

Middle East HEALTH

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May-June 2014

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Polio returns to Iraq

Experts warn vaccination alone not enough to beat the disease



The post antibiotic era

WHO issues stark warning of antibiotic resistance saying once again minor infections can kill you

Surgery with 3D printing

Surgeons in Japan use CT images to print exact 3D replicas of kidneys to aid cancer surgery

In the News

- GlaxoSmithKline, Novartis in major partnership deal
- Abu Dhabi's SEHA partners with Canada's University Health Network
- Researchers identify genetic evidence for single bacteria cause of sepsis
- MERS-CoV claims more lives in UAE, KSA, first case in Yemen

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Prognosis

Drug resistance

At the time of going to press we were able to squeeze in an important article on a report by the World Health Organisation at the end of April which issues stark warning that the world is about to enter a so-called 'post antibiotic' era where minor infections could once again be fatal. The WHO says antimicrobial resistance – although not new – has now reached dangerous levels and that the public at large around the world is now at risk succumbing to diseases like sepsis, diarrhoea and pneumonia because the antibiotics used to treat these diseases are increasingly failing to work. Read the report on page 22.

The dreaded polio has returned to Iraq after an absence of 14 years. And despite a massive vaccination campaign, experts believe vaccination alone is not enough to halt the spread of this incurable and highly contagious disease in the country. They say current living conditions – dire poverty, lack of sanitation and contaminated water exacerbate the problem and unless these are resolved vaccination alone is likely to fail. Read the Iraq Update on page 20.

Also in this issue we look at healthcare research in Qatar in our Qatar report, where we speak to two researchers at Weill Cornell Medical College in Qatar about their studies. One is looking at how a form of microRNA helps control cholesterol and the other is mapping the Qatari genome to help prevent inherited diseases. The report is on page 36.

3D printing is relatively new technology and is set to revolutionise many fields, not least healthcare. A group of surgeons from Kobe University in Japan has combined the 3D imaging capabilities of Computer Tomography, with 3D printing, to produce exact scale model of kidneys prior to surgery. This allows surgeons to practice surgery in difficult kidney cancer cases. Read the report on page 28.

As usual you will find a wealth of informative news, interviews and reviews in this issue.

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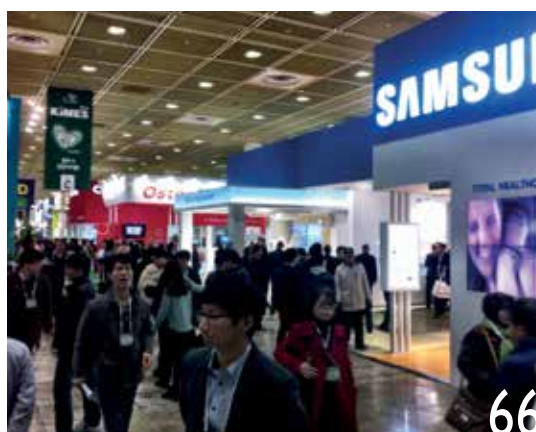
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Dr. Faraz Khan: Consultant Oncologist/Hematologist, **Dr. Nidal Mahgoub:** Consultant Pediatric Hematology/Oncology,
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middle east monitor

Update from around the region



Saudi health ministry inks partnership with BMJ

BMJ, one of the world's leading medical knowledge providers, has signed an "Executive Agreement for Cooperation in Health Learning and research" with the Ministry of Health (MoH) of the Kingdom of Saudi Arabia to provide unrestricted access to its online learning, decision support tools, quality improvement platform and journals for health professionals across the Kingdom.

The five-year partnership was signed recently during a ceremony at the Department of Health in London with Saudi Health Minister Dr. Abdullah Al-Rabeeah and the UK's Undersecretary of State for Health, Anne Soubry both in attendance and forms part of the Saudi government's 20-year workforce transformation strategy to improve the consistency and quality of healthcare throughout the Kingdom.

Speaking at the launch ceremony, Al Rabeeah said that online services are being introduced to help medics and paramedics stay up-to-date with the latest advances in the field of medicine.

Thousands of healthcare professionals employed by MoH hospitals, National Guard, Ministry of Defence and Aviation, Ministry of Interior and private hospitals will benefit from open access to a selection of BMJ's renowned evidence-based journals, learning, decision support and quality improvement resources.

BMJ CEO, Tim Brooks, said: "The agreement provides clinicians across the Kingdom with the very best tools to develop their knowledge and skills, practice

evidence-based medicine, and improve outcomes for their patients, with access to medical information covering 10,000 topics in over 20 specialities.

"The BMJ is committed to achieving high quality, evidence-based healthcare for patients throughout the world. We are very proud that the Kingdom has chosen to collaborate with us on this important project and we look forward to sharing our expertise with the medical workforce of this country," he added.

The partnership agreement with BMJ provides ministry of healthcare professionals with open access to resources such as BMJ Best Practice, offering fast and easy access to the latest research evidence, guidelines and expert opinions at the point of care - in hospital, at the clinic or on a mobile device, enabling clinicians to make the best decisions for their patients.

Clinicians will also have free on-line access to seven key BMJ Journals covering the latest research, news and expert opinion: *Heart*, *Gut*, *DTB* (Drug and Therapeutics Bulletin), *EMJ* (Emergency Medicine Journal), *British Journal of Ophthalmology*, *BJSM* (British Journal of Sports Medicine) and *Journal of Clinical Pathology*.

Another major resource is BMJ Learning, which is a fully accredited online learning module covering over 1,000 medical specialties and clinical areas, allowing clinicians to study at their own pace and convenience. This includes an online platform which supports individuals and teams through healthcare improvement projects and onto publication in the *BMJ Quality*

Improvement Reports journal.

"This provides the necessary framework, learning modules, tools and resources to make healthcare improvement simple," said Brooks.

Events company raises awareness of increasing cancer cases in Palestine

According to a recent report from the Information Center at the Ministry of Health in Palestine, 12.4% of the total deaths in Palestine were caused by cancer in 2013, with an increase of 2% from the previous year. With the lack of resources and limited accessibility to medication in the West Bank and Gaza, the number of deaths due to cancer increases year by year.

The Huda Al Masri Pediatric Cancer Center, located in Beit Jala, Palestine was founded by the Palestine Children's Relief Fund (PCRF) as a means of seeking a solution to the problem.

The company, entourage marketing & events, has signed an MOU with the Palestine Children's Relief Fund (PCRF), UAE chapter, with a view to increase the number of beds at the cancer center.

Currently, there are only 14 hospital beds in the pediatric cancer center, and entourage hopes to increase that number by at least 20 beds before the end of the year. There are between 90-120 new cases of cancer in children recorded every year. There are not enough beds in the Huda Al Masri Pediatric Cancer Center to treat even a fraction of these cases.

The PCRF is a non-profit organization that provides free medical assistance to children from all over the Middle East. The cancer center is the first privately owned hospital in the Palestinian Territories for cancer treatment and has been funded entirely by donations from all over the world. Facilities and equipment are still being added to the center, and donations are continuously being collected.

In order to increase the availability of treatment and medical resources for the maximum number of patients possible, entourage marketing & events will take over the live communication strategy for the PCRF, UAE chapter. Through entourage's work with the PCRF, entourage's team

will be dedicated to providing the PCRf with support in PR, creative, social media management and the conceptualizing of all PCRf corporate events within the UAE.

HAAD calls for regular screening for colorectal cancer

To reduce the mortality rate attributed to colorectal cancer, the Health Authority – Abu Dhabi (HAAD), the regulatory body of the healthcare sector in the Emirate of Abu Dhabi, is advocating regular screening for the disease in the form of either a colonoscopy or a simple stool test called Fecal Immunochemical Test (FIT).

Colorectal cancer, the collective term for the growth of malignant tumours in the colon or the rectum, has become the third most common cancer in Abu Dhabi.

It is estimated that colonoscopy screening prevents 40% of colorectal cancer cases. FIT is a newer kind of stool test that detects hidden blood in the stool.

According to HAAD statistics, 9% of new local cases of cancer in 2012 were colorectal in nature. In 2012, 59% of the cases were males and the average age of incidence was determined to be 54 years. 52% of deaths were in men.

Although not all risk factors have been identified, high fat, low fiber diets, lack of exercise and genetic abnormalities are among those known.

HAAD recommends a colonoscopy every 10 years for individuals – men and women – aged 40 and above or a FIT stool test every two years.

HAAD urged the community to perform the screening test for reassurance. Emiratis are eligible for screening through their Thiqa insurance, but tests for non UAE Nationals vary based on insurance policy and benefits.

More than 25 facilities across Abu Dhabi Emirate provide screening services. To enable accessibility to screening services, HAAD created an online booking tool; it is available on www.haad.ae/merelycheck/appointment

Kuwait provides funds for WHO work in Syria

The World Health Organization (WHO) has received US\$10 million from the Gov-

ernment of Kuwait to support its activities in Syria as a result of the war, According to an April 9 WHO statement. This contribution is a continuation to the \$35 million provided by Kuwait in 2013.

“WHO extends its profound gratitude to the Government of the State of Kuwait for the new donation, which makes it possible for WHO to continue to reach vulnerable people in both Syria and neighbouring countries to provide access to basic and essential life-saving care,” said Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean.

In a commemorative ceremony held at the Palais des Nations in Geneva Switzerland, Dr Abdullah Al-Matouq, Special Adviser to His Highness Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, the Emir of Kuwait, presented the donation. It was commended by Dr Keiji Fukuda, WHO’s Assistant Director General for Health Security and Environment, who said: “The assistance provided by Kuwait will contribute to delivering medicines, vaccines and medical care for close to 7 million people inside Syria and in neighbouring countries.”

Kuwait has played a major role as a contributor to WHO’s efforts in strengthening disease surveillance and polio and measles vaccination of millions of children. This is in addition to ensuring medicines, vaccines, surgical supplies and medical equipment get to hard-to-reach hospitals and health centres.

The WHO said it would ensure the new contribution of \$10 million is effectively utilized for the life-saving care of millions of Syrians affected by the war, with focus on pressing needs, such as vaccination and improved disease surveillance systems.

SKMC’s paediatric cardiac surgery program boosts survival rates from 20% to 80%

The unique paediatric cardiac surgery program at Sheikh Khalifa Medical City (SKMC), the only one of its kind in the country, has brought hope to thousands of newborns over the years, as it draws closer to its seventh anniversary of operation this year.

Before the era of paediatric cardiac surgery, the chances of survival past 18 years old for a newborn with congenital heart

disease fell below 20%, whereas presently more than 80% live past 20 years old, according to Dr Laszlo Kiraly, Chief of Paediatric Cardiac Surgery at SKMC.

According to the physician’s data, more than 500 babies are born with congenital heart disease in the UAE every year, with nearly 70% of them requiring cardiac surgery, and more than half of those within the first six months of life.

“There is great public demand for this service, as parents may not be able to take their newborn baby overseas for treatment which is predominantly surgical and can be prohibitively expensive. SKMC has the only service that is a dedicated 24/7 comprehensive program for paediatric heart disease,” Dr Kiraly said.

“We have been nominated by SEHA as ‘a centre of excellence’ that has gained the support and confidence of the community, with a third of our patients being locals,” he added.

In 2013, SKMC’s one-of-a-kind paediatric cardiac surgery program reached over 1800 surgeries conducted since its inception, treating between 300 and 330 cases per year since it started in 2007.

In addition to operating on children with congenital heart disorders, the paediatric cardiac surgery team treat adolescents and adults that were born with cardiac defects and who weren’t able to have their problems resolved in their youth. SKMC’s Grown Up Congenital Heart or ‘GUCH’ program is another initiative that is the only one of its kind in the country. The GUCH program treats patients who often fall into a ‘grey area,’ between children and adults, so a multidisciplinary input is required involving both the hospital’s adult and paediatric services.

The program requires special expertise as traditional cardiac surgery for an older person is geared towards the treatment of heart disease associated with aging and lifestyle, with the focus being on the replacement of blocked coronary arteries and damaged heart valves, as opposed to the correction of birth defects in the adult age.

The paediatric cardiac surgery division has the country’s only Extracorporeal Membrane Oxygenation (ECMO)



program for paediatric patients, which is an advanced form of life support used to treat infants and children in cardiac and/or respiratory failure. It works as a modified form of heart and lung bypass on a temporary basis, and is an alternative to conventional methods of life support.

“The ability to improve the life of a child and enable them to grow up fit and strong is one of the greatest gifts a person can bestow on society and is a skill that demands recognition. SKMC’s paediatric cardiac surgery outcomes exceed those even in the US, according to a University HealthSystem Consortium Discharges report,” said Dr Abdulmajeed Al Zubaidi, Consultant Interventional Cardiologist and Chief Medical Officer at SKMC.

King Faisal Prize awarded for foetal diseases discovery

At a ceremony in Riyadh in March, the 2014 King Faisal International Prize for Medicine was awarded to Yuk Ming Dennis Lo for his research on Non-Invasive Diagnosis of Fetal Diseases. The prize consists of a certificate, hand-written in Diwani calligraphy, summarizing the laureate’s work; a commemorative 24 carat, 200 gram gold medal, uniquely cast for each Prize; and a cash endowment of Saudi Riyal 750,000 (about US\$200,000).

In 1997 Dennis Lo discovered the presence of cell-free foetal DNA, RNA and miRNA in the plasma of pregnant women, creating a paradigm shift in non-invasive prenatal diagnosis. He elucidated the fundamental characteristics of such molecules, developed the technologies for their analysis, conceptualised their use and brought non-invasive prenatal diagnosis to a reality. He achieved the non-invasive prenatal diagnosis of trisomy 21 or Down’s syndrome, which has been hailed as the Holy Grail in prenatal diagnosis.

Within a few years of the discovery, tests, such as sex determination for sex-linked genetic disorders, began to be clinically used in many centres, replacing the corresponding conventional tests. This discovery opened up new possibilities for non-invasive prenatal diagnosis, and has effectively



Yuk Ming Dennis Lo

reduced our reliance on previous invasive and potentially risky, methods.

Dennis Lo transformed the field of prenatal genetic diagnosis through his discovery of cell free foetal nucleic acids in the maternal blood and the identification of their placental source. He built upon this pivotal discovery to develop and translate techniques for risk free determination of foetal aneuploidy and monogenic disease, and ultimately the sequencing of the full foetal genome from cell free DNA.

Professor Yuk Ming Dennis Lo is the Director of the Li Ka Shing Institute of Health Sciences, the Li Ka Shing Professor of Medicine and Professor of Chemical Pathology of The Chinese University of Hong Kong (CUHK). He is also the Associate Dean (Research) of the Faculty of Medicine of CUHK.

Abu Dhabi’s SEHA to partner with Canada’s University Health Network

The Abu Dhabi Health Services Company (SEHA) has signed a cooperation agreement with Canada’s largest research hospital, University Health Network (UHN), with the attention of improving the level of medical services provided by SEHA’s Health System facilities. This will be achieved by entering into international healthcare partnerships in order to share experiences and keep abreast with the latest healthcare technology, since UHN is internationally known for its medical quality and excellence.

The agreement was signed by Rashid Al-Qubaisi, Chief Executive officer at SEHA, Nizar Mahomed, Director General of UHN, A UHN delegation from Canada and representatives from the Canadian Embassy and a number of officials from SEHA also witnessed the signing of the agreement.

Under the five-year agreement, both parties will exchange expertise and modern technology, as well as engaging in joint research and training programmes, which will include training of SEHA’s medical and nursing staff at UHN in Canada. In addition, SEHA and UHN will carry out joint projects to improve the quality of medical services offered.

The cooperation agreement essentially aims at exchanging visits between faculty members at Canadian medical institutions including scientists, doctors and specialists, along with the medical and nursing staff in SEHA. Furthermore, the agreement intends to benefit from UHN’s experience and knowledge of scientific research and professional services in developing the healthcare services provided by SEHA and its facilities to its patients.

Rashid Al-Qubaisi conveyed SEHA’s keenness to deliver world-class healthcare services to its patients and local communities within Abu Dhabi. With regard to this, he stated: “Due to the fact that UHN represents one of the largest teaching hospitals networks in Canada, and enjoys international reputation and fame, we look forward to gain from their global knowhow and expertise in the medical sector, and harness it to serve the people of Abu Dhabi.”

Al-Qubaisi continued: “The agreement will enable the medical, nursing and management staff at all SEHA’s facilities to exchange information, articles, reports and educational materials in order to support education and training programmes at SEHA, and develop shared academic projects between both parties. This includes collaborative research, teaching, technical cooperation, and evaluation of specific programmes.”

He also asserted that the agreement will allow SEHA to develop and improve its Key Performance Indicators (KPIs) and quality metrics to improve its services

According to Dr Nizar Mahomed: “The UHN will offer SEHA the essence of its expertise and experiences in the medical field, which will be aimed at raising the quality of healthcare provided to its clients in Abu Dhabi, especially the modern technologies owned by UHN.” MEH



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worldwide monitor

Update from around the globe

The global burden of breast cancer

The global burden of breast cancer remains immense in 2013, with over 1.6 million new cases being diagnosed annually. This burden has been increasing at a rate of 3.1% per year, and while the majority of new cases are diagnosed among women in developed countries, the 450,000 deaths per year from the disease are now equally divided between the developing and developed world, the 9th European Breast Cancer conference (EBCC-9) was told on 19 March 2014.

Professor Peter Boyle, Director of the University of Strathclyde Institute of Global Public Health at the International Prevention Research Institute (iPRI) in Lyon, France, will tell the conference that in Scotland the death rate from breast cancer is now at its lowest level in over 100 years. "This positive situation has been brought about by contributions from a variety of sources including the development and availability of effective treatments, increased awareness among women, the national NHS Breast Screening programme, and free access for all women to high-quality diagnostic and treatment facilities. While this is very positive, not all women worldwide have been able to benefit from these advances and the contrast between the situation in rich and poor countries is staggering."

"But even here in Scotland there are considerable differences due to lifestyle and social class; for example, Professor Gillis has shown that, in Glasgow, two women with breast cancer of the same age, presenting for the same treatment at the same time, and with the same tumour characteristic, may have a ten point percentage difference in five-year survival simply because one comes from an affluent area of the city and the other from a deprived area. This is irrespective of whether or not they are treated by breast cancer specialists."^[1]

Eliminating these differences is a matter of urgency, Professor Boyle will say. "We need to make a reduction in the number of women developing and dying from breast cancer a global priority."

Women in low income countries, and particularly in Africa, tend to seek medical attention for their disease only once it

is at an advanced stage and has spread to other parts of the body, and by this stage the only option is palliation, which is often itself not available or, at best, not optimal. The *World Breast Cancer Report 2012*^[2], published by the iPRI, collected data about groups of breast cancer patients from institutes throughout the world in order to develop a clearer picture of the current situation. "We found that in high income countries, such as the United Kingdom and Australia, there were very few women who were diagnosed initially with stage III or IV (advanced and metastatic) disease," Prof Boyle will say, "whereas in countries such as Kenya and Uganda almost all women with breast cancer presented at Stage III or IV."

"Given that the difference in survival when going from a stage I to a stage II breast cancer is approximately 12 percentage points, and from a stage III to a stage IV around 30 percentage points, it is clear that our first priority should be to do all we can to encourage women in low-income countries to present to their doctor before their breast cancer is at such advanced stage that cure is no longer possible."

An increasing population size, longer life expectancy, a decrease in the stigma attached to a diagnosis of breast cancer, increases in awareness, and the introduction of early detection programmes in lower resource countries will inevitably lead to an increase in the numbers of new cases being diagnosed. "What we need to ensure is that appropriate treatment facilities are available, and this is often not the case," Prof Boyle will say.

For example, in many low-income countries, radiotherapy facilities are either unavailable or present on such a limited scale that they can barely make a difference, and, for women with late-stage terminal cancer who are often in great pain, opioid medications to control pain are frequently lacking.

"It is not as though breast cancer is a new disease – it has been around for thousands of years – or as though it cannot be treated effectively," Prof Boyle will conclude. "While there is plenty of good news to report, at least in the developed world, what is particularly alarming is that there

are still so many preventable deaths due to the combination of a lack of awareness and a lack of resources. Epidemiology has a vital role to play both in elucidating the current situation and in bringing it to the notice of those who are able to do something about it."

^[1] Gillis CR and Hole DJ. Survival outcome of care by specialist surgeons in breast cancer: a study of 3786 patients in the west of Scotland. *BMJ*. 1996 Jan 20;312(7024):145-8.

^[2] The *World Breast Cancer Report 2012* was funded by an unrestricted grant from the Susan G. Komen for the Cure as well as from the iPRI's own resources.

China reduces TB prevalence by half in 20 years

Over the last 20 years, China has more than halved its tuberculosis (TB) prevalence, with rates falling from 170 to 59 per 100 000 population. This unrivalled success has been driven by a massive scale-up of the directly observed, short-course (DOTS) strategy, from half the population in the 1990s to the entire country after 2000, according to findings from a 20-year-long analysis of national survey data, published in *The Lancet*.

"One of the key global TB targets set by the Stop TB Partnership aims to reduce tuberculosis prevalence by 50% between 1990 and 2015. This study in China is the first to show the feasibility of achieving such a target, and China achieved this 5 years earlier than the target date", says study leader Dr Yu Wang from the Chinese Center for Disease Control and Prevention in Beijing, China.

"Huge improvements in TB treatment, driven by a major shift in treatment from hospitals to local public health centres implementing the DOTS strategy, were largely responsible for this success."

China is a major contributor to the TB pandemic, with 1 million new TB cases every year, accounting for 11% of all new cases globally. Two national surveys of tuberculosis prevalence in 1990 and 2000 showed that levels of TB were reduced by around 30% in the 13 provinces where the DOTS programme was adopted. However, national TB

prevalence fell by just 19% over the decade.

Another survey was done in 2010 to re-evaluate the national TB burden, providing an opportunity to assess the effect of the nationwide expansion of the DOTS programme. Nearly 253 000 individuals aged 15 years and older were surveyed in 2010 at 176 investigation points chosen from all 31 mainland provinces. The results show that between 2000 and 2010, national TB prevalence fell by 57% – tripling the reduction of the previous decade.

During this time, 87% of the total decrease in prevalence was among cases already diagnosed with TB before the survey. The increase of known TB cases treated using DOTS rose from 15% in 2000 to 66% in 2010, and contributed to lower proportions of treatment default (from 43% to 22%) and retreatment (from 84% to 31%).

More than 100 dead from Ebola virus in West Africa

Guinea - According to a statement from the WHO, as of April 14, the Ministry of Health of Guinea has reported a cumulative total of 168 clinically compatible cases of Ebola virus disease (EVD), including 108 deaths.

The detailed situation report is available as at 11 April, describing 159 clinically compatible cases of Ebola virus disease (EVD), including 106 deaths. Laboratory investigations continue at the Institut Pasteur (IP) Dakar laboratory in Conakry and at the European Union Mobile Laboratory (EMLab) team in Guekedou. A total of 71 clinical cases have been laboratory confirmed (45%), while 34 of the remaining clinical cases are classified as probable cases and 54 as suspected cases. Forty-two of the 106 deaths (40%) have been laboratory confirmed.

Eleven patients were still hospitalised on 10 April while 37 have been discharged from care. A total 941 contacts have been identified since the beginning of the outbreak. Medical observation is continuing for 396 contacts while 545 have been discharged from follow-up.

Doctors at the Donka Hospital isolation facility in Conakry are investigating a cluster of cases who had funeral contact with a relative who died on 1 April with

suspected malaria. Two contacts of this patient were admitted on 12 April and tested positive. One doctor, an internal medicine physician who tested positive on a post mortem sample, had cared for this patient and is also linked to this chain of transmission. He developed an illness with features of EVD but without signs of bleeding.

Liberia - As of 11 April, the Ministry of Health and Social Welfare (MOHSW) of Liberia has reported a cumulative total of 26 clinical cases of EVD (6 laboratory confirmed, and 20 probable and suspected cases of EVD), including 13 deaths. The most recent clinical case was identified on 11 April while the date of admission of the most recent laboratory confirmed case is 4 April.

Mali - As of 14 April, the Ministry of Health (MOH) of Mali reports a cumulative total of 6 suspected cases, all of whom remained under medical observation – 3 in the capital city of Bamako, 2 in Kourémalé and 1 in Bankoumana.

The Ebola virus can cause severe viral haemorrhagic fever (VHF) outbreaks in humans with a case fatality rate of up to 90%. Ebola first appeared in 1976 in two simultaneous outbreaks, in Nzara, Sudan, and in Yambuku, Democratic Republic of Congo (DRC). The latter was in a village situated near the Ebola River, from which the disease takes its name.

The Ebola virus is comprised of five distinct species: Bundibugyo, Ivory Coast, Reston, Sudan and Zaire.

Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found dead or ill in the rainforest.

Later Ebola spreads in the community through human-to-human transmission, resulting from close contact with the blood, secretions, organs or other bodily fluids of infected people. Burial ceremonies where mourners have direct contact with the body of the deceased person can also play a role in the transmission of Ebola.

GSK and Novartis in major partnership agreement

GlaxoSmithKline announced April 22 that it has entered into a major 3-part partnership with Novartis to create a new world-leading consumer healthcare business with revenues of £6.5 billion (about US\$10.9bn). GSK will have majority control with an equity interest of 63.5%.

GSK will acquire Novartis' global Vaccines business (excluding influenza vaccines) for an initial cash consideration of \$5.25 billion with subsequent potential milestone payments of up to \$1.8 billion and ongoing royalties

GSK will divest its marketed Oncology portfolio, related R&D activities and rights to its AKT inhibitor and also grant of commercialisation partner rights for future oncology products to Novartis for an aggregate cash consideration of \$16 billion (of which up to \$1.5 billion depends on the results of the COMBI-d trial)

Sir Andrew Witty, Chief Executive Officer, GSK said: "The Novartis OTC portfolio is highly complementary to GSK's and has many well-known, widely recommended brands such as Voltaren, Excedrin, Otrivin, and Theraflu. Together, we will create the world's premier OTC business with clear opportunities to accelerate revenue growth.

"The acquisition of Novartis' Vaccines business will significantly enhance the breadth of our vaccines portfolio and pipeline, notably in meningitis, with the addition of Bexsero, an exciting new vaccine for prevention of meningitis B. The acquisition will also strengthen our manufacturing network and reduce supply costs.

"The third part of this transaction would see divestment of our Oncology portfolio to Novartis. Over the last six years we have made excellent progress to develop a series of innovative medicines. This transaction provides us with a unique opportunity to crystallise an attractive value for this portfolio and allow these medicines to benefit from Novartis' global scale in this area.

"Very importantly, this transaction strengthens GSK's offering to patients and consumers. We will expand our portfolio to both help treat illness and prevent

disease, and we will broaden our scope to improve human health with the acquired R&D and innovation expertise.”

The acquisition of Novartis’ global Vaccines business (excluding influenza vaccines) further improves GSK’s position as the world’s leading global vaccines supplier. Demand for vaccination remains significant with the global vaccine market projected to grow approximately 10% per annum over the next 10 years.

The combination is geographically well-matched. Novartis’ portfolio has had relatively limited exposure to high growth emerging markets and this presents multiple new growth opportunities for several major brands and innovations, notably Voltaren, Excedrin and Otrivin. Similarly, GSK’s brands would benefit from exposure to Novartis’ highly successful CIS, Central and Eastern European business.

Emma Walmsley has been appointed as Chief Executive Officer Designate of the new business and will be a member of its Board. Sir Andrew Witty will be Chairman of the Board. The Board will comprise directors from both GSK and Novartis.

Roche and Hitachi renew partnership in diagnostics

Roche and Hitachi High-Technologies Corporation have renewed their 10-year contract for the joint development and manufacture of the next generation of instruments and workflow automation solutions for medical laboratories. The renewed alliance marks a significant milestone towards new platform solutions in Roche’s immunochemistry and clinical chemistry business that will help laboratories meet future needs.

The agreement follows a successful 36-year partnership that yielded a number of industry-first innovations in modular designed analyser platforms and workflow automation instruments for the laboratory’s serum work area. This resulted in more than 55,000 installations in immunodiagnostics and clinical chemistry worldwide.

“The new agreement is an important new chapter for us as we’re entering a new generation of modular laboratory solutions over the next few years. Thanks

to an ideal combination of both parties’ expertise, our diagnostics solutions allow customers to choose from the broadest set of instruments available for each laboratory setting. Apart from that, we enjoy a competitive advantage from an expanding selection of over 100 different tests in immunochemistry alone, the benchmark in the industry for a consolidated instrument series,” Jean-Claude Gottraux, Head of Roche Professional Diagnostics, said.

“Concurrent with our future platform strategy, Hitachi High-Tech is contributing to Roche’s concept of addressing the various needs of healthcare professionals with customised and modular solutions that help consolidate and integrate complex laboratory workflows across the whole work chain. The renewed agreement allows both companies to apply their strengths more effectively, and we expect the result to be continuing success for all of us,” Yasukuni Koga, Head of the Medical Systems Sales and Marketing Division, Hitachi High-Technologies Corporation, said.

Collaboration began in 1978, when the two companies teamed up on the sale and development of automated analysers for the clinical laboratory testing of body fluids. Since then, a new generation of laboratory solutions has paved the way for a sequence of industry-first innovations under the ‘cobas’ name. Today, cobas instruments represent the industry benchmark owing to the flexibility, accuracy, speed and medical value they provide for clinical decision-making worldwide. Combined with the ‘Elecsys’ electroluminescence (ECL) testing technology, they augment the powerhouse of Roche’s immunochemistry line-up.

New consensus reached to help tackle drug-resistant TB

New consensus statements have been developed to help tackle the growing threat of multidrug-resistant tuberculosis (TB) and extensively drug-resistant tuberculosis (TB).

Published online 24 March 2014 in the *European Respiratory Journal*, the statements mark the first time that physicians who treat patients with multidrug- and extensively drug-resistant TB have reached a consensus

on important areas of patient management where scientific evidence is inconclusive.

The World Health Organization (WHO) estimates that currently 450,000 new cases with MDR-TB occur each year. The majority of affected patients live in the WHO European Region.

As the emergence of these forms of the disease is fairly recent, clinical evidence is lacking and could be for many years to come. To help bridge this gap in knowledge, experts from the European-based TBNET network have provided harmonised answers to the key questions for the prevention, diagnosis, treatment and management of multidrug- and extensively drug-resistant TB.

Although some guidelines are available for the treatment of people with multidrug- and extensively drug-resistant TB, this is the first time that a large group of predominantly clinical experts have joined together to provide a consensus on the management of these conditions in Europe.

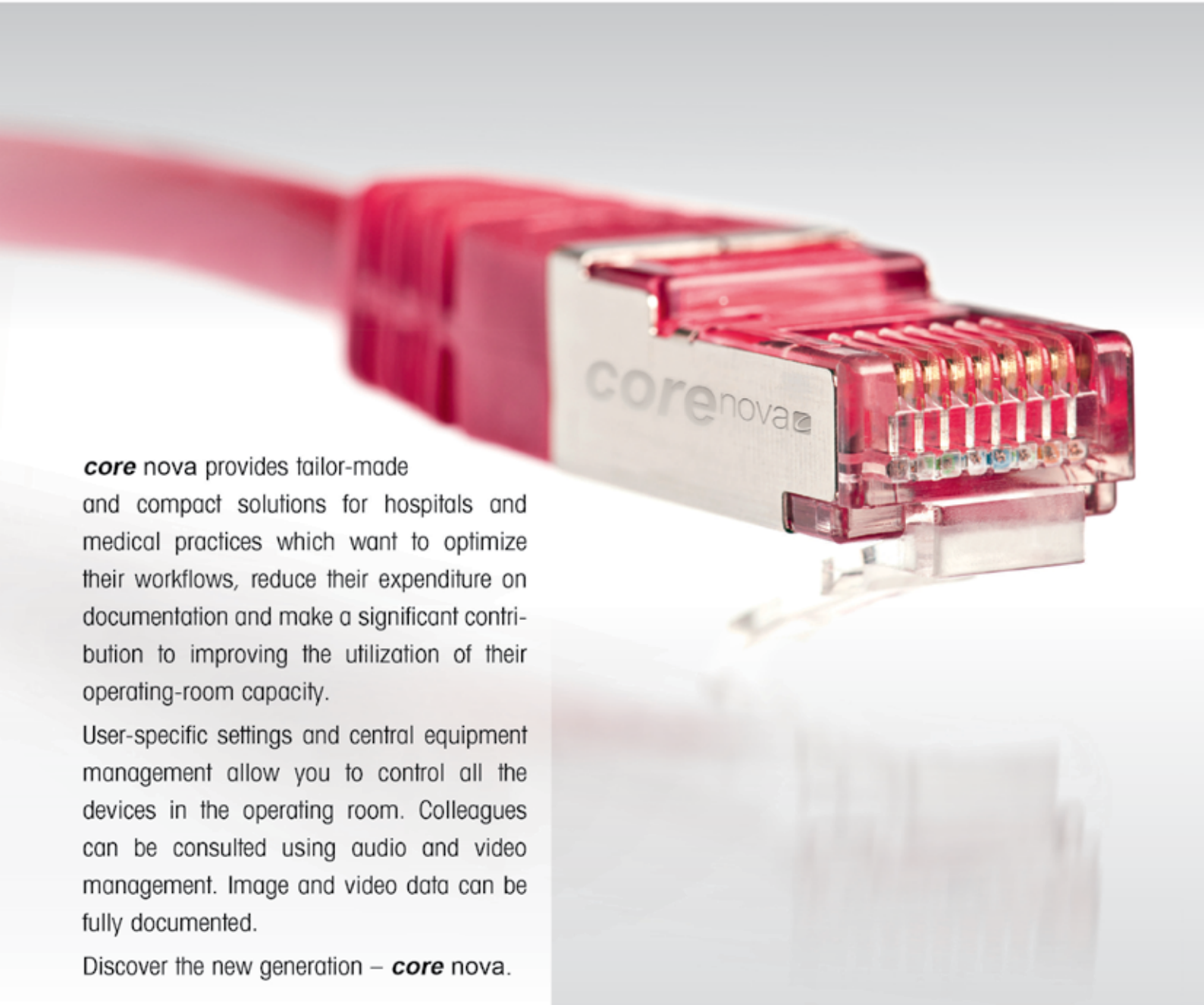
The consensus statements also include useful checklists with information on which examinations should be performed during the course of the treatment and what is necessary before discharging a patient from the hospital. The authors suggest that the document can be used as a point of reference for physicians across the continent.

Lead author, Professor Christoph Lange, Head of the Respiratory Infections Assembly at the European Respiratory Society, said: “These consensus statements provide very valuable support for physicians treating patients with these deadly conditions in all parts of Europe. The current management of patients with multidrug- and extensively drug-resistant TB is complex, very costly for healthcare systems and burdensome for those who are affected.

“We have harmonised individual expert opinions on the management of multidrug- and extensively drug-resistant TB in adults and children to ensure that consensus is available where clinical evidence is still lacking. As clinicians we hope to improve the treatment of multidrug- and extensively drug-resistant TB and the life of our patients who suffer from these difficult-to-treat conditions.”

● doi: 10.1183/09031936.00188313

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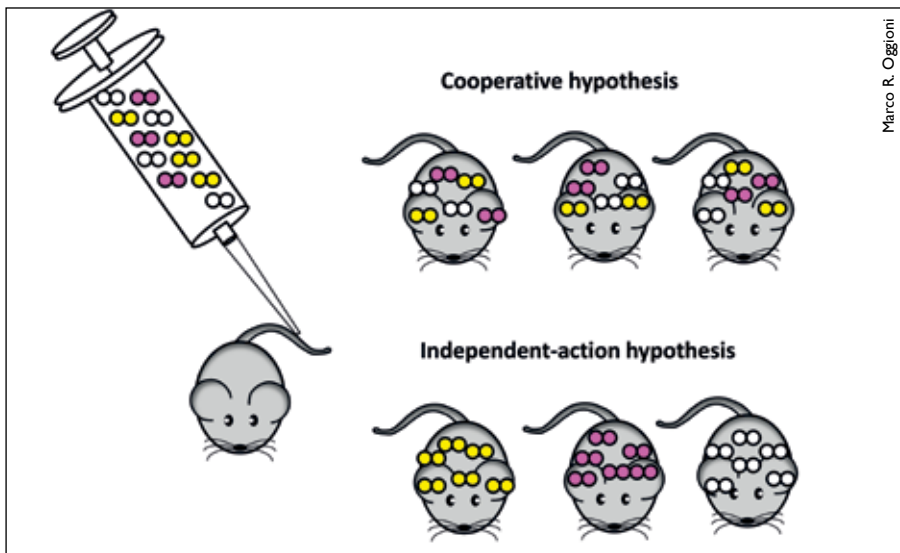
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Medical research news from around the world



Rather than from a mixture of cooperating bacteria, sepsis seems to originate from a single bacterial cell.

Researchers identify genetic evidence for single bacteria cause of sepsis

An international team of academics, including Professor Marco Oggioni from the University of Leicester's Department of Genetics, has studied how localised infections can turn into the dangerous systematic disease sepsis – and has identified for the first time through genetic evidence that a single bacteria could be the cause.

The study, published in *PLOS Pathogens* (20 March 2014), examines the events that lead to sepsis by *Streptococcus pneumoniae* (pneumococcus), a major human pathogen, in mice. They found that in most cases the bacteria causing sepsis was started by a single pneumococcal cell.

The study was an interdisciplinary collaboration between the Departments of Genetics, Infection Immunity and Inflammation and Mathematics at the University of Leicester, Professor Richard Moxon at the University of Oxford and scientists from overseas including the University of Siena.

Professor Oggioni said: "Our data in experimental infection models indicate that we do not need only strategies which target many bacteria when it is too late, but that early intervention schemes which prevent the one-single cell that starts the disease process might provide substantial benefit to the patient.

"In this work we have for the first time pro-

vided genetic evidence for a single cell origin of bacterial invasive infection. The scenario was hypothesised over 50 years ago, but so far only phenotypic and statistical evidence could be obtained for this event."

Under normal circumstances, when different bacteria are used in models of experimental infection of hosts who have not previously encountered the same pathogen, the vast majority is destroyed rapidly by the host's innate immune system.

In the researcher's model, a dose of one million bacteria is needed to induce systemic disease in about half of the hosts in the study.

This is in stark contrast to a much lower number of bacteria thought to make up the starting "seed" that leads to the development of systemic infection – and the assumption is that there must be one or more "bottlenecks" in the development of the disease.

To investigate these bottlenecks, the researchers injected mice with a mix of three different variants of *S. pneumoniae*. About half of the mice developed sepsis and in almost all cases the bacteria causing sepsis were derived from only one of the three variants used in the initial challenge.

Using statistical analysis as well as direct DNA sequencing, the researchers could show that in most cases the bacterial population causing sepsis was started by a single pneumococcal cell.

When the researchers looked closer

at how the immune system resists most injected bacteria, they found that macrophages, a type of immune cell that can gobble up bacteria, and specifically macrophages in the spleen, are the main contributors to an efficient immune response to this pathogen.

Their findings suggest that if bacteria survive this initial counter-attack, a single 'founder' bacterium multiplies and re-enters the bloodstream, where its descendants come under strong selective pressure that dynamically shapes the subsequent bacterial population – resulting in the sepsis.

The data also suggests that the single bacterium leading to sepsis has no obvious characteristics that give it an advantage over the 999,999 others, but that random events determine which of the injected bacteria survives and multiplies to cause disease.

It is believed that the findings, suggesting that the development of sepsis starting from a single founding cell which survives the immune system's initial counter-attack in mice, could also potentially apply to human systemic infections.

This information could prove vital to understanding sepsis, as the causes of the disease are still largely unknown to the scientific community.

Stem cells created from a drop of blood

Scientists at A*STAR's Institute of Molecular and Cell Biology (IMCB) have developed a method to generate human induced pluripotent stem cells (hiPSCs) from a single drop of finger-pricked blood. The method also enables donors to collect their own blood samples, which they can then send to a laboratory for further processing. The easy access to blood samples using the new technique could potentially boost the recruitment of greater numbers and diversities of donors, and could lead to the establishment of large-scale hiPSC banks.

By genetic reprogramming, matured human cells, usually blood cells, can be transformed into hiPSCs. As hiPSCs exhibit properties remarkably similar to human embryonic stem cells, they are invaluable resources for basic research, drug discovery and cell therapy. In countries like Japan, USA



and UK, a number of hiPSC bank initiatives have sprung up to make hiPSCs available for stem cell research and medical studies.

Current sample collection for reprogramming into hiPSCs include invasive measures such as collecting cells from the bone marrow or skin, which may put off many potential donors. Although hiPSCs may also be generated from blood cells, large quantities of blood are usually required. In the paper published online on the *Stem Cell Translational Medicine* journal, scientists at IMCB showed for the first time that single-drop volumes of blood are sufficient for reprogramming into hiPSCs. The finger-prick technique is the world's first to use only a drop of finger-pricked blood to yield hiPSCs with high efficiency. A patent has been filed for the innovation.

The accessibility of the new technique is further enhanced with a DIY sample collection approach. Donors may collect their own finger-pricked blood, which they can then store and send it to a laboratory for reprogramming. The blood sample remains stable for 48 hours and can be expanded for 12 days in culture, which therefore extends the finger-prick technique to a wide range of geographical regions for recruitment of donors with varied ethnicities, genotypes and diseases.

By integrating it with the hiPSC bank initiatives, the finger-prick technique paves the way for establishing diverse and fully characterised hiPSC banking for stem cell research. The potential access to a wide range of hiPSCs could also replace the use of embryonic stem cells, which are less accessible. It could also facilitate the set-up of a small hiPSC bank in Singapore to study targeted local diseases.

Dr Loh Yui Han Jonathan, Principal Investigator at IMCB and lead scientist for the finger-prick hiPSC technique, said: "It all began when we wondered if we could reduce the volume of blood used for reprogramming. We then tested if donors could collect their own blood sample in a normal room environment and store it. Our finger-prick technique, in fact, utilised less than a drop of finger-pricked blood. The remaining blood could even be used for DNA sequencing and other blood tests."

Dr Stuart Alexander Cook, Senior Consultant at the National Heart Centre Singapore and co-author of the paper, said: "We were able to differentiate the hiPSCs reprogrammed from Jonathan's finger-prick technique, into functional heart cells. This is a well-designed, applicable technique that can unlock unrealized potential of biobanks around the world for hiPSC studies at a scale that was previously not possible."

Prof Hong Wanjin, Executive Director at IMCB, said: "Research on hiPSCs is now highly sought-after, given its potential to be used as a model for studying human diseases and for regenerative medicine. Translational research and technology innovations are constantly encouraged at IMCB and this new technique is very timely. We hope to eventually help the scientific community gain greater accessibility to hiPSCs for stem cell research through this innovation."

Researchers generate new neurons in brains, spinal cords of mammals

University of Texas Southwestern Medical Center researchers have created new nerve cells in the brains and spinal cords of living mammals without the need for stem cell transplants to replenish lost cells.

Although the research indicates it may someday be possible to regenerate neurons from the body's own cells to repair traumatic brain injury or spinal cord damage or to treat conditions such as Alzheimer's disease, the researchers stressed that it is too soon to know whether the neurons created in these initial studies resulted in any functional improvements, a goal for future research.

Spinal cord injuries can lead to an irreversible loss of neurons, and along with scarring, can ultimately lead to impaired motor and sensory functions. Scientists are hopeful that regenerating cells can be an avenue to repair damage, but adult spinal cords have limited ability to produce new neurons. Biomedical scientists have transplanted stem cells to replace neurons, but have faced other hurdles, underscoring the need for new methods of replenishing lost cells.

Scientists in UT Southwestern's Department of Molecular Biology first successfully turned astrocytes – the most common non-neuronal brain cells – into neurons that formed networks in mice. They now successfully turned scar-forming astrocytes in the spinal cords of adult mice into neurons. The latest find-

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ings are published in *Nature Communications* and follow previous findings published in *Nature Cell Biology*.

“Our earlier work was the first to clearly show in vivo (in a living animal) that mature astrocytes can be reprogrammed to become functional neurons without the need of cell transplantation. The current study did something similar in the spine, turning scar-forming astrocytes into progenitor cells called neuroblasts that regenerated into neurons,” said Dr Chun-Li Zhang, assistant professor of molecular biology at UT Southwestern and senior author of both studies.

“Astrocytes are abundant and widely distributed both in the brain and in the spinal cord. In response to injury, these cells proliferate and contribute to scar formation. Once a scar has formed, it seals the injured area and creates a mechanical and biochemical barrier to neural regeneration,” Dr Zhang explained. “Our results indicate that the astrocytes may be ideal targets for in vivo reprogramming.”

The scientists’ two-step approach first introduces a biological substance that regulates the expression of genes, called a transcription factor, into areas of the brain or spinal cord where that factor is not highly expressed in adult mice. Of 12 transcription factors tested, only SOX2 switched fully differentiated, adult astrocytes to an earlier neuronal precursor, or neuroblast, stage of development, Dr Zhang said.

In the second step, the researchers gave the mice a drug called valproic acid (VPA) that encouraged the survival of the neuroblasts and their maturation (differentiation) into neurons. VPA has been used to treat epilepsy for more than half a century and also is prescribed to treat bipolar disorder and to prevent migraine headaches, he said.

The current study reports neurogenesis (neuron creation) occurred in the spinal cords of both adult and aged (over one-year old) mice of both sexes, although the response was much weaker in the aged mice, Dr Zhang said. Researchers now are searching for ways to boost the number and speed of neuron creation. Neuroblasts took four weeks to form and eight weeks to mature into neurons, slower than neurogenesis reported in lab dish experiments,

so researchers plan to conduct experiments to determine if the slower pace helps the newly generated neurons properly integrate into their environment.

In the spinal cord study, SOX2-induced mature neurons created from reprogramming of astrocytes persisted for 210 days after the start of the experiment, the longest time the researchers examined, he added.

Obesity and diabetes have adverse effects on outcomes across different tumour types

Both obesity and diabetes have adverse effects on outcomes in breast cancer patients who receive chemotherapy as primary treatment before surgery (neoadjuvant chemotherapy), according to research presented at the 9th European Breast Cancer Conference (EBCC-9) 21 March 2014. Although a high body mass index (BMI) is known to have a negative impact on cancer development and prognosis, until now there has been uncertainty as to whether having a high BMI had an equal effect on patients with different types of breast tumours.

Dr Caterina Fontanella, MD, a trainee in medical oncology from the University of Udine (Italy) and a research fellow with the German Breast Group, based in Neulsenburg, Germany, presented an analysis based on nearly 11,000 patients with early breast cancer treated with neoadjuvant chemotherapy. She showed that a high BMI adversely affects the chances of surviving without the breast cancer recurring or spreading to other parts of the body, although this detriment was not seen in those women had been diagnosed with HER2-positive disease.

“Although the overall survival of patients with metastatic breast cancer has increased over the past few decades, it remains an incurable disease,” Dr Fontanella said. “So preventing disease relapse after primary treatment of early breast cancer is fundamentally important in oncology daily practice. Considering that about one-third of the worldwide population has a body mass index higher than 25 kg/m², investigating the possible higher risk of relapse that affects overweight and obese patients compared with normal weight patients should be a priority.”

The researchers studied data from 8,872

early breast cancer patients from the German Breast Group, and 1,855 from a joint EORTC/BIG^[1] trial. All had received a modern treatment consisting of an anthracycline/taxane-based neoadjuvant chemotherapy, anti-HER-2 drugs, or hormone therapy according to tumour type and national guidelines.


The vast majority of the patients in this study received chemotherapy doses capped at a body surface area (BSA) of 2.0m², which is often the limit when calculating doses. “Obese patients may have a BSA of more 2.0m², but the chemotherapy dose they receive will not reflect this. It is a very common practice in these patients for fear of overdosing, but of course it means that they will often receive a relatively lower quantity of chemotherapy,” Dr Fontanella said. “In my opinion, a deeper understanding of chemotherapy metabolism and distribution in patients with high BMI and with increased adipose tissue is needed.”

“We already know that obese hormone receptor-positive tumour patients respond less well to aromatase inhibitors as adjuvant treatment, and this underlines a key role of higher aromatase activity in patients with increased adipose tissue.” Aromatase is an enzyme that synthesises oestrogen, and blocking it is important in cancers where oestrogen encourages tumours to grow.

Final analysis of outcomes from the two groups in the joint study showed a significant decrease in survival without the cancer spreading (metastasising) – distant disease-free survival (DDFS) – or the cancer recurring – distant relapse-free survival (DRFS) – in patients with increased BMI in all tumour types, apart from those with HER2-positive tumours.

“The exception in this group can probably be explained by the impressive impact of anti-HER2 treatment,” Dr Fontanella said. “Given the significant proportion of the world’s population with a BMI higher than recommended for good health, it is vitally important that we find a way to treat overweight and obese cancer patients that combines maximum efficacy with the avoidance of unnecessary side-effects.”

^[1] European Organisation for the Research and Treatment of Cancer 10994/Breast International Group 1-00 trial.



London Bridge Hospital
One-Stop Diabetic Foot Clinic

WORLD-LEADING EXPERTS IN THE TREATMENT OF DIABETES

Rising rates of diabetes are a cause for concern in the Middle East, with 25% of the population already suffering with the condition – a figure which is set to rise by 2015.

Foot-related disorders are one of the most serious complications of diabetes. In the UK alone, more than 125 amputations are carried out each week as a result of diabetes – however, up to 80% of these could have been prevented with the right treatment.

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More deaths from virus reported in UAE and KSA, first case in Yemen

At the time of going to press WHO reported (26 April 2014) that the ministries of health of Saudi Arabia and the United Arab Emirates (UAE) recently announced additional laboratory-confirmed cases of infection with Middle East respiratory syndrome coronavirus (MERS-CoV).

Globally, from September 2012 to date, WHO has been informed of a total of 261 laboratory-confirmed cases of infection with MERS-CoV, including 93 deaths.

CIDRAP – www.cidrap.umn.edu – notes that among the 27 cases listed by Flu-Trackers for the outbreak in Jeddah, KSA, at least 13 work in the health sector.

Meanwhile, a Yemeni man who works as an aeronautics engineer has contracted MERS-CoV according to a Reuters report from Sanaa (April 13). This is the country's first recorded case of MERS-CoV.

The National reports April 14 that one Filipino paramedic has died (April 10) and 5 other Filipino health workers were quarantined with MERS-CoV in the UAE. The four paramedics, two men and two women, were in Al Ain Hospital and the nurse, a man from Abu Dhabi, was being treated at Mafraq Hospital.

MERS-CoV Research Update


CIDRAP reports on recent research by US and Saudi scientists published online 29 April in *mBio* - doi: 10.1128/*mBio*.01146-14. The report notes that MERS-CoV isolates from camels in Saudi Arabia match MERS-CoV samples from humans and can be grown in nonhuman primate cells in a lab, further augmenting the evidence that camels are a source of human infections.

The team generated complete genetic sequences for MERS-CoV isolates from

five camels and determined that they were identical to published sequences of human isolates, according to their report in *mBio*. In addition, they succeeded in culturing viruses from two of the camels in Vero (African green monkey) cells in their lab.

They also found that viral particles from individual camels contained more

genetic variation than is true of MERS-CoV isolates from humans, which suggests that, if camels are passing the virus to humans, only certain genotypes can infect humans. That may partially explain why human MERS cases are uncommon, they say.

CIDRAP's full report can be read here: <http://tinyurl.com/no98msg> 

The UAE provided the following details to WHO on 24 April 2014:

- A 45 year-old woman from Abu Dhabi who is a daughter of a previously laboratory-confirmed case reported on 22 April. She became ill on 15 April. She is reported to have an underlying medical condition, and has no history of recent travel or contact with animals.

- A 4 year-old boy from Abu Dhabi. He developed mild illness on 19 April. He is reported to have no underlying medical condition, and does not have a history of recent travel or contact with animals. His mother returned from a visit to Saudi Arabia 10 days prior to his illness.

- A 37 year-old man from Abu Dhabi who was screened following exposure to a previously laboratory-confirmed case reported on 10 April. He is reported to have underlying medical conditions. He has no history of recent travel, but frequently visits the two farms he owns.

- A 32 year-old man from Abu Dhabi who was screened, following exposure to a previously laboratory-confirmed case reported on 10 April. He did not become ill and does not have any underlying medical condition. He has no history of recent travel and did

not have contact with animals.

- A 33 year-old man from Abu Dhabi who was screened following exposure to a previously laboratory-confirmed case reported on 10 April. He did not become ill and is reported to have no underlying medical condition. He has no history of recent travel. He owns two farms and is reported to have contact with camels.

- A 30 year-old man from Abu Dhabi. He was screened following exposure with a previously laboratory-confirmed case reported on 10 April. He does not have any underlying medical condition. He has no history of recent travel and did not have contact with animals.

- A 42 year-old man from Abu Dhabi. He was screened following exposure to a previously laboratory-confirmed case reported on 10 April. He had mild illness. He is reported to have no underlying medical condition. He has no history of recent travel and had no contact with animals.

At the time of going to press all the above mentioned cases were reported to be in isolation in a hospital and were well. Screening of other contacts within the health care setting and families were ongoing.

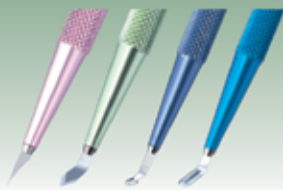


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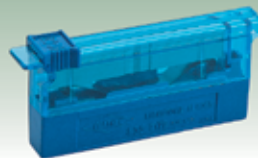
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Vaccines alone cannot beat polio in Iraq

A countrywide vaccination campaign got under way in April in Iraq following the country's first confirmed case of polio in 14 years, but public health experts warn it will take more than immunization to beat the virus, according to IRIN News.

Inadequate sanitation, contaminated water sources and poor public health systems are also major factors in the spread of polio, which – although easily preventable – is highly contagious and incurable.

“Putting all your faith in vaccination alone is putting all your eggs in one basket,” said paediatrician Annie Sparrow, assistant professor of global health and deputy director of the Human Rights Program at Icahn School of Medicine at Mount Sinai in New York City.

“When people are still living in abysmal conditions that are unsanitary, unhygienic and with contaminated water, there will still be exposure,” she told IRIN.

For Adam Coutts, an honorary research fellow at the London School of Hygiene and Tropical Medicine, the Iraq case says a lot “about the severity of poverty and state neglect of large numbers of the population as well as the decrepit condition of public health and healthcare services over the last 10 years in Iraq”.

As IRIN documented in an in-depth series last year, the US-led invasion of Iraq in 2003 had a lasting impact on Iraq's healthcare system.

“The humanitarian response sectors

Six-month-old Moussa Hezam became paralysed in 2014 after contracting polio on the outskirts of Baghdad, the Iraqi capital. His is the first case of polio in the country in 14 years, likely a result of violence and displacement, which have interrupted immunization campaigns.



Zaid Fahmi/UNICEF

need to look at how they explicitly interlink and affect each other rather than continuing to use the ‘silo mentality,’” Coutts said. “Without tackling sanitation and nutrition, any health interventions and vaccine programmes are likely to fail or have reduced efficacy.”

The UN Children's Fund (UNICEF) said that in areas where poor sanitation, lack of hygiene and malnutrition were prevalent, additional awareness activities and sanitation drives would be carried out alongside the distribution of vaccines.

This is the second country-wide immunization drive to take place in Iraq this year, following an earlier campaign in March in response to cases discovered across the border in Syria in 2013. More rounds are planned for May and June.

“If we do the right job now, we can put anything difficult aside,” Marzio Babille, UNICEF's representative in Iraq, said,

stressing the need to reach every child. “If we don't, then we are going to have 20 more or 200 more cases, and then things will become very difficult indeed.”

For every case of polio that results in paralysis, doctors estimate there could be as many as 250 other live cases of the virus. That means there could be many more polio cases in Iraq that remain undiagnosed.

Due to the social stigma attached to polio, parents may not want to put their children forward for testing, Sparrow said. Doctors who have not seen polio for a while may not even understand or recognize the symptoms, she added.

Baby Moossa

The parents of six-month-old Moossa Hezam, the baby boy at the heart of Iraq's outbreak, did take their son to the doctor when he became ill, but his father told

staff from UNICEF that neither Moossa nor his four siblings had been immunized.

“I am working so hard to support my family and had no time to think about taking my children to the hospital for vaccinations,” Abood Hezam, a driver who lives in Baghdad’s impoverished northern suburbs, told health and nutrition officer Ali Abdul.

“I truly regret this now. If only Moossa was vaccinated, he would have been polio-free now.” He added that he wanted to make sure all other parents knew the risk, so that their children would not be infected.

Moossa’s polio matches the wild polio virus type 1 (WPV1) strain found in Syria, where to date 27 children have been paralysed. The virus reappeared in Syria in September after a decade without any cases.

Health workers blame the resurgence on the civil war and the disruption it has caused to immunization activity and supply chains.

Lack of access

Iraq faces similar challenges. With parliamentary elections due to take place on 30 April, political and sectarian tensions are rising. According to the UN Assistance Mission for Iraq (UNAMI), more than 2,000 people have been killed by acts of terrorism and violence since the start of the year.

Separately, the western province of Anbar, which shares a border with Deir-ez-Zor, where Syria’s polio outbreak first occurred, has since January been caught up in fierce fighting between government forces, Islamist factions and other tribal militants.

More than 400,000 people have fled their homes and the insecurity has severely restricted humanitarian access. As a result, the last polio vaccination drive held in the province in March reached less than half of its target.

Ziad Tariq, a spokesperson at the Ministry of Health, played down the issue of poor sanitation and weak health systems, blaming the outbreak on the fact that insecurity within Iraq prevented all children from being reached in previous vaccination rounds. Some parents, he added,

did not put their children forward to be immunized.

“This case was imported from Syria,” he said. “We detected it because we have good surveillance systems in place. Now we are working hard to reach all five and half million children under the age of five to make sure they are vaccinated.”

But even before the most recent escalation in fighting, health workers struggled to ensure all Iraqi children received the three recommended doses of the vaccine. According to data from the World Health Organization (WHO), immunization coverage from 2009 to 2014 ranged from 70% to 87% of targeted children, and at times dropped to less than one-fifth of children in Diyala and Dahuk provinces.

Syed Jaffar Hussain, head of the Iraq mission for WHO, which is leading the response in conjunction with the Ministry of Health and UNICEF, told IRIN that despite the “challenging security situation”, health workers planned to achieve “coverage of 100%” in this new round.

He said the immunization campaign, which in the rest of the country ran for five days (from 6-10 April), would continue longer in Anbar to ensure full reach. The “catch up” campaign will ensure no-one was missed, he added.

Public health a key priority

But accessing funding remains a major hurdle, according to UNICEF’s Babille. With money only guaranteed for the next few months, agencies are putting steps in place for a potential emergency appeal to respond to the polio outbreak.

Babille, a medical doctor, said he hoped the government would follow up on its pledges to provide financial support to the polio response, especially given the existing strains on UN budgets.

Critics have accused the government of being slow to put money towards the polio response.

“The Ministry of Health has more than enough money to fund vaccination coverage and basic sanitation and hygiene infrastructure and they should see it as a cost-saving measure,” Coutts told IRIN.

“The problem is... many countries in the region – not just Iraq – do not see

The problem is... many countries in the region – not just Iraq – do not see public health as a key concern of human security or a driver of economic growth. Public health in [the Middle East and North Africa] is seen as high-tech curative interventions performed in hospitals rather than low cost primary health care settings in poor neighbourhoods.

public health as a key concern of human security or a driver of economic growth. Public health in [the Middle East and North Africa] is seen as high-tech curative interventions performed in hospitals rather than low cost primary health care settings in poor neighbourhoods.”

But Tariq, of the Ministry of Health, insisted the government is funding the immunization campaign, with technical support from UNICEF and the WHO.

He added: “We have started a media campaign to reach all of Iraq to make sure parents get their children vaccinated and this will continue through the year. We want to make sure we reach every child.”

Following Moossa’s diagnosis in March, there has so far only been one other suspected case in Iraq: a young refugee girl who crossed the border from Syria into the semi-autonomous Kurdistan region. She was later found to have temporary vaccine-induced paralysis and has since made a full recovery. MEH

WHO's first global report on antibiotic resistance reveals serious, worldwide threat to public health

Antibiotic resistance is now a major threat to public health – this is the essence of a new, hard-hitting, report by the World Health Organization (WHO) released on April 30. It is the global organisation's first to look at antimicrobial resistance, including antibiotic resistance, globally and reveals that this serious threat is no longer a prediction for the future, it is happening right now in every region of the world and has the potential to affect anyone, of any age, in any country.

“Without urgent, coordinated action by many stakeholders, the world is headed for a post-antibiotic era, in which common infections and minor injuries which have been treatable for decades can once again kill,” says Dr Keiji Fukuda, WHO's Assistant Director-General for Health Security. “Effective antibiotics have been one of the pillars allowing us to live longer, live healthier, and benefit from modern medicine. Unless we take significant actions to improve efforts to prevent infections and also change how we produce, prescribe and use antibiotics, the world will lose more and more of these global public health goods and the implications will be devastating.”

The report, *Antimicrobial resistance: global report on surveillance*, notes that resistance is occurring across many different infectious agents but the report focuses on antibiotic resistance in seven different bacteria responsible for common, serious diseases such as bloodstream infections (sepsis), diarrhoea, pneumonia, urinary tract infections and gonorrhoea. The results are cause for high concern, documenting resistance to antibiotics, especially “last resort” antibiotics, in all regions of the world.

Key findings from the report include:

- Resistance to the treatment of last resort for life-threatening infections caused by a common intestinal bacteria, *Klebsiella pneumoniae* – carbapenem antibiotics – has spread to all regions of the world. *K. pneumoniae* is a major cause of hospital-acquired infections such as pneumonia, bloodstream infections, infections in newborns and intensive-care unit patients. In some countries, because of resistance, carbapenem antibiotics would not work in more than half of people treated for *K. pneumoniae* infections.

- Resistance to one of the most widely used antibacterial medicines for the treatment of urinary tract infections caused by *E. coli* – fluoroquinolones – is very widespread. In the 1980s, when these drugs were first introduced, resistance was virtually zero. Today, there are countries in many parts of the world where this treatment is now ineffective in more than half of patients.

- Treatment failure to the last resort of treatment for gonorrhoea – third generation cephalosporins – has been confirmed in Austria, Australia, Canada, France, Japan, Norway, South Africa, Slovenia, Sweden and the United Kingdom. More than 1 million people are infected with gonorrhoea around the world every day.

- Antibiotic resistance causes people to be sick for longer and increases the risk of death. For example, people with MRSA (methicillin-resistant *Staphylococcus aureus*) are estimated to be 64% more likely to die than people with a non-resistant form of the infection. Resistance also increases the cost of health care with lengthier stays in hospital and more intensive care required.

Addressing the problem

The report reveals that key tools to tackle antibiotic resistance – such as basic systems to track and monitor the problem – show gaps or do not exist in many countries. While some countries have taken important steps in addressing the problem, every country and individual needs to do more. Other important actions include preventing infections from happening in the first place – through better hygiene, access to clean water, infection control in health-care facilities, and vaccination – to reduce the need for antibiotics. WHO is also calling attention to the need to develop new diagnostics, antibiotics and other tools to allow healthcare professionals to stay ahead of emerging resistance.

This report is kick-starting a global effort led by WHO to address drug resistance. This will involve the development of tools and standards and improved collaboration around the world to track drug resistance, measure its health and economic impacts, and design targeted solutions.

People can help tackle resistance by:

Report highlights for WHO Eastern Mediterranean Region

Data in the report show extensive antibiotic resistance across the WHO Eastern Mediterranean Region. In particular, there are high levels of *E. coli* resistance to third generation cephalosporins and fluoroquinolones – two important and commonly used types of antibacterial medicine. Resistance to third generation cephalosporins in *K. pneumoniae* is also high and widespread. In some parts of the Region, more than half of *Staphylococcus aureus* infections are reported to be methicillin-resistant (MRSA), meaning that treatment with standard antibiotics does not work. The report reveals major gaps in tracking of antibiotic resistance in the Region. WHO's Regional Office for the Eastern Mediterranean has identified strategic actions to contain drug resistance and is supporting countries to develop comprehensive national policies, strategies and plans.

- using antibiotics only when prescribed by a doctor
- completing the full prescription, even if they feel better
- never sharing antibiotics with others or using leftover prescriptions.

Health workers and pharmacists can help tackle resistance by:

- enhancing infection prevention and control
- only prescribing and dispensing antibiotics when they are truly needed
- prescribing and dispensing the right antibiotic(s) to treat the illness.

The report – which also includes information on resistance to medicines for treating other infections such as HIV, malaria, tuberculosis and influenza – provides the most comprehensive picture of drug resistance to date, incorporating data from 114 countries.



WHO's Global Report on Surveillance of Antimicrobial Resistance
www.who.int/drugresistance/documents/surveillancereport



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7 million deaths each year linked to air pollution

In new estimates released 25 March, the World Health Organization (WHO) reports that in 2012 around 7 million people died – one in eight of total global deaths – as a result of air pollution exposure. This finding more than doubles previous estimates and confirms that air pollution is now the world’s largest single environmental health risk.

In particular, the new data reveal a stronger link between both indoor and outdoor air pollution exposure and cardiovascular diseases, such as strokes and ischaemic heart disease, as well as between air pollution and cancer. This is in addition to air pollution’s role in the development of respiratory diseases, including acute respiratory infections and chronic obstructive pulmonary diseases.

The new estimates are not only based on more knowledge about the diseases caused by air pollution, but also upon better assessment of human exposure to air pollutants through the use of improved measurements and technology. This has enabled scientists to make a more detailed analysis of health risks from a wider demographic spread that now includes rural as well as urban areas.

Regionally, low- and middle-income countries in the WHO Southeast Asia and Western Pacific Regions had the largest air pollution-related burden in 2012, with a total of 3.3 million deaths linked to indoor air pollution and 2.6 million deaths related to outdoor air pollution.

“Cleaning up the air we breathe prevents noncommunicable diseases as well as reduces disease risks among women and vulnerable groups, including children and the elderly,” says Dr Flavia Bustreo, WHO Assistant Director-General Family, Women and Children’s Health. “Poor women and children pay a heavy price from indoor air pollution since they spend more time at home breathing in smoke and soot from leaky coal and wood cook stoves.”

Included in the assessment is a break-

down of deaths attributed to specific diseases, underlining that the vast majority of air pollution deaths are due to cardiovascular diseases as follows:

Outdoor air pollution-caused deaths – breakdown by disease:

- 40% - ischaemic heart disease;
- 40% - stroke;
- 11% - chronic obstructive pulmonary disease (COPD)
- 6% - lung cancer;
- 3% - acute lower respiratory infections in children.

Indoor air pollution-caused deaths – breakdown by disease:

- 34% - stroke;
- 26% - ischaemic heart disease;
- 22% - COPD;
- 12% - acute lower respiratory infections in children;
- 6% - lung cancer.

The new estimates are based on the latest WHO mortality data from 2012 as well as evidence of health risks from air pollution exposures. Estimates of people’s exposure to outdoor air pollution in different parts of the world were formulated through a new global data mapping. This incorporated satellite data, ground-level monitoring measurements and data on pollution emissions from key sources, as well as modelling of how pollution drifts in the air.

“The risks from air pollution are now far greater than previously thought or understood, particularly for heart disease and strokes,” says Dr Maria Neira, Director of WHO’s Department for Public Health, Environmental and Social Determinants of Health. “Few risks have a greater impact on global health today than air pollution; the evidence signals the need for concerted action to clean up the air we all breathe.”

After analysing the risk factors and taking into account revisions in methodol-



ogy, WHO estimates indoor air pollution was linked to 4.3 million deaths in 2012 in households cooking over coal, wood and biomass stoves. The new estimate is explained by better information about pollution exposures among the estimated 2.9 billion people living in homes using wood, coal or dung as their primary cooking fuel, as well as evidence about air pollution’s role in the development of cardiovascular and respiratory diseases, and cancers.

In the case of outdoor air pollution, WHO estimates there were 3.7 million deaths in 2012 from urban and rural sources worldwide.

Many people are exposed to both indoor and outdoor air pollution. Due to this overlap, mortality attributed to the two sources cannot simply be added together, hence the total estimate of around 7 million deaths in 2012.

Later this year, WHO will release indoor air quality guidelines on household fuel combustion, as well as country data on outdoor and indoor air pollution exposures and related mortality, plus an update of air quality measurements in 1600 cities from all regions of the world. MEH



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Clinical improvement solutions set to enhance service provision

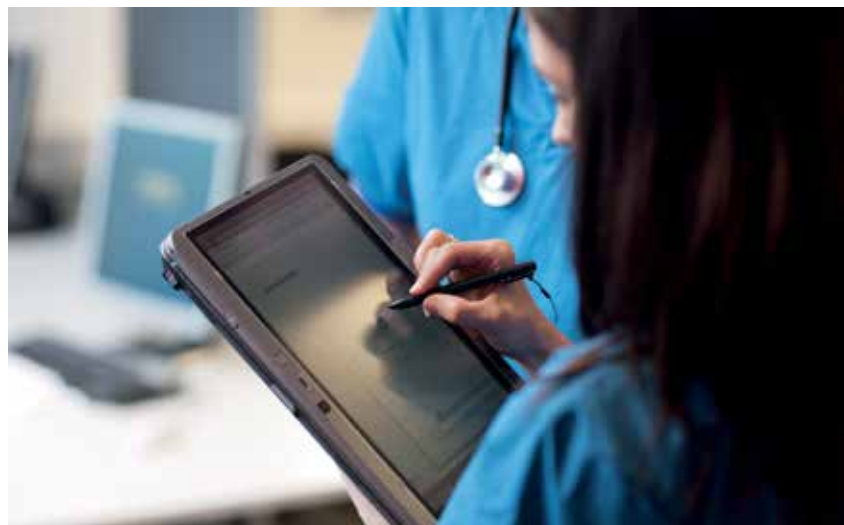


By Dr Mehmoos Syed
Clinical Programmes Director
for Zynx Health Middle East

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 Mehmoos Syed**, Clinical Programmes Director for Zynx Health Middle East, provides more detail on the project.

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 evi-



dence 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 – Zynx-

Order, 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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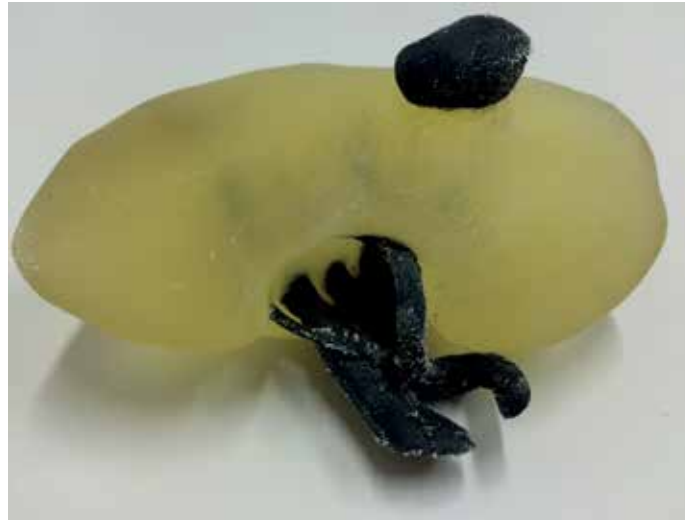


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Printed kidney with tumour 1



Printed kidney with tumour 2

Surgeons use 3D printed kidney to simulate surgery before operation

For the first time, surgeons have used 3D printing to produce exact models of tumour-containing kidneys, allowing them to simulate surgery prior to the real operation. These models can be personalised to each patient, giving doctors a 3D model of each individual's tumour.

Kidney cancers are the 8th most common cancer affecting adults, accounting for around 3% of all cancers in Europe. In 2012 it was estimated that there would be approximately 84,400 new cases of kidney cancer with 34,700 deaths. It is usually treated surgically, but the operations can be stressful, and speed and accuracy are essential.

The ability to produce exact 3-dimensional models of objects means that 3D printing is set to revolutionise many fields. A group of surgeons from Kobe University in Japan has combined the 3D imaging capabilities of Computer Tomography, with 3D printing, to produce exact scale model of kidneys prior to surgery. This allows surgeons to practice surgery in difficult kidney cancer cases. So far they have produced ten 3D kidney models to assist in kidney cancer operations.

The group used computer tomography

to produce a 3D scan of a diseased kidney. They then fed this information into a commercially-available 3D printer to produce a 3D model of the diseased kidney. As the scan is personalised for each patient, this meant that the surgeons were able to construct a 3D scale model of each individual's kidney cancer.

The model – which was printed using two different materials – allowed the surgeons to accurately determine the margins of the kidney tumours. The 3D-printed organ model was made of transparent material so that the blood vessels could be seen from the outside, meaning that surgeons could see the exact position of the blood vessels prior to surgery. This allowed the surgeons to simulate surgery on the kidney tumour prior to real surgery. The surgery itself was then performed robotically.

Presenting the work at the European Association of Urology (EAU) Congress in Stockholm (11-15 April, 2014), lead researcher Dr Yoshiyuki Shiga said: “The use of this ‘hands-on’ model system gave us a 3D anatomical understanding of the kidney and the tumour. This enabled the surgeon to work on a smaller area. This is important, as it means that the area where

the blood supply is interrupted during surgery can be reduced, in fact we found that the shortest interruption time [ischaemic time] was only 8 minutes, compared to a normal average of 22 minutes. We also found that where we had to remove part of the kidney, the fact that we knew the exact location of the blood vessels helped us greatly.

“At the moment this is still an expensive technique, adding between \$500 and \$1500 to the cost of surgery, but we hope that if it is more widely used then costs will fall.”

Commenting for the EAU, Professor Joan Palou (Barcelona, Director of the European School of Urology), said: “It looks interesting as a new methodology to improve and facilitate to learn robotic surgery. It shows great potential, especially in the most difficult cases. Any surgery benefits from the surgeon being experienced and knowing what to expect, and at this point this seems to be the best simulation we have.

“The learning process has been a matter of debate, and with the introduction of new technologies during the last few years, training has become an important issue.

This is why the EAU has created the European School of Urology training group, to order to promote, stimulate and standardize the learning process. If it is developed appropriately, this new 3D process may feed into our training programme”.

The researchers write of the results in their paper – “Benefit of three-dimensional printing in robotic laparoscopic renal surgery: Tangible surgical navigation using a patient-based three-dimensional printed kidney” – In our experience with ten consecutive cases of navigation surgery, the surgical margin and renal function were successfully secured. The median operative time was 145 min, and the shortest ischemic time was 8 min. This system enables simulation of the preoperative and intraoperative situations. Initial practice on a tangible surgical navigation using a patient-based 3D printed kidney is an advantage that can be shared with the operating room staff as well as the surgeons, as it enables them to obtain an in-depth understanding of the range of resection, angle, depth, and suturing type that will be needed in the surgery.

The use of our navigation system was helpful for gaining a 3D anatomical understanding of the surgical target, since it enabled the surgeon to reduce the ischemic area by performing segmental artery clamping. In a partial nephrectomy, in particular, the use of this tangible model increases the surgeons’ understanding of the vascular structure. The ischemic time was shortened compared to that of conventional surgery. We could perform preoperative planned procedures in all cases and prevented needless renal hilar clamping or radical nephrectomy. However, creating these organ models can cost ¥50,000 (\$500) to ¥150,000 (\$1500). As the need and use of this technology increases, the cost of the organ model will decrease.

They conclude: This patient-based 3D-printed organ model provides tangible surgical navigation. Replicas of patients’ organs provide important orientation for robotic assisted partial nephrectomy and enable precise clamping of the segmented arteries. The combined use of our interactive navigation system and these replicated organs leads to satisfactory surgical outcomes. MEH

Tissue testing during breast cancer lumpectomies prevents need for reoperation

Unique laboratory testing during breast cancer lumpectomies to make sure surgeons remove all cancerous tissue spares patients the need for a repeat lumpectomy in roughly 96% of cases at Mayo Clinic in Rochester, a success rate much higher than the rate than national rates in the United States, a Mayo study shows. During the years reviewed, 13.2% of breast cancer lumpectomy patients nationally had to return to the operating room within a month of their initial surgery, compared to 3.6% at Mayo in Rochester, which uses a technique called frozen section analysis to test excised tissue for cancer while patient are still on the operating table.

The findings are published in the journal *Surgery*.

Frozen section analysis was pioneered at Mayo Clinic more than 100 years ago and is used in a variety of Mayo surgeries.

In breast cancer lumpectomies, surgeons remove tumours with a small amount of normal tissue around them to help ensure they excised all of the cancer. This is known as obtaining “clean” or “negative” margins. During surgery at Mayo in Rochester, that tissue is transferred from the operating room to a nearby pathology lab, where the edges around the lumpectomy are shaved and each sample is frozen and reviewed under a microscope by a pathologist, all within minutes, while the patient is still anesthetized. The pathologist immediately gives the surgeon the results, so the surgeon knows whether the lumpectomy is complete or there is still cancerous tissue to remove, and at which margin, before the operation concludes.

Mayo Clinic remains one of the only U.S. medical centres to perform frozen section analysis, and its process is unique, including use of a Mayo-mod-

ified microtome to freeze tissue so the pathologist can get a 360-degree view around the lumpectomy cavity.

“This intense pathological evaluation with the use of frozen section of the margins while the patient is asleep really drops down the re-excision rate,” says first author Judy Boughey, M.D., a breast surgeon in the Mayo Clinic Cancer Center. “Achieving negative margins in one operation has a huge impact on the patient’s satisfaction, decreases time away from work, time traveling back and forth to hospital appointments, and the financial cost to the patient, the insurance company and the hospital for a second operation.”

Mayo researchers compared 30-day reoperation rates for breast cancer lumpectomy patients at Mayo Clinic in Rochester with the reoperation rates for such patients at hospitals nationally as reported in American College of Surgeons National Surgical Quality Improvement Program data from 2006-10.

Patients in the national data were roughly four times likelier to undergo reoperation as those at Mayo in Rochester. Unlike mastectomy a breast cancer lumpectomy typically preserves enough breast tissue to achieve an acceptable cosmetic result. Most women diagnosed with breast cancer have a choice between a lumpectomy and a mastectomy. However, women who have a lumpectomy and later learn another operation is needed to obtain negative margins may decide to get a mastectomy at that point, Dr Boughey says.

The study’s senior author is Elizabeth Habermann, Ph.D., associate scientific director of the Surgical Outcomes Program in the Mayo Clinic Kern Center for the Science of Health Care Delivery. Mayo Clinic funded the research. MEH

Surgeons offer a scarless solution for thyroid tumour removal



By Dr R. Padmakumar, MBBS, DNB, MNAMS, DipALS, FAIS
Specialist Surgeon - International Modern Hospital, Dubai

Thyroid disorders are common in women and they would like to have treatment options with a definite cosmetic appeal. Generally when someone is diagnosed with a single nodule or multiple nodules they need to be evaluated by ultrasound scan of neck and if needed fine needle aspiration cytology. The USG features or FNAC is suspicious of a malignancy then surgery is the solution, even at any size of the swelling. Even if the USG and FNAC suggest benign swelling the option of thyroidectomy needs to be sought if the nodule is more than 4 cm. Depending on the physical examination, USG and FNAC findings surgeon decides to offer a hemithyroidectomy (removal of full lobe on the side of lesion and isthmus) or total thyroidectomy.

The surgical solution available in most of the places is open thyroidectomy which involves a large transverse cut across the lower part of the neck. This definitely leads to an unsightly scar which is not acceptable, especially for women.

The lateral thyroidectomy by cutting on

sides of neck for each side lobe removal – though better than full open surgery – is also not a desirable one. Robotic surgery does not give any advantage on the cosmetic aspect of the thyroid surgery.

The endoscopic thyroidectomy – the keyhole or minimally invasive technique is a very good alternative to other methods. It gives excellent cosmetic outcome especially when done by an axillary approach. It gives equal or even a better surgical outcome as far as the actual thyroid nodule management is considered. There are other less preferred endoscopic approaches like sternal and breast approach.

The procedure of endoscopic thyroidectomy by axillary approach involves the following steps: A 10mm trocar placement in the axilla towards neck for the telescope, which initially helps in creating the plane and visualization of structures with magnification, precision and clarity.

Then two 5 mm trocars are introduced in to the dissected space (sub platysmal), which are used as working ports. We generally use a less heat generating energy source the harmonic scalpel instead of cautery for tissue dissection.

Once space is created in the neck the sternomastoids and strap muscles gets exposed. We can open the investing layer in midline and reach the thyroid gland. The gland is mobilized by blunt dissection and vital structures identified. The recurrent laryngeal nerve, the superior laryngeal nerve and parathyroid with their blood supply will be preserved. The vessels are divided and gland detached from trachea. A specimen bag is used to place the thyroid and removed by dilating 10 mm trocar. For a total thyroidectomy one will have to put additional trocars on the opposite side and do the same steps on that side as well.

The investing layer is sutured back, drain is placed and the trocar sites closed. Patient is asked to be in the hospital for 24 hours only and can resume all kinds of activities in a few days.

These patients will have less wound related problem compared to open surgery group. The cosmetic outcome is such excellent that the small wounds in axilla heal with minimal scarring and get covered with small inner-wears.

The earlier belief was that the endoscopic no neck scar option for thyroid swellings are applicable to lesions of less than 4 cm size. But we have observed that swellings of size of even 12 – 15 cm can be tackled very successfully through this method. The only pre-requisite will be a surgeon with good experience, in both laparoscopic surgeries and thyroid surgeries.

The complications of this surgery are very similar to that of open surgery proving that it is a much desirable option. Any kind of pathologies like benign or cancerous nodules, thyroiditis can be safely tackled by endoscopic thyroidectomy. Completion thyroidectomy is much easier with this technique as one do not dissect the other side while performing the opposite side. Lymph node clearance when indicated can also be comfortably performed by this route

The Author:

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Before surgery



After surgery



Open surgery scars



Endoscopic Thyroidectomy



Post operative



Total Thyroidectomy specimen – each lobe is 6cm



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Tracheal bioengineering should be shown to be safe before further transplants, warn leading surgeons

Reports of the two earliest tissue-engineered whole organ transplants using a windpipe, or trachea, created using the patient's own stem cells, were hailed as a breakthrough for regenerative medicine and widely publicized in the press. However, two leading transplant surgeons in Belgium warn of the dangers of media attention, and urge that tracheal bioengineering be demonstrated as both effective and safe before further transplants take place. Their views are published in an April 2014 Editorial in *The Journal of Thoracic and Cardiovascular Surgery*, an official publication of the American Association for Thoracic Surgery.

In 2008, surgeons repopulated a donor trachea with cells from a 30-year-old woman, which they then transplanted into the patient. In 2011, a 36-year-old man who had been suffering from late-stage tracheal cancer was given a new trachea made from a synthetic scaffold

seeded with his own stem cells. Both procedures were carried out by Professor Paolo Macchiarini and colleagues (Barcelona, 2008, and Sweden, 2011).

In 2012, an article in *The New York Times*, "A First: Organs Tailor-Made With Body's Own Cells," recognized tracheal regeneration as the first regenerative medicine procedure designed to implant "bioartificial" organs. The achievement was touted as the beginning of complex organ engineering for the heart, liver, and kidneys, and it was suggested that allotransplantation along with immunosuppression might become problems of the past.

"Major medical breakthroughs deserve the necessary press attention to inform the medical community and public of the news," say Pierre R. Delaere, MD, PhD, and Dirk Van Raemdonck, MD, PhD, from the Department of Otolaryngology Head & Neck Surgery and the Depart-

ment of Thoracic Surgery, University Hospital Leuven, Belgium. "Unfortunately, misrepresentation of medical information can occur and is particularly problematic when members of the professional and public press are misled to believe unrealistic medical breakthroughs."

The authors raise doubts regarding whether a synthetic tube can transform into a viable airway tube, pointing out that the mechanism behind the transformation from nonviable construct to viable airway cannot be explained with our current knowledge of tissue healing, tissue transplantation, and tissue regeneration. "Cells have never been observed to adhere, grow, and regenerate into complex tissues when applied to an avascular or synthetic scaffold and, moreover, this advanced form of tissue regeneration has never been observed in laboratory-based research," say the authors.

Delaere and Van Raemdonck reviewed

New gel to promote bone growth on implants used in surgical procedures

A research group at Uppsala University, Sweden has developed a new responsive coating for implants used in surgery to improve their integration into bone and to prevent rejection. Neutron scattering experiments at the Institut Laue-Langevin (ILL) in Grenoble, France have shown how a protein that promotes bone growth binds to this surface and can be released in a controlled way.

Orthopaedic and dental implants must last for many years. Success for these surgical components depends on integration into adjacent bone tissue. Gels made by modifying hyaluronan, a large biological molecule, can be used to coat implants. A new paper in *Advanced Engineering Materials* (April 2014) shows that the coated titanium surfaces can bind protein molecules which promote bone formation. These can be released slowly once the surface comes in contact with a solution of calcium ions. This process would stimulate the growth of

bone on the implant.

The gel layers, a few millionths of a millimetre thick, were characterised using neutron reflection at the ILL, a technique that provides a detailed picture of what happens at a surface. In their new paper the research team showed that the protein, BMP-2, that encourages bone growth was bound to the gel. They also demonstrated that the layer of protein was stable in water but could be released slowly by adding solutions containing calcium, a process that was observed in real time using neutron reflection to track the amount of protein at the surface.

The research group has now launched trials of similar materials for metal implants in rabbits. These ongoing studies are made in collaboration with the Swedish Agricultural University in Uppsala and they provide a step towards transfer of the results to clinical applications.

"Interdisciplinary research and partner-

ships allow advanced analytical tools to be applied to important but difficult medical and scientific challenges. This exciting work comes from shared goals of chemists and physicists as well as the Centre for Neutron Scattering at Uppsala University and the laboratories in Grenoble," says Professor Adrian Rennie.

"We envisage that the materials will be used in medicine to modulate the healing process in bone," says Associate Professor Dmitri Ossipov. He continues: "Neutrons are an ideal tool to understand the interactions of metal surfaces, polysaccharide biopolymers, and proteins thanks to a contrast matching technique that highlights only the protein components at the interface."

Dr Giovanna Fragneto from the Institut Laue-Langevin, said: "Neutron scattering techniques are increasingly relevant to optimise bio-materials and to study systems that relate to health. The impor-

the information gathered from published reports on three patients who received bioengineered tracheas and unpublished reports on an additional 11 patients. Although there were differences between the techniques used, production of the bioengineered trachea in all cases produced similar results, and the different approaches worked in comparable ways.

“The results show that mortality and morbidity were very high. Several patients died within a three-month period, and the patients who survived longer functioned with an airway stent that preserved the airway lumen,” they observe.

They also question whether the trachea can really be considered to be the first bioengineered organ. From the 14 reports reviewed, they concluded that the bioengineered tracheal replacements were in fact airway replacements that functioned only as scaffolds, behaving in a similar way to synthetic tracheal prostheses.

Publication of these papers in highly ranked medical journals is attributable to the media hype regarding “stem cells” and the work done on an airway that is less accessible for direct visualization, say De-

The results show that mortality and morbidity were very high. Several patients died within a three-month period, and the patients who survived longer functioned with an airway stent that preserved the airway lumen.

laere and Van Raemdonck.

“In conclusion, the ethical justification of tracheal replacement with a synthetic prosthesis or with a decellularized allograft in humans is questionable, because there are no available experimental data describing a possible successful outcome,” De-laere and Van Raemdonck remark. “The currently available published articles on bioengineered tracheas and the resulting media attention endanger the field of tracheal replacement and the field of tissue engineering as a whole. For patient safety, tracheal bioengineering must be demonstrated as being efficacious and safe before further transplants,” they conclude.

● doi:10.1016/j.jtcvs.2013.12.024). **MEH**



Ida Bernts

Gel coated titanium surface binds proteins which promote bone formation

tance of combining conventional laboratory studies with those at a large scale facility to give a complete picture of a process was proven once more. This work arose

from a studentship funded by the Institut Laue-Langevin which makes us proud of our PhD programme.”

● doi: 10.1002/adem.201400009 **MEH**

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Enhancing fertility with laparoscopic surgery and myomectomy



By Dr Nikita Trehan, MBBS, DNB, MNAMS, FOGSI Specialist Obstetrics-Gynaecology & laparoscopic surgeon

Infertility

Nowadays around 25-30% of couples who are trying to conceive are unable to do so. Of these couples 40% of the problems are in the male partner 40% in the female partner and 20% account for unexplained infertility. These couples usually immediately choose IVF treatment, as there is a lack of public awareness on the alternative option of fertility enhancing surgery.

The female factor

Laparoscopic and hysteroscopy have come as boon for infertile couples when compared to open surgeries.

The benefits of laparoscopy include:

1. Only one-day hospital stay

Comparison of Laparoscopic & Open Surgery

Lap Surgery	Open Surgery
1. Only one day stay hospital stay	1. Hospital stay for 5-6 days
2. Minimal blood Loss (Less than 100ml)	2. Patient loses approx 500ml of blood
3. No need for I.V Drip	3. I.V Drip needed for 24 Hrs.
4. Minimal Pain (Most patients do not need even oral pain killers)	4. More Pain (3-4 days after surgery)
5. Early resumption of day to day activity (Can return to work in 2-3 days)	5. Usually return to work only after 1 month
6. Less Costly	6. More expensive

2. Less pain
3. Minimal blood loss
4. Less expensive
5. Importantly for infertility couples – there is minimal adhesion formation

All-in-all laparoscopic surgeries are a far superior option for the patient and the doctor. Compared to IVF, fertility enhancing surgery is advantageous as it corrects the basic abnormality in the reproductive organs so that the female patient can go

on to conceive naturally without any help. IVF is not only more expensive and stressful for the couple, but also needs to be done repeatedly for each pregnancy; hence IVF should only be done as a last resort if fertility enhancing surgery fails.

There are many conditions in infertile couples where fertility enhancing laparoscopic surgery helps.

1. **Tubal cannulation:** When the tubes are blocked, in 60-10% cases they can be opened with thin wires. Only patients

Pre-operative



The patient about to undergo surgery

whose tubes which are permanently blocked should opt for IVE.

2. **Endometriosis:** Sandwich therapy wherein a primary laparoscopic surgery is done and all abnormalities treated following which the patient is given hormonal therapy for six months after a laparoscopic revision. In several follow-ups we have found that the chances of pregnancy increase by 80% following this treatment compared to couples who had only a 10-15% chance of conceiving otherwise.

3. **Fibroids:** After laparoscopic myomectomy (removal of fibroids) & LUAL (Uterine artery ligation) the pregnancy rate in affected woman is almost equivalent to that of a normal woman.

4. **PCOD (polycystic ovary disease):** Where other treatments have failed - laparoscopic ovarian drilling is a surgical treatment that can trigger ovulation in women who have PCOD

5. **Hysteroscopy surgeries:** malformations like septum (where there is a wall inside the uterus) or polyps or fibroids (benign growths inside the womb) can be removed easily with hysteroscopy surgery.

Laparoscopic treatment of fibroids (Laparoscopic Myomectomy)

Fibroids deserve a special mention in the UAE as their incidence is on a rise in the country.

Post operative



The patient with her baby, one and half years after the surgery

Fibroids lead to:

1. Symptoms of abnormal menstrual bleeding
2. Increased chance of miscarriage and problems in pregnancy
3. Chronic backache, urinary and bowel symptoms
4. Infertility

Any size of fibroid can be removed laparoscopically without causing any damage to the uterus. A 4.5kg fibroid was removed at our institute in India. Also we practice a procedure called LUAL (Laparoscopic Uterine Artery Ligation) for the preven-

tion of recurrence of fibroids (as fibroids recur frequently after 2 to 3years).

The author

Dr Nikita Trehan, MBBS, DNB, MNAMS, FOGSI, is a Specialist Obstetrics & Gynaecology and laparoscopic surgeon. She has a Diploma in Advanced Gynaecological Endoscopy (Sunrise Institute of Medical Sciences, Cochin, Kerala); Diploma in Gynaecological Endoscopy - Kiel Germany; Diploma in Gynaecological Endoscopy – Giessen, Germany. She is a visiting specialist at International Modern Hospital, Dubai.



Innovative research

Each year *Middle East Health* runs a report on healthcare in Qatar. This year we focus on some of the innovative medical research taking place in the country.

The leadership in Qatar, through the Qatar Foundation's division for Research and Development, has stated clearly they are committed to ensuring the country becomes a leading centre for research and development excellence and innovation, globally.

Research is supported by the Qatar National Research Fund (QNRF), established in 2006. It is noted that the QNRF, while actively seeking the participation of internationally recognized research-

ers, is dedicated to funding research that meets the needs of Qatar. The QNRF builds research capacity and promotes a research culture through its funding programs which are aligned with the following four pillars of the Qatar National Research Strategy 2012 – energy and environment; computing and information technology; health; and social sciences, arts and humanities.

Although research in healthcare is but

one facet of this, it is held in high regard and is one of the key components of Qatar's National Health Strategy 2011-2016 which is intended to help the country attain the health goals and objectives contained in Qatar National Vision 2030 – that is essentially creating a world-class, integrated, patient-centred healthcare system.

The National Health Strategy notes that "health policies and services will be

Qatar Foundation names new Executive Director of Qatar Biomedical Research Institute

On 5 March this year Qatar Foundation for Education, Science and Community Development announced that Dr Hilal Lashuel, a prominent scientist in life sciences and associate professor at the Brain Mind Institute of the Ecole Polytechnique Fédérale de Lausanne (EPFL) School of Life Sciences, has been appointed Executive Director of Qatar Biomedical Research Institute (QBRI). Dr Lashuel will contribute to the advancement of translational biomedical research and the development of innovative personalised medicine in Qatar.

Faisal Alsuwaidi, President of Qatar Foundation Research and Development (QF R&D), welcomed Dr Lashuel and highlighted the wealth of experience that he will bring to Qatar Foundation Research and Development.

“Building on his past experiences and previous activities with Qatar Foundation, we are pleased to have Dr Lashuel in the Executive Director role to guide QBRI in support of our vision of becoming a leading centre for research and development excellence and innovation,” said Alsuwaidi.

Dr Lashuel is internationally recognised for his work in the molecu-

lar basis of neurodegenerative diseases such as Alzheimer’s, Parkinson’s disease and related disorders. His research has contributed significantly to the identification of novel disease mechanisms and therapeutic targets for the treatment of these conditions. His scientific contributions include more than 100 publications in major peer reviewed journals including Nature journals, Cell, PNAS and Angewandte Chemie, as well as patents on novel strategies for preventing protein aggregation.

Dr Lashuel expressed his enthusiasm to take up the exciting and challenging position. “I am truly honoured and humbled by the trust and confidence Qatar Foundation have invested in me, and for giving me this unique opportunity to lead QBRI and contribute to achieving the objectives of the Qatar National Research Strategy and Qatar National Vision 2030,” he said. “While there are challenges that lie ahead, I also see great opportunities to make transformative changes that will impact education, research, and healthcare in Qatar and the region.”

Dr Lashuel has had several previous engagements in Qatar including coordinator of the biomedical group and active member of Arab Expatriate Scientists –



Dr Hilal Lashuel

an initiative launched by Her Highness Sheikha Moza bint Nasser – in 2006, and serving as consultant and advisor to Qatar Foundation and the Sidra Medical & Research Center.

His contribution to promoting higher education and research in the Middle East is exemplified by his roles as co-founder and Secretary General of the Society for the Advancement of Science and Technology in the Arab World (SASTA), co-founder and co-director of the American Association of Yemeni Scientists and Professionals, and a founding member of the IBRO-MENA (International Brain Research Organization) sub-region chapter, which aims to promote neuroscience research in the MENA region. He serves as research advisor to several organisations and universities in the region. IMEH

based on the latest scientific research and evidence. The Supreme Council of Health will encourage medical research at the frontiers of science in Qatar’s centres of excellence while conducting high-quality health services research itself, including collecting appropriate data to guide policy and monitoring and evaluating progress against specified objectives”.

In order to carry out this research the country has established – or is in the process of establishing – a number of world class research facilities including Sidra Medical and Research Center

and the Qatar Biomedical Research Institute (QBRI), which incorporates the Qatar Biobank for Medical Research. The QBRI is a centre of Qatar Foundation Research and Development. Also conducting healthcare research is the Weill Cornell Medical College in Qatar, Hamad Medical Corporation Medical Research Center (HMC MRC), among other organisations.

The Qatar Biomedical Research Institute (QBRI) was established in 2012 to tackle diseases of major worldwide importance (and particularly prevalent in Qa-

tar and the Middle East) such as diabetes and certain forms of cancer. QBRI has a specific focus on developing translational biomedical research and biotechnology. To fulfill its mission, QBRI has set up eight cutting-edge research centers: Stem Cell and Regenerative Medicine Research Center, Genomic Medicine and Systems Biology Research Center, Gene-based Therapy Research Center, Biomedical Engineering Research Center, Diabetes Research Center, Cancer Research Center, Genetic Diseases Research Center, and the Qatar Biobank.

Interviews

Middle East Health spoke to researchers at Weill Cornell Medical College in Qatar (WCMC-Q) involved in two research projects:

1. The discovery of how a form of microRNA helps control cholesterol – Dr Hani Najafi, Assistant Professor of Cell and Development Biology, WCMC-Q, answers questions about his contribution to a discovery that could one day rival statins as a means of regulating cholesterol.

The discovery of how a form of microRNA helps control cholesterol could have huge implications, improving the quality of life and preventing the premature deaths of tens of thousands of people each year.

2. Mapping the Qatari genome to prevent inherited diseases – Dr Khalid Fakhro, Postdoctoral Associate in Genetic Medicine at Weill Cornell Medical College in Qatar, and Dr Juan L. Rodriguez-Flores, Postdoctoral Associate in Genetic Medicine at Weill Cornell Medical College in New York, answer questions about a WCMC-Q study that analyzed the DNA of Qatar’s population discovered genetic variations that could help doctors reduce a variety of hereditary disorders. Researchers helped identify 37 genetic variants in 33 genes known to play causal roles in 36 diseases. The results also provided unexpected insight into genetic variation affecting African-derived populations globally.

The discovery of how a form of microRNA helps control cholesterol

Middle East Health: Can you give me some time context about this study – when was it begun? How long has it been running? Is it ongoing?

■ **Dr Hani Najafi:** The project started in 2010 with my discovery published in Science magazine that described a novel mechanism controlling cholesterol levels present in human cells and mice. However, most of the results shown in the recent paper came from the work accomplished in the last two years that were all carried in diabetic/obese non-human primates (African Green Monkeys). It is an ongoing project as it has



Dr Hani Najafi, Assistant Professor of Cell and Development Biology, WCMC-Q

now reached a new level of investigation given the novel findings. We are now preparing to enter the first clinical trial and are in the process of completing further control experiments in animal models. This is mainly done in US as the patents are owned by Massachusetts General Hospital (MGH).

MEH: Who is conducting the research? Who are the researchers you are collaborating with?

■ **HN:** The Project was mainly conducted in US at MGH in Boston under the supervision of Dr Anders Näär, who partially owns the patent rights. I have developed and outlined the concept of the research before and after I joined WCMC-Q. The researcher we are collaborating with is Dr Robert Gerszten, head of the Cardiology department at MGH as well as RxGen company who provided the monkeys colony and help with the animal experiments.

MEH: What is the reasoning behind doing this research? What were the researchers looking for?

■ **HN:** We are mainly focused on finding new cellular mechanisms in order to identify new therapeutic targets for the

treatment of dyslipidaemia and other obesity-associated disease conditions, such as type II diabetes, given the lack of novel and more potent and effective therapeutic modalities not currently available for the treatment of high lipid/cholesterol levels in individuals who suffer from metabolic disorders and are at a high risk of developing severe cardiovascular and liver diseases.

MEH: Can you give some detail about how the discovery was made?

■ **HN:** The discovery was made by looking at the gene context of major regulators of lipid and cholesterol metabolism. Intriguingly, we found that those genes harbour much smaller genes that encode for distinct tiny RNAs called microRNAs 33a and 33b (in short: miR-33a/b). Then we found that those microRNAs block the secretion of good cholesterol in the form of HDL. We then designed a molecule, an antisense oligonucleotide called LNA, in order to inhibit miR-33a/b. We injected first the LNA into obese mice and observed that blood HDL levels (also known as good cholesterol) were markedly elevated. In subsequent studies we tested the same in monkeys and we could see a greater effect (up to 40% increase in HDL.)



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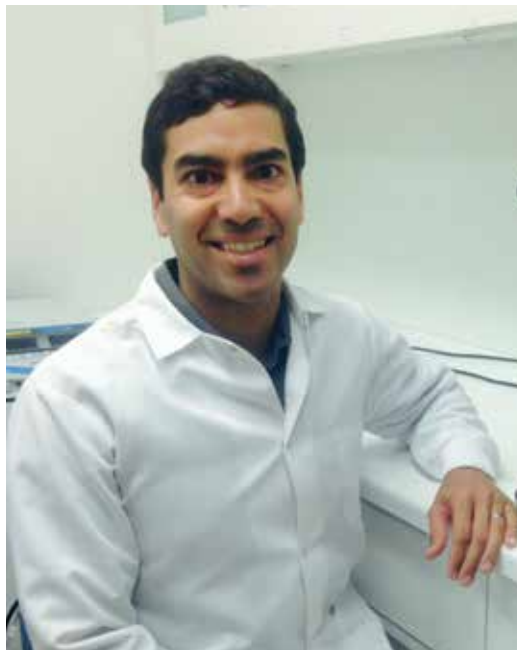
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Dr Khalid Fakhro, Postdoctoral Associate in Genetic Medicine at Weill Cornell Medical College in Qatar



Dr Juan L. Rodriguez-Flores, Postdoctoral Associate in Genetic Medicine at Weill Cornell Medical College in New York

MEH: What are the implications of this discovery?

■ **HN:** The new discovery can eventually lead to the development of an alternative new cholesterol-lowering drug for the better treatment of dyslipidaemia, atherosclerosis and insulin resistance.

MEH: What is the next step?

■ **HN:** To evaluate the broader effect of the miR-33a/b blocking agent, the LNA lead compound (drug) on other metabolic pathways to ensure the safety (side effects) and effectiveness of the applied drug later on using animal models.

MEH: When can we hope to see commercialization of a product using this discovery?

■ **HN:** Hopefully in the near future (5-6 years) if the needed financial support is received as planned.

Mapping the Qatari genome to prevent inherited diseases

Middle East Health: Can you give me some time context about this study – when was it begun? How long has it been running? Is it ongoing?

■ **Dr. Khalid Fakhro & Dr. Juan L. Rodriguez-Flores:** This study is part of an ongoing effort to expand and improve the genetic screening program in Qatar.

It began about four years ago with the first description of the basic structure of the population using a few markers in a small number of individuals. For the publication we sequenced 100 Qataris, and we are in the process of sequencing 1,000 more in the next year.

MEH: Who is conducting the research?

■ **KF & JRF:** The research is conducted through collaboration between three Cornell campuses, including the Department of Biostatistics and Computational Biology at Cornell University in Ithaca (United States) and the Department of Genetic Medicine at Weill Cornell Medical College in New York City and Doha. The research is funded by a grant from the Qatar Foundation, and the principal investigators are Ronald G Crystal and Jason G Mezey, while the analysis was led by Khalid Fakhro, from WCMC-Q, and Juan L Rodriguez-Flores, from WCMC. The samples are obtained through a collaborative effort at WCMCQ and Hamad Medical Corporation.

MEH: What is the reasoning behind doing this research? What were the researchers looking for? What type of inherited diseases were the researchers concerned about?

■ **KF & JRF:** Genetic screening programs around the world can be implemented in three formats: premarital, prenatal, and neonatal. Currently the genetic screening program in Qatar consists of 4 to 10 genetic diseases for premarital screening. These mutations were selected based on prior reports of genetic disorders common in Qatar where the causative mutation was known. Our study sought to improve on this by taking a random sample of Qataris and identifying known variants linked to genetic disorders that should be added to the Qatari screening panel based on high prevalence in Qatar. These are typically recessive disorders where there is an elevated risk for homozygosity within a consanguineous marriage. The rate of consanguineous marriage in Qatar can be as high as 50%, hence having a screening program is essential. In addition, Qataris and other Gulf Arabs are poorly represented in international DNA databases, so when a doctor finds a mutation in a patient with a rare disease (s)he has no reference to compare against to see if this mutation is seen in control individuals or not. This is important because if you want to report a mutation causing a disease, then you need to be absolutely sure it is not present in the controls.



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MEH: Who were the subjects of the research? How big was population sample?

■ **KF & JRF:** We sampled 100 Qataris, and are aiming to expand the study to a sample of 3000, or 1% of the Qatari native population of 300,000

MEH: Can you give some detail about how the research was carried out / the processes involved?

■ **KF & JRF:** This is an international collaboration. For the published study, DNA samples collected in Doha were subjected to exome sequencing, which involves reading the DNA of 1% of the genome that codes for proteins, this is where the majority of genetic mutations linked to disease are located. This sequencing is conducted using an Illumina high-throughput sequencer, over a gigabase of DNA is sequenced. The data is transferred in electronic format to supercomputers in Ithaca, New York and Doha, where high-performance DNA analysis algorithms search for genetic mutations in each Qatari genome. The most challenging part is genome interpretation, making sense of the mutations present within each genome. We looked at over 100 thousand mutations, and developed computational tools in order to shrink this list down to the 37 mutations reported in the paper where there is solid evidence in the biomedical literature that the mutation causes recessive or dominant Mendelian disorders at elevated prevalence in Qatar.

MEH: Can you describe the results?

■ **KF & JRF:** We found over 100,000 mutations in the coding regions of these 100 individuals, of which almost 25% were novel to all public databases. This is a glaring number and highlights the paucity of Arab representation in global databases. If a similar cohort of Caucasians were sequenced today, the novelty level would not exceed 5-10%, possibly less. We also found over 30 recessive disease-causing mutations occurring at significantly higher frequencies in Qataris than any other population around the world. Only four of these are currently being tested for routinely in Qatar.

MEH: And what are your conclusions?

■ **KF & JRF:** Our major conclusions are

QBRI impresses at World Stem Cell Summit

A delegation from Qatar Biomedical Research Institute (QBRI) made a big impression by attending its first World Stem Cell Summit in America in December last year, with two scientists presenting research posters and Executive Director Dr Abdelali Haoudi speaking in a panel discussion on “Strategic Partnerships for Successful Research, Commercialization and Economic Development – An International Perspective”.

QBRI, a member of Qatar Foundation Research and Development made many new contacts for collaboration and recruitment at its exhibition booth and was the only institute from the Gulf region invited to give a panel presentation. Dr Prasanna Kolatkar, a senior scientist with QBRI, and Dr Essam Abdelalim, a postdoctoral researcher, both had their posters accepted for the event, which drew more than 1,100 attendees from 40 countries. The posters discussed the molecular mechanisms behind the functions of different stem cells.

“This is the first time QBRI has presented outcomes of its research at a major stem cell conference,” said Dr Haoudi. “It demonstrates that QBRI is becoming a productive member of the international stem cell community, and really producing research with global impact.”

“QBRI is taking an integrated approach to biomedical research,” Dr Haoudi told an audience of about 150

in his panel discussion. “For example, we are currently combining stem cell research and genomic medicine to address diabetes, and we are bringing together stem cell research and biomedical engineering to address cancer.”

Dr Haoudi went on to describe the partnerships QBRI has formed with entities inside Qatar – including The Supreme Council of Health, Weill Cornell Medical College in Qatar, Hamad Medical Corporation, Sidra Medical and Research Center, and Qatar Biobank – to conduct basic biomedical research, translational research, and clinical trials in Qatar.

In addition, QBRI works with international entities such as the James Baker Institute for Public Policy at Rice University to develop stem cell policy, and in order to train the next generation of biomedical researchers through the Qatar Science Leadership Program, QBRI works with Cambridge University, Oxford University, Imperial College London and Harvard University.

“The end goal of our multidisciplinary, integrated approach is to develop personalised medicine that will improve the health of individuals by addressing their unique genetic and systemic makeup,” said Dr Haoudi.

The World Stem Cell Summit took place in San Diego, California, America from 4-6 December 2013. MEH

that Qatar can significantly improve its genetic screening program, and can also better characterize the prevalence of genetic disorders in the population. Although there are ethical issues and societal stigma related to discovering that a genetic disorder is at high risk in your family, Qataris should embrace rather than fear this information and use it to empower themselves and use it in family planning decisions. An

objective of this would be exome sequencing of every Qatari national, or every child born and their parents.

MEH: For reference for our readers, where has the research been published (doi)?

■ **KF & JRF:** The research was published in Human Mutation doi: 10.1002/humu.22460 MEH



University of Calgary in Qatar providing world-class nursing education

The only international branch of one Canada's top research universities, the University of Calgary in Qatar (UCQ) educates world-class nursing professionals in support of Qatar National Vision 2030 and the National Health Strategy. UCQ Bachelor and Master of Nursing program graduates are poised to do their part to ensure a healthy future for the people of Qatar.

International accreditation for excellence in nursing education

The Canadian Association of Schools of Nursing (CASN) has granted UCQ accreditation for a 7-year term.

"Achieving national accreditation provides students and graduates with assurance that the University of Calgary in Qatar program meets recognized standards of excellence that are applicable to masters programs throughout the world," states UCQ Dean and CEO Dr Kim Critchley.

"Nursing education programs must continually incorporate new knowledge and be responsive to the changing needs of students and the healthcare environment. Graduates must be prepared to work safely in increasingly complex environments

in the context of the constantly changing and growing body of knowledge on which nursing practice is based. One of the ways to ensure this is being done is the CASN accreditation process."

Interprofessional education

Initiative in healthcare research is one of the key areas in which UCQ demonstrates its commitment to enriching health and wellness in Qatar.

The Interprofessional Education (IPE) project focuses on enhancing the interprofessional and collaborative nature of healthcare delivery. IPE is promoted by the World Health Organization as an important tool to improve healthcare systems.

"We're using an evidence-based approach to develop an interprofessional education project that is suitable for and fits the Qatari context. We believe it will improve patient outcomes, potentially improve patient safety, in addition to improving staff morale and well-being and a whole other range of potential benefits," explains Jason Hickey, UCQ nursing instructor and Project Lead. The Qatar Academic Health System is a partner in the project. MEH





Weill Cornell Medical College in

Healthcare is going through a dynamic change in Qatar and nowhere is the drive for a world-class health system more apparent than at Weill Cornell Medical College in Qatar (WCMC-Q).

A branch campus of Weill Cornell Medical School in New York –the medical school of the Ivy League Cornell University – WCMC-Q is the only institution to award U.S accredited MD degrees outside of the United States. Since we began teaching operations we have created 147 new doctors and this will be further boost-

ed following this year's graduation ceremony when a further 34 students will take the Hippocratic Oath and receive their M.D. degrees. Following their residencies at institutions in the U.S and at Hamad Medical Corporation, we fully expect many of our graduates to return to Qatar to take up leadership roles within the medical community and help augment healthcare for future generations.

But WCMC-Q is not just about creating new doctors. We are also creating knowledge, pushing the boundaries of medical



Dr Firouz Darroudi explains the function of the Radiation Genetics and Chemical Mutagenesis Lab to visitors.

CNA-Q to tackle impact of environment on health issues with opening of new research and training laboratory

The lab was officially opened in March this year and has four main responsibilities: to assess human risks from exposure to environmental and chemical hazards; to understand the mechanisms of chemical and radiation induced DNA damage; to initiate a training and research program in biomedical and environmental research programs to build research capacity and finally to create a network of

experts within the country and region.

Dr Firouz Darroudi, a leading cancer researcher, will be spearheading the research and training work at the lab. Dr Darroudi has been working with CNA-Q since 2012 as a Research and Training Consultant, working with both CNA-Q students and external stakeholders.

“From our studies we can investigate the causes of cancers, find biomarkers of can-

cers of different origins and improve the cancer therapy regimens of people who have cancer,” Dr Darroudi explained. “We are incredibly excited about the potential of the lab and the students at CNA-Q I have been working with, and the amazing response we have received from researchers throughout Qatar. We have been very busy working with people from Hamad Medical Corporation, Qatar Foundation,

Qatar leads the change

science to help create a better future for everyone.

Through programs specially designed to reflect the health issues facing Qatar, we are investigating new treatments for cholesterol, examining the genetics of regional variations in breast cancer, and looking at creating a new, non-invasive test for diabetes.

Not only this, we are taking action to improve the health of the nation today. Through initiatives like Your Health First, a high-profile government-backed campaign, we are providing people with the knowledge they need to make a difference to their health today so they can make a meaningful contribution to the Qatar of tomorrow.

The health of Qatar has never looked better.




Qatar University and the Ministry of the Environment, and it has been amazing to see the level of interest and collaboration.”

Currently, 11 students from the School of Health Sciences are working with Dr Darroudi. In the past 12 months, he has also held workshops including graduate and post-doctoral students, oncologists and cancer researchers from across the country. The success of the workshops led to the opening of the Radiation Genetics and Chemical Mutagenesis Lab.

“CNA-Q is widely known for its quality training,” noted Dr Mike Long, Chair of the Office of Applied Research. “Our partnership with Dr Darroudi has allowed us to use the talents of a world renowned biomedical researcher to engage in cancer and biomedical research and at the same time develop the skill sets of the research community in Qatar.”

While the lab will be of immediate benefit to CNA-Q students and instructors, Dr Darroudi intends the lab to have a national impact. “Not only will the work being done in this lab help to generate a safer environment and improve human health, it will also serve to initiate joint collaborations with other research centers in Qatar to further develop local knowledge and expertise at international high standards.”

These collaborations will help generate an educational and scientific center in the Middle East on biological, environmental and medical programs, ensuring researchers and practitioners are able to provide the best medical advice for the people of Qatar and the Arab world. 



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Interview

Treating cancer with immunotherapy

Callan Emery spoke to Dr Francesco Marincola – Chief Research Officer at Sidra in Doha and President of the Society for the Immunotherapy of Cancer (www.sitcancer.org) about immunotherapy and recent advances in its use as a treatment for cancer.

Callan Emery: In current practice, for which types of cancers has immunotherapy been shown to work as a treatment?

■ **Dr Francesco Marincola:** Currently, monoclonal antibodies are the most widely used form of cancer immunotherapy. They have been approved for use in treating several types of leukemia and lymphoma, as well as some types of breast, colorectal, head and neck cancers. Cytokines are a second type of immunotherapy, which are hormone-like molecules that regulate immune cells. Interferon and interleukin-2 are two cytokines used commonly to treat patients with melanoma and kidney cancer.

Cancer vaccines have been studied for several decades, but until recently, advances in this field have been slower than for other forms of immunotherapy. For example, new vaccines against the human papilloma virus (HPV) help prevent women from getting cervical, vaginal, and vulvar cancer. Vaccines against hepatitis B virus (HBV) may lower some people's risk of getting liver cancer. These vaccines don't target cancer cells; they target the viruses that can cause these cancers.

Adoptive t-cell therapy is an emerging type of immunotherapy in which t-cells found within a patient's tumor are 'trained' to attack cancerous cells. In gene therapy, tumor cells are modified and then used to immunize cells against cancer. Both of these types of therapy have shown a high response rate in leukemia and solid tumors.

Checkpoint inhibitors are another type of immunotherapy. They work by altering the way that tumor cells interact with the patient's immune system. In 2011, the US Food



Dr Francesco Marincola

and Drug Administration (FDA) approved ipilimumab (Yervoy) for the treatment of melanoma, a type of skin cancer. It is also being investigated in other types of cancer.

CE: For the cancer patient, what does immunotherapy treatment involve? How is the treatment provided?

■ **FM:** Different types of immunotherapy are used in different ways. Monoclonal antibodies are used either with standard chemotherapy or alone. They are usually administered by intravenous infusion (drip) and may be given to patients either on an inpatient or outpatient basis. The number of times a patient will receive an infusion and the dose that he or she will receive depends on the type of cancer and the patient's response to the therapy. Some monoclonal antibodies can be given by subcutaneous injection.

Interferon and interleukin-2 are usually given by subcutaneous injection but can also be given by infusion. Both may be used in

combination with other therapies.

Adoptive t-cell therapy requires infusion of the 'trained' cells.

CE: Is it used as an alternative to other forms of treatment, such as radiation, or can it be used in combination with them?

■ **FM:** Current cancer treatments such as chemotherapy, radiation and surgery tend to destroy healthy tissue in the course of treatment. Immunotherapy can avoid this by harnessing the body's innate protective mechanisms to fight cancer.

At present, immunotherapy is often used in combination with other treatments such as chemotherapy. For example, there is something called the abscopal effect where the use of radiation and use of checkpoint inhibitors improves treatment results. In the future, however, it may be possible to tackle cancer with immunotherapy alone.

CE: Is immunotherapy a better option than radiation or chemotherapy?

■ **FM:** Immunotherapy will harness the body's innate protective mechanisms to fight cancer. In doing this it has the potential to fight cancer without causing damage to the body, which would mean effective cancer treatment with few or no side effects for patients. Side effects can be a problem with current cancer treatments (chemotherapy, radiation, surgery) that tend to destroy healthy tissue during treatment.

However, we should look at immunotherapy as a complementary treatment to the existing ones as each one is more effective on certain types of cancer and in certain patients.

CE: For practicing oncologists who are used to providing traditional radiation or chemotherapy treatments what advice can you give them regarding the use of immunotherapy?

■ **FM:** I would advise them to get up to speed as soon as possible to ensure they are able to provide their patients with the best possible

treatments now and in the future. There will, of course, be a learning curve for oncologists in the region as not much is available here yet. However, that's rapidly changing. As we saw with the Sidra-hosted Updates on Immunotherapy and Immunoscore event in January, there are hundreds of people in the region interested in learning more and who are actively involved in research on this topic. Joining professional organizations like the Society for Immunotherapy of Cancer (SITC at www.sitcancer.org) is an excellent way to keep up to date with this rapidly evolving field.

CE: Where are we, with regards current research in immunotherapy? What do you think the future holds with regards immunotherapy for cancer?

■ **FM:** Immunotherapy has become the fourth treatment modality for patients (after radiation, surgery and chemotherapy), as it has been shown to have the

potential to significantly increase survival rates.

Immunotherapy is a potential game-changer in cancer treatment, helping pave the way for more personalized medicine. However, more research will need to be done to understand why some patients respond to treatment better than others.

CE: As Chief Research Officer of Sidra Medical and Research Center, will you be continuing research in immunotherapy? In what specific areas do you envision doing this?

FM: Yes, absolutely. Our research will focus on addressing the health challenges faced by the people of Qatar and the region, including cancer. We will work with other international institutions in the immunotherapy arena to bring personalized treatments to patients with focus on combination therapies, in particular t-cell therapy. **MEH**

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Interview

Gaining insight into the IT needs of hospitals

IDC Health Insights' Central and Eastern Europe, Middle East and Africa Healthcare Technology Strategies do research and analysis of IT trends in healthcare in the region with a specific focus on electronic health records, health information exchange and patient management systems. *Middle East Health* spoke Mahmoud Mounir, Director Information Intelligence Group (IIG), Turkey, Emerging Africa, and Middle East, EMC, about recent research conducted by IDC in the region.

Overview

Recent research in hospital IT carried out in the Middle East region by EMC and IDC has made a number of findings. The study is based on interviews with 188 hospital IT and non-IT executives from across Western Europe, the Middle East and Africa (EMEA) as well as with 12 national and regional government executives in charge of eHealth programs.

The key findings

IT – in particular patient data integration – is seen as an integral strategic platform for the delivery of better healthcare outcomes for patients in EMEA:

- Patient care and satisfaction enhancement top priority for hospitals in EMEA: 4.1 for Western Europe, 4.4 for Middle-East and Africa.
- The IT organisation's contribution to business goals (3.8 in WE and 4.1 in MEA) is rated as more important than reducing operational costs (3.8 in WE and 4 in MEA) and procurement efficiency (3.8 in WE and 3.9 in MEA).
- 51% of hospital executives – (46% in WE and 57% in MEA) expect to see their organisation's total IT budget increase in 2014, while only 7.5% in WE and 9% in MEA expect to see it decrease.
- Integrated and secure access to data and applications (4.2 in WE and 4.4 MEA) ranked as most important hospital IT priority, well above lowering the cost of IT (3.9 in WE and 3.6 in MEA). The IDC-EMC study notes that when

it comes to delivering on integrated patient care, hospitals need to be able to effectively and securely share information with other healthcare providers such as GPs and specialists. Document management capabilities will be essential for this as they allow organisations to archive, combine, extract and analyze patient information in an integrated way:

- 56% of hospital executives – 71% in WE and 46% in MEA already have a document lifecycle management solution in place.
 - Hospital executives in WE that plan to invest in document life-cycle management solutions in the next 12 months are also more likely to invest in Electronic Health Records (EHR) (50%).
 - However, only 7% of WE hospital executives plan to invest in a new document life-cycle management solution over the next 12 months
- The research has revealed that several barriers may be holding back the wider adoption of document lifecycle management solutions to enable integrated patient care. This is particularly true of budget allocations which remain focussed on maintaining legacy systems:
- 46% of 2014 IT budget allocation in EMEA – 54% in WE and 39% in MEA – is set aside for maintenance of systems.
 - Only 18.5% - 19% in WE and 18% in ME – is set aside for enhancements or upgrades and 19% to innovate: 12% in WE and 23% in MEA.

Middle East Health: In an effort to establish the credibility of this research, can you tell me a bit about it – where it was conducted, with whom and when? How was the interview conducted and with how many people?

■ **Mahmoud Mounir:** The study was conducted by IDC amongst leading hospitals in Western Europe and selected emerging markets such as Saudi Arabia, Turkey and South Africa. It is based on interviews with 188 hospital IT and non-IT executives as well as with 12 national and regional government executives in charge of eHealth programs. The research emphasizes the increase of long term chronic illnesses and how hospitals need to look beyond their borders to provide an improved quality service and cost effective patient care.

MEH: In a summary of the research findings it states – as you say – that hospitals will need to look beyond their borders to deliver improved and cost effective patient care in an environment where long term chronic illness is on the increase and that structured data and unstructured document management capabilities will be essential to meet this challenge. Can you explain the difference between structured and unstructured data and explain in some detail how an improved, more efficient IT network will improve healthcare and make it more cost effective?

■ **MM:** Nowadays, the new IT solutions available have helped us in organizing unstructured data and making it an op-

portunity for the healthcare providers rather than having a big pile of data with no value. Unstructured data is now seen as a valuable portion of the medical record and with the help of eHealth programs it can be used to extract valuable medical history elements which can assist different entities to provide better services to their patients. With the help of the analytical tools available, the unstructured data can also be used to uncover historical patterns of cause and effect and indicators of disease that weren't known earlier. By combining both structured and unstructured data the result is immense improvement in the healthcare services as well as drastically reducing their costs. This way a lot of manual work is saved as it saves clinicians from filling forms and provides a better experience to the patient, helps doctors make better decisions and provide quality services that put the patient at the centre of the nexus.

MEH: Clearly an efficient IT network is an ideal solution, but there are some real hindrances to this – such as the unwillingness of hospitals to share information in a competitive field, particularly across borders; insufficient financial resources on the part of some hospitals to implement a new IT system and; in some places, poor public IT infrastructure, which makes cloud storage of hi-resolution images, for example, unfeasible. What do you suggest can be done to counter these hindrances?

■ **MM:** Sharing patient's data across care providers will lead to better results and would improve patient well-being. This will provide different care providers with access to patient history, allergies, exam results, past episodes and drug prescription to prescribe treatment and continue care monitoring and follow ups without having to do repetitive work. This enables the healthcare providers to do remote monitoring, pill reminders, follow up appointments and vital readings even after the patient has left the hospital and clinic. This drastically reduce costs on the ICT side as this will put an end to the usual time consuming

process where the data is locked and several steps are required to generate patient data. This will actively reduce costs and enable the care providers to focus on innovations. Keeping this in mind, this actually provides an opportunity to improve the cost structure and enhance the specialised cost effective care delivery units where the mistakes are minimized, advanced and efficient care is provided.

MEH: What do you suggest hospitals that have legacy systems in place do? They will be reluctant to change their system for fear it too will become obsolete.

■ **MM:** There are several ways to introduce the change in a gradual manner. First, is to establish central integrated patient record (IPR) system and start to capture the data that are generated by the dedicated care system. Most of them communicate via HL7 messages. Those messages that are passes today between care systems via communication servers could be placed in the central registry and stored in the IPR using HL7 2 XDS adapter. Once new system will be introduced then those systems will be obliged to communicate via XDS protocol and then there won't be a need to continue with messages transformation.

Once new systems are introduced then the old systems can be off-loaded via an EMC clinical Archive tool, which will move the patient's data from source system to IPR and make it available for sharing with the newly introduced systems.

In such a way we could start to capture ongoing patient data and have a migration strategy in mind. This will be the last introduced migration step; from this point onwards patient data will be managed independently in IPR and will be available for sharing with any other care application in the hospital (or with any other parties in the health or social systems as long as patient consent has been provided).

MEH: How do you ensure that any new system implemented now at considerable cost will not be considered a legacy system in 10 years with the current rapid advancements in technology?

■ **MM:** Our strategy of managing patient data in IPR, independently of the source system that generated the data (decouple the data from the Application as recommended by IDC) will ensure that the organization won't be challenged any longer with application decommissioning and data migration as they would be able to ingest quickly and more frequently new innovative applications which will join the shared IPR. The patient data will become the integration tissue of all those applications (inside and outside the hospital). IPR will enable the complete eHealth Ecosystem to collaborate, with no need for point-to-point integration and communication.

MEH: The research summary notes: 'The research has revealed that IT – and especially document lifecycle management capabilities – will play a key role in this transformation [to integrated, cost-effective healthcare], with many healthcare providers in the region already looking to invest in key technologies.' Can you explain what these key technologies are and how they will facilitate a transformation in healthcare (the operative word being transformation)?

■ **MM:** Over the recent years, interoperability has become a serious concern in the healthcare sector and has been blamed for the huge cost of keeping systems in sync. Thus, EMC has been delivering a document lifecycle management solution since the mid-90's and has invested heavily to embrace open standards to support healthcare protocols such as HL7, DICOM and XDS in its leading Documentum ECM brand in order to enable smooth integration into the healthcare ecosystem. Document lifecycle solutions are essential as they help the healthcare providers facilitate a more efficient provision of medical care as a result of rapid and secure information shared across hospitals at a local, regional or state level. The ability to manage, store, secure and share the right information effectively is critical for the future of the healthcare industry in order to help doctors provide accurate diagnosis. MEH

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GERIATRICS	1- Sinan İbiş / Flavius 2- Ishak Alaton / ALARKO 3- Ministry of Health (Turkey) / 4- Mr. Guido v.d. Logt - Holland Social Services Management	1- Aging Population needs in developing countries in medical aspect and residential needs 2- Privileges and protocols for senior citizens 3- Focus on need for government intervention in setting geriatric care centers 4- Elder Care & Geriatrics Tourism
DETERMINING FACTOR AT COMPETITION: SPECIFIC AND COMPLEX TREATMENTS	1- Dr. Cem Yılmaz - Oncology Patients 2- Haddasah Center - Israil Genetic Center 3- Health Care Cybernetics - Constantine Constantinides -Greece 4- Mr. Koray Yörük - Holland 5- Dr. Alper Çelik	1- What do they look for? What is real quality management in oncological care? 2- Obtaining global recognition through research, therapeutics and diagnostics 3- Sector specific technologies and the power of know-how transfer 4- Innovative solutions to make medical care more safe , trustworthy and efficient in Health Tourism 5- Metabolic Surgery
HOW TO SEGMENT SOCIAL MEDIA TO HEALTH CARE	1- LinkedIn / Jeff Weiner (CEO) 2- Google / Bülent Hiçsönmez (Manager for Turkey) 3- Patients Beyond Borders / Joseph Woodman 4- Health Tourism / Oren Gresh	1- Social Media & International Healthcare Services 2- The influence of 'search' on International Competition 3- How to become a trusted source in Medical Tourism Lands 4- Discovering the opportunities in Global Health Market
COMPETITION AND COMPETITIVENESS IN HEALTH CARE MARKET AND TURKEY PERFORMANCE	1- Bumrungrad Center-Thailand / Dennis Brown (CEO) 2- Apollo Group Hospitals - India / Ms. Suneeta Reddy (Joint Managing Director) 3- Raffles Hospital - Singapore / Dr. Prem Kumar Nair (General Manager) 4- Clinic Hamburg Germany / Thorsten Schлом or Marcus Graefen 5- Liv Hospital- Turkey/ Meri İstiroti	1- How present Health Tourism Destinations have evolved, what they have succeeded. 2- How they manage competitiveness Price,Technology, Services impact on the preference of the patients? 3- How to enhance health and well-being in international medical services? 4- Understanding buyers in Healthcare. 5- The Future of Medical Tourism and next step(suggestion)
EFFECTS OF HEALTH INSURANCE COMPANIES ON EMERGING MEDICAL TOURISM DESTINATIONS	1- BUPA / Stuart Fletcher (Chief Executive) 2- SOGAZ - Russia / Sergey Sergeyevich Ivanov (Chairman of the Management Board) 3- SOS Germany / Ivana Ivani (Global Assistance Network Manager - Central Europe) 4- Vanbreda / Wouter Reggers (Chief Operating Officer and Director of International Benefits) 5- Marm / Firat Olgun (CEO) 6- Aid / Dr. Cüneyt Ersoy	1- Needs for better policy 2- Financial Transparency in Emerging Markets 3- Building a high trust culture at health care coverage 4- Refinding how cross-border care is practiced 5- Reaching succes in the light of needs for clients from all around the world??? 6- Art of Care Taking
INNOVATION AND COMPETITION	1- General Electric - General Manager Mr. Sia 2- JCI / Ann Jacobson (Executive Director of JCI) 3- ISO/SGS / Asım Yazıcıoğlu (Consultant to Management) 4- TÜV SÜD / Michael K.(Product service account manager) 5- THY / Temel Kotil (CEO)	1- Innovation in Healthcare and its impacts in Medical Tourism 2- The importance of certification and accreditation 3- Breaking down the barriers of international trade. 4- How to ensure safety, quality and profitability in the international market 5- 10 things that Hospitals should learn from airline companies
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Patient travellers seek to alleviate high cost of healthcare

Health tourism, also referred to as medical tourism or medical travel, is the travel of people to another country for the purpose of obtaining medical treatment in that country. Traditionally, people would travel from less developed countries to major medical centres in developed countries for medical treatment that was unavailable in their own communities. However, the recent trend is for people to travel from developed countries to third world countries for medical treatments because the cost of treatment is lower, though the traditional pattern still continues.

Factors that have led to the increasing popularity of medical travel include the high cost of health care, long wait times for certain procedures, the ease and affordability of international travel, and improvements in both technology and standards of care in many developing countries. The avoidance of waiting times is the leading factor for medical tourism

from the UK, whereas in the US, the main reason is cheaper prices abroad.

Many surgery procedures performed in medical tourism destinations cost a fraction of the price they do in the Economically Advanced countries. For example, a liver transplant costs around US\$300,000 in the US, but in Taiwan is costs around \$91,000, according to a 2010 report in *Time* magazine. A large draw to medical travel is convenience and speed. Countries that operate public healthcare systems are often so overburdened that it can take considerable time to get non-urgent medical care. In Canada for example, an estimated 782,936 Canadians spent time on medical waiting lists in 2005, waiting an average of 9.4 weeks, according to a 2005 report by the Fraser Institute.

Accreditation

To facilitate and attract foreign patients, there is a growing move by hospitals to get

International Healthcare Accreditation. In response to this marketing opportunity, some national accreditation groups – such as the Joint Commission in the US – have expanded their wings internationally (establishing for example, Joint Commission International – JCI), and gone on to survey and accredit hospitals outside of their own national borders. These groups now, in essence, provide “international healthcare accreditation”.

Accreditation systems are structured so as to provide objective measures for the external evaluation of quality and quality management. Accreditation schemes ideally focus primarily on the patient and their pathway through the healthcare system – this includes how they access care, how they are cared for after discharge from hospital, and the quality of the services provided for them. At the heart of these schemes is a list of standards which, ideally, serve to assess evaluate in a sys-

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tematic and comprehensive way the standards of professional performance in a hospital. This includes not only hands-on patient care but also training and education of staff, credentials, clinical governance and audit, research activity, ethical standards etc. The standards can also be used internally by hospitals to develop and improve their quality standards and quality management. Some international accreditation schemes believe that the standards applied should be fixed and are non-negotiable, while others operate a system of negotiation over standards – however, whatever approach is taken the every aspect of the process should be evidence-based.

The International Society for Quality in Health Care ISQua - www.isqua.org – is an umbrella organisation for such organisations providing international healthcare accreditation. Its offices are based in the Republic of Ireland. ISQua is a small non-profit limited company with members in over 70 countries. ISQua works to provide services to guide health professionals, providers, researchers, agencies, policy makers and consumers, to achieve excellence in healthcare delivery to all people, and to continuously improve the quality and safety of care. ISQua does not actually survey or accredit hospitals or clinics itself.

The process for seeking treatment abroad

The typical process is as follows: the person seeking medical treatment abroad contacts a medical tourism provider. The provider usually requires the patient to provide a medical report, including the nature of ailment, local doctor's opinion, medical history, and diagnosis, and may request additional information. Certified physicians or consultants then advise on the medical treatment. The approximate expenditure, choice of hospitals and tourist destinations, and duration of stay, etc., is discussed. After signing consent bonds and agreements, the patient is given recommendation letters for a medical visa, to be procured from the concerned embassy. The patient travels to the destination country, where the medical tourism provider assigns a case executive, who takes care of the patient's accommodation, treatment and any other form of care. Once the treatment is done, the patient can remain in the tourist destination or return home. 

Turkish company offers free flights for foreign patients

In Turkey, one of the country's leading medical tourism companies is offering foreign patients free economy class return flights in an effort to stay one step ahead of their competitors in what is now becoming a very competitive field.

Longevita, with a footprint across 20 private hospitals in Istanbul, Izmir and Antalya, is offering free economy class return flights for international patients seeking surgery in Turkey. Patients also get no obligation free video consultation with their surgeons on Skype prior to making a decision on their medical travel.

Mustafa Temiz, the Marketing and Business Development Manager at Longevita, told *Middle East Health*, the company works with hospitals that are accredited by international bodies like JCI.

He confirmed that the offer is available to patients from the Middle East.

"It is valid for patients from Middle East and already we have had many patients from Middle East who have benefited from the free flight offer," he said.

"Our patients are mostly from UK, Europe and Middle East. In addition to these regions we have patients from USA, Canada, Australia, Japan, Hong Kong and Ghana," Temiz added.

Authorized by the Republic of Turkey Ministry of Economy, Longevita's free flights campaign contributes to the Turkish Government's efforts in promoting medical travel to Turkey.

Demand for medical treatment abroad is growing rapidly and medical travel is becoming more and more popular around the globe. Turkey is one of the most visited destinations by patients in Europe and the Middle East. Every month, thousands visit Turkey for private surgery to benefit from affordable prices, high quality hospitals, and US or European board certified surgeons.

Temiz pointed out that having medical treatment abroad has many advantages.

- Firstly from a cost perspective, the package price of private medical treatment, flights and accommodation is much lower than the stand-alone sur-

gery price in the Western world. Patients going to Turkey for surgery save from 30% up to 80% on costs.

- Secondly, patients going to Turkey do not need to put up with the long waiting lists of hospitals in the UK or Europe.

- Thirdly, Turkey has the highest number of JCI accredited hospitals in the world and the quality of the medical treatments are on par with the quality in Western countries, if not better. Facilities are new and equipped with cutting-edge technology.

- Turkey has a lot of surgeons certified by international associations. Medical doctors start seeing patients very early in their medical career in Turkey, therefore they are more experienced than most of their European counterparts.

"Longevita provides an easy gateway to these advantages of medical treatment in Turkey."

Ozgur Taskaya, Medical Travel Coordinator at Longevita noted in regards to Longevita's free flights packages: "We are proud to be the first and the only company offering free flights to international patients seeking hair transplantation, cosmetic surgery, dentistry and eye surgery in Turkey. Wherever our patients are in the world, they may benefit from Longevita's all-inclusive medical treatment packages covering the cost of their economy class return flights from their country to Turkey. All they need to do is contact Longevita to make a booking for their treatment. Longevita patients may do a no obligation free video consultation with their doctors prior to booking their medical treatment.

"Our patients may have their hair transplantation for €2,100, breast enlargement for €2,950 and nose surgery for €2,550 including all their medical expenses, return flights, accommodation and breakfast, airport transfers, and an English speaking host. We facilitate a wide range of other medical procedures for our patients as well."

- www.longevita.co.uk

3D printing puts patients in surgeons' hands

By Tom Ulrich
Boston Children's Hospital

3D printing technology has exploded in the last few years, and it's already making a mark on medicine. Look to the recent stories of a baby whose windpipe was replaced with a 3D-printed replica, or a U.K. patient who now has a 3D-printed pelvis.

Instead of printing implants, Peter Weinstock, MD, PhD, and his team at Boston Children's Hospital's Simulator Program are putting a child's internal anatomy in surgeons' hands before going near an operating room.

Not your average 3D printer

The service that Weinstock's team is putting together – along with collaborators like Sanjay Prabhu, MBBS, of Boston Children's Department of Radiology – has four key features. First, it's completely in-house, so the team can turn models around quickly. “There are medical 3D printing vendors, but they take weeks to months to send you a model and cost a great deal of money,” says John Meara, MD, DMD. “We gave Weinstock the patient's image data, and he printed the model for us overnight.”

Second, the printer – provided by the hospital's Department of Anesthesia, Perioperative and Pain Medicine – has extremely high resolution: down to 16 microns (the size of a droplet in a cloud). This allows models to capture fine details, which can be critical for something as small as a baby's brain or skull.

Third, the models can be built from multiple plastics, mimicking the physical characteristics of different tissues like bone, skin and blood vessels all in a single model.

Lastly, because the printer uses individual patients' CT or MRI scans as source data, the models accurately capture the unique anatomy of each individual child.

“We see it as the realization of ultra-high fidelity simulation,” says Weinstock. “Imagine being able to print an organ and surrounding anatomy, take it into the simulation suite or the operating room and practice on it. Then take that same model you've operated on and use it as a guide for treating that child. This could be a game changer in surgical preparedness.”



Neurosurgeon Joseph Madsen, MD, with a model brain printed from images of one of his patients. Notice the different plastics for different brain structures.

Your child's model is ready

Neurosurgeon Joseph Madsen, MD, expresses a similar sentiment as he reaches into his desk and pulls out a printed model of a brain based on one of his epilepsy patients. The model shows her brain's exact contours, even the placement of her “grid”: the network of electrodes Madsen's team used to find the focal point of her seizure activity.

“It can be hard to conceptualize and explain an operation just from imaging,” says Madsen, who with engineer Tomer Anor, PhD, is using 3D printing to develop and train neurosurgical robots. “In a case like this, there's no good way to practice before surgery.”

Except to practice with a model, as Madsen has done for another epilepsy patient who needed to undergo a hemispherectomy (removal or disconnection of one hemisphere of the brain). “Doing a dry run of the case ahead of time using a model from this child's imaging has certainly helped us,” he says.

Darren Orbach, MD, PhD, and his colleague Edward Smith, MD, are already looking at turning simulation into a regular clinical offering, making 3D-printed models a standard service for every patient who comes to the Cerebrovascular Surgery and Interventions Center.

“It's very different to hold a model in your hands when you've been used to trying to manipulate images on a screen for years,” says Orbach, a neurointerventional radiologist. He thinks that models with hollow veins and arteries could have potential for practicing vascular procedures. “They would let me figure out what approaches and catheter sizes would work and what wouldn't before going into the catheterization suite.”

Smith, the hospital's director of cerebrovascular neurosurgery, envisions practicing surgery on a patient's model and using a scan of that model as a real-time guide in the operating room.

Tool for the next generation

Weinstock's models also may be important tools for training future specialists.

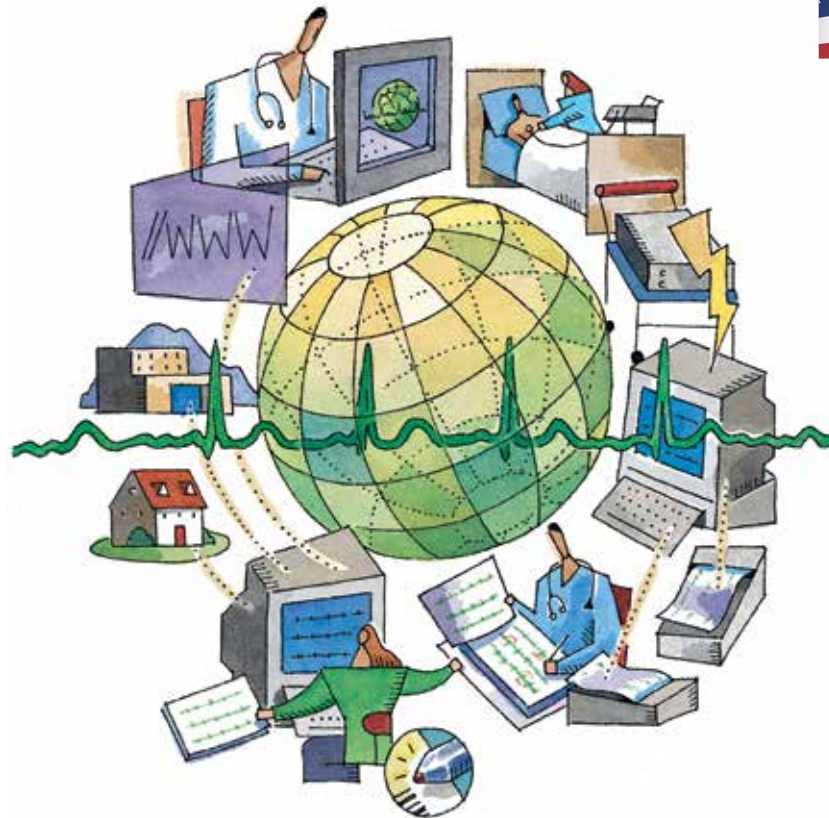
Meara's shelves now hold models of skulls purchased from a commercial vendor, each an example of a different craniofacial anomaly. While those models have some training value for new fellows, they don't capture a breadth of variation. “Each of those models represents an ‘average’ for each anomaly. But every child's case is different.”

Nor can the bought models be operated on. Made with an older technology, they don't have the material properties of bone and tissue and can't be cut or manipulated like Weinstock's models.

“It's hard for a trainee to visualize exactly what a severe anomaly looks like,” Meara says. “To give them the opportunity to hold and feel the anatomy lets them train their proprioceptive senses and learn more than they could from imaging.”

Orbach agrees, “If we could make models tailored specific cases and specific trainees, it could be revolutionary.”

“It's good to see how 3D printing inspires people and gets them to come up with new ideas about how to approach patient care,” says Madsen. “We're used to thinking about anatomy in one way, and then someone like Peter comes along and says, ‘Let's print that.’ It brings a new perspective that can help solve old problems.” **MEH**



Health information management – learning from the US experience

Recent reports indicate that the countries of the Gulf Cooperation Council (GCC) are experiencing a period of significant economic growth in the development of healthcare technology infrastructure. It is estimated that amounts in excess of \$43.9 billion will be spent on health information technology annually by 2015 within the region. With the dedication of resources and funding allotted to aid in the development of a technology-based healthcare system, the GCC has a unique opportunity to leapfrog Western nations in terms of both quality of care and its provision to various populations. For the GCC to successfully move towards a technologically-advanced healthcare system, however, a highly-skilled workforce must be established to support the adoption, implementation, and use of health information and technologies. This paper provides an outline of the requisite educational competencies and skills needed for the implementation of a state of the art health information technology infrastructure.

By William J. Rudman, PhD, RHIA, Executive Director, AHIMA Foundation and VP of Education Visioning, AHIMA
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US healthcare transformation requires highly skilled workforce

The use of health information technologies (IT) is essential in helping the United States ensure the provision of better care to individuals while reducing costs through improved efficiencies.ⁱ To advance the tech-

nology needed to achieve these goals, in 2009 the US passed the Health Information Technology for Economic and Clinical Health Act (HITECH).ⁱⁱ This provided incentive programs for eligible hospitals and professionals to adopt electronic health records (EHRs) capable of “collecting, storing, transmitting, and using healthcare information in a meaningful, timely and secure way.”ⁱⁱⁱ HITECH created an important foundation for restructuring healthcare systems; meeting the National Quality Strategy; and increasing access through better methods of storing, analyzing, and sharing health information^{iv} ultimately providing

the infrastructure for the Patient Protection and Affordable Care Act of 2010 (Affordable Care Act). The Affordable Care Act targeted reforms to the healthcare system by reducing care fragmentation and improving care coordination as a means of improving quality and reducing costs.^v A number of provisions in the Affordable Care Act will need to leverage a health IT infrastructure to enable the programs and reforms.^{vi}

To meet the technological demands required by the Affordable Care Act, the following multi-pronged approach is currently being utilized in the US:^{vii}

- Implementing Workforce Develop-

Table 1. Environmental Scan Examining the Current State of the need to expand HIM/HIT at a Global Level.

Current Conditions	Trends	Assumptions About the Future
Move to electronic health records worldwide	Demand for more qualified HIM/HIT professionals and training opportunities; demand for standards in use and exchange of health data	Rapid adoption of new health technologies will continue and create the need for more data governance, decision support, and information exchange
Lack of trained HIT workforce outside the U.S.	Training opportunities, "export" of products and services independently or through partnerships	Workforce development will continue to be a need domestically and outside the U.S.
Low recognition of HIM profession and lack of educational standards	Need for continued accreditation standards to ensure quality, at same time as need for more professionals	Competition of new credentials and certificates; need for employer education and to build reputation of professionals

ment Programs that target incumbent workers, displaced workers, and colleges and universities to provide multiple education and training options, resources for educators, and open-source tools. The Office of the National Coordinator for Health IT (ONC) funded two workforce development initiatives – the Community College Consortia Program^{viii} and the University-based Health IT Training Program.^{ix} These programs offered tuition reimbursement and grants to workers through grant funding. Colleges and universities continue to offer the programs after the grant funding ended.^x

- Developing Curriculum and Competency Examinations that provide important tools for both educators and the employer community by identifying foundational competencies of HIM/HIT workers, linking agreed upon curricula standards, and identifying certifications and credentials that demonstrate a foundational knowledge by workers.^{xi} Under this program six competency exams were created for different roles.^{xii}

- Engaging Public-Private Stakeholders to bring together policy, healthcare and education system experts to collaborate on strategies and activities that advance the workforce to meet short- and long-term goals. For example, ONC convenes a Federal Advisory Committee subgroup with government representatives and experts in the private sector including employers, healthcare providers, educators, associations, and others to evaluate and recommend actions to advance the healthcare workforce.^{xiii}

Achieving transformation and reform in the US healthcare system is a long-term initiative that requires the active engagement of policy-makers, healthcare providers and services, payers, vendors and educators. A focus on workforce development to ensure a highly-skilled workforce is a critical priority for any nation seeking to advance the use of health IT in their health system.

Healthcare in the GCC

According to a 2014 Deloitte report, the most significant global economic activity in developing healthcare infrastructure is taking place among members of the GCC^{xiv} Global spending on healthcare is expected to increase by 5.3%, with the GCC increasing most rapidly, and expansion expected to exceed 10%. These findings project to an annual spending of \$43.9 billion by 2015, up from \$25.6 billion in 2010.^{xv} In Saudi Arabia, the largest nation in the Middle East North African region, government allocations for healthcare are expected to exceed \$14.5 billion in 2014 – a 15% increase from 2012. During 2012, 3.8%

of the United Arab Emirates' GDP – approximately \$14.2 billion – was spent on healthcare development, a trend which is expected to continue.^{xvi} Similarly, during 2011 the healthcare expenditure in Qatar increased by 27% and per capita spending increased by \$1,920.

The development of healthcare infrastructure is a significant factor in this growth. In Saudi Arabia, for example, the development of 19 new hospitals, 155 new primary healthcare centers,

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and five new medical cities is expected during 2014.^{xvii} To ensure the success of these facilities and those like them within the region, there is a need to develop a trained and highly skilled national workforce.

Trained global healthcare workforce

From an environmental scan focused on the expansion of health information management and health information technology (HIM/HIT) education conducted for the American Health Information Association (AHIMA),^{xviii} data point to the lack of a trained global workforce and the need to provide standardized HIM/HIT training (Table 1). An examination of the current realities and evolving dynamics of the healthcare environment underscores the need to create educational and workforce standards.

There is a distinct shift in global markets toward recognition of the following:

- Need to implement eHealth technologies,

- Lack of a trained HIM/HIT workforce, and

- Importance of creating standards for HIM/HIT education and workforce (as outlined in Table 1).

While each of these items is of great import, the critical need to create defined standards for educational and workforce training cannot be underestimated. The HIM/HIT field is integral in providing oversight of healthcare data governance, ensuring integrity of data and information, and reviewing analytics of clinical and financial data of the healthcare provider. To collect, store, and use eHealth data to reduce healthcare costs while expanding and improving care, data must be made available in a seamless and interoperable manner. The first step in this process is the creation of a trained HIM/HIT workforce that share similar educational experiences and knowledge to allow them to communicate across operating systems and national boundaries.

In addition to the global environmental

By not having nationals as care providers there is a loss of sensitivity to cultural norms and a decreased commitment to working to improve population health.

scan conducted by AHIMA, a recent survey was conducted to identify the needs associated with the development of an education and workforce standards-setting body. From analysis of African and Eastern Mediterranean countries by the International Federation of Health Information Management Associations (IFHIMA),^{xix} the top priority for developing countries is a need for HIM education, training and certification. In addition to HIM Education, the following were noted as priority areas:

1. HIM education system
2. EMR
3. HIMS
4. National association

Innovative US healthcare technologies and partnerships deliver better health for patients in the Middle East

By Ken Hyatt, Acting Under Secretary of Commerce for International Trade

As an international leader in the development of innovative healthcare technologies – medical devices, pharmaceuticals, and therapies – the United States medical technology industry is the source of products and services that can help improve healthcare around the world. Like their global counterparts, healthcare professionals in the Middle East depend on the US healthcare sector to provide the highest quality products and the most advanced diagnostic and treatment services in the world.

The specialty items available from US medical device manufacturers range from imaging systems using X-rays, ultrasound, MRI and CT to cardiovascular products, such as pacemakers, coronary stents and catheters. Rapid diagnostic test kits and new drug treatments from US companies are other tools that doc-

tors around the world use to improve the quality of healthcare for their patients.

Innovation is not limited to devices, diagnostic products, and pharmaceuticals. US healthcare institutions are constantly developing new procedures in critical care fields such as trauma treatment, burn care, pain management, diabetes monitoring, renal therapy, cancer treatment and blood banking.

Healthcare in the Middle East is also benefiting from the growing number of partnerships between US hospitals and clinics and healthcare institutions abroad. Such partnerships enable hospitals in the region to have direct links to state-of-the-art diagnostic tools and treatment planning. Although many patients still opt to travel to the United States to receive treatment, international partnerships help keep local doctors involved in the process, enabling them to provide better follow-up care when patients return home.

The US Department of Commerce's International Trade Administration (ITA)

is confident that the already close relationship between the US healthcare sector and the medical community in the Middle East will continue to be strengthened in the coming year. We invite businesses from the area to contact the ITA's Foreign Commercial Service offices located in embassies and consulates throughout the region. Our staff is available to assist local medical professionals, medical-related businesses and healthcare institutions find suppliers and partners in the United States. Please visit http://export.gov/worldwide_us/index.asp for a list of contacts.

The International Trade Administration looks forward to working closely with our trading partners in the Middle East to facilitate the ability of US companies to help provide the people of the region with the highest quality, most innovative and effective medical devices, pharmaceuticals, healthcare services, and training in the world. 

5. E-health

6. Understanding HIM, its role, responsibility, and competency

Health information professionals in the GCC

The patterns of expenditure and effort in building of the IT infrastructure and subsequent lack of trained HIM/HIT professionals are similar. Recent studies suggest that the GCC's spending on healthcare IT will increase to more than \$550 million by 2015^{xx}. The most confining factor preventing the implementation of an integrated and interoperable country-wide healthcare system is the lack of trained workers. The majority of personnel who currently possess the training and qualifications to manage healthcare IT solutions are expatriates. To ensure the creation of a stable and sustainable HIM/HIT workforce, it is critical that the number of technical institutes and academic programs in the GCC continue to increase.

The importance of creating a national healthcare provider workforce cannot be underestimated. To address the health problems facing the GCC (e.g., increas-



ing obesity, diabetes, and cardiovascular disease); it is important to create a culture focused on providing continuity of care between patients and providers. Patients must develop a sense of trust and comfort with providers and providers' knowledge of those patients they serve over a period of time. By not having nationals as care providers there is a loss of sensitivity to cultural norms and a decreased commitment to working to improve population health. In addition, due to a lack of HIM/HIT professionals, physicians and nurses may be required to complete technical and administrative tasks rather than providing direct clinical care.

AHIMA's response

All healthcare systems, regardless of how well-financed or organized, require a sufficient population of well-trained and highly-skilled workers to meet the needs of implementing health IT systems. A comprehensive healthcare education and workforce strategy is needed to ensure that the aim of building new and enhancing existing long-term national capacity and sustainability is met. Through the creation of international HIM/HIT academic and workforce training standards, it will be possible to increase the number of trained HIM and HIT professionals living in the GCC.

In October 2013 the AHIMA received

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a grant from the Department of Commerce to create an international curriculum in the areas of HIM and HIT. As part of this grant, AHIMA will focus on three countries within the GCC: Qatar, Saudi Arabia, and the United Arab Emirates (UAE). Using the three-pronged approach outlined below, AHIMA will work with these countries to develop a national workforce in HIM/HIT:

1. Create an international curriculum and workforce training modules in HIM/HIT
2. Recruit students to accredited US universities in HIM/HIT
3. Provide educational materials and services for development of a trained workforce

To provide structure and to meet the goals of this project, AHIMA has established a Global Health Workforce Council (GHWC). This group's mission is the provision of reliable and replicable curricular standards for training of a global HIM/HIT workforce. The GHWC will provide a global forum for effective and efficient communication between HIM/HIT educators, vendors, and the healthcare provider community with the express purpose of developing transferable education and workforce training standards to create a highly-skilled HIM/HIT workforce at an international level. The GHWC is comprised of members representing entities whose mission is to advance the development and use of global educational and workforce training standards. Members include, but are not limited to: educators, government officials, leaders from industry, global thought leaders in the area of HIM /HIT and policy analysts. While the membership of the GHWC is global in nature, three members have been selected from the GCC to ensure that the region is well represented.

Through the GHWC, AHIMA will:

- Open communication channels between educators and workforce training entities on a global level;
- Lead in the development of HIM/HIT standards for educational programming and workforce training; and
- Establish a curriculum that will guide educators in order to increase the number of trained and qualified HIM/HIT professionals.

Educational competencies and required skills – the HIM/HIT curriculum of the future

To meet the needs and prepare market-

ready students to lead in the areas of health information management; the curriculum developed by the GHWC will focus on development of competencies and skills. The following domains represent the broad nature of both the HIM profession and HIT academic training which will serve as the basis for the curriculum developed:

- I. Health IT Systems and Technologies
- II. Clinical and Health IT Standards
- III. Information Governance
- IV. Information Protection: Access Disclosure, Archival, Privacy and Security
- V. Informatics, Analytics and Data Use
- VI. Revenue Management
- VII. Compliance
- VIII. Leadership

Health IT systems and technologies: This domain provides a foundational understanding of the types and uses of different health information technologies (e.g., EHRs, personal health records, mobile technologies) and system architectures. It includes foundational computer science principles including programming languages, software engineering, data structures, database management, modeling, system integration/interfaces, and management of information systems. It also includes specific healthcare applications and understanding of their use in supporting clinical, operational, and business practices.

Clinical and health IT standards: In the standards domain students gain an understanding of the types of clinical and health IT standards used in healthcare and their application to system architecture and data structures. This domain includes an understanding and application of diagnostic and procedural classification systems, clinical terminologies, vocabularies, and data sets. It also includes the identification and application of technical standards for system functionality, communication, exchange, and integration.

Information governance: The Domain of Information Governance focuses on academic content related to decision-making, oversight and organizational practices for diagnostic and procedural classifications and terminologies; health record documentation requirements; char-

acteristics of the healthcare system; data accuracy and integrity; data integration and interoperability; response to customer needs; data management and information standards.

Information protection: Access Disclosure, Archival, Privacy and Security: The information protection domain examines healthcare law (theory of all healthcare law to exclude application of law covered in Domain VII) and is intended to help the student work in the areas of privacy, security, and confidentiality policies, procedures and infrastructure; educate staff on health information protection methods; risk assessment; access and disclosure management. It includes the application of information protection features and functionality in health IT systems and related operational policies in collaboration with information governance practices (Domain III).

Informatics, analytics and data use: The domain area of informatics, analytics and data use was developed to help the student work in the creation and use of business health intelligence; select, implement, use and manage technology solutions; system and data architecture; interface considerations; information management planning; data modeling; system testing; technology benefit realization; analytics and decision support; data visualization techniques; trend analysis; administrative reports; descriptive, inferential and advanced statistical protocols and analysis; research; patient-centred health information technologies; health information exchange; data quality.

Revenue Management: The revenue management domain is directed toward providing the student skills and competencies in developing enterprise-wide strategic and operational planning models for revenue cycle management; forecasting on-going regulatory impact on revenue cycle and enterprise-wide reimbursement; implementing processes for revenue cycle management and reporting; and related clinical documentation improvement (CDI) practices.

Compliance: The compliance domain centers on activities and methods related to compliance processes, policies, and procedures to ensure the accuracy of

coded data based on established guidelines; coding auditing; severity of illness; data analytics; fraud surveillance; clinical documentation improvement; analysis of standards and regulations in healthcare and how they drive and/or constrain operations.

Leadership: The leadership domain will provide information and practical application management models, theories, and skills; critical thinking; change management; workflow analysis, design, tools and techniques; human resource management; training and development theory and process; strategic planning; financial management; ethics and project management.

Conclusion

To develop a global network of highly-trained HIM/HIT personnel, short- and long-term educational and strategic planning of the eHIM workforce is critical. The lack of a trained HIM/HIT workforce is seen as the most important factor limiting the expansion and development of and interoperable and sustainable health information network. There is a need to provide HIM/ HIT educational and workforce training that can be globally extrapolated across national boundaries. MEH

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Long-awaited breakthrough in the diagnosis of preeclampsia

Measuring the sFlt-1/PlGF ratio with Roche's Elecsys Immunoassay

With the vast number of biological and physiological factors that can influence the health of a pregnant woman and her unborn child, accurate monitoring throughout the pregnancy is essential. One of the conditions that can affect a mother and child during pregnancy is preeclampsia, a hypertensive disorder that complicates 3-5% of pregnancies¹. The challenge facing clinicians with preeclampsia today is its similarities with other conditions such as pregnancy-induced hypertension. Although preeclampsia can be potentially life-threatening for both mother and fetus, recent medical advancements in the last decade have paved the way for improved accuracy in its diagnosis.

Characterized by both hypertension and proteinuria, which are leading detectable risk factors for stillbirth, preeclampsia is a leading cause of maternal and infant illness and mortality. Certain factors can put some women at greater risk for developing preeclampsia, according to PD Dr. med. Michaela Jaksch, General Manager of Freiburg Medical Laboratory Middle East LLC and Associate Professor with the Munich University in Germany. "Pre-existing conditions such as high blood pressure, type 2 diabetes, renal or autoimmune disease can increase the likelihood of a woman developing preeclampsia. Probability can also increase if the mother had preeclampsia in a previous pregnancy, has a high body mass index, or has her first pregnancy over the age of 40," said Dr. Jaksch. Early onset of preeclampsia, the more severe case, can appear from week 20 of the pregnancy and late onset is usually after week 34.

Unmet medical needs in diagnosis

The growing need for a rapid and accurate aid in diagnosing preeclampsia to facilitate effective clinical management and improve outcome for mother and fetus has long been evident. Typically diagnosed on the basis of high blood pressure and protein in the urine, the cause of preeclampsia is not yet clearly identified and its variable symptoms have made it difficult for clinicians to diagnose. High-blood pressure and proteinuria, for example, can both be linked to other conditions such as bacterial infections or pregnancy-associated hypertension, respectively.

However, Dr. Jaksch points out that recent evidence demonstrates that angiogenic growth factors such as placental growth factor (PlGF) and soluble fms-like tyrosine kinase-1 (sFlt-1) have a major role in the development of preeclampsia. PlGF is required to stimulate blood vessel growth in the placenta to support the fetus's nutritional needs. In preeclampsia, the placenta releases more soluble sFlt-1 than it should, which bind to the PlGF and decrease PlGF levels. "Detecting an imbalance of these two biomarkers can help clinicians diagnose cases of preeclampsia, where sFlt-1 levels are raised and PlGF levels are decreased," said Dr. Jaksch.

"I would always suggest testing for both angiogenic growth factors together instead of only one to assist in the diagnosis of preeclampsia," recommends Dr. Jaksch. Roche's Elecsys sFlt-1/PlGF immunoassay, the first available and approved automated diagnostic test, could allow clinicians to make a major advance in the diagnosis of preeclampsia, which has remained unchanged for years.



Dr. med. Michaela Jaksch

With a simple laboratory test, the Elecsys Immunoassays helps optimize clinical management for an improved outcome by giving physicians more to rely on than the low sensitivity and specificity measurement of blood pressure and urine protein sampling. In addition to the test's availability, highlighting the importance of testing for the sFlt-1/PlGF ratio among the medical community is essential to improve detection.

In regular pregnancy management, testing the sFlt-1/PlGF ratio helps identify women who are most at need for intensified care by creating a precise, consistent, and reliable picture for an accurate diagnosis and timely intervention, and measuring both the sFlt-1 and PlGF levels has shown to be more useful than either measurement individually, forming an objective tool to substantiate signs of preeclampsia. MCH

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State-of-the-art women and children's hospital to open in Abu Dhabi

Danat Al Emarat Hospital for Women and Children (DAE) is expected to open its doors to patients in the second half of 2014. During the first phase, the facility will open 117 beds, 4 major operating theatres, 10 Labour and Delivery rooms, 1 minor operating theatre, 3 adult ICU beds, 2 Paediatric ICU beds and 15 Neonatal ICU beds. All the rooms in the hospital are single bedded with variety ranging from normal in-patient rooms to executive, VIP and Royal suites.

Owned by Abu Dhabi's United Eastern Medical Group, the leading private healthcare investment company, Danat Al Emarat Hospital for Women and Children is managed by ParkwayHealth which is a premier brand of Parkway Pantai Limited, one of Asia's largest private healthcare groups with more than 3,500 beds. Their experience in healthcare extends over Singapore, Malaysia, Brunei, India, China and Vietnam.

Danat Al Emarat Hospital is a specialized hospital catering only to Women and Children. Although the hospital will have a full-fledged state-of-the-art maternity department, the facility will offer a whole

range of services catering to the needs of women and children. The clinical programmes which will be provided at the hospital will be those covering Obstetrics and Gynaecology, Paediatrics and Neonatology, General Surgery, General and Internal Medicine, Adult and Paediatric Cardiology, Plastic and Reconstructive Surgery, Paediatric Surgery, Paediatric Orthopaedics and others. This extensive service portfolio is furthermore supported by allied services such as an in-house laboratory and radiology facilities.

In the area of the Neonatal ICU (NICU), Danat Al Emarat is the first private hospital in the United Arab Emirates to encompass a Centre of Excellence in Neonatology. There will be 4 beds for Level 3 NICU babies, 2 Isolation rooms which can handle either Level 2 or Level 3 babies and 9 beds for Level 2 babies.

Paediatricians & Neonatologists will be managing Level 3 NICU babies supported by nursing staff qualified and experienced in the respective areas. The other key support staff will include Paediatric Surgeons, Pae-

diatric Ophthalmologists, Paediatric Cardiologists and other sub-specialists as needed.

The hospital will be a "paper-light" facility. Medical and Nursing records will also be input through the use of notebooks and computers. This will allow instant access to the medical records of a particular patient's condition. Such access will be restricted to only those who are involved in the care of the patient.

As DAE is managed by ParkwayHealth, standards and quality outcomes are a given. Specific clinical outcomes/indicators will be benchmarked against those of the group on a regular basis. Such benchmarking will help DAE to continually improve on its clinical indicators thus making sure that the services provided by the hospital are comparable with internationally accepted standards.

● Located in the Officers City area towards the outskirts of Abu Dhabi, the serene and calm surroundings provide plenty of parking spaces and easy access to care. The facility can be reached on +971-2-5581515 or more information can be found at www.danatalemerat.ae

Abbott Labs developing molecular technology for broad, rapid pathogen detection

New tech set to accelerate accurate diagnosis

Middle East Health spoke to Deepak Nath, DVP of Abbot Labs. He discusses a new molecular diagnostic tool that US-based Abbot Labs is currently developing and which promises to bring new hope to patients with critical infections.

Patients with critical infections face a high risk of mortality because they are poorly served by existing diagnostic tools says Deepak Nath, DVP of Abbot Labs, explains that patients admitted to hospital with unknown infection or are already in hospital and acquire infection have to rely on current diagnostic methods which are at best slow to provide results. These methods entail extracting a blood sample which is sent to the lab where it is cultured. The hope is to detect the pathogens that are causing the infection. The issue with this is the time it takes, which can be days or even weeks, in the case of fungal infections, before a reliable diagnosis can be made.

“So what physicians do today is they have to guess,” says Nath. “They start patients on a broad antimicrobial treatment while they wait for the lab results. There is a problem with this. Firstly, it deals with guesswork – they have to prescribe a relatively broad spectrum antibiotic, sometimes, because they have to guess, they end up giving the wrong type of antimicrobial treatment.”

The second issue, he points out, is the fact that you are putting someone on a treatment tends to influence the culture results and throw up a lot of false negatives in the results.

“These patients are very, very sick. They are patients with bloodstream infections, like sepsis; or pneumonia; or immuno-compromised patients who have undergone organ transplant procedures,” Nath says.

Every year about 8 million people around the world are diagnosed with sepsis. About 6 million are hospitalised for pneumonia and about 160,000 immuno-compromised patients are hospitalised with infections. The single leading cause of death for transplant patients is infection.

Many of these deaths can be prevented – if the right diagnostic information is available.

What Abbot Labs is developing is a new DNA-based technology (more commonly known as molecular diagnostics). This technology promises to deliver results within six hours. Abbot Labs’ particular diagnostic tool is not yet named as it is still in development.

“We are testing it for 600 pathogens, bacteria and different viral families,” Nath says.

“By providing accurate results in such a short time it will enable physicians to confidently rule out certain infections and provide them the information they need to make an accurate diagnosis.”

The technology in development has the ability to extract the pathogen DNA from



Deepak Nath, DVP of Abbot Labs

the sample (blood or other body fluids) and test it for a broad range of pathogens.

“The combination of quick turnaround and accuracy translates into significant cost-savings for healthcare systems,” Nath points out, “because by identifying the pathogen early you are able to initiate the appropriate treatment quicker, which translates into a shorter hospital stay overall.”

Asked what time scale they are looking at for commercialisation, Nath says: “We are looking at bringing this to market within the next 12-14 months [the first quarter of 2015] when we expect to launch the product in Europe and Middle East. The US launch will come later as FDA certification requires significantly more trial data.

“We expect to initiate trials for certification later this year.”

He noted that the technology is well studied with more than 100 publications about it in peer-reviewed journals.

“Molecular diagnostics is a very rich area. There are many companies participating in this field, however there is no company that we are aware of that has developed the technology to cover such a broad scope of pathogens and provide results as quickly as we can from sample acquisition to result without the need for culture. This is the key differentiator for us.”

In conclusion Nath emphasises a crucial point: “This technology has the potential to positively impact a large number of patients and possibly save many lives in the process.” MEH



Anna O' Hare, a scientist at Abbot Labs, tests the molecular diagnostic technology.

Spend some time in the sun – for your mood and your bones



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

The UK media recently reported some worrying news of children being diagnosed with rickets, an 'old-fashioned' disease that died out after the Second World War. Bone disorders such as rickets have been linked to a deficiency vitamin D, and some have blamed the aggressive sun awareness campaigns that highlight the dangers of the sun. Of course, the sun has some great health benefits too and it's a shame that we sometimes forget to mention this. As well as brightening our mood, the sun is a great source of vitamin D – vital for healthy bones. The vitamin is made by our body under the skin in reaction to summer sunlight and helps to absorb calcium into our bones.

Upon further reading, I discovered the rate of women suffering from osteoporosis is also rising at alarming levels. Whilst the link between vitamin D and osteoporosis is still under examination, it's undeniably a growing concern for women all over the world.

Osteoporosis is a lifestyle disease, not to be confused with age-related, degenerative

diseases osteoarthritis and rheumatoid arthritis. It affects the whole skeleton, causing pain and limited mobility. In simple terms, osteoporosis occurs when the bones do not regenerate quickly enough to replace deteriorating bones, leaving them brittle and fragile. Osteoporosis is known as the 'silent disease' because diagnosis doesn't usually occur until after a first fracture.


In the UAE, it's estimated that 1 in 3 women over the age of 50 will suffer from osteoporosis. Recent figures also suggest that 58% of Saudi women currently suffer from the disease compared with just 2% of Saudi men. The National Osteoporosis Foundation says that women are four times more likely to develop osteoporosis than men because of the reduced levels of the oestrogen hormone during menopause and the consequential effect this has on bone density.

There are also lifestyle and cultural reasons. Conservative dress codes in the Middle East mean many women aren't exposing their skin to the sunlight, and therefore not getting enough vitamin D. Sedentary lifestyles have also been blamed as a lack of exercise is a great contributing factor to weakening bones.

Although there is no cure for the disease, there are several medications available to prevent and treat osteoporosis. In addition, a well-balanced diet rich in calcium and vitamin D, regular weight-bearing exercise and a healthy lifestyle can prevent or lessen the effects of the disease.

The International Osteoporosis Foundation has a number of campaigns and initiatives to raise awareness of osteoporosis. One campaign is the world-wide 'Capture the Fracture', which aims to set an internationally endorsed standard of healthcare for dealing with fractures, focusing particularly on preventing sec-

ondary fractures. Last year, RAK Hospital in the UAE held a 'Love Your Bones' event which offered women and men bone density scans. These scans determined whether osteoporosis was a risk, enabling the patient to make changes to their lifestyle, and consequently delaying or even preventing the risk of osteoporosis.

Prevention of osteoporosis still remains the most effective 'cure' and thankfully it's possible to reduce the risk of developing the disease. Spending 10-15 minutes a day in the sunshine and a balanced diet with oily fish and eggs will increase vitamin D levels, and exercises such as swimming, jogging or tennis will help maintain bone health. It's also recommended that post-menopausal women or women over the age of 50 get regular bone density scans to keep an eye on their bone health. All of these basic changes will not only help minimise the chances of getting osteoporosis, but will also improve your general health too. So when the sun does come out, enjoy it. It does wonders, not just for your mood but for your physical health too. 

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 Email: L.morgan@durbin.co.uk



KIMES celebrates 30 years of Korean medical device manufacturing

Middle East Health attended the 30th Korea International Medical and Hospital Equipment show (KIMES 2014) held in Seoul from 13-16 March. We visit this show each year and have noticed considerable growth in the number of exhibitors year-on-year, with this year's show clearly the largest in many years as exhibitors filled every available space in the cavernous COEX exhibition centre.

The theme of this year's show was 'Smart World for a Better Life'.

At KIMES 2014 there were 1095 exhibitors – mostly medical equipment manufacturers – from 38 countries, including 99 from the US, 124 from China, 77 from Germany, 47 from Taiwan, 68 from Japan, 21 from Switzerland and 19 from Italy – as well as 510 domestic manufacturers. More than 30,000 hi-tech medical products were on show – including medical devices, hospital information systems, rehabilitation equip-

ment and other healthcare-related devices.

Speaking at the opening ceremony, Choong-jin Kim noted that their efforts to attract foreign buyers to KIMES are starting to bear fruit. "More than 3000 foreign buyers from some 70 countries over the past few years," he said. He pointed out how much the local industry has grown. "In the 1980s when we started this show there were very few domestic manufacturers. They were mostly importing companies. This year we have more than 500 domestic manufacturers of healthcare products exhibiting.

"This year we celebrate 30 years of this exhibition. We have come a long way and it hasn't been without its difficulties over the years, but this year will be our best for improving public health and the advancement of the domestic medical manufacturing market."

We spoke to a number of companies ex-

hibiting their products at the show.

Jason Kwon of ORTEC (www.ortec.co.kr), an orthosis and prosthesis manufacturer



Jason Kwon of ORTEC, stands with some of the company's orthopaedic products



Doug Kim, of Samsung-Medison, demonstrates the company's premier ultrasound device with the "Hello Mom" feature



Carlos Song of Luvis Lighting, shows the new Luvis M/L ceiling-mounted theatre light

based in South Korea – specialising in various spinal braces, such as the back brace, chair brace and corset – explained that they have almost saturated the local market with domestic sales in excess of US\$4 million and that for the past 3 years they have been expanding their export market. In 2013 they recorded export sales in excess of \$1 million.

“Asia is currently our biggest market, but I expect the Middle East to take this spot this year or in 2015 because our sales are increasing rapidly in this part of the world,” Kwon said.

He said they have an exclusive partner in Saudi Arabia – Medical Light – who is responsible for a large proportion of their sales in this region.

He said they will also be looking at expanding sales in Europe and the US now that their products are certified with the CE mark and US FDA.

Kwon explained that their products are designed and developed inhouse in conjunction with research done at local medical universities and hospitals.

Korean manufacturer Samsung (www.samsung.com) had a large stand at KIMES. The company introduced a number of

new products to the market. In particular it launched a new wireless detector to its premium ceiling mounted XGEO GC80 digital xray.

Doug Kim, the assistant manager of the Samsung Medison Planning Group, explained that the new wireless detector has high DQE (detective quantum efficiency) while maintaining a low radiation dose.

He also noted that the company has introduced new image processing software – called S-Vue – which enables much improved image resolution and provides a much clearer image between bone and tissue.

Samsung also launched their first premium level ultrasound – the UGEO WS80A for obs/gyn. The device provides 3D color images of the foetus. “We have added a special feature to this device,” Kim explained. “We call it ‘Hello Mom’.”

“The feature enables the radiographer or gynaecologist to email an image of the foetus to a mobile device directly from the ultrasound scanner. The ‘mom’ can download an app to her Android mobile device and the 3D image of the foetus will show in the App. It’s a great way for the proud mom-to-be to show

off her child to friends and relatives.”

“We launched this product in December and it is available for worldwide export,” he said.

We spoke to Carlos Song of Luvis Lighting (www.eng.luvis.co.kr). The Korean-based company manufactures LED lighting for healthcare – specifically for the operating theatre.

“We are well known in Korea for our Dentis line of lighting for the dental surgery. Our Luvis brand is relatively new,” explained Song. “We are launching the Luvis M/L ceiling-mounted theatre light at this year’s KIMES show.”

The LED light has four built-in sensors to ensure constant light brightness for surgeons while operating on a patient. The sensors control the brightness from all angles and prevents shadows forming if the surgeon covers part of the light field.

The light has a natural clarity which prevents eye strain. It has an optical lens to ensure even quality of light in the focal area. The Luvis M/L has an intuitive control panel with touch screen which enables 6-step brightness and focal size control. It also has a sterilisable detachable hand grip. A built-in Full HD camera is optional. MEH

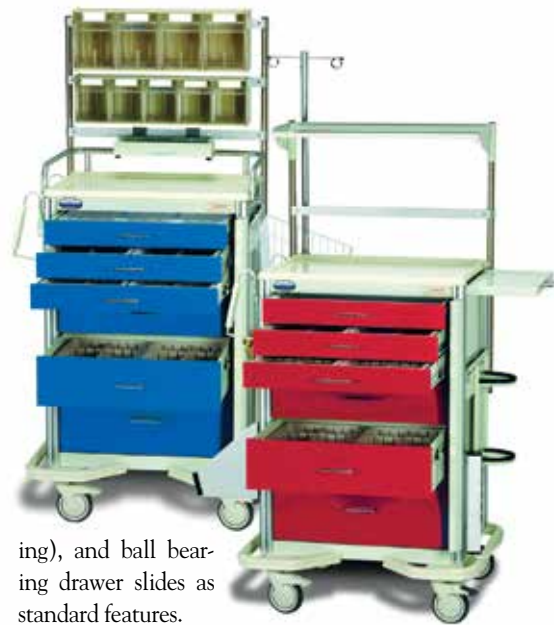
Armstrong's aluminum A-SMART Premier Carts are the perfect fit

Dependable and durable, Armstrong's A-SMART Aluminum (doesn't rust!) Premier Carts are the perfect fit no matter what your department.

Eighteen colors and hundreds of accessories make A-SMART Carts the most versatile on the market. A-SMART Carts are offered with

either a key, breakaway or push-button lock.

Also, all A-SMART Carts are manufactured to ISO 9001:2008 certified standards, and all full-size A-SMART Carts come with double side-wall construction, stabilizing frame with bumper, soft-grip handles, high-quality swivel casters (two locking, one track-



ing), and ball bearing drawer slides as standard features.

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

Rack Mount Recirculating Chiller raises the bar for performance

The CRAL700 series of chillers are the most powerful thermoelectric based chillers on the market. These units are designed to handle high heat dissipation without sacrificing efficiency.

The CRAL700DRHP is a rack-mounted unit that offers built-in heating and cooling. The CRAL700 is recommended for those customers looking for the highest capacity recirculating thermoelectric chiller in their Photonics systems.

The CRAL700 CustomChill has raised the bar for performance without compromising utility. The CRAL700 is almost twice as powerful as the CRAL400 while in the same package. This high efficiency unit offers maintenance-free long-lasting performance.

This chiller comes standard with a uni-

versal power input with PFC (Power Factor Correction), PID (Proportional Integral Derivative) control, and heating option as a standard.

The CRAL700DRHP chiller maintains temperature accuracy of fluid within +/- a tenth of a degree C. To ensure long lasting quality and performance these units are also offered with a variety of safety features and alarms upon customer request.

The CRAL700DRHP rack mount chiller offers the most innovative cooling and heating technology available for Laser, Medical, and specific industrial applications.

CustomChill's chillers utilize thermoelectric technology, making them the most efficient and environmentally friendly chillers on the market today.



CRAL700DRHP Standard Features

- Programmable Digital Controller (PID)
- Low Fluid Level Indicator
- Fluid Inlet and Outlet Quick Disconnect Valves
- Heating option of 500 Watts is standard

CRAL700DRHP Optional Features

- RS485/RS232 computer communication
- Flow control (Alarm)
- Temperature alarm
- Other safety and control features available
- For more information, visit: www.CustomChill.com

Primera launches Signature Cassette Printer for the lab

Primera Technology, ("Primera"), one of the world's leading manufacturers of specialty printing equipment, has launched its Signature Cassette Printer.

Signature Cassette Printer is designed for use in pathology and histology labs to print high-resolution text, graphics and bar codes directly onto tissue cassettes. In the past, much of this labeling has been accomplished by handwriting information with a pencil or marking pen. However, handwriting tends to be difficult to read, can be inaccurate and might even rub off dur-

ing processing. In addition, the increasing use of 2D bar codes for accurate specimen identification also requires the use of a latest-generation direct-to-cassette printer.

Unlike other similar printers, Signature Cassette Printer utilizes thermal transfer ink ribbons instead of solvent inkjet or laser ablation. There are many advantages to thermal transfer inks, including:

- Virtually silent while printing
- No smell or smoke
- Unlike laser, does not require proprietary cassettes and no fume removal system is required

- No ink tanks or print heads that dry out, need maintenance and have short expiration dates

- Crisp, clear text, graphics and bar codes that won't smear or rub off during or after processing

- The ability to print color on white cassettes, eliminating the need for colored cassettes

- Significantly lower acquisition cost than competitive units

"Signature Cassette Printer is the final component of our complete solution for accurate and efficient specimen identification," said Mark D. Strobel, Primera's

Timesco introduces Optima Neo wall mounted diagnostic sets

The Timesco Optima Neo wall mounted diagnostic set has been designed to offer the clinician a perfect diagnostic tool for ophthalmology and aural examination with the convenience of always being ready for use. Powered from mains the Optima Neo wall mounted diagnostic set is available with superb fiber optics and precision lenses in both the ophthalmoscope and otoscope for unrivaled visual examination.

The Optima Neo sets are available in EU and USA models with voltages for each. The units are supplied complete ready to use from the box, simply connect to the wall / rail, plug in and use. The EU and USA models are supplied with rel-

evant speculums for each market.

The Optima Neo wall mounted sets are supplied with 2 each handles coupled with Optima Neo Ophthalmoscope and Neo Oscope instruments heads. The handles are connected to the base unit with 3m coiled cables. Illumination is provided with Xenon 3.5v high light intensity bulbs which are surge protected to allow extended bulb life. The non slip handles come on automatically once removed from the cradle and off once returned. Rotating rheostats on the handles allow the variation of the intensity of the light.

A selection of set options, accessories and spare parts are available.



Timesco Neo wall mounted sets conform to international standards of manufacture and safety.

- For more information, visit: www.timesco.com
- Contact Timesco's regional office in Dubai: Misbah Jabbar, email: misbah.jabbar@timesco.com

Infinium Medical – Seeking new partners in the Middle East

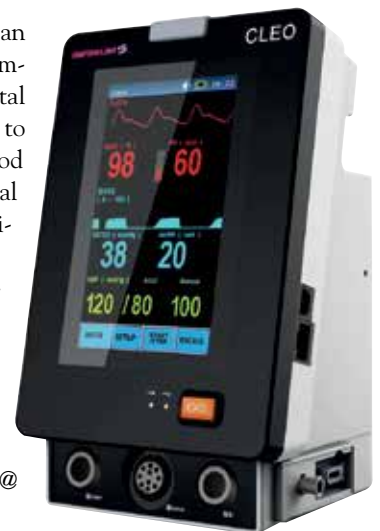
Infinium Medical, a manufacturer of patient monitors, is making headway into the Middle Eastern and Gulf states market a while seeking new distribution partners. Medical has installed over 2000 patient monitors in the Saudi Arabian peninsula since Q2 2013. Many monitors installed in the regions are for mid to high-acuity hospital and transport use having features such as: end-tidal Co₂, Cardiac output and 12 lead ECG.

Infinium has plans to begin a major marketing campaign seeking to offer a lower acuity patient monitor – the Cleo into the Middle Eastern markets. The Cleo monitor is a one of the few USA manufactured vital signs monitors suitable for multiple care areas. Offering any combination of pulse oximetry, Blood pressure, Rapid oral

temperature and end-tidal CO₂, the customer can choose the configuration from a basic pulse oximeter with Spo₂ measurement only, to a basic vital signs monitor with blood pressure and Spo₂, to a more rounded vital signs monitor with Blood pressure, Spo₂ and Rapid temperature. End-tidal Co₂ can be added to open the Cleo up to applications in transport and sedation cases.

From a general physician's office to an ambulance transport to the general floor of a hospital, the Cleo vital signs monitor is customizable and versatile enough to fit the vital signs measurement needs in many care areas.

- To inquire about a distribution partnership or product demonstration please contact: sales@infiniummedical.com or (1) 727-531-8434



vice president of sales and marketing. "With Signature Slide Printer already in daily use at hundreds of facilities around the globe, labs can now install a total solution that's all from a single vendor."

According to Strobel: "Patient safety is at the heart of our specimen identification solution. By utilizing 2D bar codes printed directly onto the tissue cassettes and slides, specimens are precisely tracked each step of the way as they are processed."

Two versions of the printer are available:

- **SCP-M** is a compact, robust printer that is small enough to fit next to the grossing station. One cassette at a time is

loaded by the operator. Print speed is fast at about 6 seconds per cassette.

- **SCP-R** is a fully robotic system that has four separate hoppers each with 40 cassettes for a total capacity of 160 cassettes. It does not rely upon gravity to feed cassettes into the printer. Instead, a robotic arm positively picks each cassette from the top of the desired stack and places it into the printer. After printing, cassettes are deposited onto an output rack on the front of the printer. Up to 7 cassettes can be placed onto the rack at a time. With the included extension tray, output capacity is increased to 17 cassettes.

An exclusive feature of Signature Cas-

sette Printer is that a smaller lab can start with the manual-feed SCP-M. When processing volumes increase they can add the robotics module later. The same SCP-M printer is simply placed on top of the robotics module and connected via a USB communications cable.

Availability

SCP-M is available now worldwide. SCP-R will be available in June 2014. Both are sold and supported by Primera's authorized healthcare distributors and resellers.

- For more information, visit: <http://primera-healthcare.eu>

The Cyborg Era is upon us

Medical implants, complex interfaces between brain and machine or remotely controlled insects: Recent developments combining machines and organisms have great potentials, but also give rise to major ethical concerns. In their review entitled “Chemie der Cyborgs – zur Verknüpfung technischer Systeme mit Lebewesen” (The Chemistry of Cyborgs – Interfacing Technical Devices with Organisms), KIT scientists discuss the state of the art of research, opportunities, and risks. The review is published in the journal “*Angewandte Chemie Int. Ed.*” (doi: 10.1002/ange.201307495).

They are known from science fiction novels and films – technically modified organisms with extraordinary skills, so-called cyborgs. This name originates from the English term “cybernetic organism”. In fact, cyborgs that combine technical systems with living organisms are already reality. The KIT researchers Professor Christof M. Niemeyer and Dr Stefan Giselbrecht of the Institute for Biological Interfaces 1 (IBG 1) and Dr Bastian E. Rapp, Institute of Microstructure Technology (IMT), point out that this especially applies to medical implants.

In recent years, medical implants based on smart materials that automatically react to changing conditions, computer-supported design and fabrication based on magnetic resonance tomography datasets or surface modifications for improved tissue integration allowed major progress to be achieved. For successful tissue integration and the prevention of inflammation reactions, special surface coatings were developed also by the KIT under e.g. the multidisciplinary Helmholtz program “BioInterfaces”.

Brain-machine interfaces

Progress in microelectronics and semiconductor technology has been the basis of electronic implants controlling, restoring or improving the functions of the human body, such as cardiac pacemakers, retina implants, hearing implants, or implants for deep brain stimulation in pain or Parkinson therapies. Currently, bioelectronic devel-

opments are being combined with robotics systems to design highly complex neuroprostheses. Scientists are working on brain-machine interfaces (BMI) for the direct physical contacting of the brain. BMI are used among others to control prostheses and complex movements, such as gripping. Moreover, they are important tools in neurosciences, as they provide insight into the functioning of the brain. Apart from electric signals, substances released by implanted micro- and nanofluidic systems in a spatially or temporarily controlled manner can be used for communication between technical devices and organisms.

BMI are often considered data suppliers. However, they can also be used to feed signals into the brain, which is a highly controversial issue from the ethical point of view. “Implanted BMI that feed signals into nerves, muscles or directly into the brain are already used on a routine basis, e.g. in cardiac pacemakers or implants for deep brain stimulation,” Professor Christof M. Niemeyer, KIT, explains. “But these signals are neither planned to be used nor suited to control

the entire organism – brains of most living organisms are far too complex.”

Biobots

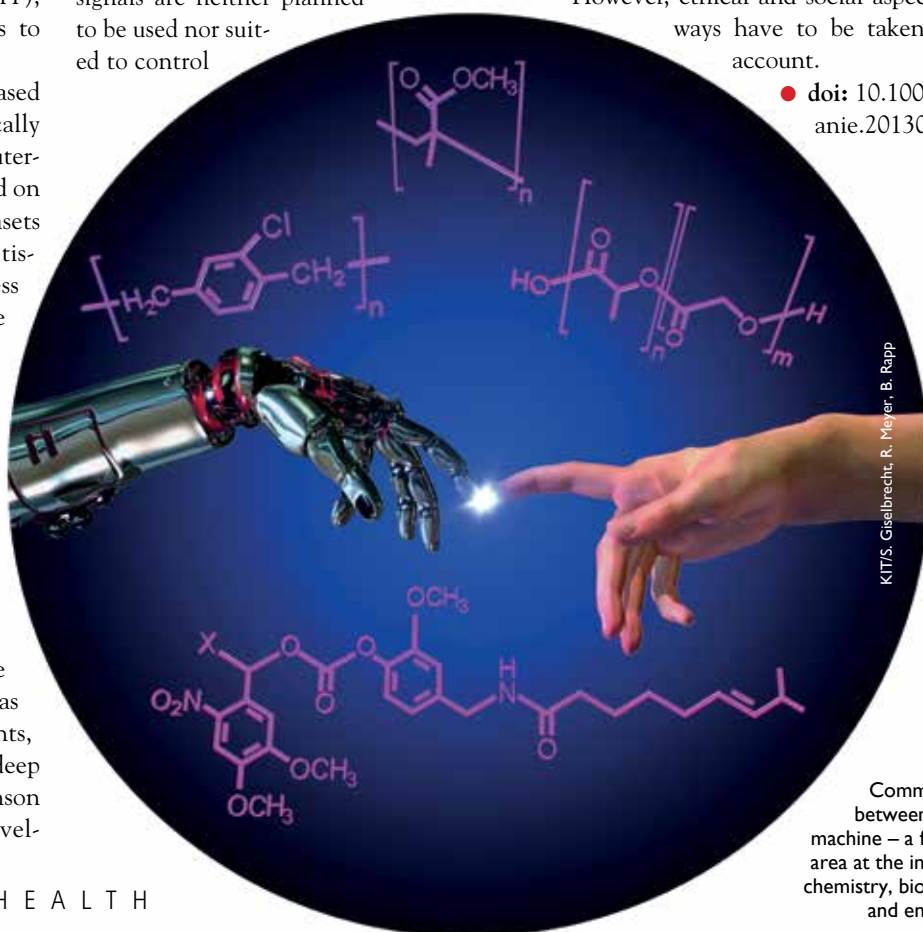
Brains of lower organisms, such as insects, are less complex. As soon as a signal is coupled in, a certain movement program, such as running or flying, is started. So-called biobots, i.e. large insects with implanted electronic and microfluidic control units, are used in a new generation of tools, such as small flying objects for monitoring and rescue missions. In addition, they are applied as model systems in neurosciences in order to understand basic relationships.

Electrically active medical implants that are used for longer terms depend on reliable power supply. Presently, scientists are working on methods to use the patient body’s own thermal, kinetic, electric or chemical energy.

In their review the KIT researchers sum up that developments combining technical devices with organisms have a fascinating potential. They may considerably improve the quality of life of many people.

However, ethical and social aspects always have to be taken into account.

● doi: 10.1002/ange.201307495



KIT/S. Giselbrecht, R. Meyer, B. Rapp

Communication between man and machine – a fascinating area at the interface of chemistry, biomedicine, and engineering.

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ MAY 2014		
1st ACP Saudi Arabia Chapter Congress medicine 2014	11 – 12 May, 2014 Riyadh, KSA	asp-ksa@mci-group.com
Symposium on 'Current Issues in Surgical Pathology'	13 – 14 May, 2014 Riyadh, KSA	garcia@kfshrc.edu.sa
3rd Annual Autism Conf & Workshop	13 – 15 May, 2014 Riyadh, KSA	accaff1_symposia@ngha.med.sa
Saudi Health 2014	19 – 21 May, 2014 Riyadh, KSA	http://www.saudihealthexhibition.com/
1st IMCAN (International Management Conference of Al Noor Hospital)	22 May 2014 Abu Dhabi, UAE	cme@alnoorhospital.com
Iraqi Paediatric Orthopaedic Conference	22 – 24 May, 2014 Erbil, Iraq	toc@theorganizers-iraq.com www.theorganizers-iraq.com
The International Conference On E-Health and TeleMedicine	22 - 24 May 2014 Istanbul, Turkey	http://www.icehtm.net/ coordinator@icehtm.net
Future Health Care – Iraq	26 – 28 May, 2014 Erbil, Iraq	nour.naffi@acm-events.com www.futurehealthcareiraq.com
m-Health Summit Middle East 2014	28 – 29 May, 2014 Abu Dhabi, UAE	http://www.mhealthsummit.me/
4th GCC Hospitals Conf. on Fatal and Horrific Accidents Prevention	28 – 29 May, 2014 Dubai, UAE	www.datamatixgroup.com/conference
Arab Paediatric Medical Congress	29 – 31 May, 2014 Dubai, UAE	http://arabpediatriccongress.com/ info@arabpediatriccongress.com
■ JUNE 2014		
Hospital Build Middle East	2 – 4 June, 2014	http://www.hospitalbuild-me.com/
Emergency Medicine Conference & Exhibition	2 – 4 Jun3, 2014 Dubai, UAE	http://www.emergencyme.com/amedicare
International Workshop on Cardiology and Cardiothoracic Surgery	2 – 4 Jun3, 2014 Dubai, UAE	http://www.emergencyme.com/amedicare
36th Asia Pacific Dental Congress	17 – 19 June, 2014 Dubai, UAE	apdc2014@kenes.com www.apdentalcongress.com
International Congress of Estip	18 – 20 June 2014 Alexandria, Egypt	www.alfamedical.org/events.php
The International Congress of Pediatric Laboratory Medicine	20 – 22 June 2014 Istanbul, Turkey	http://www.icplm2014.org/ grey@univmail.cis.mcmaster.ca icplm2014@mzcongressi.com



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ August 2014		
15th Iranian & Int'l Congress of Microbiology	26 – 28 August, 2014 Tehran, Iran	congress@ismcongress.ir www.ismcongress.ir/en
■ September 2014		
2nd INCAN (International Nursing Conference of Al Noor Hospital)	5 September 2014 Abu Dhabi, UAE	cme@alnoorhospital.com www.incanuae.com
7th Medication Safety Congress	7 – 9 September 2014 Dubai, UAE	info@synovetics.com www.medicationsafetyconference.com
Oman Health 2014	9 – 11 September, 2014 Muscat, Oman	info@omanexpo.com www.omanhealthexpo.com
World Congress on Controversies in Hematology conference	11 – 13 September 2014 Istanbul, Turkey	cohem@comtecmed.com http://www.comtecmed.com
International Conference of The Arab Society for Medical Research (ASMR)	13 – 16 September 2014 Suez, Egypt	http://www.asmr.eg.net/ asmr@asmr.eg.net society_arab@yahoo.com karammahdy@yahoo.com
GCC Pharmaceutical Congress	14 – 16 September 2014 Dubai, UAE	http://gccpharmacongress.com/ info@gccpharmacongress.com
Medical Cities	14 – 16 September 2014 Dubai, UAE	www.medicalcitieslse.com marcusevans.com/
Patient Safety Middle East	16 – 18 September, 2014 Dubai, UAE	info@lifesciences-exhibitions.com http://patientsafety-me.com/
4th IDCAN (International Dental Conference of Al Noor Hospital)	18 – 19 September 2014 Abu Dhabi, UAE	cme@alnoorhospital.com www.idcanuae.com
Turkey Healthcare Exhibition 2014	25 – 26 September, 2014 Istanbul, Turkey	info@oliverkinross.com www.turkeyhealthsummit.com www.oliver-kinross.com
2nd Abu Dhabi Obstetrics, Gynecology, & Midwifery Congress 2014	25 – 26 September 2014 Abu Dhabi, UAE	http://adogc.com/ info@synovetics.com www.synovetics.com
4th Abu Dhabi Advanced Rheumatology Review Course	27 – 29 September 2014 Abu Dhabi, UAE	info@adarrc.org http://www.adarrc.org/
■ October 2014		
3rd IPCAN (International Pharmacy Conference of Al Noor Hospital)	10 October, 2014 Abu Dhabi, UAE	www.ipcanuae.com cme@alnoorhospital.com
Pan GHQ Medical Conference	16 – 18 October, 2014 Dubai, UAE	bkadara@diaedu.com http://www.adpmmc.org/
Clinical Congress And Gulf Chapter Annual Meeting	23 – 25 October 2014 Abu Dhabi, UAE	http://www.aacegulf.org/
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