dr Saghir: Regarding obesity, the UAE is ranked 5th in the world, with an average adult weighing approximately 76 kg, about 14 kg heavier than the global average of 62 kg, according to a team of European researchers who recently published their research in *BMC Public Health*. The USA ranked number one as the heaviest nation with an average adult weight of 81.9 kg. Kuwait stands at No. 2 in the world with 77.5 kg, followed by Qatar at No. 3 (76.9 kg) and Bahrain at No. 8 (73.5 kg).

MEH: Can you provide some of the more recent approaches to weight loss and give the pros and cons?

Dr Saghir: Diet and eating plans are the first approach to lose weight, as it is affordable for all people, but as demonstrated in the review of Mann et al- 2007, there is no evidence to support significant weight loss through dieting. In fact, two thirds of people weighed more after the diet than they did at baseline.

Physical activity is the second most common approach, and the four main types of physical activity are aerobic, muscle-strengthening, bone strengthening, and stretching. It is also easy and affordable for most people, except for older people who may have health issues such as a heart problems or chronic diseases like diabetes, joint issues or high blood pressure.

Approved weight-loss medicines might be an option for some people, and they might be suitable for adults who cannot lose weight by dieting and physical activity. But most of these medicines have major side-effects and may be harmful to the cardiovascular system.

Weight-loss surgery might be an option for people who have extreme obesity when the above treatments have failed. Results are positive and the weight loss target is soon achieved, but the surgery can be risky, and lifelong medical follow-up is needed after surgery. MEH

IDF publishes first *Global Diabetes Scorecard*

The International Diabetes Foundation (IDF) released their first *Global Diabetes Scorecard* in September this year.

It follows a decision at the United Nations (UN) Summit of 2011, during which global leaders signed up to an historic commitment to reduce premature deaths from diabetes and other NCDs (non-communicable diseases) by 25% by 2025. They also agreed a Global Action Plan designed to achieve a range of measurable targets on diabetes and NCDs.

Those goals include halting the rise in diabetes and obesity as well as promises of action on prevention and care.

The *Global Diabetes Scorecard* contains the views of 125 IDF Member Associations from 104 countries on how far their national governments have progressed in responding to the diabetes challenge by December 2013 and sets the baseline for future monitoring.

The Scorecard enables the global diabetes community to track and report progress on diabetes, to highlight areas of good practice and to identify areas that may need targeted advocacy to encourage government action.

In his foreword to the Scorecard, Sir Michael Hirst, president of the IDF, notes: "Key themes emerge from this first Scorecard, which sets a benchmark for on-going monitoring. Across the globe, health systems emerge as a stronger-performing element but it is evident more focus needs to be put on preventive policies, financing and rights.

"IDF's Global Diabetes Plan provides a blueprint for national action and I urge governments not already doing so to work with their appropriate diabetes associations in policy-making. Hearing the expert voice of people with diabetes at the heart of government can only strengthen programmes and actions."

Following are brief outlines from the report for countries that signed up from the Middle East region. The United Arab Emirates and Qatar are noticeably absent.

on the WEB Global Diabetes Scorecard
www.idf.org/global-diabetes-scorecard

Saudi Arabia

Saudi Arabia needs to make progress across a range of areas to respond to the diabetes challenge. Particular areas for action are national plans and policies and monitoring and surveillance and national plans and policies areas. The Member Association reports that there is a lack of collaboration between relevant Government bodies to prevent diabetes.

A moderate proportion (12.4%) of diabetes-related deaths have been prevented due to previous diabetes related health expenditures. Increased funding for cost-effective diabetes prevention and treatment is needed.

There is a national diabetes plan in development but no NCD plans or policies. No Ministries apart from Health are discussing the response to the diabetes challenge.

The health system provides services for early diagnosis and treatment, although not universally. Less than 50% of the costs are covered and no services exist for diabetes prevention. Specialised services are provided for women but availability of self-education management is limited.

There is no framework for the monitoring and surveillance of diabetes.

The Government allocates funding for diabetes as part of the general health system budget.

The Government offers minimal scope for engagement and has taken no action on rights.

Global Monitoring Framework: Not adopted.

Saudi Arabia at a glance (2013)

Adult population (20-79) in 1000s	18,056.84
Diabetes expenditure / person with diabetes (USD)	943
Diabetes cases (20-79) in 1000s	3,650.89
Diabetes related deaths (20-79)	22,113
Diabetes raw national prevalence (%)	20.22
Number of people with undiagnosed diabetes (20-79) in 1000s	1,485.91

Jordan

Jordan is providing services for the treatment of diabetes but more progress is needed across all other areas to respond to the challenge of diabetes, especially in monitoring and surveillance. The Member Association reports that insulin is provided free of charge to children under 14 years old.

A moderate proportion (6.2%) of diabetes-related deaths have been prevented due to previous diabetes-related health expenditures. Increased funding for cost-effective diabetes prevention and treatment is needed.

Jordan has a partially implemented NCD programme; a national diabetes plan exists but has not been implemented. Policies on promoting physical activity are partially enforced; those on regulating marketing to children are in development. One Ministry apart from Health is discussing other NCD policies.

There is no framework for the monitoring and surveillance of diabetes.

The Member Association contributes to policymaking through consultations. No Government action on rights.

The health system provides universal services for treatment and specialised services for women and the rural poor. Early diagnosis services are not universally provided and availability of self-management education is limited. Less than 50% of costs are covered.

The Government allocates funding for diabetes as part of the general health system budget.

Global Monitoring Framework: No information available.

Jordan at a glance (2013)	
Adult population (20-79) in 1000s	4,091.78
Diabetes expenditure / person with diabetes (USD)	598
Diabetes cases (20-79) in 1000s	356.33
Diabetes related deaths (20-79)	3,111
Diabetes raw national prevalence (%)	8.71
Number of people with undiagnosed diabetes (20-79) in 1000s	178.17

Egypt

Egypt's stronger performances come in its health systems policies and budget and financing, while progress needs to be made in national plans and preventive policies. The Member Association reports that services for treatment and the prevention of secondary complications are shared by the Government, the insurance system, private sector and NGOs.

Some diabetes-related deaths (1.5%) have been prevented due to previous diabetes-related health expenditures. Increased funding for cost-effective diabetes prevention and treatment is needed.

Egypt has a partially implemented diabetes plan. The Member Association proposed it and the Government and other civil society groups were invited to discuss it. One Ministry apart from Health is working on the NCD agenda but only a policy to promote physical activity is being developed.

There is no framework for the monitoring and surveillance of diabetes but the Government gathers data on the incidence/prevalence of diabetes. NGOs carry out some monitoring and surveillance in limited areas.

The Government offers minimal scope for engagement and has taken no action on rights, but the Member Association has developed awareness campaigns.

The health system provides free insulin in Government hospitals and women and people in vulnerable situations receive specialised services. Prevention, early diagnosis and prevention of secondary complications are not universally provided and availability of self-management education is limited. Medical insurance covers all Government employees with diabetes and the Member Association reports that there is universal health coverage for low resources populations.

The Government allocates funding for diabetes as part of the general NCDs budget, including prevention, early diagnosis and treatment.

Global Monitoring Framework: No information available.

Egypt at a glance (2013)	
Adult population (20-79) in 1000s	48,276.39
Diabetes expenditure / person with diabetes (USD)	176
Diabetes cases (20-79) in 1000s	7,510.60
Diabetes related deaths (20-79)	86,478
Diabetes raw national prevalence (%)	15.56
Number of people with undiagnosed diabetes (20-79) in 1000s	3,755.30

The consumerization of healthcare: Who will be our trusted advisors?

By **Jeroen Tas**
CEO Informatics Solutions & Services, Philips Healthcare

Imagine a time when a device alerts you to the onset of a disease in your body long before it's a problem. Or when your disease is diagnosed in Dubai, based on the medical scan you had in the United States. This future is far closer that you might think, due to rapid advances in connected devices and sensors, big data and the integration of health services. Combined, these innovations are introducing a new era in health care and personal wellbeing.

In just a few years, mobile technologies have led to tremendous innovation in consumer health tools. Research and development is focusing on health conditions over a person's lifetime and on holistic care, generating constant learning through analytics and algorithms that identify patterns and behaviors. Social and digital technologies herald a new dawn of collaboration and cooperation that reach out to communities of people with similar conditions, engaging them in ways which were never before possible. We are starting to get a taste of what the consumerization of healthcare will mean in the future. In two to three years, analyzing personal health data will become commonplace for large parts of the population in many countries. Also, it is very likely that for the first time, it will not be the chronically ill but the healthy people who will invest the most in managing their health.

Digitalization and consumerization will rattle the healthcare industry. It is already revolutionizing the business models of traditional healthcare companies and providers. Innovation is not only about adding a new channel or connecting a product, it is a complete redesign of long-established practices, adjustment of systems and processes. Most importantly, it calls for a change of culture in companies to reflect the new opportunities – and challenges – presented by the digital world. There is a tremendous opportunity to consumerize healthcare, but to drive true industry transformation, companies need to collaborate and continue to learn from each other. Great strides will be made in alliances which, for example, will deliver open, cloud-based healthcare platforms that combine customer engagement with leading medical technology and clinical applications and informatics.

These advances may not only open the doors wider for traditional healthcare providers – with consumerization, companies without healthcare expertise but with strong consumer engagement and trust, could potentially become healthcare companies. Big multinationals invest incremental budgets in developing new propositions and count on their global user bases or professional networks to gain a foothold in the market and in parallel, a raft of start-ups are attempting to transform the worlds of preventive or curative health care – in many cases only limited by their imaginations. For example, we may see virtual reality technology moving from the gaming industry to healthcare for improving patients' rehabilitation after a stroke.

While these new propositions tackle a number of the healthcare industry's core concerns and provide solutions to completely new areas, these propositions still need to mature. They need to become scalable, reliable and open, and the user experience needs to be harmonized.

Perhaps one of the most important challenges is related to people's behavior and preferences. Regardless of whether these new and existing companies are analyzing health data, using virtual reality or reading people's vital signs, they all need ample time to become trusted and accepted in the emerging digital health care space. Especially for the new entrants, obtaining the right level of credibility will be one of the key success factors. Consumers, patients and professionals alike will need the right motivation, reassurance and mindsets to adopt these new solutions. The companies who know how to offer us tailored, cutting-edge solutions combined with meaningful advice and trustworthiness, will be the winners and become our trusted advisors in health. MEH

Most importantly, it calls for a change of culture in companies to reflect the new opportunities – and challenges – presented by the digital world. There is a tremendous opportunity to consumerize healthcare, but to drive true industry transformation, companies need to collaborate and continue to learn from each other.

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ESC Congress 2014 highlights

The annual European Society of Cardiology (ESC) Congress was held this year in Barcelona from 30 August to 3 September and attended by more than 30,300 delegates.

"This has been the strongest scientific programme yet and the congress has broken records in attendance and scientific submissions. The quality of the work we received is outstanding and attracted doctors from all over the world. In the digital age, cardiologists want to attend our congress because we have used modern technology to enhance interaction and discussion and to allow participants to get behind the headlines. Delegates will go home not just knowing the headlines, but what is important and will change practice and what to look out for on the horizon," said Prof Keith Fox, Chair of the Congress Programme.

Some of the most important studies presented at ESC Congress 2014 were: (Some of these studies will be presented in the cardiology focus in the next issue (January-February 2015) of *Middle East Health*.

- **PARADIGM-HF**: Investigational new heart failure drug could be poised to change the face of cardiology based on Hot Line results
- **ODYSSEY studies Combo II & FHI & FHII**: Investigational lipid-lowering agent alirocumab produced superior results compared to placebo
- **SIGNIFY**: Adding ivabradine (used for the treatment of heart failure and stable angina) to standard therapy, has no effect on cardiovascular events in patients with stable CAD and should be used with caution in patients with severe forms of angina
- **CONFIRM**: Intravenous doses of an iron supplement improves functional capacity and quality of life in heart failure patients with iron deficiency
- **EUROECO**: First financial assessment of the impact of home monitored follow-up estimates the cost to physicians, hospitals and insurance providers is the same as traditional in-office monitoring, according to a new study, but reimbursement is lagging behind
- **FOCUS**: Patients were more likely to take their medication to prevent a heart attack when it was given as a polypill, rather than as three separate pills.

"We have learnt a lot during this past week. The results from all these studies need to be carefully considered. New research has shown us many ways to improve our practice and procedures. These trials will be discussed in the months to come. Cardiologists will 'digest' all this information and the ESC will certainly review the new evidence in order to update its guidance," said Prof Panos Vardas, President of the ESC. "The ESC must also acknowledge developments in strategic areas, such as digital health," he concluded.

Some of the most popular news stories coming out of ESC Congress (apart from Hot Lines) this year were:

- **Batteryless pacemaker** A new batteryless cardiac pacemaker based on an automatic wristwatch and powered by heart motion was presented. The prototype device does not require battery replacement.
- **Obesity and hypertension in adolescents** Obesity is on the rise among youth. Obese teenagers have a nearly six fold risk of hypertension, according to research in more than 22,000 young people from Germany.
- **Wine and exercise** Wine only protects against cardiovascular disease (CVD) in people who exercise
- **Fruit consumption** Daily fruit consumption cuts the risk of cardiovascular disease (CVD) by up to 40% (see Lifestyle Diseases focus in this issue).
- **Energy drinks** can cause serious heart problems such as sudden or unexplained death, arrhythmia and heart attack

At the ESC General Assembly the ESC Presidency was transferred from Professor Panos Vardas to Professor Fausto Pinto from Portugal. MEH

ATLANTIC study – Ambulance administration

Ambulance administration of the antiplatelet medication ticagrelor to patients with a type of heart attack known as ST segment elevation myocardial infarction (STEMI) is not better than hospital administration, in terms of improving blood flow in blocked arteries before a revascularisation procedure, according to a new study presented at ESC Congress 2014 today.

However, findings from the ATLANTIC (Administration of Ticagrelor in the cath Lab or in the Ambulance for New ST elevation myocardial Infarction to open the Coronary artery) study show that the earlier administration of ticagrelor may prevent stent thrombosis - which is clotting within the tube (stent) that is inserted during revascularisation to keep the artery open.

"Pre-hospital administration of other anti-clotting agents such as fibrinolytics or glycoprotein IIb/IIIa inhibitors has been associated with improved coronary reperfusion and other outcomes in STEMI patients, and we know there is benefit to in-hospital therapy with ticagrelor as compared with clopidogrel in STEMI patients when they are stented," said investigator Gilles Montalescot, M.D., Ph.D, from the ACTION Study Group at the Institut de Cardiologie of Pitié-Salpêtri re Hospital, in Paris, France. "It was not known whether earlier administration of ticagrelor would be safe and possibly more effective."

ATLANTIC was presented as a Hot Line at the congress, with simultaneous publication in the *New England Journal of Medicine*. The international, multicentre, randomised, double-blind study included 1,862 patients with an ongoing STEMI diagnosed by ambulance personnel based

BIOSCIENCE trial – Experimental coronary stent combines ultrathin structure with biodegradable material

A new generation of coronary artery stent that combines a biodegradable component with an ultrathin scaffold showed promising results compared with the current gold standard, in a large population of coronary artery disease patients, according to a new study.

The BIOSCIENCE trial was presented as a Hot Line at the ESC Congress 2014, and published simultaneously in *The Lancet*.

The experimental stent "represents the next logical step in stent refinement by combining an ultrathin platform with a polymer that completely degrades," said BIOSCIENCE investigator Thomas Pilgrim, MD, from the Swiss Cardiovascular Center at University Hospital, in Bern, Switzerland.

Coronary artery stents are metal scaffolds that are inserted to unblock the small arteries supplying the heart. For well over a decade, stents have been "drug-eluting", meaning they are coated with medication to prevent re-blockage of the artery. Earlier drug-eluting stents were coated with non-biodegradable polymers and had thick stainless steel struts – both features that have been linked with an increased rate of complications.

In contrast, the experimental stent combines both a biodegradable polymer and an "ultrathin" cobalt-chromium strut – the thinnest strut currently available.

Subjects in the trial had coronary artery disease and were randomly assigned to receive either the experimental stent (n=1063) or the standard stent (n=1056) during percutaneous coronary intervention.

They were then followed for 12 months, with the primary endpoint of the study being a composite of cardiac death, heart attack caused by a re-blockage in the treated artery, and the need for revascularisation of the treated artery within the study period.

The trial was designed to show non-inferiority of the experimental stent compared to the standard stent and indeed, the composite endpoint occurred in 6.5% versus 6.6% of subjects respectively.

The non-inferiority for the experimental stent is noteworthy, in that "it matched the outcomes of one of the safest and most effective new generation drug-eluting stents," explained Dr. Pilgrim.

"Because of the low event rates of contemporary stents it is becoming increasingly difficult to establish superiority of newer stents in clinical trials," he added.

However, in a subgroup of patients presenting heart attack, the experimental stent showed superiority over the standard stent, with the primary endpoint occurring in only 3.3% versus 8.7% respectively (relative risk [RR] 0.38, p=0•024).

The study was not powered to assess differences in this subgroup, "therefore we cannot exclude that these findings are due to chance alone," he said.

"But future studies will need to explore whether such differences can be reproduced in this patient population, which is at highest risk for ischemic adverse events." MEH

# of anti-clot drug may benefit heart attack patients

on an electrocardiogram (ECG).

Patients were randomised to receive either ambulance treatment (n=909) or in-hospital (n=953) treatment with ticagrelor or placebo, in addition to aspirin and standard of care.

Randomisation took place in 102 ambulance services. Patients were then transferred to 112 centres in 13 countries to undergo percutaneous coronary intervention (PCI) – a procedure that unblocks the "culprit" artery that has caused the heart attack, usually by placement of a stent.

In the ambulance treatment arm, patients received a loading dose of 180 mg ticagrelor before getting to hospital, and then a matching placebo when they arrived at the hospital. Patients in the other arm received in-ambulance placebo and then a hospital dose of ticagrelor 180 mg.

Subsequently, all patients received 90 mg of ticagrelor twice daily for 30 days, with the recommendation that treatment continue for a year.

The study did not show any difference between the groups for the two primary endpoints of: (i) absence of at least a 70% resolution of ECG abnormalities before PCI (odds ratio [OR] 0.93, p=0632) and (ii) absence of normal blood flow in the heart attack-related artery before PCI (OR 0.97; P=0.8214).

Results for these co-primary endpoints were similar across subgroups, except that patients who did not receive morphine had significantly better ECG normalisation when they received ticagrelor in the ambulance versus in the hospital.

"Co-administration of morphine in the ambulance may have delayed ticagrelor's onset of action," noted Professor Montalescot. "To what extent this interaction may have affected our results remains unknown at this stage."

For secondary outcomes, there were no significant differences between groups for a composite of death, heart attack, stroke, urgent coronary revascularisation and stent thrombosis. However, definite stent thrombosis was significantly reduced in the ambulance arm, both at 24 hours (0 vs. 0.8%, p=0.0078) and 30 days (0.2% vs. 1.2%, p=0.0225).

"Our study shows that there is no downside to earlier administration of ticagrelor, and it reduces the risk of post-procedure stent thrombosis which is a serious iatrogenic complication. It is also a more practical time point for administration of the drug than in the catheterisation laboratory, where considerable staff and technical demands already exist." MEH

Turkey's medical tourism leads the way at centre of vast geographical area

The Istanbul Medical Tourism Fair & Congress (IMTF) was a great success with many contracts signed between industry professionals and corporations in Turkey's health tourism sector. The event was held from 11-13 June 2014 at Harbiye Istanbul Congress Center (ICC). The event, attended by health tourism professionals from around the world, was sponsored by the Turkish Ministry of Health, Turkish Ministry of Family and Social Policies, Günes Sigorta, Turkish Airlines. *Middle East Health* was the official media partner.

In parallel to the development of the health tourism sector worldwide in recent years, IMTF –organized by Türkel Fair Organization Inc. – brought together for the first time – world health tourism industry corporations and professionals in the industry.

More than 2000 national and international professionals attended. They came from all corners of the world including: Algeria, Austria, Australia, Azerbaijan, Bosnia And Herzegovina, Bulgaria, Cyprus, Czech Republic, Democratic Congo Republic, Denmark, Egypt, England, Finland, Georgia, Germany, Greece, Holland, Iran, Iraq, Italy, Jordan, Kazakhstan, Kosovo, Kyrgyzstan, Libya, Lithuania, Mongolia, Oman, Pakistan, Romania, Russian Federation , Saudi Arabia, South Africa, Sweden, Switzerland, Turkey, UAE, Ukraine, USA and Yemen.

Turkey's leading health corporations including Acıbadem, Medical Park, LIV Hospital, Medipol, Kolan Hospital, Medicana Hospital, Istanbul Florance Nightingale Hospital, Tınaztepe Hospital, zmir Kent Hospital, Ankara Güven Hospitaland Dentaluna Dental Clinic as well as other corporations such as ECK Health Services, Etik Efekt Consulting, Black Sea Development Agency, Trabzon County Health Management, Hemosoft, Remedy Medical Tourism, Taraklı Thermal and Gönen Thermal Resort exhibited at the exhibition.

There were a total of 29 speakers – all experts in the field – from the United Kingdom, the United States, India, Germany and Greece. They included: Prof. Dr Yaman, TOKAT; Meri stiroti, Liv Hospital General Manager; Josef Woodman, *Patients Beyond Borders* writer; and Oren Gersh, CEO of Health-Tourism.com .

Buyers

At Istanbul Medical Tourism Fair & Congress 74 VIP buyers from 12 countries met on a one-on-one basis in b2b meetings with the leading corporations in the sector. Many signed contracts with Turkey's hospital chains.

Buyer delegation groups from Bulgaria, Yemen, Iran and Saudi Arabia met with the exhibitors through b2b meetings and the Iran delegation signed contracts for the transfer of patients to Turkey.

In addition to that, other than the VIP buyer and buyer delegation program, Istanbul Medical Tourism Fair & Congress had influence over a large geographical area with 323 sector professionals from more than 30 countries.

Istanbul Medical Tourism Fair & Congress is an important event as it covers a vast geographical area of some 200-million sq.km. Turkey is at the centre of this and over the past 10 years it has made its mark as a leader in this field.

• Istanbul Medical Tourism Fair & Congress 2015 will be from 7-9 May next year.

● Visit *www.imtfair.com* for more information.

Institute for Healthcare Improvement 26th Annual National Forum on Quality Improvement in Health Care

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Orlando, FL, USA

The IHI National Forum has shaped the course of health care quality in profound, enduring ways. Lend your voice, share your ideas, and join a force of great minds that will inspire and challenge you on December 7-10, 2014, in Orlando, FL, USA. This conference is more than a chance to network with nearly 5,000 health care professionals and gain actionable ideas for your organization. It's also an opportunity to play a part in effecting real change in health care quality and safety. Choose from over 161 unique sessions. Be inspired by featured keynote speakers: Maureen Bisognano, President and CEO of the Institute for Healthcare Improvement (IHI), Atul Gawande, MD, MPH, Professor at Harvard Medical School and the best-selling author of the books *The Checklist Manifesto*, *Complications*, *and Better*. Robin Roberts, co-anchor of ABC's *Good Morning America* (GMA), and Donald Berwick, MD, MPP, President Emeritus and Senior Fellow at IHI.

● To learn more go to *www.ihi.org/Forum*

Paradigm shift of healthcare IT to accelerate transformation into smart hospitals

Hospitals today are being transformed into sophisticated medical facilities with computer-based medical equipment and intelligent, connected medical devices. From the Statista report in 2014, the value of the mobile healthcare industry will quadruple in the next six years. As healthcare providers deploy more technology into hospital settings, not only the staffs' workflows can be optimized, patients can also enjoy the benefits of the renovation. Therefore, a trusted and experienced hospital IT solution provider becomes critically important to deliver effective, safe and quality healthcare. Advantech is committed to assist hospitals implement technical solutions that help them improve areas such as outpatient services, nursing care, and critical care.

Hospital of the future

Imaging walking through a hospital entrance, there is no more long queuing because of the UTC-5 series self-check in system connected to the Hospital Information System (HIS). Not only is the patient guided to the right department, the doctor will already know the patient has arrived for appointment. Bacterial Control is enhanced from the use of medical grade IP-certified, fanless POC-W series in the OR/ICU environment. Workflow inside the hospital is uninterrupted thanks to clinical mobility devices such as AMiS series Computerized Nursing Cart and MiCA series Clinical Pocket Pad. For emergency check in from the ambulance, patient data has already been synchronized and initial diagnostics completed prior to arrival, saving precious time. Furthermore, more time is saved by installing fleet management TREK series to guide the ambulance drivers by knowing the most updated route situations. Coming back to the hospital, the patients no longer feel isolated inside the wards due to the implementation of the HIT series Bedside Infotainment Terminals. Patients in hospitals can access to the health profile, internet, television, and other multimedia easily without using their own gadgets. Each of Advantech's high-tech solutions are helping hospitals to be smarter than ever before. In Advantech, we believe saving precious time means saving more lives.

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Through our success of delivering smart hospital IT solutions, Advantech have helped world-renowned hospitals / organizations such as: Hamad Medical Corporation (Qatar), TATA Hospital (India), Netherlands Cancer Institute (Netherlands), Han Yang University Hospital (Korea), King Khalid University Hospital (Saudi Arabia), Cleveland Clinic (UAE), and Richard Wolf GmbH (Germany).

● For our complete worldwide installations, please visit our website – *www.advantech.com* – or our local specialists for more information. MEH

Advantech Digital Healthcare

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With Advantech, there is no limit to the applications and innovations our products make possible for future hospitals. For more information, please visit: *www.advantech.com/digital-healthcare*

Providing protective gear for aid workers in Ebola crisis

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

Regular readers of this column will know that Durbin has many business divisions, one of which has a long history of co-ordinating relief shipments in emergency situations.

We have all seen on television the devastating effects of the Ebola crisis. Ebola is one of the deadliest diseases known to humans and is transmitted through direct contact with the blood, body fluids, or tissues of infected people. The current outbreak has already killed over 2400 people, including several aid workers and medical staff who have gone to the affected countries of Sierra Leone, Guinea and Liberia to help the local people.

The international community has joined forces to try and contain the spread of the virus and many humanitarian agencies have sent emergency medical aid. Durbin has also been extremely busy providing many of the vital supplies the aid workers require, including coveralls, goggles, boots, gloves, special protective gowns, aprons, antibacterial wipes and even baby milk.

While the aid agencies carry out their work in Sierra Leone, Guinea and Liberia, the World Health Organisation is working with neighbouring governments on preventative and precautionary measures to keep the disease from spreading further. An emergency committee convened by the director general of the WHO said all countries should provide travellers with information on the health risks, the measures to minimise them, and advice on managing potential exposure to the disease.

In the Middle East, the Gulf Cooperation Council has met to discuss the implications of the virus and to draw out a unified strategy to combat it. As a result, Saudi Arabia has advised its citizens and residents not to travel to the affected countries until further notice. Stringent measures have also been implemented at airports in an attempt to prevent Ebola virus patients entering the region. Additionally, some airlines have cancelled flights to the affected regions, including Emirates who suspended flights to Guinea.

Screening was particularly rigorous in Saudi Arabia where millions of Muslims travelled to perform the Umrah and Haj pilgrimage. The Saudi health ministry took steps to train personnel at all ports of entry to help them identify and deal with Ebola cases and over 7000 pilgrimage visas from the infected West African countries were cancelled. Pilgrims from neighbouring countries were also closely monitored to prevent any potential spread of the virus.

There is currently no licensed treatment for the Ebola virus although several experimental treatments are being developed and some have shown promising results. The WHO's panel of medical ethicists has said that these drugs should be fast-tracked into clinical trials and made available for compassionate use.

But what can be done in the meantime? Well until a treatment becomes available to the mass market, prevention is the best way to deal with Ebola in the interim. And, as it is not an airborne virus like flu, medical experts say that avoiding it should therefore be quite straightforward: 1) wash hands often with soap and clean water 2) avoid touching anyone suspected of having Ebola 3) do not touch a dead body where someone has died from Ebola, even as part of a burial ceremony 4) avoid eating bushmeat such as bats and monkeys as scientists believe this is how the virus was first transmitted to humans 5) don't panic – there have been cases of people being abandoned when they are suspected of having Ebola when in fact they are suffering from something else.

Hopefully with the pharma community concentrating their efforts, a treatment for Ebola will be available soon. Until that time comes however I'm proud that Durbin is able to play its part in helping to keep aid and medical staff on the ground safe by providing the protective clothing that they need to go about their work to prevent the spread of the disease. MEH

Durbin PLC is a British company based in South Harrow, London. Established in 1963, the company specialises in supplying quality assured pharmaceuticals, medical equipment and consumable supplies to healthcare professionals and aid agencies in over 180 countries. As well as reacting rapidly to emergency situations, Durbin PLC responds to healthcare supply needs from local project level to national scale programmes.
Web address: www.durbin.co.uk
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GMU and Roche Diagnostics partner to launch the Complete Automation Project

At Gulf Medical University (GMU) in Ajman, United Arab Emirates, Thumbay Labs recently inaugurated the much awaited Complete Automation Project at the Centre for Advanced Biomedical Research and Innovation. Attended by the Crown Prince of Ajman, HH Sheikh Ammar Bin Humaid Bin Rashid Al Nuaimi, this new fully automated laboratory is the latest initiative in the growing portfolio of Indian entrepreneur Thumbay Moideen.

Commenting on the launch, Moideen noted: "We already have labs in Sharjah, Dubai, Fujairah and Ajman. In addition to this, we're building six clinics under the Thumbay brand in the UAE. With the inauguration of this lab, the plan is to continue growing our strong network of clinics and labs. It's an ambitious plan, but our strategic plan is called Vision 2020, which aligns with the government's thinking, and this lab's growth is only a part of it."

The Thumbay Group is listed among the Top 100 Companies making an impact in the Arab World by Forbes Middle East.

The aim for Gulf Medical University is to develop and offer state of the art innovation to the country's citizens, and ultimately the wider region, whilst also becoming a reference lab in the UAE. The Laboratory's Director, Dr. P K Menon, MD PhD shares this sentiment, noting that the lab is a rarity for medical institutions not just in the country, but all over the world.

"In many university centres of excellence, you'll find certain equipment, an atomic absorption instrument for instance, in one lab. Then you'll have to go to another to find an HPLC, and yet another to find a GCMS. What we've done here is we've managed to combine all this super-specialty equipment under one roof and within walking distance of each other. We did this because we wanted to enhance the university's reputation from just an education-based institute to one that also provides an important service to the community. Now, patients who need super specialty testing need not travel abroad," said Menon.

Gulf Medical University

"Setting up a lab of this complexity and sophistication required the help of multiple partners, including the likes of Zahrawi, Gulf Scientific, Life Technologies and Roche Diagnostics. To give an indication of the contributions and support our partners have provided, Roche Diagnostics for example, played a very significant role in setting up the chemistry analysers and the automation, which along with the POCT will handle almost 70% of our testing in a highly accurate and reliable manner," noted Menon.

Both Menon and Thumbay also commented on the growing interest in healthcare in the country, with both noting the increased investment in the sector on the part of the UAE's government as part of their long-term strategic vision. A recent report by the US-UAE Business Council put the UAE's healthcare spending in 2013 alone at $16.8 billion.

"Healthcare and education make up the largest part of a country's budget. The UAE's government is spending heavily on these sectors and as a private organization, we're doing our part to contribute to this. I see it headed in a very positive direction," said Thumbay.

"Soon, everyone will be covered by insurance, which means that now they'll have access to high-quality healthcare. I think this is a big step, with the immediate implication being that one does not have to rush abroad to get advanced treatment. In addition, as insurance coverage and local high-quality facilities offering sophisticated testing, diagnostics and treatment become more readily available and accessible the country will be able to attract experts from all over the world, because ultimately, you need high-quality facilities expertise. Only then can we take that next step, and make the UAE a top destination for medical tourism - I don't see that being too far way," said Menon. MEH

Karl Storz's VisitOR1 provides global interaction from anywhere in a clinical setting

The VisitOR1 is a unique telepresense/telesurgical robotic device which can be placed in any location within a clinical institution and provide immediate and direct interactions with experts across the globe. The device is unique in that it only requires an internet connection to transmit live images from interventions or surgeries at a moments noticed. To utilize the system, a user simply has to login to a secure server and can access the VisitOR1 when required. While logged into the device, both locations connected can be seen and heard.

Also, the robotic head unit can be positioned and controlled so as to provide the best unobstructed view. Physicians on the local end can send simultaneous video signals from both the exterior and endoscopic views in order to provide a clear representation of the intervention. Since the user in control is interacting directly with the surgical staff, the device is a complete mobile production studio which can record images and videos, telestrate, switch viewable sources, connect to traditional video conference devices, and lastly pinpoint specific locations in the surgical environment by utilizing the built-in laser pointer.

The device is truly a mobile telehealth tool which is intuitive and simple to use. With wired, wireless, and tablet capabilities, the VisitOR1 is portable and flexible to meet the growing demands of an institution looking to expand its knowledge and influence in the surgical arena.

Key Use Cases:

- Physician to Physician Direct Interaction (OR to OR)
- Physician to Department Interaction (OR to Pathology)
- Institution to Service Department (Remote Troubleshooting)
- Patient to Physician (Remote Patient Rounding Capabilities)
- Physician to Group/Institution (Multipresense Telehealth to Lecture Hall)

Key Features:

- Control your position in the OR for maximum visualization
- Share images and data files for improved collaboration
- Extend your interactive reach into the OR via laser pointing and telestration
- Multiple inputs for greater flexibility
- Portable access via mobile tablet software
- Multiple user log in and access to same device
- Broadcast access available via secure connectivity
- 256 AES Encryption
- Clean transmission rates greater than 700kbps

KARL STORZ (Tuttlingen, Germany) is a worldwide leading manufacturer of rigid endoscopes, endoscopic instruments and devices for more than 15 human medical disciplines. With OR1, it is a leader in integrated OR systems and sets the standard in telemedicine. With more than 5,000 OR1 installations worldwide, KARL STORZ is a technological pioneer in this highly innovative, promising field.

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

BOA vision and COBRA vision – dual uniqueness meets digital vision

Medical instrument manufacturer Richard Wolf presents two new flexible Sensor Ureterorenoscopes: the single-channel ureterorenoscope (URS) 'BOA vision' and a dual-channel URS 'COBRA vision'.

"When we were developing 'BOA vision' and 'COBRA vision', we held discussions with leading urologists to find out the aspects of our renoscopes that could be optimized. We also incorporated the latest findings from the areas of imaging, illumination and ergonomics," commented Stefan Gillé, Head of Product Marketing Urology at Richard Wolf.

Due to the very small sheath diameter of 8.7 Fr., 'BOA vision' can be introduced through ureteral guides with a diameter of just 9.5 Fr. This makes it particularly suitable for the treatment of children and adult patients with very narrow ureters. 'COBRA vision' also permits the simultaneous option of using one or two working instruments with outstanding irrigation performance in both cases. This significantly reduces the intervention times compared with single-channel renoscopes.

Common attributes of both instruments include LED illumination, the digital image sensor, and the higher torsional stiffness of the sheaths. The LED illumination integrated in the instruments generates homogenous lighting instead of spot illumination. The high-resolution image sensor provides a large-format, bright and high-contrast image. White balance and focusing are no longer necessary. The more robust design of the sheaths by comparison with the flexible ureterorenoscopes from other manufacturers found in the marketplace allows the instruments to be pushed much more easily through a ureteral guide into the kidney duct system.

● For more Information,
visit: *www.richard-wolf.com*
Email: *middle.east@richard-wolf.com*

A-SMART carts for quality healthcare

Armstrong's A-SMART carts are light to push and do not rust as they are made of durable aluminum. This dependable line of PremierTM Carts comes in many sizes and colors, offers a choice of locking systems with either key lock, breakaway seals or push button lock. You can customize your cart and change its configuration at any time when needs change with a selection of hundreds of accessories.

A-SMART carts are stable thanks to a stabilizing frame, easy to maneuver with soft grip handles, swivel casters, 2 brakes and one tracking guiding caster. The drawers open and close softly on ball bearing glides and are protected by double side panels and bumpers all around. A-SMART carts undergo the highest quality controls standards to meet ISO 9001:2000 certification requirements. The most reputable hospitals depend on A-SMART carts to provide high quality healthcare to demanding patients.

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

Coronis Uniti – one display, any image

Imagine reviewing both PACS and mammography, grayscale and color, 2D and 3D, static and dynamic images on a single display. One that features the best image quality you've ever witnessed and is packed with wonderful features that reduce occupational stress and strain. That's exactly how Coronis Uniti makes any radiologist's dreams come true.

Big and beautiful

Featuring the largest form factor today, 12 million pixels, the brightest calibrated colours and superb grays, Coronis Uniti offers the best image quality on the market. The display has been designed to mirror a human's natural field of vision so radiologists can view images comfortably without extraneous eye, head, and neck movement.

Because of its 1:1 image presentation and Optical Glass technology, Coronis Uniti always presents the best image without the need for scaling, panning or zooming. Its feature-rich design – including exceptional light control options and high-speed cine imaging – make Coronis Uniti the display your reading room deserves.

As a truly "unified" display, it brings together colour PACS and breast images on a single screen, to enable a more thorough examination. For your radiology department, the result is a more efficient, cost-effective workstation built around a single display, which is simpler to manage and control.

- For more information, visit: *www.barco.com/uniti*

Timesco Optima Pocket diagnostic sets – the perfect mobile diagnostic tool

The Timesco Optima Pocket diagnostic sets have been designed to offer the clinician and student alike with a perfect diagnostic tool for ophthalmology and aural examination with the convenience of being small enough to be carried in a pocket.

The Timesco Optima Pocket diagnostic sets feature the same superb quality optics, precision lenses, fibre optics and Xenon illumination for pure white light and durable materials as Timesco's Desk and Wall mounted Diagnostic sets, Optima Neo.

Individual Ophthalmoscopes and Otoscopes as well as a combination of both in Diagnostic sets in hard and soft cases are available.

The Optima Pocket Ophthalmoscopes feature durable construction, superb bright Xenon white light Illumination and five apertures: large, small macular (spot), half moon, fixation, red free filter and 18 dioptre lenses.

The Optima Pocket Otoscopes features high intensity Xenon illumination and fibre optics.

Timesco Optima Pocket Diagnostic Sets are constructed from durable plastics, metal alloys and stainless steels.

Timesco Healthcare Diagnostic Products are ISO, CE and FDA approved and guaranteed for materials and manufacture.

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

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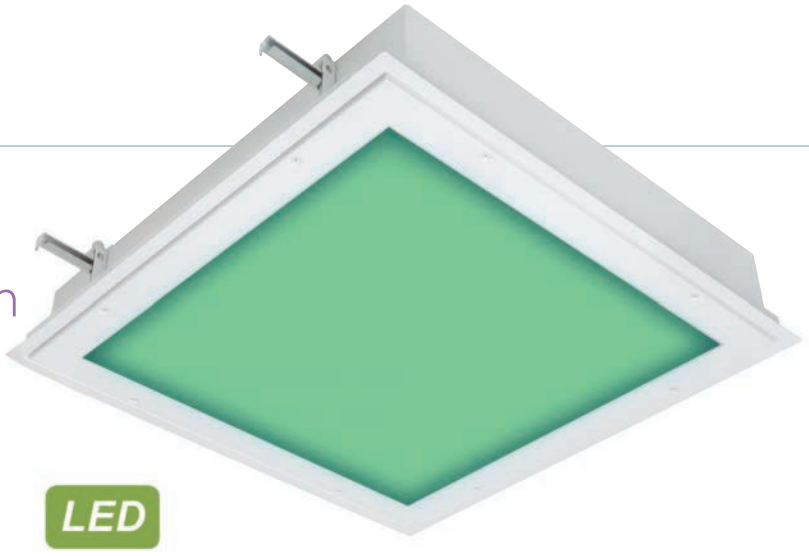
Kenall MedMaster M4 Green LED delivers effective light for the surgical suite



Surgical suites are the centers of efficient, precise and often life-saving work, making the visual needs of the medical staff critical to successful outcomes. Kenall's MedMaster M4 LED delivers consistent, effective light where and when it's needed.

See better, perform better

Surgical teams need to be both effective and efficient during a procedure without straining to see the operating field, monitors or equipment. Kenall understands that high visual contrast and acuity with minimal eye strain is crucial for operating rooms. With 50 years of experience in delivering lighting solutions for challenging applications, our proven MedMaster M4 Green LED surgical suite light fixture provides improved visual contrast, clarity and comfort, and gives physicians a confident advantage. The MedMaster M4 is available for the operating room in White LED or White LED & Green LED and can be independently dimmed to create the perfect balance of light. It offers an application optimized spectrum for increased visual acuity with no transmission loss due to filters. These light fixtures are sealed for infection control and feature the NSF2 listing, which supports ease of maintenance, and IP65 listed per IEC 60598, which ensures ingress protection against contaminants.

- For more information, visit *www.kenall.com/News--Events/Whats-New/M4-Green.htm*

MR-conditional carts for Magnetic Resonance Imaging suites

Harloff offers a line of carts that meet American Society for Testing and Materials (ASTM) International Designation of MR-Conditional for use in a 3 Tesla or less environment of the Magnetic Resonance Imaging Suite (testing date 1-13-2010). Whether you need it for Anesthesia or Emergency, Harloff has the right MR-Conditional cart for your needs. Harloff was the first medical cart manufacturer to design and test a medical cart built of non-ferrous components, knowing that there is a need within facilities to have critical supplies organized and readily available in the Magnetic Resonance Imaging environment. Harloff MRI carts are available with break-away locks or key locks, and have the option of two cabinet sizes – standard or narrow body.

Construction:

- Non-magnetic or "weakly magnetic" materials including aluminum, stainless steel, plastic, and aluminum and brass attachment hardware

Standard Features:

- Designed and built for safe use in the strong magnetic fields present in Magnetic Resonance Imaging (MRI) suites
- Tested by independent testing authority to 3 Tesla level
- Meets American Society for Testing and Materials (ASTM) International, Designation: F2503-05 definition of "MR-Conditional
- Cabinet painted gloss white with MRI identification sticker applied
- 13 drawer colours available
- Low-ferrous, ball-bearing, full extension drawer slides
- Low-ferrous 5" sealed ball-bearing casters; full swivel – one with brake, one directional
- Full wrap-around vinyl bumper
- 5" sealed ball-bearing casters; full swivel – one with brake, one directional
- Stainless steel pull-out shelf
- Low ferrous, ball-bearing, full extension drawer slides
- Replaceable plastic top with integrated push handles
- Cart is delivered fully assembled with pre-threaded accessory mounting holes
- MR-Conditional accessories available
- Choice of sizes, drawer configurations, locking options, and accessories
- Latex free
- Five year warranty

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

Painless blood sampling – what every person with diabetes must know

With six US, and 22 international patents, Genteel is the first totally pain-free lancing instrument, for both adults and children with diabetes, allowing the right amount of test blood to be drawn from both fingers and alternate sites, completely without discomfort.

Genteel eliminates the usual pain and anxiety of lancing with a patented combination of vacuum, precise depth control, and vibration. The patented Nozzle/Contact Tip Assembly controls the lancet to penetrate just deeply enough to touch the closer-to-the-surface blood capillaries, but never the deeper pain nerves. Genteel's vacuum then draws up the blood from this extremely shallow site, whether on sensitive fingertips, or such alternate sites as shoulders, arms, or above the knee. Genteel's 120-day money-back and five year warranty ensure years of painless testing, drawing the precise amount of test blood, every time, without the need to squeeze the lance site.

Genteel also has the potential to "re-draw", enabling the user to go back to an earlier test site, and with Genteel's vacuum alone – without a lance – continue to draw test blood throughout the day.

Requiring only four easy-to-use steps, Genteel works with any square shaft lancets, test strips and meters, allowing the user to continue with whatever testing supplies they are most comfortable with.

Because Genteel is painless, and offers other body sites to choose from, parents can now test their young child at night, say from their shoulder or leg, without having to wake them.

Genteel's elegant design comfortably fits the hands of both adults and children. With customizable colour options, and an imaginative sticker collection, Genteel users can now make lancing both a comfortable and creative experience.

■ For more information, visit: *www.mygenteel.com*

The completely new hygiene and toileting system

Time and again, research has shown the necessity of good toileting for children's health. So Rifton designed the Rifton HTS with that in mind. Hygienic, simple, affordable, the Rifton HTS promotes the forward positioning that is ideal and natural for effective toileting. Meanwhile, its versatility and simplicity – usable on, over and off the toilet, no tools required – make the lives of caregivers better too.

Benefits

- The unique design of the optional seat pad opening, open to the rear for larger clients – facilitates clear access for cleaning and hygiene.
- The portability kit provides clients greater independence, and their families greater freedom to travel.
- Optional integral skin foam pads for the back and seat provide comfort for clients and easy disinfecting for caregivers.
- A silhouette of a boy standing with a line next to him indicating that the key user dimension for this product is height.
- Optional gas-assisted tilt-in-space enables the Rifton HTS to tilt 15° forward for easier transfer and better toileting position, as well as 15° back for showering and hair washing.
- On. Over. Off. No matter what your toileting situation or special need, the Rifton HTS can meet it with its unmatched versatility:

What clients say?

"The Rifton HTS is yet another fantastic innovation. The creative and highly adjustable design gives children comfort, security and the opportunity for success while offering caregivers ease and simplicity. Our staff has high praise for its simple adjustability and ease of cleaning. The quality of this product is by far the best on the market. Rifton has once again set the bar high!"

■ For more information on Health Mart:
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Robotic smart suit designed to help people with limited mobility

The Wyss Institute for Biologically Inspired Engineering at Harvard University has been awarded a first-phase US$2.9 million follow-on contract from the US-based Defense Advanced Research Projects Agency (DARPA) to further develop a biologically inspired smart suit. The device, the Soft Exosuit, is intended to be worn comfortably under clothing and could enable soldiers to walk longer distances, keep fatigue at bay, and minimize the risk of injury when carrying heavy loads. Alternative versions of the suit could eventually assist those with limited mobility as well.

DARPA's Warrior Web program seeks to develop technologies to prevent and reduce musculoskeletal injuries for military personnel, but the same technologies could also have civilian applications. A reduction in such injuries could reduce long-term healthcare costs and enhance quality of life for wearers of the suit.

This is the first of a potentially two-phase contract, which enables Wyss Institute Core Faculty member Conor Walsh, Ph.D., and his team to build upon their earlier work, also funded by DARPA, demonstrating the proof-of-concept of this radically new approach to wearable robot design and fabrication. Inspired by a deep understanding of the biomechanics of human walking, the Soft Exosuit technology is spawning the development of entirely new forms of functional textiles, flexible power systems, soft sensors, and control strategies that enable intuitive and seamless human-machine interaction.

"While the idea of a wearable robot is not new, our design approach certainly is," said Walsh, who is also an Assistant Professor of Mechanical and Biomedical Engineering at Harvard's School of Engineering and Applied Sciences (SEAS) and founder of the Harvard Biodesign Lab.

The lightweight Soft Exosuit is designed to overcome the challenges of traditional heavier exoskeleton systems, such as power-hungry battery packs and rigid components that can interfere with natural joint movement. It is made of soft, functional textiles woven together into a piece of smart clothing that is pulled on like a pair of pants and intended to be worn under a soldier's regular gear. Through a biologically inspired design, the suit mimics the action of the leg muscles and tendons when a person walks, and provides small but carefully timed assistance at the joints of the leg without restricting the wearer's movement.

In a current prototype, a series of webbing straps positioned around the lower half of the body contain a low-power microprocessor and network of supple strain sensors that act as the "brain" and "nervous system" of the Soft Exosuit, respectively – continuously monitoring various data signals, including the suit tension, the position of the wearer (e.g., walking, running, crouched), and more.

Photo courtesy Harvard's Wyss Institute

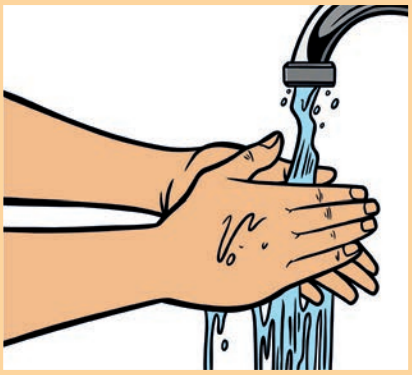
In addition to its military application, the team will collaborate with clinical partners to develop a medical version of the suit that can help stroke patients, for example, who often experience a slow, inefficient gait and could greatly benefit from walking assistance.

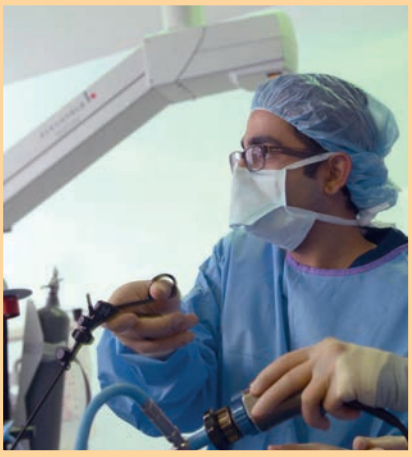
The Wyss Institute for Biologically Inspired Engineering at Harvard University <*http://wyss.harvard.edu*> uses Nature's design principles to develop bioinspired materials and devices that will transform medicine and create a more sustainable world. Working as an alliance among all of Harvard's Schools, and in partnership with Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Boston Children's Hospital, Dana Farber Cancer Institute, Massachusetts General Hospital, the University of Massachusetts Medical School, Spaulding Rehabilitation Hospital, Boston University, Tufts University, and Charité - Universitätsmedizin Berlin, and the University of Zurich, the Institute crosses disciplinary and institutional barriers to engage in high-risk research that leads to transformative technological breakthroughs. By emulating nature's principles for self-organizing and self-regulating, Wyss researchers are developing innovative new engineering solutions for healthcare, energy, architecture, robotics, and manufacturing. These technologies are translated into commercial products and therapies through collaborations with clinical investigators, corporate alliances, and new start-ups. MEH

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
November 2014		
Emirates International Urological Conference 2014	13 – 15 November, 2014 Dubai, UAE	*http://atnd.it/12231-0*
Emirates Oncology Conf.	14 – 16 November, 2014 Abu Dhabi, UAE	*www.asco.org/meetings meetings@asco.org*
The Middle East Pharma Cold Chain Congress	17 – 20 November, 2014 Dubai, UAE	*www.pharmacoldchainme.com*
Saudi Pharma Exhibition and Conference	23 – 26 November, 2014 Riyadh, KSA	*www.saudipharmaexhibition.com/en/Conferences/*
GCC Healthcare Innovation Congress	24 – 27 November, 2014 Abu Dhabi, UAE	*www.gcchealthcareinnovation.com*
December 2014		
International Congress in Aesthetics, Anti-Ageing Medicine & Medical Spa (ICAAM) Middle East	5 – 6 December, 2014 Dubai, UAE	*www.antiagingme.com*
12th Congress of the Arab Society of Nephrology and Renal Transplantation (ASNRT)	10 – 13 Dec 2014 Dubai, UAE	*http://www.nephrology.emanuae.com/*
Istanbul HealthExpo 2014	11 – 14 Dec, 2014 Turkey, Istanbul	*www.ifm.com.tr*
January 2015		
4th Family Medicine Conference	11 – 13 January, 2015 Dubai, UAE	*www.familymedicineuae.com*
5th Emirates Rhinology & Otology Conference	14 – 16 January, 2015 Dubai, UAE	*http://www.emiratesrhinologyandotology.ae/*
Congress of the International Academy of Legal Medicine & Exhibition	19 – 21 January, 2015 Dubai, UAE	*http://www.ialmdubai.ae/*
IMTEC Oman 2015	19 – 21 January, 2015 Muscat, Oman	*http://www.imtecoman.com/*
9th Annual Healthcare Insurance Forum	25 – 28 January, 2015 Dubai, UAE	*www.healthcareinsurance.informa-mea.com/*
Arab Health 2015	26 – 29 January, 2015 Dubai, UAE	*www.arabhealthonline.com*
The International Conference Infectious Disease	26 – 27 January, 2015 Jeddah, KSA	*www.waset.org/conference/2015/01/jeddah/ICID On*
ICPPS 2015: XIII International Conference on Pharmacy and Pharmaceutical Sciences	30 – 31 January, 2015 Dubai, UAE	*www.waset.org/conference/2015/01/dubai/ICPPS*





Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ February 2015		
7TH International Conference on Drug Discovery and Therapy	16 – 19 February, 2015 Dubai, UAE	*http://www.icddt.com/home.php*
UAE International Dental Conference & Arab Dental Exhibition – AEEDC	17 – 19 February, 2015	*http://aeedc.com/*
■ March 2015		
The 3rd Int'l Communication Disorders Audiology & Neuro Otology Conference	1 – 4 March, 2014 Riyadh, KSA	*http://ican-hear.org/*
Ajman HealthCare Summit	5 – 7 March, 2014 Ajman, UAE	*http://ahs-ajman.com/index.html*
Dubai Anaesthesia	5 – 7 March, 2015 Dubai, UAE	*www.dubaianaesthesia.com*
QMED 2015	9 – 11 March, 2015 Doha, Qatar	*www.qmedexpo.com national@qmedexpo.com international@qmedexpo.com*
2015 Gulf Thoracic	11 – 14 March, 2015 Dubai, UAE	*www.saudithoracic.com*
Kuwait Medica 2015	16 – 18 March, 2015 Kuwait City, Kuwait	*gracy@kuwaituniversal.com www.kuwaitmedica.com*
Dentistry 2015	18 – 20 March, 2015 Dubai, UAE	*contact@omicsgroup.com www.dentistry2015 conferenceseries.net*
2nd International Conference and Exhibition on Rhinology & Otology	18 - 20 March, 2015 Dubai, UAE	*http://otolaryngology. conferenceseries.net/*
IECM Dubai 2015	24 – 26 March, 2015 Dubai, UAE	*osman.khalil@index.ae www.emergency.ae*
ABILITIESme 2015	24 – 26 March, 2015 Abu Dhabi, UAE	*jamesmeltz@dmgeventsme.com www.abilitiesme.com*
PACD19 – The 19th Pan Arab Conference on Diabetes	24 – 27 March, 2015 Cairo, Eqypt	*www.arab-diabetes.com*
IFM 2015	25 – 27 March, 2015 Dubai, UAE	*index@emirates.net.ae www.ifm.ae*
ExpoMED Istanbul	26 – 29 March, 2015 Istanbul, Turkey	*www.expomedistanbul.com expomed@reedtuyap.com.tr*
OBS-GYNE 2015	29 – 31 March, 2015 Dubai, UAE	*obsgyne@informa.com*

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

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