Middle East HEALTH
Serving the region for 40 years
March-April 2017
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Yemen's health system collapses

- 10 million Yemenis in acute need
- UN calls for assistance

Bioterrorism, Pandemic Warning

Bill Gates says we must prepare for next major pandemic which could kill 30 million

Cervical Cancer

New subset found to have no link to HPV

Strength in the face of adversity

When asked what she wants to be when she grows up, Alanoud answered immediately: "I want to become a doctor," adding "I will not charge people, because people have no salaries now and they can't afford healthcare." At only 12 years old, Alanoud already understands all too well the drastic impact that the current economic crisis in Yemen is having on ordinary people.

Cover photo: Nuha Mohammed/ Norwegian Refugee Council

In the News:

- Mahmoud Fikri appointed Regional Director of WHO EMRO
- Qatar's HMC performs first live liver transplant
- Paradigm shift: Antibodies capable of activating nerves, serve as messengers

Bahrain BD3, Egypt EE40, Iran IRR75, Iraq IQD9,400, Jordan JD5, Kuwait KD3, Lebanon LBP12,000, Oman RO3, Qatar QR30, Saudi Arabia SR30, UAE Dh30, Yemen YR1,600

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Prognosis

Pandemic warning

In February, Bill Gates issued a dire warning about the threat of bioterrorism and pandemics in a speech to the 53rd Munich Security Conference. Over the past decade or so, the philanthropist has donated a large proportion of his enormous wealth to healthcare, specifically vaccine development. Having worked closely with stakeholders in this field for many years, he can speak with authority on the subject of disease and the danger of pandemics.

At the conference, he issued a wake-up call, warning that "we ignore the link between health security and international security at our peril". He reckons the next pandemic could kill more than 30 million people in less than a year and points out there is a reasonable probability the world will experience such an outbreak in the next 10-15 years. Because this speech is so important – in which he offers a number of proposals to try mitigate such a deadly event – we publish it in full in this issue of *Middle East Health*.

Yemen's health system has all but collapsed and there are now more than 10 million Yemenis in acute need. In February, the UN issued an international appeal for desperately needed assistance. We hope it does not fall on deaf ears, particularly when set against simultaneous humanitarian crises in Africa and the Middle East. Read the Yemen report in this issue – and donate if you can.

We attended the vast Arab Health exhibition in Dubai in January and spoke to many exhibitors. It is always fascinating to see the progress in medical technology year to year which is so apparent at this event. In our review, we publish some of the interviews we conducted. You will find more in the next as well.

In our focus on oncology, we look at select new research in this field that has been recently published. Of interest is the identification of a cervical cancer subset that has no link to the human papillomavirus.

As in every issue we publish a wide array of medical news, interviews and product reviews. Read on and be informed.

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middle east monitor

Update from around the region

Dr Mahmoud Fikri, new Regional Director of WHO EMRO

Mahmoud Fikri appointed Regional Director of WHO EMRO

The World Health Organization's Executive Board, at its 140th session in Geneva, has appointed Dr Mahmoud Fikri, from United Arab Emirates, as WHO Regional Director for the Eastern Mediterranean Region (EMRO), following his nomination by the Regional Committee for EMRO in October last year. Dr Fikri took up his appointment for a five-year term on 1 February 2017.

Before the appointment, Dr Fikri was adviser to the Minister of Health of United Arab Emirates and was previously the Assistant-Undersecretary for Preventive Medicine and Health Policies Affairs in the Ministry (1995-2013). He served as a Member of the Board of Directors of the WHO Centre for Health Development, "WHO Kobe Centre", Japan and a Member of the Advisory Board of the Gulf Health Council for Cooperation Council States (1996-2005). He was also a Member of the WHO Executive Board from 1997 to 2000.

For the last 19 years, Dr Fikri has been either a Member or the Head of UAE's Ministry of Health (MoH) Delegation to WHO's Health Assembly and the Regional Committee for EMRO.

Dr Fikri was a Member of the Pandemic Influenza Preparedness (PIP) Advisory Group during the period 2008-2011 when the open–ended working group of Member States worked to finalize the PIP Framework for sharing Influenza Viruses and Access to Vaccines and other Benefits.

He was responsible for upgrading and adapting the National Immunization Programme of UAE in line with the Expanded Programme of Immunization (EPI) of WHO. Due to these efforts, the United Arab Emirates has achieved polio and malaria-free status.

Dr Fikri was a Member of the UAE Ministry of Foreign Affairs Standing Committee entrusted with the follow-up of the Universal Periodic Review of the Human Rights report (2009-2013) and a Member of the UAE National Committee to Combat Human Trafficking (2007-2013).

He was Head of UAE MoH delegation to the UN High-level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases (NCD) (2011).

Dr Fikri graduated in medicine and surgery from Ain Shams University, Cairo, Egypt in 1979. He holds a Diploma in Tropical Medicine and Hygiene from Liverpool School. He is a Member of the faculty of Public Health Medicine of the Royal College of Physicians UK and holder of a PhD in Medicine from the University of Medicine and Pharmacy Carol Devila, Romania.

WHO EMRO comprises the following Member States: Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

GE Healthcare selected to provide tech for Kuwait hospital program

A partnership between GE Healthcare and Advanced Technology Company (ATC) has been selected as the key medical technology provider for five new Ministry of Health hospitals in Kuwait as part of the Ministry's strategic healthcare infrastructure modernization plan.

The new partnership, announced at Arab Health 2017, will provide a range of healthcare technologies, including healthcare IT systems, CT and MRI devices, to modernize the current infrastructure at Al-Razi Hospital, Sabah Hospital, Kuwait Cancer Hospital, Farwaniya Hospital, and Jahra Hospital.

The new facilities will help Kuwait to address the increasing incidence cardiovascular disease, diabetes and cancer. They will also be able to offer specialized treatments to the local and expatriate population of over four million, helping to reduce the national healthcare bill over time by reducing the number of outbound patients.

In total, the Government of Kuwait will invest several billion dollars over three years to construct nine hospitals, in an overhaul of the country's healthcare sector as part of the over KD 31 billion (US$102.9 billion) Kuwait Development Plan (KDP). Over 3,334 hospital beds are expected to be added to the country with 15,000 jobs created during the program.

Sabah Hospital and Jahra Hospital are due to open in 2018, with the remaining three, served by the GE/ATC partnership, due to be completed by 2019. These five hospitals will initially create 3,000 extra patient beds in Kuwait.

The Sabah Hospital contract includes the supply of diagnostic imaging, ultrasound and healthcare IT as well as the first surgical MRI, GE's SIGNA Architect, in the Middle East region. This device is a 3.0T MRI system, premium wide bore scanner that features the eXpress detachable table that delivers feet-first or head-first imaging.

The contract for Jahra Hospital will equip the new facility with all these technologies and an integrated, simultaneous PET/MR system, GE's SIGNA PET/MR.

Qatar's first liver transplant from living donor performed at Hamad General Hospital

The Organ Transplant Team at Hamad Medical Corporation's (HMC) Hamad General Hospital has successfully performed Qatar's first ever liver transplant from a living donor, HMC announced in January.

According to HMC, each year, between 20 and 25 patients are added to the waiting list for organ transplantation in Qatar.

The surgical team that performed Qatar's first live liver transplant.

Dr Yousef Al Maslamani, Medical Director of Hamad General Hospital and Head of the Organ Transplant Committee at HMC, said: "The transplant was planned and performed by HMC's highly qualified team of liver transplant surgeons, anesthetists, nurses and technicians. The procedure consisted of the partial resection of the donor's liver, which took eight hours to complete, and the removal of the recipient's liver. Implanting the donated portion of the liver in the recipient's body who suffered from liver cirrhosis took 12 hours to complete. This successful transplant procedure also saw the participation of a team of visiting Korean organ transplant surgeons."

"There are plans to increase liver transplants in Qatar from live and brain-dead donors. HMC's Qatar Center for Organ Transplantation and the Qatar Organ Donation Center (Hiba) are relentless in their efforts to encourage new organ donors to enroll in the donor registry, with the ultimate goal of helping patients who are currently awaiting a lifesaving transplant," added Dr Al Maslamani.

Dr Hatem Khalaf, Senior Consultant and Clinical Lead of HMC's HPB and Liver Transplant Services, who led the local transplant team, said: "There are certain criteria that both a donor and recipient should meet before a procedure can be done. The criteria for the donor include motivation to donate the organ for altruistic reasons, verification of the relation of donor to the recipient, compatibility of blood type with the recipient and being between the ages of 18 and 45 and free from chronic diseases."

"Following these criteria being verified, a series of preoperative tests are performed to determine if a donor is medically suitable for the procedure. These tests include x-rays and ultrasound imaging to assess the size of the liver, and a liver biopsy. A psychosocial and social evaluation of the donor are also conducted by a competent committee from Hiba," said Dr Khalaf.

"In the case of this recent transplant, the right lobe of the donor's liver, totaling 65 percent of the liver mass, was resected and implanted in the recipient's body, following the removal of the cirrhosis-ridden liver. The donor recovered and was discharged from hospital one week after the procedure. The recipient remained under the care of HMC for two weeks and was then discharged," explained Dr Khalaf.

Al Jalila Foundation funds osteoporosis study in UAE

Al Jalila Foundation, a philanthropic organisation dedicated to transforming lives through medical education and research has launched 'Together Against Osteoporosis' -- the first osteoporosis research study of its kind in the United Arab Emirates.

The study, to be conducted by Dubai Bone & Joint Center, will investigates the prevalence of osteoporosis and vitamin D deficiency in the UAE, as well as the correlation of vitamin D, diabetes mellitus and other risk factors with bone mineral density.

The study will be conducted over a 24-month period and aims to asses a total of 2,500 participants.

Gargash Enterprises has donated two fully equipped Mercedes-Benz Sprinter vans to facilitate the research and enable Dubai Bone & Joint Center to screen people to promote early detection and prevention of the disease.

Dr Abdulkareem Sultan Al Olama, Chief Executive Officer, Al Jalila Foundation said: "Vitamin D deficiency has become a global health concern. Studies have shown that insufficient levels of Vitamin D can lead to a number of chronic illnesses and life-threatening diseases. As UAE's 'Year of Giving' kicks off we are grateful to Gargash Enterprises for their support and look forward to working together on this important study to advance medical research, improve patients' lives and contribute to a healthier and happier nation."

Osteoporosis is preventable and treatable, however, many people are not diagnosed in time to receive effective therapy during the early phase of the disease.

● Al Jalila Foundation is fully funded by the generosity of donors – *www.aljalilafoundation.ae*

HMC wins prestigious international nursing awards

Hamad Medical Corporation (HMC) has won the 2016 NDNQI Award for Outstanding Nursing Quality by Press Ganey Associates. HMC won awards for both its Mental Health Service and Rumailah Hospital.

Selected from over 1,900 hospitals affiliated with the National Database of Nursing Quality Indicators (NDNQI), HMC was the only award recipient located outside of the United States and is among an elite group of six hospitals that received the national award for 2016 during a ceremony held last month in Orlando, Florida.

Ms. Hoda Salam Nakhla and Ms. Deborah Nelson, Mental Health Service, HMC, with their NDNQI award.

Ms. Ghaya Al Tamimi and Dr. Steven Beaumont, Rumailah Hospital, HMC, with their NDNQI award.

The NDNQI Award for Outstanding Nursing Quality is bestowed annually to the best performing hospital in each of six categories: academic medical center, teaching hospital, community hospital, pediatric hospital, rehabilitation hospital and psychiatric hospital. In order to be eligible for the award, hospitals must have submitted data on a minimum number of measures in 2015.

Ghaya Al Tamimi, Director of Nursing at Rumailah Hospital, said: "I am extremely glad and proud that we have received this award. This award represents the high-quality care that patients at Rumailah Hospital receive from a group of dedicated nurses."

Nurses have a real and significant impact on their patients' healthcare experience and these awards are a celebration of HMC's nursing staff and the work they do on a daily basis.

Hoda Salam Nakhla, Acting Director of Nursing with HMC's Mental Health Service, said the award is an important achievement for HMC and its patients.

"It is an honor to receive this prestigious award and the momentum within the mental health nursing team is very high because of this international recognition," said Nakhla.

40,000 health workers provide polio immunisation in Yemen

On 20 February, national health authorities with support from WHO and UNICEF launched a nationwide polio immunisation campaign in Yemen, aiming to immunise 5,019,648 children under the age of 5.

More than 40,000 health workers took part in the 3-day campaign. In addition, religious and local council's officials, as well as health educators provided support for the campaign. High-risk groups, such as internally displaced persons (IDPs) and refugees, were also expected to be vaccinated.

"WHO is working closely with UNICEF and health authorities to keep Yemen polio-free. The threat of virus importation is serious and this campaign aims to curb any possible return of the virus to Yemen," said Dr Nevio Zagaria, WHO Acting Representative in Yemen.

This is the first polio immunisation campaign since April 2016. The security situation in Yemen has limited accessibility of many parts of the country, leaving many children at risk of vaccine preventable diseases.

HMC's new trauma centre to be one of largest in the region

The construction of a new trauma and emergency center at Hamad Medical Corporation (HMC) will enable a significant expansion of these services in Qatar. The trauma and emergency facility, scheduled to open in 2019, will more than quadruple the existing department's space, making it one of the largest such facilities in the region. It will provide greater capacity to care for patients presenting with a range of illnesses and injuries, with a focus on life-threatening medical conditions, according to a statement by HMC.

"Qatar's population has grown significantly in recent years, resulting in increasing numbers of patients relying on our trauma and emergency services," said Hamad Al Khalifa, HMC's Chief of Healthcare Facilities. "The new facility represents a substantial investment in the provision of leading edge, best practice emergency care and reinforces HMC's commitment to providing the people of Qatar with high quality, world class facilities and healthcare."

Located in front of the existing Emergency Department at Hamad General Hospital, the new trauma and emergency facility will be housed on four floors and will accommodate 226 patient stations. A full range of diagnostic and treatment facilities will be provided, with enhanced operational links to adjoining buildings for efficient transfer of patients, including a direct link to the new operating theater facility and the Trauma Intensive Care Unit at Hamad General Hospital.

Public drop-offs will be located on the ground floor level and ambulance drop-off facilities on the upper level. A dedicated ambulance ramp will separate public and emergency traffic movement and will ensure rapid transfer of patients.

The Emergency Department at Hamad General Hospital had over a million patient visits last year, according to HMC. In recent years, the Department has witnessed a steady increase in the number of patients treated, including pediatric emergency cases. MEH

worldwide monitor

Update from around the globe

WHO launches new data portal to track universal health coverage

The World Health Organization has launched a new data portal to track progress towards universal health coverage (UHC) around the world. The portal shows where countries need to improve access to services, and where they need to improve information.

The portal features the latest data on access to health services globally and in each of WHO's 194 Member States, along with information about equity of access. Next year WHO will add data on the impact that paying for health services has on household finances.

"Any country seeking to achieve UHC must be able to measure it," said Dr Margaret Chan, Director-General of WHO. "Data on its own won't prevent disease or save lives, but it shows where governments need to act to strengthen their health systems and protect people from the potentially devastating effects of healthcare costs."

UHC means that all people and communities can access the health services they need without facing financial hardship. So countries aiming to provide UHC need to build health systems that deliver the quality services and products people need, when and where they need them, through an adequately resourced and well-trained health workforce.

The ability to provide strong primary health care services at community level is essential to make progress towards universal health coverage.

Last year, the world's governments set themselves a target to achieve UHC by 2030 as part of the Sustainable Development Goals (SDGs). UHC is not only essential to achieving the health-related targets, it will also contribute to other goals such as no poverty (Goal 1), and decent work and economic growth (Goal 8).

In November, the United Nations working group responsible for deciding how to monitor progress towards the SDGs agreed on two measures for UHC: the proportion of a population with access to 16 essential health services; and the proportion of a population that spends more than 25% of household income on health. WHO's new UHC Data Portal offers data on both indicators in a single place, offering an initial snapshot of the status of UHC globally and by country.

> Data on its own won't prevent disease or save lives, but it shows where governments need to act to strengthen their health systems and protect people from the potentially devastating effects of healthcare costs.

The portal shows that:

- Less than half of children with suspected pneumonia in low income countries are taken to an appropriate health provider.
- Of the estimated 10.4 million new cases of tuberculosis in 2015, 6.1 million were detected and officially notified in 2015, leaving a gap of 4.3 million.
- High blood pressure affects 1.13 billion people. Over half of the world's adults with high blood pressure in 2015 lived in Asia. Around 24% of men and 21% of women had uncontrolled blood pressure in 2015.
- About 44% of WHO's member states report having less than 1 physician per 1000 population. The African Region suffers almost 25% of the global burden of disease but has only 3% of the world's health workers.

"Expanding access to services will involve increasing spending for most countries," said Dr Marie-Paule Kieny, WHO's Assistant Director-General for Health Systems and Innovation. "But as important as what is spent is how it's spent. All countries can make progress towards UHC, even at low spending levels."

on the WEB UHC Data Portal
http://apps.who.int/gho/cabinet/uhc.jsp

85% of cervical cancer deaths occur in low and middle income countries

Noting that cervical cancer kills more than 250,000 women every year and that 85% of these deaths occur in low- and middle-income countries, the United Nations health agency underlined the importance of vaccinating girls against the cancer-causing virus and screening programmes to detect and treat precancerous lesions.

The agency also stressed the need to overcome cultural norms and dispel gender biases that are challenging the effectiveness of vaccination initiatives.

"In high-income countries, widespread screening has radically reversed the trends, and cervical cancer incidence and mortality have declined sharply [with] the impact of vaccination in reducing human papillomavirus (HPV)-related diseases is already being documented," said the World Health Organization's International Agency for Research on Cancer (IARC).

"But in developing countries, where the burden of the disease is heaviest, cervical cancer control is often not seen as a priority within tight health budgets, and women are not given life-saving access to adequate prevention and treatment," it added.

While HPV vaccination has shown it can protect women from chronic infection caused by HPV16 and HPV18 (the two main types of the virus known to cause cervical cancer, vaccination programmes have not been implemented nationally in many low- and middle-income countries in Asia and Africa.

As a result, women are left vulnerable to the risk of developing cervical disease, which – given the inadequacy of screening and treatment services in many countries – is likely to go untreated.

"Unless we act rapidly, thousands of women will develop cervical cancer because they are not vaccinated," says Rolando Herrero, head of Early Detection and Prevention Section at the IARC.

"In countries where early detection and screening are difficult to implement due to a lack of proper infrastructure, vaccination has a vital role to play in protecting women from cervical cancer," he added, urging

government commitment to implement HPV vaccination regimes.

Also, in some regions, cultural norms and fear that "vaccination would promote sexual activity" is also a barrier in vaccinating young girls as are low schooling rates, which can limit the reach of immunization programmes, which often take place in schools.

On top of these hurdles, "gender bias" and perception that "women are a less important population to invest in" in many countries is making matters much worse.

"It is vital that governments address these barriers," said Rengaswamy Sankaranarayanan, Special Advisor on Cancer Control and Head of IARC's Screening Group, stressing: "In many countries, women are often the only breadwinners, and therefore protecting them is of huge human and economic importance."

Drawing attention to the need to make vaccines cheaper, particularly for the development world, to step up vaccination coverage, IARC Director Christopher Wild stressed: "Competition between potentially new and existing vaccine manufacturers is urgently needed in order to reduce costs and enable countries to better protect women against cervical cancer."

UN calls for commitment to stop FGM

Female genital mutilation denies women and girls their dignity and causes needless pain and suffering, with consequences that endure for a lifetime and can even be fatal, United Nations Secretary-General António Guterres has said, stressing that the UN Sustainable Development Agenda promises an end to this practice by 2030.

"On this Day of Zero Tolerance, let us build on positive momentum and commit to intensifying global action against this heinous human rights violation for the sake of all affected women and girls, their communities and our common future," the Secretary-General said in a message on the International Day, marked annually on 6 February to strengthen momentum towards ending the practice of female genital mutilation, globally recognized as a violation of the human rights of girls and women.

Despite a significant an overall decline in the prevalence of the practice, widely referred to by the acronym FGM, the United Nations warns that this progress is likely to be offset as the population grows in countries where female genital mutilation is practiced, and without beefed up efforts to eliminate it, more girls will be cut.

In a blog post on the occasion of the International, Phumzile Mlambo-Ngcuka, the Executive Director of UN Women, wrote: "The cutting and sewing of a young child's private parts so that she is substantially damaged for the rest of her life, has no sensation during sex except probably pain, and may well face further damage when she gives birth, is to many an obvious and horrifying violation of that child's rights."

"It is a kind of control that lasts a lifetime," she continued. "It makes a mockery of the idea of any part being truly private and underlines the institutionalized way in which decisions over her own body have been taken from that girl – one of some 200 million currently."

The main reason that FGM continues – as it does in some 30 countries across three continents – is out of a desire for social acceptance and to avoid social stigma, according to a 2016 report by the Secretary-General.

"The hidden nature of the support for ending the practice slows down the process of abandonment," the authors wrote.

Underlining that the Sustainable Development Goals (SDGs), adopted in 2015 and now heading their second year of implementation, recognized the close connection between FGM, gender inequality, and development – and reignited global action to end the practice by 2030, heads of UN Children's Fund(UNICEF) and UN Population Fund (UNFPA) called for faster action to achieve this commitment.

"It means creating greater access to support services for those at risk of undergoing FGM and those who have survived it," said Anthony Lake, UNICEF Executive Director and Babatunde Osotimehin, UNFPA Executive Director.

"It also means driving greater demand for those services, providing families and communities with information about the harm FGM causes – and the benefits to be gained by ending it," they added

Calling on governments to enact and enforce laws and policies that protect the rights of girls and women and prevent FGM, they urged everyone to make this the generation that abolishes FGM once and for all – and in doing so, helps create a healthier, better world for all.

UNFPA, jointly with UNICEF, leads the largest global programme to accelerate the abandonment of FGM. The programme currently focuses on 17 African countries and also supports regional and global initiatives.

WHO, partners move to 'green' procurement of health commodities

WHO joined other international agencies in signing a Statement of Intent to align and "green" procurement of health commodities, in an effort to protect the environment and contribute to sustainable development.

"We need to make sure that when international organizations procure health commodities, we promote responsible consumption and production patterns and support the Sustainable Development Goals," said Dr Margaret Chan, WHO Director-General, in signing the joint statement at WHO Headquarters in Geneva.

WHO and its sister UN agencies collectively procure an estimated US$3 billion in health commodities each year. UN agencies procure significant amounts of generic anti-retroviral therapies (ARTs), anti-malaria drugs and insecticide-impregnated bed nets, anti-TB medicines and condoms as well as certain vaccines. Additional health commodities procured include medical and laboratory equipment and consumables.

The new agreement sends an important message to suppliers and manufacturers of health commodities that purchasers will

increasingly be looking for environmentally and socially sourced health commodities, particularly those within the international health development sector.

WHO and the other signatories have agreed to reflect this common commitment to advancing environmental and socially responsible procurement as part of their standard engagement with suppliers and manufactures. They will also include it in their institutional strategies and policies.

Future of health care needs global standardization of care

"The management and delivery of healthcare in the hospital of the future will be driven by big data and powered by artificial intelligence and this trend is going to get bigger and better," according to the panel of experts that discussed the 'Hospital of the Future' at the 47th Annual Meeting of the World Economic Forum in Davos in January.

The panelists in the discussion included Dr Shamsheer Vayalil, Founder & Managing Director of VPS Healthcare; Sean Duffy, Co-founder & CEO of Omada Health; Dr Elizabeth Nabel, President of Brigham and Women's Healthcare; Thomas DeRosa, CEO of Welltower USA; Sarah Doherty, Co-founder & Chief Technology Officer of TeleHealthRobotics and Dr David B. Agus, Professor of Medicine & Engineering at the University of Southern California.

Noting significant transformations affecting the world and the advances made in healthcare, the panel was tasked to find answers about the emerging technologies that would impact the way of healthcare delivery in the future.

Dr Shamsheer said: "As almost every expert agrees, data is the new oil, the new currency and the healthcare industry is already using this and moving towards a sustainable, accessible and affordable delivery model."

With advances in technology, it is imperative that digital health records be standardized. The interoperability of data is going to play a major role in the future of healthcare delivery.

"We would like to take healthcare delivery systems in to the homes and in to the communities as much as possible because we believe we can deliver better care at lower costs. If you believe in value-based healthcare, we believe that outcomes will be better delivered in the homes and communities rather than hospitals," said Dr Elizabeth Nabel.

The healthcare industry has been a bit slower to embrace the digital revolution compared to others. There is a lack of uniformity across technology systems and these self-created silos are creating confusion, errors, redundancy, missed opportunities, and waste.

"The healthcare industry is very risk averse because of the issues of quality and safety. There has to be some disruption in the industry and I believe the disruption in healthcare will come from outside the industry because we still tend to think very conventionally. We need to come up with new ideas, new technologies that will lead to disruptions. We need a change across the globe, a change which can make things work," added Dr Shamsheer.

Digitization continues to be at the heart of change in healthcare delivery and has led to the introduction of complex technical systems across the globe.

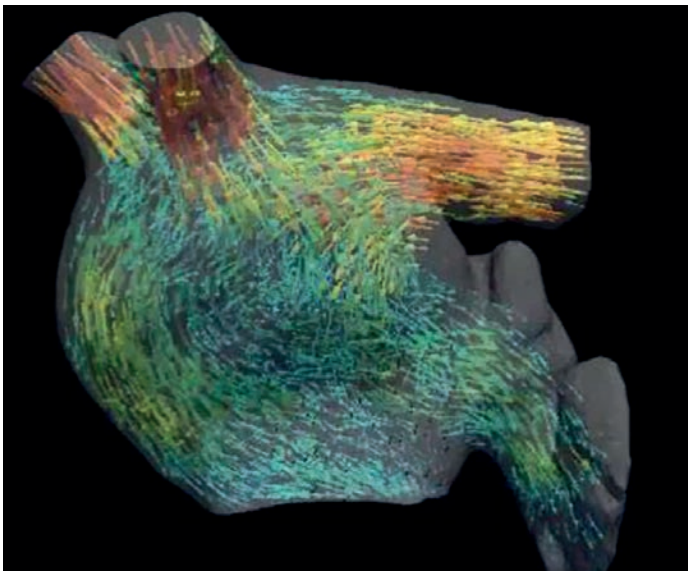
"Privacy is going to be a big issue because of cyber security. We need to encrypt data. As we know, a single stolen EHR is valued at 100 times that of a stolen credit card, so we need to be careful about online security," said Dr Shamsheer.

"It is an exciting time to be in healthcare. Medicine is becoming more democratized and patients are already pushing health systems to innovate and to collaborate with them," said Sean Duffy.

"The hospital of the future will only be used for catastrophic care with individuals using the quantified self with sophisticated artificial intelligence and predictive analytics to create the best possible scenarios for their health. I am excited to be a part of this brave new world and believe that a broad-based revolution in healthcare is just on the horizon," added Dr Shamsheer. MEH

the laboratory

Medical research news from around the world



Corkscrew-like flow of blood in left atrium may lower risk of stroke

Using specialized CT scans of a healthy heart and one with heart disease, a team of Johns Hopkins cardiologists and biomedical engineers say they've created computer models of the "shape" of blood flow through the heart's upper left chamber that someday may help predict stroke risk.

Specifically, their computer visualizations found that blood in the diseased heart failed to flow in corkscrew-like "eddies" that most effectively moved blood out of the left atrium in the healthy heart. "It showed us exactly how this motion would increase the risk of developing a blood clot," says Hiroshi Ashikaga, M.D., Ph.D., assistant professor of medicine and member of the Heart and Vascular Institute at the Johns Hopkins University School of Medicine.

The researchers say the same fluid motion analysis used in their two-heart proof-of-concept study may one day offer an accurate way to predict stroke risk in people with heart disease marked by enlargement and weakness of the cardiac muscle.

A description of the study and its results was published in the November 2017 print issue of *Annals of Biomedical Engineering*.

"By looking at blood flow through the atrium, we think we can accurately assess stroke risk better than such risk factors as heart size and pumping strength," says Ashikaga. "Our study fills in a missing diagnostic link between heart function and fluid motion in our understanding of how each can affect stroke risk."

Before this study, Ashikaga notes, researchers knew that enlargement of the heart, particularly the left upper chamber, was linked to increased stroke risk, particularly in people with atrial fibrillation.

The new study, Ashikaga says, sheds significant light on just how an enlarged and "floppy" atrium led to blood clot formation.

Using CT scans of a healthy heart and an enlarged heart to create blood flow models, the researchers were able to visualise the blood flow. In the healthy heart, the researchers saw that the blood flow formed into tight, corkscrew-like motions that circled around into doughnut formations, known as vortexes. The researchers say the vortexes helped move the blood efficiently through the atrium quicker and with less contact with the atrium's surface tissue.

The diseased heart they chose to examine was enlarged due to overuse, muscle fatigue and scarring, all of which can promote atrial fibrillation.

In the enlarged heart, the researchers noticed that at the top of the atrium, the blood never fully forms the corkscrews that loop around into vortexes. Instead, by the time the blood reaches the bottom of the atrium, it seems to be falling in "sheets" that coat the surface of the heart.

"As the blood comes in contact with the atrium's surface, it slows down due to shearing forces similar to friction, and this appears to prevent the blood from exiting the chamber as smoothly as it might," says Ashikaga. "The slower the blood moves and the more contact it has with the atrium, the more risk there is for a clot to form."

Ashikaga says his team is currently conducting a larger long-term study looking at the blood flow of many more people with normal and ailing hearts, and monitoring the incidence of stroke and other signs of blood clots over time.

doi: 10.1007/s10439-016-1590-x

Paradigm shift: Antibodies capable of activating nerves, serve as messengers

Antibodies are able to activate human nerve cells within milliseconds and hence modify their function. This is the surprising conclusion of a study carried out at Human Biology at the Technical University of Munich (TUM). This knowledge improves our understanding of illnesses that accompany certain types of cancer, above all severe intestinal malfunctions.

Functional disorders in organs that manifest in conjunction with tumours are called paraneoplastic syndromes. These syndromes are not caused by the primary tumour itself, but are instead frequently a result of the body's autoimmune reaction. In such cases, a person's own antibodies turn against their own cells and attack them.

One of these functional disorders is paralysis of the intestinal tract, for example intestinal pseudoobstruction. It makes it difficult for patients to obtain the nutrients and calories they require from their diet. The so-called anti-Hu syndrome is a type of paraneoplastic syndrome often associated with atonic gut and generally occurs in conjunction with small-cell lung cancer. Paraneoplastic syndromes often occur before the tumour is even detected.

Hu proteins are usually located in the nucleus of all nerve cells and consist of four family members (HuA, B, C, and D). Because the tumour releases the Hu protein, the immune system generates antibodies to fight it. Initially, they

serve to defend against the tumour: The greater the concentration of antibodies, the slower the tumour grows. However, these anti-Hu antibodies – named after the first patient in whom these antibodies were discovered in 1985 – also result in an autoimmune reaction with severe gut disorders as an accompanying illness.

Professor Michael Schemann and his colleagues at the Chair for Human Biology at TUM wanted to identify causes for possible nervous function disorders that occur in paraneoplastic syndromes and paralytic intestine. For this purpose, they examined serums from patients with small-cell lung cancer from the Mayo Clinic in Rochester, MN (USA). In a study conducted over a period of ten years, the researchers were able to show for the first time that these patient serums activate human nerve cells within milliseconds without causing neuronal damage. This modifies nerve functions long before the autoimmune reaction damages the nerves.

Working together with the company Euroimmun from Lübeck, the team was even able to identify the factor responsible for this: Normally, nerve cells are activated or inhibited via neurotransmitters that bind to specific structures in the cell membrane (receptors). Surprisingly, it turned out to be an antibody – namely the anti-HuD antibody – which stimulated the nerve cells in the patient serums.

What was striking about this finding was the fact that the antibody does not achieve this effect binding to its genuine target protein. "Interestingly, the nerve-activating effect is transmitted via receptors for neurotransmitters," said Prof Schemann. "These receptors are usually activated by acetylcholine and adenosine triphosphate." In a nutshell, the antibody more or less mimics the effects of the neurotransmitters acetylcholine and adenosine triphosphate.

The HuD protein typically stabilizes ribonucleic acid (RNA) and has nothing to do with nerve activation. How and where exactly the anti-HuD antibody binds to the receptors continues to remain a black box. However, this newly discovered effect of the anti-HuD-antibody heralds a paradigm shift, according to Prof Schemann, because antibodies are able to activate nerves regardless of antibody-specific binding structures on the cell membrane.

"Although what we have found will not heal lung cancer itself," Prof Schemann explained, "it will lead to new clinical understanding and hence hopefully to new therapeutic approaches for related paraneoplastic syndromes such as intestinal pseudoobstruction."

Just recently, the research group at the Chair for Human Biology, in collaboration with the Charité in Berlin, demonstrated that antibodies are able to activate human nerves. In this case, the functional principle was obvious, as the binding of the antibody to defined structures of a potassium channel modified the excitability of the nerves.

● **doi:** 10.1038/srep38216

Children of obese parents at risk of developmental delays

Children of obese parents may be at risk for developmental delays, according to a study by researchers at the National Institutes of Health. The investigators found that children of obese mothers were more likely to fail tests of fine motor skill – the ability to control movement of small muscles, such as those in the fingers and hands. Children of obese fathers were more likely to fail measures of social competence, and those born to extremely obese couples also were more likely to fail tests of problem solving ability.

The study, appearing in *Pediatrics*, was conducted by scientists at the US NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD).

"The previous U.S. studies in this area have focused on the mothers' pre- and post-pregnancy weight," said the study's first author, Edwina Yeung, Ph.D., an investigator in NICHD's Division of Intramural Population Health Research. "Our study is one of the few that also includes information about fathers, and our results suggest that dad's weight also has significant influence on child development."

In the study, authors reviewed data collected from the Upstate KIDS study, which originally sought to determine if fertility treatments could affect child development from birth through age 3. More than 5,000 women enrolled in the study roughly 4 months after giving birth in New York State between 2008 and 2010. To assess development, parents completed the Ages and Stages Questionnaire after performing a series of activities with their children. The test isn't used to diagnose specific disabilities, but serves as a screen for potential problems, so that children can be referred for further testing.

Children in the study were tested at 4 months of age and retested 6 more times through age 3. When they enrolled, mothers also provided information on their health and weight – before and after pregnancy – and the weight of their partners.

Compared to children of normal weight mothers, children of obese mothers were nearly 70% more likely to have failed the test indicator on fine motor skill by age 3. Children of obese fathers were 75% more likely to fail the test's personal-social domain – an indicator of how well they were able to relate to and interact with others by age 3. Children with two obese parents were nearly three times more likely to fail the test's problem solving section by age 3.

It is not known why parental obesity might increase children's risk for developmental delay. The authors note that animal studies indicate that obesity during pregnancy may promote inflammation, which could affect the foetal brain. Less information is available on the potential effects of paternal obesity on child development. The authors added that some studies have indicated that obesity could affect the expression of genes in sperm.

If the link between parental obesity and developmental delays is confirmed, the authors wrote, physicians may need to take parental weight into account when

screening young children for delays and early interventional services.

Transcaval access for aortic valve replacement in high-risk patients

Researchers at the National Institutes of Health have developed a new, less invasive way to perform transcatheter aortic valve replacement (TAVR), a procedure widely used to treat aortic valve stenosis, a lethal heart condition. The new approach, called transcaval access, will make TAVR more available to high risk patients, especially women, whose femoral arteries are too small or diseased to withstand the standard procedure. The *Journal of the American College of Cardiology* published the findings.

Aortic valve stenosis involves the narrowing of the heart's aortic valve which reduces blood flow through the heart. For about 85 percent of patients with this condition, doctors typically perform TAVR through the femoral artery in the leg. But for the other 15%, doctors must find a different access route. The most common alternative routes are through the chest, which requires surgery and are associated with significantly more complications.

Transcaval access, which can be performed in awake patients, involves electrifying a small wire so that it crosses between neighbouring blood vessels in the abdomen. The technique calls for making large holes in both the abdominal aorta and the inferior vena cava, which physicians previously considered dangerous because of the risk of fatal bleeding.

The new method was developed by researchers at the US National, Heart, Lung and Blood Institute (NHLBI) and tested in a trial on 100 patients at 20 hospitals across the United States. Researchers said it proved successful in 99 of the patients.

"This is a seminal study," said the lead author, cardiologist Adam B. Greenbaum, M.D., co-director of the Henry Ford Hospital Center for Structural Heart Disease, Detroit. "It challenged conventional wisdom, which objected to the idea of safe passage between the vena cava and the aorta. More important, it is the first of many non-surgical minimally-invasive tissue-crossing, or so-called transmural catheter procedures developed at NIH that can be applied to diverse fields of medicine."

Robert J. Lederman, M.D., a senior investigator in NHLBI's Division of Intramural Research who led the study, said researchers developed the method to address a specific clinical need, even though they knew it would be a challenging proposition for most surgeons and physicians to accept. The proposed and counterintuitive mechanism of action is that bleeding from the aorta spontaneously decompresses into a corresponding hole the physician makes in the vein, because the surrounding area behind the peritoneum has higher pressure than the vein.

The results of the research, which were independently confirmed by a committee of outside cardiologists, show the procedure not only has a high success rate, but also an acceptable rate of bleeding and vascular complications, particularly in the high risk patients studied. The study builds on the access technique that Lederman's NHLBI team developed and first tested in animals in 2012 and first applied with Henry Ford physicians to help patients in 2013. NHLBI and its collaborators are now working to find ways to train more specialists to perform the procedure.

doi: 10.1016/j.jacc.2016.10.024

Gastric bypass helps severely obese teenagers maintain weight loss over long term, with side-effects

Gastric bypass surgery helps severely obese teenagers lose weight and keep it off, according to the first long-term follow-up studies of teenagers who had undergone the procedure 5-12 years earlier. However, the two studies, published in *The Lancet Diabetes & Endocrinology*, show some patients will likely need further surgery to deal with the complications of rapid weight loss or may develop vitamin deficiencies later in life.

Severe obesity is classified as having a BMI of 40 or over. Obesity causes ill health, poor quality of life and cuts life expectancy.

The studies are the first to look at long-term effects of gastric bypass surgery in teenagers. Until now, it has been unclear how successful the surgery is in the long-term and whether it can lead to complications. Despite this thousands of teenagers are offered the surgical treatment each year.

Both papers showed that gastric bypass dramatically reduced the teenagers' weight and helped them maintain weight loss over more than five years of follow-up. However, the surgery was associated with the development of vitamin D and B12 deficiencies and mild anaemia, and some of those who had a bypass needed further surgery to deal with complications. While the surgery resulted in dramatic weight loss and BMI reductions, many of the teenagers remained obese, meaning that earlier intervention may be needed coupled with lifestyle changes such as diet and exercise.

In the first paper, researchers studied 58 American teenagers aged between 13 and 21 who were severely obese and had a gastric bypass.

Average BMI was reduced from 59 before surgery to 36 a year after surgery. Eight years later, average BMI was 42, equivalent to a loss of 50 kilos per person or a 30% weight reduction. Although the weight loss was significant, almost two-thirds of cases (63%, 36/57) remained very obese (BMI over 35) and only one person became a normal weight (BMI 18.5-25) at follow-up.

The number of teenagers with diabetes dropped from 16% to 2%, those with high cholesterol reduced from 86% to 38%, while the number with high blood pressure decreased from 47% to 16% as a result of the surgery. However, some had low levels of vitamin D (78%, 39/50), B12 (16%, 8/50) and mild anaemia (46%, 25/54), which could be a result of lower food consumption or impaired gut absorption.

Given the long-term weight loss and health benefits that result from the surgery, the researchers note that these benefits outweigh the small and manageable risk of nutritional deficiencies.

"Weight loss is crucial for severely obese patients who face poor health and shorter lifespans," said lead author Dr Thomas Inge, Cincinnati Children's Hospital Medical Center, USA. "These two manuscripts clearly document long-term benefits of adolescent bariatric treatment, but also highlight several nutritional risks. Now it is important to focus on delivery of the substantial health advantages of surgery while minimizing these risks. Since there are currently two effective bariatric procedures, namely gastric bypass and vertical sleeve gastrectomy, we are currently examining the outcomes of both procedures to determine what is best for adolescents."

The second study included 81 obese teenagers (average BMI 45) and 81 adults (average BMI 43) in Sweden who had a gastric bypass and 80 teenagers who did not have surgery.

Five years after surgery, the teenagers and adults who had a gastric bypass had a reduced BMI (by 13 points for teenagers, a weight reduction of 28%; 12 points for adults), whereas teenagers who did not have surgery had an increased BMI (by three points from 42 to 45).

Of the teenagers who underwent the gastric bypass, a quarter (25%, 20/81) had further surgery to treat complications from the bypass or as a result of rapid weight loss, including bowel blockage (11 cases) and gallstones (nine cases).

Despite the additional care and resources needed to offer the surgery, overall, the cost of prescriptions for teenagers who had surgery did not differ (US$2317 and $2701). In addition, a quarter of those in the control group (20 of 80) went on to have a gastric bypass as an adult during the study follow-up.

"Gastric bypass results in substantial weight loss as well as cutting heart and metabolic problems and improving quality of life into the long-term for severely obese teenagers. While some patients may face complications, those given non-surgical treatment often continue to put on weight, putting them at higher risk of poor health throughout life," said lead author Dr Torsten Olbers, University of Gothenburg, Sahlgrenska University Hospital, Sweden. "To reduce risk of complication it's important that gastric bypass for teenagers is done in centres that can provide the full care needed and long-term follow-up and support."

- US study – **doi:** 10.1016/S2213-8587(16)30315-1
- Swedish study – **doi:** 10.1016/S2213-8587(16)30424-7

Researchers show how emotional stress is associated with cardiovascular disease

Heightened activity in the amygdala – a region of the brain involved in stress – is associated with a greater risk of heart disease and stroke, according to a study published in *The Lancet* that provides new insights into the possible mechanism by which stress can lead to cardiovascular disease in humans.

While more research and larger studies are needed to confirm the mechanism, the researchers suggest that these findings could eventually lead to new ways to target and treat stress-related cardiovascular risk.

Smoking, high blood pressure and diabetes are well-known risk factors for cardiovascular disease and chronic psychosocial stress could also be a risk factor.

Previously, animal studies identified a link between stress and higher activity in the bone marrow and arteries, but it has remained unclear whether this also applies to humans. Other research has also shown that the amygdala is more active in people with post-traumatic stress disorder (PTSD), anxiety and depression, but before this study no research had identified the region of the brain that links stress to the risk of heart attack and stroke.

In this study, 293 patients were given a combined PET/CT scan to record their brain, bone marrow and spleen activity and inflammation of their arteries. The patients were then tracked for an average of 3.7 years to see if they developed cardiovascular disease. In this time 22 patients had cardiovascular events including heart attack, angina, heart failure, stroke and peripheral arterial disease.

Those with higher amygdala activity had a greater risk of subsequent cardiovascular disease and developed problems sooner than those with lower activity.

The researchers also found that the heightened activity in the amygdala was linked to increased bone marrow activity and inflammation in the arteries, and suggest that this may cause the increased cardiovascular risk. The authors suggest a possible biological mechanism, whereby the amygdala signals to the bone marrow to produce extra white blood cells, which in turn act on the arteries causing them to develop plaques and become inflamed, which can cause heart attack and stroke.

In a small sub-study, 13 patients who had a history of PTSD also had their stress levels assessed by a psychologist, underwent a PET scan and had their levels of C-reactive protein – a protein that indicates levels of inflammation in the body – measured. Those who reported the highest levels of stress had the highest levels of amygdala activity along with more signs of inflammation in their blood and the walls of their arteries.

"Our results provide a unique insight into how stress may lead to cardiovascular disease. This raises the possibility that reducing stress could produce benefits that extend beyond an improved sense of psychological wellbeing," said lead author Dr Ahmed Tawakol, Massachusetts General Hospital and Harvard Medical School, USA. "Eventually, chronic stress could be treated as an important risk factor for cardiovascular disease, which is routinely screened for and effectively managed like other major cardiovascular disease risk factors."

The researchers note that the activity seen in the amygdala may contribute to heart disease through additional mechanisms, since the extra white blood cell production and inflammation in the arteries do not account for the full link. They also say that more research is needed to confirm that stress causes this chain of events as the study was relatively small.

- **doi:** 10.1016/S0140-6736(16)31714-7

Next deadly pandemic poses global security risk

Bill Gates, founder of Microsoft, Co-Chair of the Bill & Melinda Gates Foundation and Philanthropist, gave an important speech at the 53rd Munich Security Conference on 18 February in which he draws the world's attention to the very serious global security risks we face from pandemics and intentional biological attacks. Because of the gravity of his warning and solutions he offers, *Middle East Health* publishes his full speech to the conference.

Pandemics are an international security issue

When I decided 20 years ago, to make global health the focus of my philanthropic work, I didn't imagine that I'd be speaking at a conference on international security policy. But I'm here today because I believe our worlds are more tightly linked than most people realize.

Here's one example. I spend a lot of my time on the effort to eradicate polio. We've made incredible progress. Of the 125 countries where polio was endemic, 122 countries have eliminated the disease. Only Afghanistan, Pakistan, and Nigeria have never been polio-free. And that's no coincidence.

War zones and other fragile state settings are the most difficult places to eliminate epidemics. They're also some of the most likely places for them to begin – as we've seen with Ebola in Sierra Leone and Liberia, and with cholera in the Congo Basin and the Horn of Africa. So, to fight global pandemics, we must fight poverty, too.

It's also true that the next epidemic could originate on the computer screen of a terrorist intent on using genetic engineering to create a synthetic version of the smallpox virus ... or a super contagious and deadly strain of the flu.

The point is, we ignore the link between health security and international security at our peril.

Whether it occurs by a quirk of nature or at the hand of a terrorist, epidemiologists say a fast-moving airborne pathogen could kill more than 30 million people in less than a year. And they say there is a reasonable probability the world will experience such an outbreak in the next 10-15 years.

It's hard to get your mind around a catastrophe of that scale, but it happened not that long ago. In 1918, a particularly virulent and deadly strain of flu killed between 50 million and 100 million people.

You might be wondering how likely these doomsday scenarios really are. The fact that a deadly global pandemic has not occurred in recent history shouldn't be mistaken for evidence that a deadly pandemic will not occur in the future.

And even if the next pandemic isn't on the scale of the 1918 flu, we would be wise to consider the social and economic turmoil that might ensue if something like Ebola made its way into a lot of major urban centers. We were lucky that the last Ebola outbreak was contained before it did.

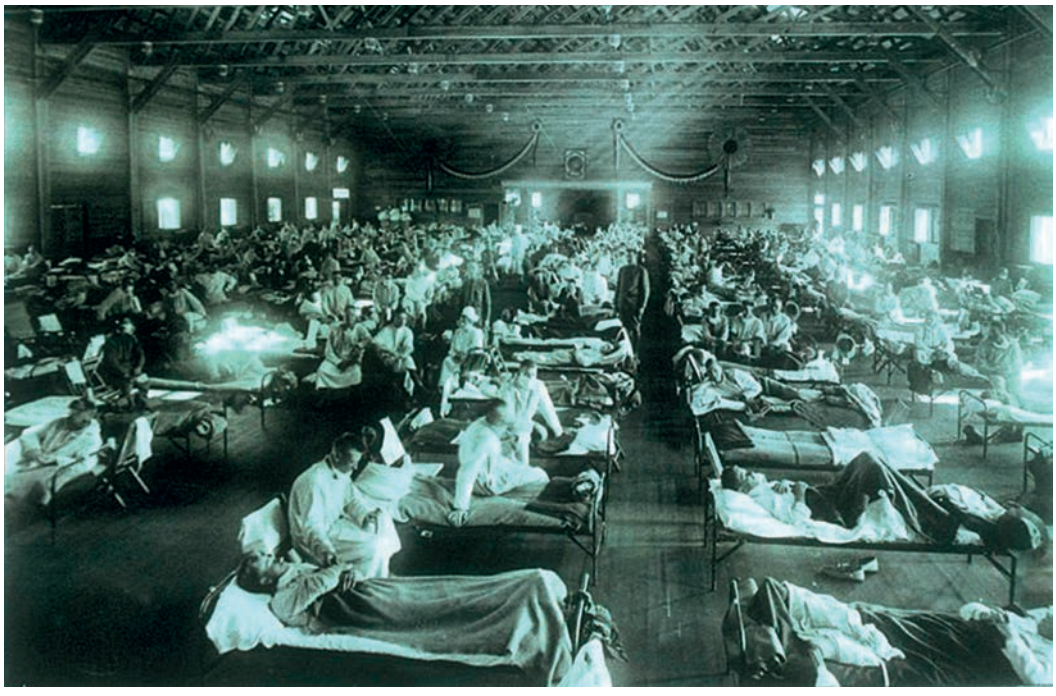
The good news is that with advances in biotechnology, new vaccines and drugs can help prevent epidemics from spreading out of control. And, most of the things we need to do to protect against a naturally occurring pandemic are the same things we must prepare for an intentional biological attack.

We need to invest in vaccine innovation

First and most importantly, we have to build an arsenal of new weapons – vaccines, drugs, and diagnostics.

Vaccines can be especially important

The Walter Reed Hospital, Washington, D.C., during the great Influenza Pandemic of 1918 - 1919, also known as the Spanish Flu. The global mortality rate from the 1918/1919 pandemic is not known, but an estimated 10% to 20% of those who were infected died. With about a third of the world population infected, this case-fatality ratio means 3% to 6% of the entire global population died. Influenza may have killed as many as 25 million people in its first 25 weeks. Older estimates say it killed 40–50 million people, while current estimates say 50–100 million people worldwide were killed.



The Spanish Influenza ward at Camp Funston, Kansas, 1918.

in containing epidemics. But today, it typically takes up to 10 years to develop and license a new vaccine. To significantly curb deaths from a fast-moving airborne pathogen, we would have to get that down considerably – to 90 days or less.

We took an important step last month with the launch of a new public-private partnership called the Coalition for Epidemic Preparedness Innovations. The hope is that CEPI will enable the world to produce safe, effective vaccines as quickly as new threats emerge.

The really big breakthrough potential is in emerging technology platforms that leverage recent advances in genomics to dramatically reduce the time needed to develop vaccines.

This is important because we can't predict whether the next deadly disease will be one we already know, or something we've never seen before.

Without getting too technical, these new platform technologies essentially create a delivery vehicle for synthetic genetic material that instructs your cells to

> Whether it occurs by a quirk of nature or at the hand of a terrorist, epidemiologists say a fast-moving airborne pathogen could kill more than 30 million people in less than a year. And they say there is a reasonable probability the world will experience such an outbreak in the next 10-15 years.

make a vaccine inside your own body. And the great thing is that once you've built a vaccine platform for one pathogen, you can use it again for other pathogens. You only need to substitute a few genes.

That flexibility and reusability would cut the vaccine development and approval timeline significantly. And we can apply this new vaccine technology to other hard-to-treat diseases like HIV, malaria, and tuberculosis.

The $550 million that launched CEPI is just a down payment. We will need considerably more support from governments to fund the R&D necessary to realize the promise of this new technology.

We need stronger health systems and surveillance

Of course, the preventive capacity of a vaccine won't help if a pathogen has already spread out of control. Because epidemics can quickly take root in the places least equipped to fight them, we also need to improve surveillance.

That starts with strengthening basic public health systems in the most vulnerable countries. This has a double benefit.

It improves our ability to prevent, detect, and respond to epidemics. And it enables us to break the cycle of poverty and disease that is at the root of so much instability in the world.

We also have to ensure that every country is conducting routine surveillance to gather and verify disease outbreak intelligence.

And we must ensure that countries share information in a timely way, and that there are adequate laboratory resources to identify and monitor suspect pathogens. We can build on the lab network that's in place now for polio, as well as a new network of field sites and labs that will help us better understand the causes of child mortality in poor countries.

We need to be better prepared

The third thing we need to do is prepare for epidemics the way the military prepares for war. This includes germ games and other preparedness exercises so we can better understand how diseases will spread, how people will respond in a panic, and how to deal with things like overloaded highways and communications systems.

We also need trained medical personnel ready to contain an epidemic quickly, and better coordination with the military to help with logistics and to secure areas

The Ebola epidemic might have been much worse if the U.S. and UK governments had not used military resources to help build health centers, manage logistics, and fly people in and out of affected countries.

It is encouraging that global alliances like the G7 and the G20 are beginning to focus on pandemic preparedness, and that leaders like Chancellor Merkel and Prime Minister Solberg are championing health security.

By the end of this year, 67 countries are expected to have completed independent assessments of their epidemic readiness. But there isn't enough money to help the poorest countries with epidemic preparation.

The irony is that the cost of ensuring adequate pandemic preparedness worldwide is estimated at $3.4 billion a year – yet the projected annual loss from a pandemic could run as high as $570 billion.

Pandemics are everyone's problem – and as leaders, we cannot ignore it.

Imagine if I told you that somewhere in this world, there's a weapon that exists – or that could emerge – capable of killing tens of thousands, or millions, of people, bringing economies to a standstill, and throwing nations into chaos.

You would say that we need to do everything possible to gather intelligence and develop effective countermeasures to reduce the threat.

That is the situation we face today with biological threats. We may not know if that weapon is man-made or a product of nature. But one thing we can be almost certain of – a highly lethal global pandemic will occur in our lifetimes.

A pandemic is one the three biggest threats the world faces; Preventing it is up to us

When I was a kid, there was really only one existential threat the world faced. The threat of a nuclear war.

I view the threat of deadly pandemics right up there with nuclear war and climate change. Getting ready for a global pandemic is every bit as important as nuclear deterrence and avoiding a climate catastrophe.

By the late 1990s, most reasonable people had come to accept that climate changed represented another major threat to humankind.

I view the threat of deadly pandemics right up there with nuclear war and climate change. Getting ready for a global pandemic is every bit as important as nuclear deterrence and avoiding a climate catastrophe.

Innovation, cooperation, and careful planning can dramatically mitigate the risks presented by each of these threats.

Indeed, the fact that fewer people die in conflicts now than at any time in human history is the direct result of choices made together by the international community – including through efforts like the Munich Security Conference.

The global good will evidenced at the historic Paris Climate talks a year ago give us a chance to prevent the worst effects of climate change.

The opportunity now is to extend that cooperation to pandemic preparedness. We've gotten a good start on innovation with the launch of CEPI. Reflecting on the lessons learned with Ebola, there is a shared consensus about the things we need to invest in.

I'm optimistic that a decade from now, we can be much better prepared for a lethal epidemic – if we're willing to put a fraction of what we spend on defense budgets and new weapons systems into epidemic readiness.

When the next pandemic strikes, it could be another catastrophe in the annals of the human race. Or it could be something else altogether. An extraordinary triumph of human will. A moment when we prove yet again that, together, we are capable of taking on the world's biggest challenges to create a safer, healthier, more stable world. MEH

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CHI St. Luke's Health, Baylor College of Medicine®, and **Texas Heart® Institute** are making bold moves forward in cardiovascular care. As part of this mission, **we're proud to welcome Dr. Joseph Lamelas to our ranks.**

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Learn more about **Dr. Lamelas** and the breakthroughs happening at Baylor St. Luke's Medical Center by visiting **CHIStLukesHealth.org/BaylorStLukes.**

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Achievements and challenges in public health

The annual address of the WHO Director-General to the executive board is always a good measure of the current state of affairs in global public health. *Middle East Health* publishes an edited version of Dr Margaret Chan's speech on January 23 in Geneva.

Dr Margaret Chan, WHO Director-General

The World Economic Forum (in January) identified rising income and wealth inequality as the most significant trend that will shape global development over the next 10 years.

In a world facing considerable uncertainty, international health development remains a unifying force and a solid reference point for delivering fair social outcomes under the 2030 Agenda for Sustainable Development.

Key WHO achievements over just the past few months illustrate the range of our work and its impact on the lives of people, especially vulnerable groups.

At the start of this year, WHO and the US National Cancer Institute published a landmark report on the economics of tobacco and tobacco control. At nearly 700 pages, this is a definitive assessment, prepared by more than 60 authors and peer-reviewed by an additional 70 experts.

Tobacco control

You will have seen the headlines. "Smoking costs the global economy more than $1 trillion yearly." "Smoking will soon kill more than 6 million people worldwide each year."

The report shows how tobacco control, including significant tax increases on tobacco products, can save lives while also generating revenues for health and development.

As documented, the economic losses caused by smoking far outweighs global revenue from tobacco taxes, estimated at nearly $270 billion in 2013-2014.

If all countries raised cigarette taxes by about 80 cents per pack, annual tax revenues could increase by 47%, amounting to an additional $140 billion per year.

The overarching conclusion is stark: tobacco control makes good economic sense and does not harm economies. The evidence is abundant and compelling. It ought to put an end to one of the tobacco industry's most frequent and effective arguments.

Ministers of health are convinced by the evidence. I ask you to be vocal in persuading ministers of finance, trade, foreign affairs, and others not to be swayed by industry's false claims.

It takes courage to issue reports that antagonize powerful economic operators. Economic power readily translates into political power.

It falls to WHO to do this. If we fail to

accept this responsibility, we will never make sufficient progress against lifestyle-related noncommunicable diseases.

Health inequalities

Health inequalities are often aggravated by the high price of medical products.

In September 2016, WHO and industry groups announced new financing arrangements, in line with industry practices, that will sustainably finance the WHO Prequalification Programme from now into the future.

The programme is one of our most successful initiatives. It has transformed the market for public health vaccines and other medical products, making supplies more abundant and predictable, and prices affordable.

In addition, the new financing model is designed to ensure equity among manufacturers, with provisions included to enable small manufacturers that meet quality safety and efficacies standards to enter the market on an equal footing with large companies.

More good news for affordable medicines came the next month, when WHO released a report documenting dramatic price reductions for a revolutionary cure for hepatitis C infections. Strategies used include price negotiations, local production, and licensing agreements that promote competition among generic manufacturers.

As noted in the report, price reductions have made treatment possible for more than 1 million people living with chronic hepatitis C infection in the developing world.

Authoritative data

WHO is widely respected as a source of authoritative data, a watchdog of evolving trends, and a force that can shape these trends through partnership.

Last September, WHO released country air quality estimates showing that 92% of the world's population lives in places where air pollution levels exceed WHO limits.

That same month, WHO announced an end to the largest emergency vaccination campaign against yellow fever ever undertaken in Africa. A crisis was averted.

More good news came in November, when WHO statistics showed that measles immunization over the past 15 years has spared more than 20 million young lives. That good news contrasts sharply with the hundreds of measles deaths that are still occurring every day.

And, of course, our annual reports on the HIV, tuberculosis, and malaria situations made headlines, with the best news coming from the shrinking malaria map.

The achievement that brought the most joyful headlines came at the end of last year, when WHO published final trial results demonstrating that the new Ebola vaccine confers nearly 100% protection. Several media outlets covered the vaccine results as the year's most uplifting news.

We have by no means defeated this re-emerging disease, but when the next outbreak inevitably occurs, responders will not be empty-handed. I thank our many partners, countries who supported that clinical trial, including the

Coalition set to accelerate vaccine development and availability

The Coalition for Epidemic Preparedness Innovations (CEPI) was launched 19 January at the 47th World Economic Forum Annual Meeting in Davos-Klosters, Switzerland. This unique initiative aims to shorten the response time to epidemics by creating vaccines that could be released quickly once an outbreak occurs. By financing and doing the research before a crisis erupts, CEPI would dramatically speed up the ability to counter the spread of an infectious disease such as Ebola. CEPI was conceived by some of the launch partners who met at the Annual Meeting in Davos a year ago.

"This has grown out of the lessons learned – what was good about our response to the Ebola crisis and what went wrong," said Erna Solberg, Prime Minister of Norway. "The international response was too late, but now we know how to respond faster the next time."

With US$460 million in initial funding from the Bill & Melinda Gates Foundation, the Wellcome Trust and the governments of Germany, Japan and Norway, and promises for a total of $700 million, the programme involves the global vaccine manufacturers. With the advance work that CEPI will do, prepared vaccines could go straight to phase-three trials and get regulator approvals faster.

"What CEPI does is take the things that we do in battle and do them in peace time," explained Andrew Witty, Chief Executive Officer of GlaxoSmithKline in the UK.

Epidemics have become more frequent in today's interconnected world. "What happens in Lagos will affect Davos tomorrow," warned Jeremy Farrar, Director of the Wellcome Trust in the UK, who noted that there is still no licensed vaccine for Ebola. "The world is incredibly vulnerable." With CEPI, "we will change the paradigm for how we get vaccines for these epidemics."

William H. Gates III, Co-Chair of the Bill & Melinda Gates Foundation in the US, said: "Unfortunately, even though there is substantial risk for epidemics, there is not a natural market for vaccines. You have to get governments to create the right incentive structure. If you can predict what the pathogens are going to be and can get vaccines stockpiled, then that would be a very good response. This is a substantial step that deals with a problem that can keep you up at night if you aren't ready for it."

"We need to mobilize this research," agreed Alpha Condé, President of Guinea. "If we had had a vaccine a lot quicker, the Ebola epidemic wouldn't have spread as far. We want to see a vaccine that is 100% effective and financed." He said he hopes that CEPI would not only allow for a quick response to a disease outbreak, but would also help countries like Guinea develop the local capability to react to healthcare emergencies.

A new $500 million coalition to develop vaccines ahead of epidemics was announced during the World Economic Forum. It draws on the WHO list of priority pathogens, and benefits from the normative support and expedited procedures set out in the R&D blueprint. In this way, WHO's work catalyses targeted priority investments.

government and people of Guinea, for making this happen.

Outbreaks and emergencies response

In the first nine months of 2016, WHO responded to major emergencies in 47 countries. The Mosul humanitarian operation in Iraq has been the largest and most complex.

WHO has given the research community a shortlist of especially worrisome pathogens with epidemic potential.

The R&D blueprint, developed in response to lessons learned during the Ebola outbreak, has been immediately applied to expedite the development of new medical products for Zika virus disease. It aims to cut the time needed to develop and manufacture candidate products from years to months.

Vaccines

A new $500 million coalition to develop vaccines ahead of epidemics was announced during the World Economic Forum. It draws on the WHO list of priority pathogens, and benefits from the normative support and expedited procedures set out in the R&D blueprint. In this way, WHO's work catalyses targeted priority investments.

As a contribution to the global health emergency workforce which is very important to many countries, the initiative for building up a strike force of emergency medical teams has moved forward quickly. Through this initiative, international preparedness to provide clinical care during emergencies has been structured and standardized.

The requirements for WHO verification and registration are high. Having the competence of an emergency team peer-reviewed and verified is a source of great national pride. Many countries have already done that and many countries have registered. This is life-saving capacity building at its best. It is rapidly making order out of a situation historically prone to chaos.

Influenza

The best-documented success story is the Pandemic Influenza Preparedness, or PIP, Framework. The Framework was set up in 2011 as a bold and innovative preparedness tool that puts virus sharing and benefit sharing on an equal footing.

To date, legally binding agreements have secured access to around 350 million doses of vaccine to be delivered, as they roll off the production line, during the next influenza pandemic.

Partnership financial contributions from industry for which I am grateful have been invested to build surveillance, laboratory, regulatory, and other capacities in developing countries.

Tobacco control can save

Policies to control tobacco use, including tobacco tax and price increases, can generate significant government revenues for health and development work, according to a new landmark global report from WHO and the National Cancer Institute of the United States of America. Such measures can also greatly reduce tobacco use and protect people's health from the world's leading killers, such as cancers and heart disease.

But left unchecked, the tobacco industry and the deadly impact of its products cost the world's economies more than US$ 1 trillion annually in healthcare expenditures and lost productivity, according to findings published in *The economics of tobacco and tobacco control*. Currently, around 6 million people die annually as a result of tobacco use, with most living in developing countries.

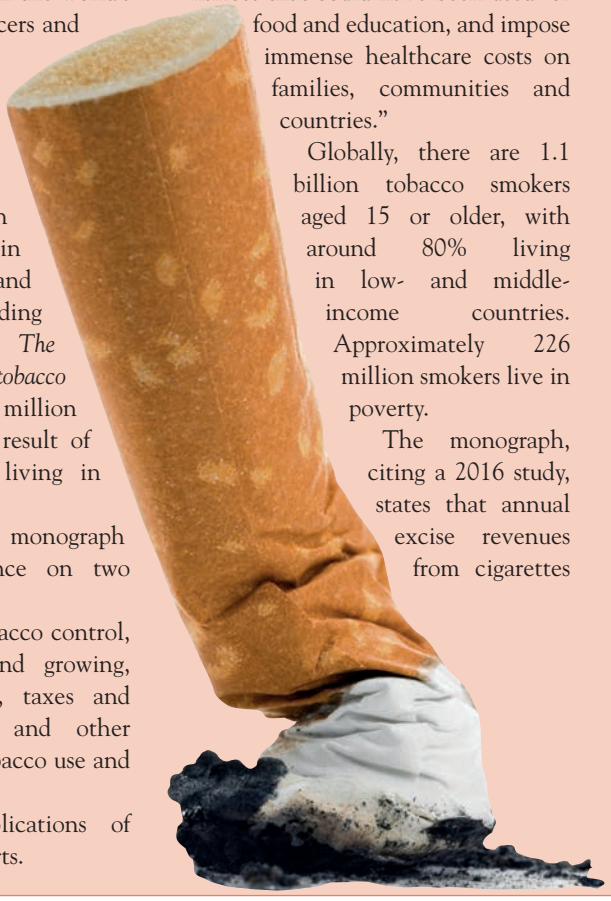
The almost 700-page monograph examines existing evidence on two broad areas:

- The economics of tobacco control, including tobacco use and growing, manufacturing and trade, taxes and prices, control policies and other interventions to reduce tobacco use and its consequences; and
- The economic implications of global tobacco control efforts.

"The economic impact of tobacco on countries, and the general public, is huge, as this new report shows," says Dr Oleg Chestnov, WHO's Assistant Director-General for Noncommunicable Diseases (NCDs) and mental health. "The tobacco industry produces and markets products that kill millions of people prematurely, rob households of finances that could have been used for food and education, and impose immense healthcare costs on families, communities and countries."

Globally, there are 1.1 billion tobacco smokers aged 15 or older, with around 80% living in low- and middle-income countries. Approximately 226 million smokers live in poverty.

The monograph, citing a 2016 study, states that annual excise revenues from cigarettes



billions of dollars, millions of lives

globally could increase by 47%, or US$ 140 billion, if all countries raised excise taxes by about US$ 0.80 per pack. Additionally, this tax increase would raise cigarette retail prices on average by 42%, leading to a 9% decline in smoking rates and up to 66 million fewer adult smokers.

"The research summarized in this monograph confirms that evidence-based tobacco control interventions make sense from an economic as well as a public health standpoint," says the monograph's co-editor, Distinguished Professor Frank Chaloupka, of the Department of Economics at the University of Illinois at Chicago.

The monograph's major conclusions include:

• The global health and economic burden of tobacco use is enormous and is increasingly borne by low- and middle-income countries (LMICs). Around 80% of the world's smokers live in LMICs.

• Effective policy and programmatic interventions exist to reduce demand for tobacco products and the death, disease, and economic costs resulting from their use, but these interventions are underused. The WHO Framework Convention on Tobacco Control (WHO FCTC) provides an evidence-based framework for government action to reduce tobacco use.

• Demand reduction policies and programmes for tobacco products are highly cost-effective. Such interventions include significant tobacco tax and price increases; bans on tobacco industry marketing activities; prominent pictorial health warning labels; smoke-free policies and population-wide tobacco cessation programmes to help people stop smoking. In 2013-2014, global tobacco excise taxes generated nearly US$269 billion in government revenues. Of this, less than US$1 billion was invested in tobacco control.

• Control of illicit trade in tobacco products is the key supply-side policy to reduce tobacco use and its health and economic consequences. In many countries, high levels of corruption, lack of commitment to addressing illicit trade, and ineffective customs and tax administration, have an equal or greater role in driving tax evasion than do product tax and pricing. The WHO FCTC Protocol to Eliminate Illicit Trade in Tobacco Products applies tools, like an international tracking and tracing system, to secure the tobacco supply chain. Experience from many countries shows illicit trade can be successfully addressed, even when tobacco taxes and prices are raised, resulting in increased tax revenues and reduced tobacco use.

• Tobacco control does not harm economies: The number of jobs dependent on tobacco has been falling in most countries, largely due to technological innovation and privatization of once state-owned manufacturing. Tobacco control measures will, therefore, have a modest impact on related employment, and not cause net job losses in the vast majority of countries. Programmes substituting tobacco for other crops offer growers alternative farming options.

• Tobacco control reduces the disproportionate health and economic burden that tobacco use imposes on the poor. Tobacco use is increasingly concentrated among the poor and other vulnerable groups.

• Progress is being made in controlling the global tobacco epidemic, but concerted efforts are needed to ensure progress is maintained or accelerated. In most regions, tobacco use prevalence is stagnant or falling. But increasing tobacco use in some regions, and the potential for increase in others, threatens to undermine global progress in tobacco control.

• The market power of tobacco companies has increased in recent years, creating new challenges for tobacco control efforts. As of 2014, 5 tobacco companies accounted for 85% of the global cigarette market. Policies aimed at limiting the market power of tobacco companies are largely untested but hold promise for reducing tobacco use.

Dr Douglas Bettcher, WHO Director for the Prevention of NCDs, says the new report gives governments a powerful tool to combat tobacco industry claims that controls on tobacco products adversely impact economies. "This report shows how lives can be saved and economies can prosper when governments implement cost-effective, proven measures, like significantly increasing taxes and prices on tobacco products, and banning tobacco marketing and smoking in public," he adds. MEH

This is a ground-breaking model for partnership with the private and non-governmental sectors to ensure greater fairness in global public health. It is also a model for global solidarity that addresses critical policy, operational, and capacity barriers ahead of an emergency.

The world is better prepared for the next influenza pandemic, but not at all well enough.

I am asking all countries to keep a close watch over outbreaks of avian influenza in birds and related human cases. Just since November of last year, nearly 40 countries have reported fresh outbreaks of highly pathogenic avian influenza in poultry or wild birds.

The rapidly expanding geographical distribution of these outbreaks and the number of virus strains currently co-circulating have put WHO on high alert. For example, the H5N6 virus causing severe outbreaks in Asia is a new strain created by gene-swapping among four different viruses.

Since 2013, China has reported seasonal epidemics of H7N9 infections in humans, now amounting to more than 1,000 cases, of which 38.5% were fatal.

The latest epidemic, which began in late September 2016 and since December has shown a sudden and steep increase in cases. In two clusters, WHO could not rule out limited human-to-human transmission, though no sustained transmission has been detected to date.

As required by the International Health Regulations, all countries must detect and report human cases promptly. We cannot afford to miss the early signals. MEH

Health system collapses – more than 10 million Yemenis in acute need

Beside the casualties of the conflict in Yemen, thousands more are dying in silence and obscurity from malnutrition and easily treatable illnesses. The situation was highlighted in February when the World Health Organisation issued a dire warning about the desperate plight of the people of Yemen. Simultaneously the United Nations launched an international appeal to raise more than US$2 billion to provide lifesaving assistance to the population. *Middle East Health* reports.

"Some days we only have bread and water to eat, that's all."
Shawaia is a 40-year-old Yemeni divorcee living with her parents and her siblings. Her father provides for the whole family. Like many of Yemen's 1.2 million civil servants, Shawaia's father hasn't received his salary for almost 4 months.

Yemen does not feature on many people's radar, but it should as the country is fast headed towards a human tragedy of catastrophic proportions. Yemen's healthcare system is in the process of collapse. Already thousands of people are dying from easily preventable illnesses because there is no medication available. Many more are dying from malnutrition. If a UN appeal for donor funds for humanitarian assistance is not successful – the situation for more than 10 million Yemenis in acute need looks extremely bleak indeed.

"The health system in Yemen is extremely challenged and highly dependent on international support," the WHO said in February. "Currently more than 14.8 million people lack access to basic health care. Less than 45% of health facilities are still functioning – 17% are completely non-functional. At least 274 of those facilities have been damaged or destroyed during the current conflict."

WHO said that healthcare workers have not received their salaries regularly for about 6 months. Medical supplies are in chronic shortage despite extensive support from WHO and Health Cluster members, further complicating the delivery of life-saving health care.

Beyond the direct casualties of the armed conflict, many Yemeni people die in silence and are largely unaccounted for, unnoticed and unrecorded. Girls, boys, women and men are dying of malnutrition and diseases that could be easily preventable and treatable. People with chronic diseases, including high blood pressure,

KEY FACTS

AND FIGURES

POPULATION OF YEMEN

27.4 million

TOTAL PEOPLE IN NEED

18.8 million

PEOPLE IN ACUTE NEED

10.3 million

TOTAL PEOPLE TARGETED

12.0 million

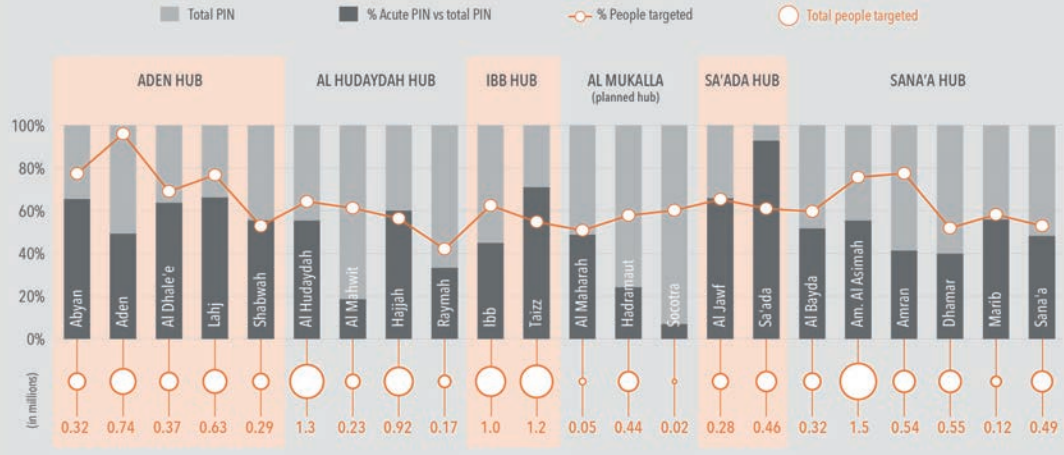
REQUIREMENTS (USD)

2.1 billion

OF ORGANIZATIONS

120 partners

PEOPLE TARGETED VS PEOPLE IN NEED AND PEOPLE IN ACUTE NEED BY GOVERNORATE



> Beyond the direct casualties of the armed conflict, many Yemeni people die in silence and are largely unaccounted for, unnoticed and unrecorded. Girls, boys, women and men are dying of malnutrition and diseases that could be easily preventable and treatable.

diabetes, kidney conditions etc. are slowly dying as they lack access to life-sustaining treatments.

Humanitarian partners are increasingly being asked to fill gaps created by the collapsing health institutions, including helping with payment of salaries of health professionals and the procurement of medicines and medical supplies.

"It is therefore essential for all stakeholders to help stem this collapse, including through selective reengagement and prioritization of interventions and ▶

UN appeals to international donors for desperately needed assistance

On 8 February, the United Nations and humanitarian partners launched an international appeal for $2.1 billion to provide life-saving assistance to 12 million people in Yemen in 2017 – the largest-ever humanitarian response plan for the war-torn country.

"Two years of war have devastated Yemen… Without international support, they may face the threat of famine in the course of 2017 and I urge donors to sustain and increase their support to our collective response," said UN Emergency Relief Coordinator Stephen O'Brien on the launch of the Humanitarian Response Plan for Yemen in Geneva.

"Humanitarian partners are ready to respond. But they need timely, unimpeded access, and adequate resources, to meet the humanitarian needs wherever they arise," said O'Brien, who is also the Under-Secretary-General for Humanitarian Affairs.

He noted that since March 2015, violent conflict and disregard by all parties to the conflict for their responsibility to protect civilians have created a vast protection crisis in Yemen and millions of people face threats to their safety and basic human rights every day. In addition, deliberate war tactics are accelerating the collapse of key institutions and the economy, thereby exacerbating pre-existing vulnerabilities.

This has left an alarming 18.8 million people – more than two thirds of the population – in need of humanitarian ▶

districts to be supported, the WHO said.

Speaking at a donor conference in Geneva on 9 February 2017, Jan Egeland, Secretary General, Norwegian Refugee Council (NRC), said: "In Yemen, if bombs don't kill you, a slow and painful death by starvation is now an increasing threat."

He warned: "Yemen's downward spiral means that we will see more shocking scenes of despair, with famine possibly spreading across the country, unless the conflict is ended and the deep economic crisis and aid shortage is reversed."

The NRC pointed out that a total of 462,000 children are at immediate risk of death from severe malnutrition. Among the 2.2 million displaced Yemenis, 75% identified food as their top priority. Displaced people face a number of hardships, including lack of access to water, healthcare, shelter, education and a basic income. Still, 75% identify food as their top priority among all these, illustrating the immediate and desperate need, a daily struggle for survival.

"Since the conflict started, all the warring parties have impeded our ability to reach people who were in most need of humanitarian assistance," Egeland said. "It is crucial that all restrictions on aid are lifted so that we are able to deliver life-saving services throughout Yemen. All parties to the conflict in Yemen should allow free and clear access to humanitarian agencies, as is required under International Humanitarian Law."

The NRC noted that a de-facto blockade on imports has had a devastating impact on the Yemeni economy. Public sector health workers and teachers do not get their salaries. The private sector is collapsing in a country dependent on imports for 90 per cent of its food. The blockade, the violence and restrictions to humanitarian access on the ground, as well as the continued destruction of civilian infrastructure in violation of humanitarian law, is turning Yemen into a country where an entire population soon will be dependent on assistance.

"Over the last years we have shown that we can respond rapidly to needs on the ground, but unless the financial commitments match the response, we will not be able to reach the most vulnerable," Egeland said. "Last year's appeal was only 58% funded, limiting our overall response substantially. We appeal today to international donors to step up the funding, but also to apply all the pressure possible on the involved parties to secure peace and a revival of Yemen's economy."

During 2016, WHO and their Health Cluster partners targeted 10.6 million people with life-saving health services in Yemen and were able to sustain the functionality of more than 414 healthcare facilities. Together, they operated 406 health and nutrition mobile teams in 266 districts, conducted 541 child health and nutrition interventions in 323 districts, and vaccinated 4.5 million children against polio.

"We thank all Member States that supported the Health Cluster and WHO's emergency operations in Yemen in 2016 and we encourage you to continue and scale-up your support for this year in order to respond to the increasing needs. The Health Cluster in Yemen is appealing for US$322 million, of which WHO is requesting $126 million." MEH

Continued from page 25

assistance, according to the UN Office for the Coordination of Humanitarian Affairs (OCHA), which also estimates that 10.3 million people are acutely affected and nearly 3.3 million people – including 2.1 million children – are acutely malnourished.

"We remain committed to the principle that our plans must be grounded both in evidence and actual capacity, and I ask donors today to help Yemen in its moment of great need," said the Humanitarian Coordinator in Yemen, Jamie McGoldrick.

In 2016, 120 national and international partners including UN agencies and non-governmental organisations working out of humanitarian hubs in Aden, Al Hudaydah, Ibb, Sana'a, and Sa'ada assisted more than 5.6 million people with direct humanitarian aid.

on the WEB Humanitarian Response Plan for Yemen
http://ochayemen.org/hrp-2017/

Photo: Nuha Mohammed/NRC

Two years ago Amina, 7, and her sister Aisha, 4, had to flee their home with their 35-year-old widowed mother because of airstrikes. They are now living in an abandoned house in Al-Zuhra District in Al-Hudaydah Governorate. "We came here with empty hands, we did not have clothes or mattresses, we had nothing. When we first came the neighbours gave us some basics to live on." Their mother A'aish told Norwegian Refugee Council representatives. A'aish is a NRC beneficiary and received unconditional cash. "My only wish is to ensure my children will live with dignity. I used most of the money I received to buy food and the rest I spend on providing my children with clothes and mattresses," A'aish said.

Donate to help the people of Yemen

- UNICEF
https://www.unicef.org.uk/donate/yemen
- UNHCR
https://donate.unhcr.org/gu-en/yemen

Introducing peanuts in infant diet prevents dangerous peanut allergy

An expert panel sponsored by the National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health, recently issued clinical guidelines to aid health care providers in early introduction of peanut-containing foods to infants to prevent the development of peanut allergy.

Peanut allergy is a growing health problem for which no treatment or cure exists. People living with peanut allergy, and their caregivers, must be vigilant about the foods they eat and the environments they enter to avoid allergic reactions, which can be severe and even life-threatening. The allergy tends to develop in childhood and persist through adulthood. However, recent scientific research has demonstrated that introducing peanut-containing foods into the diet during infancy can prevent the development of peanut allergy.

The new Addendum Guidelines for the Prevention of Peanut Allergy in the United States supplement the 2010 Guidelines for the Diagnosis and Management of Food Allergy in the United States. The addendum provides three separate guidelines for infants at various levels of risk for developing peanut allergy and is targeted to a wide variety of health care providers, including paediatricians and family practice physicians.

"Living with peanut allergy requires constant vigilance. Preventing the development of peanut allergy will improve and save lives and lower health care costs," said NIAID Director Anthony S. Fauci, M.D. "We expect that widespread implementation of these guidelines by health care providers will prevent the development of peanut allergy in many susceptible children and ultimately reduce the prevalence of peanut allergy in the United States."

Addendum Guideline 1 focuses on infants deemed at high risk of developing peanut allergy because they already have severe eczema, egg allergy or both. The expert panel recommends that these infants have peanut-containing foods introduced into their diets as early as 4 to 6 months of age to reduce the risk of developing peanut allergy. Parents and caregivers should check with their infant's health care provider before feeding the infant peanut-containing foods. The health care provider may choose to perform an allergy blood test or send the infant to a specialist for other tests, such as a skin prick test or an oral food challenge. The results of these tests will help decide if and how peanut should be safely introduced into the infant's diet.

Guideline 2 suggests that infants with mild or moderate eczema should have peanut-containing foods introduced into their diets around 6 months of age to reduce the risk of peanut allergy. Guideline 3 suggests that infants without eczema or any food allergy have peanut-containing foods freely introduced into their diets.

In all cases, infants should start other solid foods before they are introduced to peanut-containing foods.

Development of the Addendum Guidelines was prompted by emerging data suggesting that peanut allergy can be prevented by the early introduction of peanut-containing foods. Clinical trial results reported in February 2015 showed that regular peanut consumption begun in infancy and continued until 5 years of age led to an 81 percent reduction in development of peanut allergy in infants deemed at high risk because they already had severe eczema, egg allergy or both. This finding came from the landmark, NIAID-funded Learning Early About Peanut Allergy (LEAP) study, a randomized clinical trial involving more than 600 infants.

"The LEAP study clearly showed that introduction of peanut early in life significantly lowered the risk of developing peanut allergy by age 5. The magnitude of the benefit and the scientific strength of the study raised the need to operationalize these findings by developing clinical recommendations focused on peanut allergy prevention," said Daniel Rotrosen, M.D., director of NIAID's Division of Allergy, Immunology and Transplantation.

In 2015, NIAID established a coordinating committee representing 26 professional organizations, advocacy groups and federal agencies to oversee development of the Addendum Guidelines to specifically address the prevention of peanut allergy. The coordinating committee convened a 26-member expert panel comprising specialists from a variety of relevant clinical, scientific and public health areas. The panel, chaired by Joshua Boyce, M.D., professor of medicine and paediatrics at Harvard Medical School, used a literature review of food allergy prevention research and their own expert opinions to prepare draft guidelines. The draft guidelines were available on the NIAID website for public comment from March 4 to April 18, 2016. The expert panel and coordinating committee reviewed the 104 comments received to develop the final Addendum Guidelines.

The Addendum Guidelines appear January 5 in the *Journal of Allergy and Clinical Immunology* and will be co-published in the *Annals of Allergy, Asthma, and Immunology; Journal of Pediatric Nursing; Pediatric Dermatology; World Allergy Organization Journal; and Allergy, Asthma, and Clinical Immunology*.

- A summary for clinicians is available here: *www.niaid.nih.gov/sites/default/files/peanut-allergy-prevention-guidelines-clinician-summary.pdf*

on the WEB Addendum Guidelines for the Prevention of Peanut Allergy *http://tinyurl.com/6bx6rv9*

Sedative may prevent delirium after operation with general anaesthetic

A mild sedative could greatly reduce the risk of people experiencing delirium after an operation with general anaesthetic, according to new research.

The study, by scientists at Imperial College London and Peking University First Hospital, suggests sedating patients after they undergo an operation may reduce the risk of post-operative delirium by up to 65%.

The condition may affect up to one in three people who have a major operation, causing confusion and hallucinations – with the over-65s particularly at risk.

The team, who published their study in *The Lancet*, believe the sedative may help the brain 'recover and reset' after surgery.

Post-operative delirium usually strikes within the first two days of a person waking from general anaesthetic.

The symptoms range from relatively mild, such as a person not knowing their name or where they are, to more severe, such as aggressive behaviour, believing people are trying to harm them, or even hallucinations.

Professor Daqing Ma, co-lead author of the study from the Department of Surgery and Cancer at Imperial College London, said: "Post-operative delirium is a huge challenge for the medical community – and incredibly distressing for patients and their families. In many cases patients become almost child-like, and do not understand where they are, what is happening, and become very upset. Hospital staff have also been injured by delirious patients becoming aggressive. However, we currently have no treatment options available for this condition."

The causes are unknown, but one theory is that major surgery can trigger inflammation throughout the body, which in some cases can spread to the brain.

The risk of the condition increases with age, and it seems to strike more often when patients undergo major, lengthy operations.

The delirium can last from a few hours to a couple of days, and some research suggests it may be linked to an increased risk of elderly patients later developing dementia.

In the study, co-led by Professor Dongxin Wang at Peking University First Hospital, researchers assessed 700 patients age 65 or older who were about to undergo major surgery at the Beijing hospital.

Half received a low dose of a type of sedative called dexmedetomidine after the operation, as an infusion directly into a vein in their arm, while half received a placebo salt-water infusion.

The patients received the infusion of sedative or placebo around an hour after surgery, and for the next 16 hours.

CASE STUDY: "I thought I was sailing down the River Trent on a hospital ship."

Professor Michael Wang, a clinical psychologist from the University of Leicester, suffered post-operative delirium after major heart surgery in 2012. He recalls the experience.

I first woke around 18 hours after my operation at a Leicester hospital. A doctor was speaking with a nurse about my operation at the foot of my bed, and I asked them where we were. I thought the doctor replied Nottingham, which confused me as I thought we were in Leicester.

I formed the conclusion I was on a hospital ship, sailing down the River Trent. My operation took place over the Christmas period, and I thought perhaps the ship was a private facility allowing surgeons and anaesthetists to earn extra money.

I looked out of the window and saw trees moving past on the 'river bank', which confirmed my suspicion. I also thought I heard the sound of other ships' fog horns in the distance, which I now realise was the sound of other patients' bedside call buttons.

I kept trying to pull out the tubes in my arm and chest, which were providing vital fluid, antibiotics and monitoring as I didn't believe I needed them.

The staff, who were incredibly patient and to whom I subsequently apologised – said to me: 'We know you believe this is all part of a conspiracy, but if you pull out your lines you will die.'

Shortly after this, I believed I was moved into a dark room filled with rolled-up carpets. This, of course, didn't happen and I now know I stayed in my bed on the intensive care unit the whole time.

However, I was convinced I had been placed in this room, and when friends came to visit, I was puzzled by why they needed to squeeze through the gaps between the carpet rolls. I also saw a nurse nearby keeping an eye on me, perched among the rolls of carpet.

Later I awoke to find myself in a sinister Chinese mausoleum under the intensive care unit (or so I thought). It felt like some kind of nightmare, with dark recesses and glowing Chinese symbols. I have since realised these symbols were based on the illuminated heart monitor buttons on the wall opposite my bed.

Once I was discharged from intensive care (approximately three days after my operation) most of the delusions cleared.

Although my hallucinations sound frightening, I felt strangely detached from them. I think this is because of my familiarity, through my work, with the intensive care unit environment and the experiences of patients – and so part of me knew I was suffering from delusions. Indeed, I have researched post-operative delirium and I know that most patients find their experiences far more terrifying than I found mine.

However, the experience allowed me a crucial insight into what patients experience in post-operative delirium, and why it's so important to gain understanding to improve treatment and prevention of this condition.

This sedative, which is commonly used for medical procedures and in veterinary medicine, leaves a patient relaxed and drowsy, yet conscious. The drug is considered safe as it doesn't affect breathing.

Both groups received the same general anaesthetic before undergoing their operation. They were then assessed for

symptoms of delirium every day for a week after their procedure.

The results revealed that nearly one in four patients in the placebo group – 23% – developed delirium. However only just under one in ten patients – 9% – who received the sedative developed the condition.

Scientists are still unsure how the sedative works, but one theory is it allows the brain to rest and recover immediately after surgery, explained Professor Ma.

"Previous studies have shown that patients who struggle to sleep after their operation – perhaps because they are in pain or on a busy, noisy ward – are at increased risk of delirium."

He added that the sedative dexmedetomidine seems to not only trigger sleep, but actually mimics the natural state the brain enters during sleep.

"Although other sedatives induce sleep, they do not trigger the natural 'sleep state' the brain requires to rest, reset, and recover."

Professor Ma added that previous research has suggested the sedative may help prevent delirium, but this is the largest study to show such beneficial effects. The study also confirmed there were no side effects of the sedative.

Further results showed the patients given the sedative had fewer post-operative complications than the placebo group, and were discharged from hospital earlier.

The team will now assess if the sedative has long-term benefits, beyond the seven-day study period.

Professor Ma added: "There is still much more work to do around post-operative delirium, as we still don't fully understand what is happening in the brain, and why some patients are more at risk.

"However, these findings suggest this sedative may be a potential method of preventing post-operative delirium in some patients."

The research was funded by the Braun Anaesthesia Scientific Research Fund and Wu Jieping Medical Foundation.

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Paving the way to safer anaesthesia

Researchers have made a breakthrough which could help prevent patients suffering stress to the body and from feeling pain or becoming aware during anaesthesia.

The breakthrough could help to provide a new guide for anaesthetists and lead to much quicker recovery times for patients following operations as greater optimisation of dosage could lead to drugs being significantly reduced.

If drug levels are judged incorrectly this has led to well documented, albeit very rare, cases of patients becoming aware or feeling pain during surgery due to insufficient dose of anaesthetic drugs. Also, overdosing of drugs may be harmful, resulting in cardiovascular malfunction and prolonged delay in awakening after surgery.

In a study published in the journal *Anaesthesia* (9 September 2015) researchers tested a new more nuanced form of investigating the subtle clues sent out by the human body during anaesthesia – particularly the cardiovascular signals that can indicate the state of the pain-monitoring autonomous nervous system. The results have proved more reliable than existing methods.

The journal article – The Discriminatory value of Cardiorespiratory Interactions in distinguishing awake from anaesthetised states: A randomised observational study – found that by looking at how key indicators – such as ECG, respiration, skin temperature, pulse and skin conductivity – interacted with one another researchers could much more accurately predict whether a patient was awake or anaesthetised. They also helped distinguish between the effects of two commonly-used anaesthetic drugs, propofol and sevoflurane.

The study measured the depth of anaesthesia of 27 patients in good health during surgery in the United Kingdom and in Norway. Readings were taken at a high frequency – several hundred samples per heart beat – for 30 minutes while the patients were awake before their surgery and for up to 30 minutes during general anaesthesia. The signals showed, with a high degree of accuracy, how the patients reacted to the anaesthetics.

Lancaster University's Professor Aneta Stefanovska said: "We have developed new methods to study complex interactions between ever changing processes such as the processes in our heart, lungs and vasculature. These physiological processes constantly interact with one another, but anaesthetic drugs change the level of these interactions. By applying our new methods, in this study we were able to get a very accurate picture of what was going on, leading to the most reliable predictions of the state of anaesthesia obtained from cardiovascular signals to date of closer to 97%."

Johan Raeder, Professor in Anaesthesiology at Oslo University Hospital, who also took part in the study, said: "This very complex work is a logical step further in the search for specific and sensitive methods of objectively detecting the state of anaesthesia.

"While so far, most methods have relied on a single kind of measurement, our work tries to integrate information from many different physiological processes at the same time, thus adding an entirely new perspective. Namely how the different processes interact with each other and synchronise."

Professor Peter McClintock, also of Lancaster University said: "The likelihood of waking up during surgery is extremely small but, if it happened, it could be a distressing experience. So, we are delighted to pave the way to a new tool for gauging depth of anaesthesia."

The collaborative research involved consultant anaesthetists from University Hospitals of Morecambe Bay NHS Trust in North West England.

Professor Andrew Smith, Consultant Anaesthetist, Royal Lancaster Infirmary said: "Whilst it is early days, the prospect of a monitor of anaesthetic depth that relies on measurements of the circulation and respiration is very attractive."

doi:10.1111/anae.13208

RNOH provides a new one-stop procedure of stem cell harvest and transplant for cartilage defects in the knee

Articular cartilage is a thin layer of highly specialised tissue that provides a smooth, lubricated surface for joint movement and transmits forces to the underlying bone. Articular cartilage, however, has a limited capacity for healing and repair, which means that once the joint surface is damaged, the subsequent repair is limited. The resultant repair is often with a different type of cartilage – fibrocartilage, which lacks the same biochemical structure as normal articular cartilage and has been shown to break down more rapidly. The injured joint is therefore unlikely to return to its original structure and function, predisposing the patient to premature osteoarthritis.

Articular cartilage damage in the knee is commonly seen in the elderly as part of the degenerative process of arthritis, and can relatively easily be managed with joint replacement surgery when symptoms are sufficiently severe. Articular cartilage damage in the younger population is a far more challenging dilemma with no currently accepted and effective treatment. This can lead to pain, loss of function and an inability to participate in everyday activities. This damage can also lead to further breakdown of the joint resulting in early osteoarthritis. Joint replacement in active, younger patients often gives inferior outcomes and will result in premature implant failure due to the higher demands being placed upon the implant.

The Cartilage Transplantation Unit at the world-renowned Royal National Orthopaedic Hospital, Stanmore has over the last 15 years pioneered the technique of two-stage cartilage transplant in the United Kingdom. Over 1500 cases have been performed with high success rates, producing healing of the joint, relief of pain and restoration of function. The onset of osteoarthritis, which affects 25% of people over 50, is also delayed, preventing the need for joint replacement. The first stage is a telescopic examination of the knee to take a small piece of normal cartilage which is sent to the cell culture laboratory.

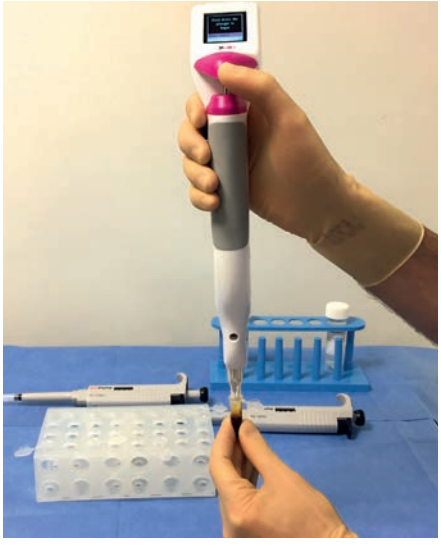
Mr James Donaldson, Consultant Orthopaedic Surgeon (right) performs surgery

This cartilage is then cultured for 4 to 6 weeks to increase the number of cartilage cells. These cells are then transplanted back into the damaged area of the knee by an open operation to develop a new cartilage surface in the joint.

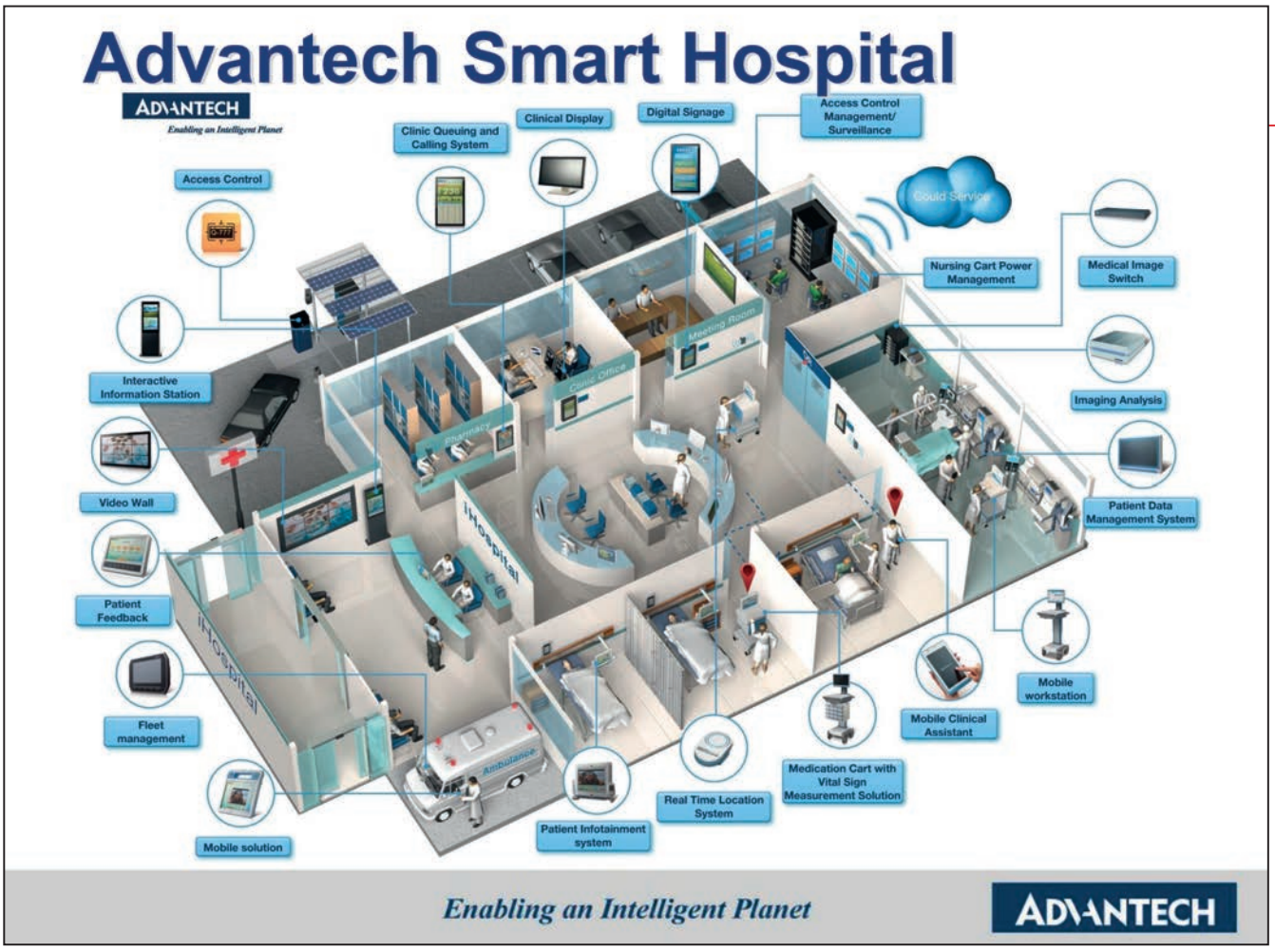
This method has proved very valuable in relieving pain and restoring activity in younger patients. However, it requires two operations, it is costly and the rehabilitation period before full activity is long, taking up to 12 months.

More recently, Mr James Donaldson and his colleagues, Mr Richard Carrington and Mr Jonathan Miles, on the Cartilage Transplantation Unit have begun using an exciting and novel single stage procedure involving the patients' own stem cells. Stem cells are initially harvested from the patient's bone marrow in the pelvis using a small needle and are then centrifuged in a specialised machine in the operating room. This provides a concentrated volume of stem cells which, when transplanted and secured back into the knee joint, will give rise to new cartilage cells and repair the damaged part of the joint.

So far, the team have performed over 70 procedures with promising short to medium term results. Only one operation and hospital stay are required for the patient, rehabilitation is accelerated and the procedure is more cost effective. The study has commenced at the RNOH for younger patients (under 45 years) with painful knees and cartilage damage. It will also hopefully provide further possibilities for the treatment of other joints such as the hip, ankle and the upper limbs.



■ Private patient enquiries can be made via: *www.rnohppu.com*



Digital products for the hospital of the future

Taiwanese company Advantech was at Arab Health to show some of their solutions designed for the 'smart hospital'. The company is one of the leading players in digital healthcare and their products are used in several leading hospitals in the region, including Cleveland Clinic Abu Dhabi, King Khalid University Hospital in Riyadh and Hamad Medical Corporation in Qatar.

We spoke to Allen Tsai, senior sales manager, about some of their futuristic devices.

He explained that their POC W243 24" Widescreen Point-of-Care Terminal has a touchscreen and can also be used hands-free, similar to "Connect" technology, which is especially useful in the OR when it comes to improving infection control. Rather than using cameras like the Connect technology, the surgeon wears an armband – an Internet of Things (IOT) device – which connects via a sensor to the terminal. The surgeon has full control over the images on the terminal monitor and can manipulate them with

simple hand gestures and muscle movements made under the armband. This enables them to continue surgery without having to touch the screen repeatedly, which improves infection control – so essential in the OR.

Tsai pointed out that Advantech is not a turn-key company, but provides smart hospital solution packages with an equal-partner alliance, including companies like GE Healthcare, Philips Healthcare and Drager.

"We can customize solutions for hospitals, according to their needs," Tsai said.

Some of the other digital products they were exhibiting included a patient infotainment system, a smart nurse cart and a complete digital Patient Visit Management System.

The Patient Visit Management System enables patients to check-in on their own and self-check their vital signs before seeing the doctor. This system includes an

Intelligent Self-Check-in, which is linked to a mobile app on the patient's smart phone. The patient checks-in by filling in their data on the monitor and the Intelligent Queueing and Calling System enables them to keep track on the app of when exactly the appointment is due. This way they don't have to sit around waiting, but can go get a coffee and will be alerted a few minutes in advance of when their appointment will begin. The system also includes a Vital Signs Self-Service kiosk, which the patient uses before seeing the doctor. The results are relayed to the patient's electronic medical record and to the doctor. There is also has a patient feedback system enabling the patient to rate the service, providing important service-quality feedback for the healthcare facility.

Advantech's patient infotainment terminal for the ward environment is a smart TV, providing TV channels, health educational videos, scheduling so the patient can know in advance when their next appointment is, nurse call, internet and Skype, and food ordering. Nurses and doctors can use an RFID card to call up the patient's medical records on the monitor and discuss them with the patient in the ward. "This significantly increases efficiency and quality of care," explained Tsai.

The nurse cart mobile workstation, automates drug administration, ensuring patients do not get the wrong medication. The system has a series of draws to store medication specific to each patient. Identification of the specific drawer for the patient is made by scanning the barcode that the patient wears on their wrist. The nurse cart is ergonomically designed and has antimicrobial coating for infection control. It has a battery life of at least 8 hours to run for a full nurse shift.

"It's important to note that the terminal in the nurse cart has no fan," said Tsai. "This greatly reduces the spread of microbes in the hospital environment. Systems with fans seldom have the fans cleaned and are renowned to harbour microbes on the fan and blow them out into hospital environment as the cart is wheeled around the wards."

Advantech's digital products are the way of the future in smart healthcare facilities. They are all digitally integrated. Using them will increase efficiency, lower costs, improve infection control, reduce medical errors, increase patient happiness and uplift the quality of healthcare – all increasingly important aspects of modern healthcare. MEH

Next generation Ford Transit Ambulance takes centre stage

The Dubai ambulance fleet has recently been strengthened by the addition of nine brand new custom-made Ford Transit vans, the world's best-selling cargo van nameplate with a 50-plus year legacy.

Ferno, the global leader in emergency pre-hospital patient handling equipment, spent more than three years developing the iNTraxx System (Integrated Vehicle Component System and iNLine Fastening System) using the Ford Transit for ambulance conversion, winning a top innovation award at the 2016 World Expo.

These Ford Transit ambulances delivered to the Dubai Corporation for Ambulance Services (DCAS) are the first of their kind in the world. Customized by Horton Emergency Vehicles, a division of market-leading emergency vehicle manufacturer REV Group, the interior of the ambulance is modular, and can be changed around in a matter of minutes, depending on the emergency situation.

The new Ford Transit Van ambulance is more compact than the typical box-on-a-chassis style ambulance. Vital tools, such as IV equipment, oxygen, monitors and supply bags, all hang along the side of the cabin with quick-release mounts on a track system for easy and immediate access, which makes the administration of medical attention as nimble and capable as the Transit itself.

"One of the greatest benefits of the Ford Transit IPTS (Integrated Patient Transport System) is that its design allows our emergency medical technicians to remain safely seated and restrained while performing on-route to the hospital," said Khalifa bin Darri, CEO and executive director, DCAS. "Paramedics can be strapped into their seat, which can move forwards and backwards, meaning everything, including the patient, is safely accessible on the journey where time may very well be of the essence." MEH

Patients receive treatment inside a hyperbaric oxygen chamber designed by Fink Engineering.

Hyperbaric oxygen therapy has great potential in region

Fink Engineering in partnership with Al Fajer Emergency Medical Services were at Arab Health to promote their hyperbaric chambers designed and built for medical facilities to enable them to provide hyperbaric oxygen therapy to patients.

Middle East Health spoke to Dr Ian Millar, a hyperbaric medical expert. Dr Millar, MBBS, FAFOEM, FUHM, Dip DHM, Cert DHM, is Medical Director of The Alfred Hospital, Melbourne, Australia.

Hyperbaric medicine is not well known in the region. However, it has some unique therapeutic qualities, specifically for wound healing. For this reason, there is great potential for its application in the Gulf countries which are struggling to cope with the large number of diabetic patients, many of whom are likely to suffer chronic wounds from the disease.

The console used to control the hyperbaric chamber.

So, what exactly is hyperbaric medicine?

Dr Millar explained: "Hyperbaric medicine uses super-dose oxygen to elevate the blood oxygen levels in the body 15-20 times above normal. The patient breathes 100% oxygen in a pressurised room, or hyperbaric chamber, which is pressurised to between 2 and 3 times atmospheric pressure.

"This turns the oxygen into a 'drug'. It becomes more than just a supplement and stimulates the body's healing response through a complicated, but now well understood, physiological process. This has a range of therapeutic benefits that can't be achieved by any other method."

Simple hyperbaric chambers for divers have been around for a long time. Chambers designed for for medical purposes have been around for 50-60 years, Dr Millar said.

"However, medical hyperbaric chambers are now seeing a resurgence because of two factors – the science improved better with numerous recent clinical trials and secondly, the technology is more advanced – with these clinically friendly chambers that manufacturers, like Fink Engineering, are building."

Fink Engineering designs state-of-the-art chambers in a range of sizes that accommodate several people comfortably.

Live surgery performed at Arab Health

During a complex cardiac surgery performance at Arab Health 2017, specialist surgeons from Royal Brompton & Harefield Hospitals (RB&HH) took to the show floor to demonstrate a procedure that provides rapid relief for those suffering Obstructive Hypertrophic Cardiomyopathy in the Middle East.

Through this surgery, patients are able to experience a substantial improvement in quality of life and the risk of sudden cardiac arrest is reduced.

RB&HH is one of few specialist Inherited Cardiac Conditions (ICC) centres across the globe, and the procedure provides hope to patients in the Middle East with obstructive Hypertrophic Cardiomyopathy, an inherited heart disease, which affects as many as 1 in 500 people across the world.

Performed to an audience made up of show visitors, the technically demanding practise was simulated by Mr Fabio De Robertis, adult consultant cardiac and transplant surgeon at RB&HH while Dr Antonis Pantazis, consultant cardiologist at RB&HH, Lead of the Cardiomyopathy Service, talked through the procedure.

Mr Fabio De Robert, adult consultant cardiac and transplant surgeon at RBHH, performs a live surgery for an audience at Arab Health

They are designed especially for the healthcare setting. They provide clean, sterile environments, with proper lighting and ventilation, and contain all the equipment that is required. Ideally, they should be integrated into the hospital and be used as conventional therapy, Dr Millar pointed out.

Therapeutic effects

The key therapeutic effects of hyperbaric medicine include maximising wound healing and response to infection, as well as tissue that is threatened by ischemia and injury.

The most common patient group for which it is used are diabetic patients with gangrene, diabetic foot ulcers or surgical complications.

"How it is used varies depending on the needs of the patient. In emergency conditions the patient may only use the chamber for one or two days. For chronic conditions, it is like a drug and needs to be administered daily for six to eight weeks, such as for a diabetic patient whose wound has not healed for a year and the only other option is amputation," Dr Millar pointed out.

He noted that 30 to 50% of patients with gangrenous wounds from diabetes will have an amputation. Hyperbaric therapy can reduce this to around 10%.

"That's the potential to save a lot of amputations," he said.

"A patient with severe infection might have the infection turned around in three or four days," he added.

Beside wound healing and infection treatment, it can be used for a group of patients who get complications from cancer treatment, such as those suffering the side effects of radiotherapy.

"Hyperbaric therapy is unique in its ability to reverse the damage done from radiotherapy," Dr Millar said.

It can also be used to reduce complications following major trauma, such as open wounds, crush injuries – acute wounds.

"It has been shown to be effective against necrotising infections – and chronic infections, such as those that may arise from prosthetic joint replacement, or spinal surgery. Hyperbaric therapy cures the infection and enables the patient to keep the prosthesis."

Physiologically, the safety profile is now very well established with this therapy, provided it is administered in a safe way, he noted.

"Although quite well established in most parts of the world, this therapy has minimal availability in the Middle East, but looking at the multi therapeutic uses it has there is justification for its establishment in all major hospitals and, at least, certainly in every major city," Dr Millar said.

The chamber is relatively capital intensive to set up – in the price range of an MRI or linear accelerator, but unlike these pieces of equipment, the chamber's lifespan is long – at least up to 50 years.

Claire Hill, Training and Operations Manager at Al Fajer, said that Fink Engineering and Al Fajer had recently signed an MoU with the intention to create awareness of the unique benefits of the this therapy, as well as increasing visibility of the chamber, in the region.

"There are no large rectangular hyperbaric chambers in the UAE, ones that provide space for patients to be wheeled into while in a bed, for example," she said.

on the WEB Hyperbaric medicine organisations

www.echm.org

www.uhms.org

Interview

Miele develops innovative sensor to improve sterilisation process

Matthias Schmitz

At the Arab Health 2017 exhibition, *Middle East Health* spoke to Matthias Schmitz, Miele's Marketing Regional Director for the Asia-Pacific, about their corporate philosophy, innovation, quality and position in the Middle East.

Miele exhibits their latest innovation in sterilization at Arab Health.

***Middle East Health*: Can you tell us a bit about Miele as a company?**

■ **Matthias Schmitz:** Miele was founded in 1899 by two gentlemen, Carl Miele and Reinhard Zinkann. Although Miele is now a global company with around 18,500 employees worldwide, it is still 100% family-owned and under the management of the fourth generation of the founding families.

Most people will know Miele for its high-quality domestic appliances, such as washing machines, tumble dryers and kitchen appliances. However, we have been active in the healthcare sector for more than 50 years. Miele Professional has contributed many innovations to infection control, such as the Vario TD programme which set the standard for the automated washing and disinfection of surgical instruments and is still the basis for any kind of automated instrument reprocessing processes, just to name one example.

Now we are launching our 4D sensor, which will set new standards in steam sterilisation and therefore in infection control and patient safety in the future.

***MEH*: Can you tell us a little bit more about the size of Miele´s business?**

■ **MS:** In 2016 we achieved a total revenue of around 3.8 billion with a healthy and sustainable organic growth rate of 5%. 70% of the turnover is generated outside our home market of Germany.

Miele Professional is an integral part of that, with a revenue of 473 million and growth rates in line with the company as a whole.

We are very happy that we have been able to increase our business especially in the Middle East.

***MEH*: What is Miele's objective and approach to doing business in the Middle East?**

■ **MS:** Miele's slogan is "*Immer Besser*" or "Forever Better". This is not only a motto, but a clear promise to provide best quality machines, best service and continuous development. Middle Eastern countries are witnessing significant developments in the healthcare sector, especially in infection control standards, which is precisely where Miele provides state-of-the-art medical solutions.

We have been making very good progress in this region. We have had successful installations in Saudi Arabia, the United Arab Emirates, Iran, Qatar, and Oman in strategic reference hospitals. But it doesn't stop there: we also provide our customers training, service support and advice to guarantee 100% satisfaction.

Miele's team – the top management and our UAE-based sales office and service centre – will maintain its focus and support for this region.

***MEH*: You focused on the word 'service', what is Miele's perspective on 'service'?**

■ **MS:** Service is one of the most important core values in our company. We believe that providing perfect quality is the first step, but maintaining high levels of service will reflect

the real image of our products. Our aim is to guarantee peace of mind and the best return on their investments to customers who invest in our brand. So, for this to happen, service is the key. Critical operations such as hospitals should never struggle with servicing our machines or suffer from prolonged downtimes.

Service capability is a crucial decision-making criterion for our partners in the respective regions.

We support our partners in the Middle East from our subsidiary in Dubai where we have an organisation with around 40 people.

But service for us means more than just providing technical support.

We assist our customers right from the outset and are involved as early as the planning stage, such as with designing a new central sterile services department (CSSD). With our international experts, we can provide support in the design phase by providing capacity calculations, planning layouts and workflows and finally, of course, by ensuring the efficient use of our equipment.

To give you an example: Following the Arab Health exhibition, a team of three experts will visit the Kingdom of Saudi Arabia and Iran to provide training on infection control and to consult hospitals on how to create an efficient reprocessing facility from an economic, technical and process perspective.

Miele will never compromise on technology and service which makes it the trusted brand for which it is so well known.

MEH: Can you tell our readers about Miele's new innovation for sterilisers?

■ **MS:** We refer to Miele's new innovation as the 4th dimension of instrument reprocessing.

According to scientific literature, surface steam sterilisation conditions comprise saturated steam and a specified temperature / time combination. For example, 134°C for 3 minutes. Pressure is used to control the sterilisation process.

That means that to ensure successful and safe steam sterilisation you have to measure four parameters:

1. Pressure
2. Temperature
3. Time
4. (Penetration with) saturated steam

In the past, it was usual to deem sterilisation successful if the parameters of pressure, temperature and holding time – only three parameters – were measured during the process. Using these parameters it was presumed that sterilisation always took place using saturated steam, although this was not always the case in practice.

The new sensor from Miele continuously monitors the presence of saturated steam (the 4th dimension) and thereby gives users the peace of mind of knowing that sterilisation took place under the most favourable conditions in the interests of safety.

MEH: What sets it apart from the competition?

■ **MS:** The Miele 4D sensor is the only available system on the market that is able to measure the presence of saturated steam in each sterilisation cycle in real time. All other systems monitor pressure and/or temperature but these parameters do not guarantee that saturated steam is present for a safe sterilisation. MEH

Cultural attitudes a barrier to fertility treatment

A deep-rooted reluctance among men in the UAE to address their own fertility issues is causing couples to go childless instead of seeking treatment, according to leading fertility expert Dr Geetha Venkat from the Harley Street Fertility Clinic (HSFC), London, UK.

Dr Venkat was at Arab Health to raise awareness of the need for more education and a shift in cultural attitudes.

With the region having some of the highest levels of obesity and Polycystic Ovarian Syndrome (PCOS) in the world – two of the condition's key contributing factors – it is easy to understand why one in six couples in the UAE is facing fertility issues. However, Dr Venkat is keen to emphasise to patients that the root of the problem is not unique to women – in fact males are found to be solely responsible for 20-30% of infertility cases and contribute to 50% of cases overall. As a result, Dr Venkat wants to encourage both partners to seek help and leave any stigma surrounding infertility at the clinic door.

"Lifestyle factors such as obesity, diabetes, smoking and stress affect both men and women and so, naturally, both sexes need to be tested for infertility," she says. "While attitudes and opinions are slowly changing, more still needs to be done to educate both men and women and replace any negative feelings of blame, guilt or embarrassment with a greater acceptance of infertility and the treatment pathway associated with it.

"While symptoms can be easy to spot in women – such as abnormal or irregular periods, in most cases of male infertility, there are no obvious signs, so the need for medical testing for male partners is crucial.

"Over the last few years, developments in the area of infertility have advanced, to include the use of metformin as an effective treatment for PCOS sufferers, and inofolic to correct the insulin resistance associated with PCOS; so there's a lot to be optimistic about," said Dr Venkat.

"My clinic is one of very few that offers an extensive range of fertility services and treatments to couples who can't conceive on their own, including a dedicated andrologist and consultant urologist specifically to treat male infertility problems," she added. "We're keen to bring our expertise to the region and work together with local medical organisations and professionals to help ensure patients can benefit from the very latest developments."

The Harley Street Clinic provides comprehensive assistance to couples who are not able to conceive. This ranges from fairly simple techniques such as timing intercourse and inducing ovulation, to more advanced treatments such as in vitro fertilisation (IVF), IVF/ICSI, ICSI using IMSI technique and time lapse embryoscope, etc.

■ For more information, visit: *www.hsfc.org.uk*

Akazienstrasse, Berlin-Schöneberg. For relatives accompanying long-term patients, Berlin is a great city to explore.

Altes Museum, Berlin

World-class hospitals for international patients

In the second part of our focus on German hospitals and medical tourism – part 1 was published in the Jan-Feb 2017 issue of *Middle East Health* – we focus on Berlin.

Berlin, the capital of Germany, is an historic, vibrant and culturally rich city. Lacking in natural resources, throughout its history Berliners have had to rely on their intellect and ingenuity to prosper in the world. In this, Berlin has been very successful and the city continues to attract the top brains in various fields, not least in healthcare and the life sciences. This is evidenced by a number of world-leading science research clusters on the outskirts of the city and several world-class hospitals, such as Charité International, Vivantes International Medicine, the German Heart Institute Berlin, the Meoclinic and Helios Healthcare International. Put this altogether and it becomes clear why the city is now one of the major centres in the world for medical tourism.

Every year between 17,000-20,000 international patients travel to Berlin for inpatient and outpatient treatment. And when it comes to complex medical cases, these hospitals provide the most advanced treatment available in cardiology, oncology, endocrinology and

The Ritz-Carlton, Berlin

The *Middle East Health* journalists were fortunate to be accommodated at the luxurious Ritz-Carlton Berlin during their stay in city. The hotel is situated on Potsdamer Platz, a famous landmark square in the heart of the city, and forms an integral part of the elegant Beisheim-Center, adjacent to Berlin's largest park, the Tiergarten.

The Ritz-Carlton, Berlin resembles the Art Déco high-rise buildings of New York and Chicago in the 1920s. The 5-star hotel pays homage to the German empire style with its luxurious, classical interior creating the atmosphere of a grand hotel. It was inspired by the Prussian architect Karl Friedrich Schinkel (1781-1841), who has like no other formed the architecture of the old and new capital.

The hotel has 303 guestrooms in various categories: 225 Deluxe Rooms; 40 Suites; 37 Club Rooms and; 1 Apartment.

The Ritz-Carlton, Berlin built in the German empire style of architecture.


Club Lounge in the Ritz-Carlton, Berlin.


Home-away-from-home. The luxurious apartment at the Ritz-Carlton, Berlin.

International patients

The Ritz-Carlton, Berlin is the accommodation of choice selected by Arabic families accompanying a patient who has come to Berlin for medical treatment. These families often choose the luxury suites of the Ritz-Carlton, which are equipped for long-term guests.

The hotel has all the amenities you would expect from a 5-star hotel, including fine restaurants, trendy bars, luxurious lounges, as well as fitness, recreation and beauty amenities.

For guests from the Middle East, the hotel provides an Oriental ambience including Qur'an and prayer rug. Special attention is given to the needs and wishes of guests travelling for medical reasons.

The special services for Arabic-speaking guests of the hotel include numerous Arabic TV channels and daily Arabic newspapers.

"For our guests from the Middle East, religion and faith play an important role in their lives," explained Robert Petrovi , General Manager at the Ritz-Carlton, Berlin. "With our services, we offer them a home away from home, enabling them to enjoy the city of Berlin to the full."

Arabic food is served on request in the Brasserie Desbrosses, as well as in the exclusive Club Lounge on the 10th floor of the hotel. With the hotel's limousine service, guests can also reach two of the most beautiful mosques in the city.

The hotel has several unique offerings. For example, to accommodate the needs of hotel guests with specific allergies, the Ritz-Carlton has allocated two rooms which are certified as environmentally free of products and substances which can provoke health-related problems. From special pillows to carpet free flooring, these rooms reflect the concerns of Ritz-Carlton for the comfort and wellbeing of all its guests. MEH

many other medical specialties, at rates that are significantly less than those in the United States for equivalent procedures.

We thank VisitBerlin for their support in helping to arrange our visits to some of the city's leading hospitals and the Ritz-Carlton Berlin for accommodating us during our stay in the city.

- VisitBerlin has a website specifically for international patients seeking healthcare in the city: *www.visitberlin.de/en/experience/health*. If you are considering seeking healthcare in the city – this is a good place to start.

Vivantes International

Vivantes is the largest governmental hospital group in Germany with nine hospitals in Berlin and others in cities across the country. The group's advanced facilities in Berlin make it a popular destination for international patients, whether they seek a simple preventive healthcare check-up or require complex surgery.

In Berlin we visited two of their hospitals – Vivantes Spandau Hospital and Vivantes Humboldt Hospital.

The hospital group offers a complete spectrum of medical specialties, from cardiology, endocrinology and neurology to paediatrics, oncology, urology, robotic surgery and more.

"We have our own laboratory, and our own catering company for patient food," Nizar Maroouf, Vice Director Vivantes International Medicine, explained, as an indicator of the large size of the group.

"Vivantes has more than 40 highly specialised Centers of Excellence, including those for Breast, Cochlear Implant, Minimally Invasive Surgery, Plastic Surgery, Obesity and Obstetrics," he added.

"The Cochlear Implant Center is one of the biggest in Germany. Many patients from the Arab world come here for treatment," he said.

We spoke to Dr Colin Krüger, Division of Minimally Invasive Surgery and head of the Robotic Surgery unit.

The unit uses Da Vinci robots. The surgery is done laparoscopically and while the surgeon sits at the robot console in a room adjacent to the OR enabling the operating of the robot outside of the sterile field of the OR. Inside the OR a scrub nurse is with patient.

"It is a single-surgeon procedure," Dr Krüger explained. Only one surgeon is required to manipulate the robot.

Using the robot has significant advantages. "You view the site of operation in 3D with 10 times magnification, making it excellent for oncologic procedures," he said. "Lymph node resection is increased by around 25% and there is significant reduction in blood loss compared to other forms of surgery."

Vivantes is a Reference Centre for the Da Vinci robot. It is one of only three training centres in Europe and surgeons come from across the continent to learn how to use the robot.

More than 3 million procedures have been done using these robots around the world.

"The big market is for urological procedures, with 80% of the prostate cancer cases done robotically. There is growing use of it in general surgery – specifically for the big oncologic procedures, such as pancreatic cancer surgery or oesophageal cancer, with significantly decreased morbidity as it is done laparoscopically with the robot.

"We can see better, prep better and reconstruct better as we suture intracorporeally, which is very hard in laparoscopic surgery. This is a big technological step forward," he said.

Dr Krüger summarized what Vivantes offers with robotic surgery: "We have a focus on upper GI (gastrointestinal) surgery. Initially, we started with colorectal surgery, but there wasn't much improvement in outcome for this surgery compared to the laparoscopic procedure, so we changed to focus on upper GI surgery especially for gastric cancer, oesophageal cancer and pancreatic cancer.

"We also do all the endocrine surgery procedures with the robot."

Obesity

Vivantes sees many international patients for bariatric surgery to reduce weight. Around 60% of international patients

Leading doctors

Many of the doctors at Vivantes International Medicine are world-leading specialists in their respective fields, and are renowned for their practise, research and their innovation in medicine. Here is small selection of Vivantes' well-known doctors:

- Prof Dr med. Andree Faridi, Director, Department of Senology, Breast Cancer, Surgery, Plastic and Reconstructive Breast Surgery – specialises in Breast Cancer Surgery, Reconstructive Breast Surgery, Aesthetic Breast Surgery and Gynecological Oncology.
- Prof Dr med. Steffen Behrens, Director, Department of Cardiology and Conservative Intensive Care – specialises in Coronary Artery Disease, myocardial infarction, heart failure, cardiac arrhythmias, pacemaker and ICD therapy, and Interventional electrophysiology.
- Prof Dr med. Joerg Mueller, Director, Department of Neurology – is an internationally renowned expert for Parkinson's disease and other Movement Disorders, MS, Stroke and Neurorehabilitation.
- Prof Dr med. Volker Lange, Director, Centre for Obesity and Metabolic Surgery – specialises in operative treatment of obesity.

International patient services

Individually planned and implemented medical care, is always accompanied by services such as:

- Personal treatment and consultation by the Chief Physician
- If necessary, VIP accommodation at the hospital – with all modern comforts
- Round-the-clock care by staff who speak Arabic, English and Russian
- Cost estimate and treatment contract within 48 hours
- Invitation for visa application, also for accompanying persons as needed
- Final medical reports in the required languages
- Lunch à la carte with individual choices and religiously adapted menus (halal)
- Security service

Comfort Hospitals

To appeal to international patients and cater to wealthy self-paying patients, Vivantes has established a concept called 'Comfort Hospitals'. The group has five Comfort Hospitals with more than 220 beds, where they offer patients superior comfort and service, equivalent to a luxury hotel.

The Comfort Hospitals offer the following:

- Air conditioned spacious rooms
- Optional dining à la carte in the room and at the restaurant
- Breakfast- and dinner-buffet
- Separate lounge-area
- Minibar, bathrobe and safe in the room
- Optional room-service
- Internet and media-access TV

come to Vivantes for revision surgery, following bariatric surgeries that have gone wrong.

"Severe obesity is increasing in adults and children. It shortens lives due to concomitant disease by an average of 11 years for men and eight years for women," explained Prof Dr Volker Lange, Director of the Department of Obesity and Metabolic Surgery at Vivantes Center.

He noted that bariatric surgery is the only durable and effective treatment of obesity – that is obesity grade 2 or severe obesity (BMI of 30-39.9) and grade 3 or morbid obesity (BMI greater than or equal to 40).

"It is not superficial plastic surgery that only reduces abdominal fat. Bariatric surgery not only reduces weight, but improves and resolves concomitant diseases, such as diabetes, dyslipidaemia and hypertension, which together are known as 'metabolic syndrome'. So, this surgery is now being referred to as 'metabolic surgery'," Dr Lange said.

Common procedures are the gastric bypass – the gold standard. However, a newer procedure gaining popularity is the sleeve gastrectomy, but data on this only goes back 10 years, so the jury is still out on long-term effectiveness of this procedure, Dr Volker said.

"The operation takes about one hour. It is all done laparoscopically," he said.

"We have done 4500 operations, the highest in Germany. Surgical complications at Vivantes are very low, at around 2.5%," he added.

Dr Lange explained that there is a procedure that should be followed when offering this type of surgery.

"Patients are required to learn how to eat correctly before the operation and after care is required for a short while following surgery.

"Plastic surgery is often necessary for body contouring after bariatric surgery."

Generally, the patient stays as an inpatient for 3 days following bariatric surgery and Vivantes recommends that the patient stays a further 10 days as an outpatient in the city for follow-up checks.

Middle East Health also spoke to Prof Dr Ernst Späth-Schwalbe, Director of the Department of Hematology, Oncology, Gastroenterology and Palliative Medicine. He gave us a detailed presentation on the latest developments in treatment for oncological diseases, including immunotherapy

Prof Dr Jörg Wissel, Director of the Center for Neurological Rehabilitation and Physical Therapy, spoke to us about Vivantes' expertise in this field and this was followed by a tour of Vivantes Spandau Hospital's state-of-the-art Center for Neuro-Rehabilitation.

Taking in the breadth of Vivantes Group and the many specialties they cover with some of the world's leading doctors and surgeons, this group deserves serious consideration when looking at international treatment options.

■ For more information, visit: *www.vivantes-international.com*

PGD International

Paul Gerhardt Diakonie (PGD) has six hospitals in Berlin.

Their International Patient Office works with patients from the Far East, Middle East, Russia, Europe and the Americas.

"We have relationships with embassies to treat their citizens and their military personnel," explained Soumeya Meraghni, the manager of the Arab Department in the International Patient Office of PGD.

PGD also works with several international health insurance companies to facilitate payment.

PGD offers a wide spectrum of specialties with an interdisciplinary approach, including: spinal surgery, internal medicine, general surgery, gynaecology, paediatrics, paediatric orthopaedics, centres for breast and bowel cancer, plastic aesthetic surgery, orthopaedics, endocrinology, foot and hand surgery, neurosurgery and treatments of the thyroid gland.

"We treat patients from around the world and see many patients from the GCC, especially Kuwait, Saudi Arabia, and Bahrain," explained Meraghni.

"About 80% of our international patients are Arabic," said Meraghni.

Beside regular consultation and treatment, PGD offers a complete concierge service for international patients – including VIP airport transfers, visa assistance, VIP catering and accommodation for patients and accompanying relatives, etc.

"We also provide a dedicated assistant who acts as translator as well as providing many other services to the patient, such as serving food.

Treatment is provided only by the head of department.

"We also offer a VIP section with luxury accommodation, which is often used by our patients from the GCC. In most cases, international patients are accommodated in attractive single rooms with internet access, their home TV programs and magazines in their native language. Our philosophy is to make patients feel at home – which is also an important part of their therapy."

PGD also treats some patients for free on humanitarian grounds – when certain international patients are unable to afford it and their treatment can't be provided in their home country.

■ For information on PGD's complete range of services, visit: *www.pgd-healthcare.com*

Children's Hospital of Pittsburgh of UPMC ranked highest in United States for liver transplant outcomes

The Hillman Center for Pediatric Transplantation at Children's Hospital of Pittsburgh of UPMC is ranked highest in the United States for pediatric liver transplant outcomes, according to January data released from the Scientific Registry of Transplant Recipients (SRTR).

The SRTR, which manages and analyzes a wide range of transplant data as a service to the public, noted several achievements for Children's in 2017. When comparing hazard ratio estimates, Children's ranks as number one out of 62 pediatric liver transplant centers in the U.S. in one-year overall patient survival as well as one-year overall graft survival.

Of the 29 centers performing pediatric living-donor liver transplants in the U.S., Children's hazard ratio estimates also rank first in one-year patient and graft survival, as well as three-year patient and graft survival. Children's has performed over 135 living-donor liver transplants since 1997, and more than any pediatric transplant center in the last five years nationally.

The hazard ratio provides an estimate on how the results at Children's Hospital of Pittsburgh compares with what was expected based on modeling the transplant outcomes from all U.S. programs. Based on the characteristics of patients transplanted at Children's from July 2013 through December 2015, SRTR hazard ratio results indicate a 59 percent estimated lower risk of patient mortality and a 76 percent estimated lower risk of graft failure when compared to other pediatric liver transplant centers.

"This new data exemplifies the extraordinary talent and skill our surgeons, hepatologists and entire transplant team bring to hopeful patients and families around the world," said George Mazariegos, M.D., chief of pediatric transplantation at Children's. "Our decades of experience are unparalleled – we have performed more pediatric liver transplants than any other center in the United States while achieving patient survival rates that are consistently among the best."

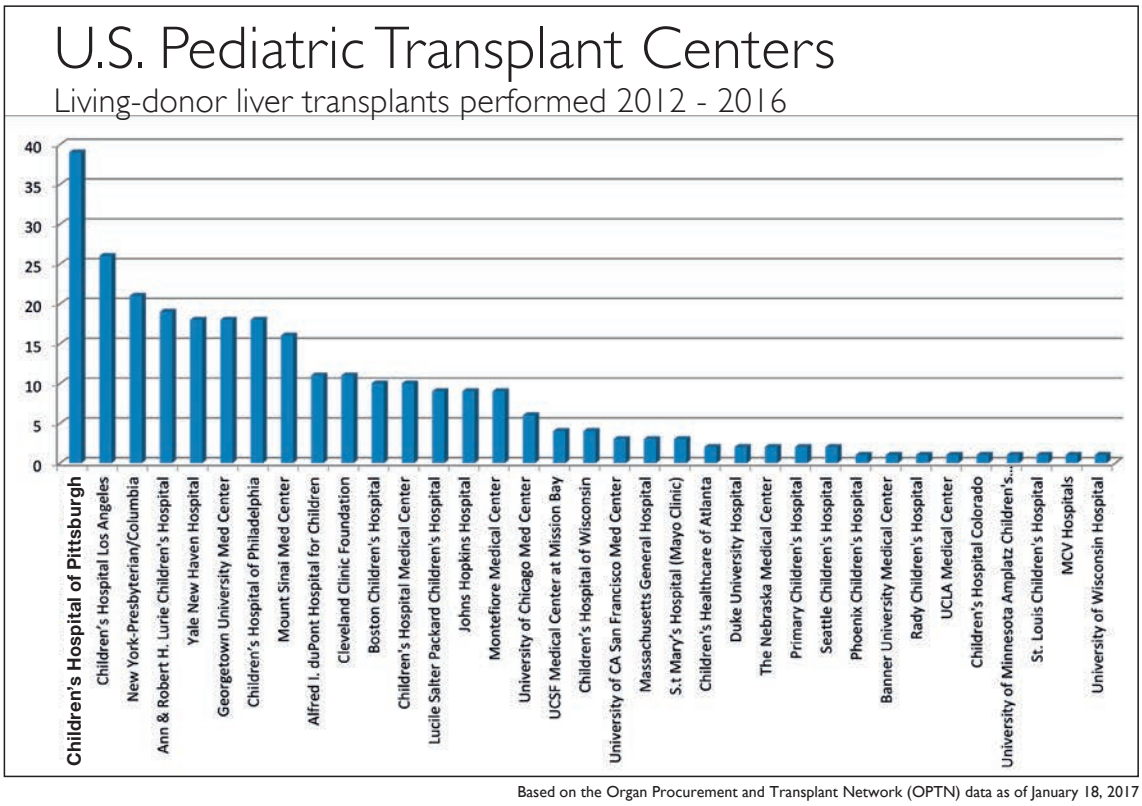
Children's has performed more than 1,800 pediatric liver transplants since the program's inception in 1981 through December 2016. This includes:

- 70-plus transplants in children and young adults with maple syrup urine disease – more than any other center in the U.S., while achieving 100 percent patient and graft survival.
- 330-plus transplants for children and young adults with metabolic liver disease – more than any other transplant center, including adult facilities.
- 135-plus living-donor liver transplants since 1997. In the last five years of recorded data (2011 to 2016), Children's has performed more living-donor liver transplants than any other pediatric liver transplant center in the country.
- 18 domino liver transplants – more than any other center in the nation, while achieving 100 percent patient and graft survival.

Liver transplantation is often a lifesaving procedure for children with end stage liver disease, but it's also an attractive approach for improving quality of life for many young patients with metabolic disease. In 2004, the protocol for liver transplantation for Maple Syrup Urine Disease (MSUD) was developed at Children's Hospital of Pittsburgh. Today, these patients show normal liver function, have avoided the risk of neurological complications and enjoy an unrestricted diet.

Children's also is the first and only pediatric transplant center in the nation to expand the geographic reach of its program through a partnership with the University of Virginia Children's Hospital in Charlottesville, Virginia.

For more information about the Pediatric Liver Transplant Program at the Hillman Center for Pediatric Transplantation at Children's Hospital of Pittsburgh of UPMC, please visit: *www.chp.edu/livertransplant* MEH



Based on the Organ Procurement and Transplant Network (OPTN) data as of January 18, 2017

The burgeoning threat of infectious diseases

Time to raise the bar in blood safety

107 million – that's the number of blood donations made worldwide every year. As this blood makes its journey from one person's arm to another, how certain can we be of its safety? Infectious diseases pose a significant burden on global economics and public health, making blood safety indispensable. In a world where hepatitis, Zika virus and Middle East Respiratory Syndrome (MERS) continue to plague us, it is time to raise the bar and aggressively tackle the problem head on.

How? The answer is simple – *diagnostics*.

Combating threats to blood safety

Organisms like of bacteria, viruses, fungi and parasites live in and on our bodies all the time. Normally, they are harmless and under certain circumstances, helpful. However, some are harmful and cause disease. Some of these infectious diseases are passed on from person to person. Others are transmitted through animal or insect bites or acquired by digesting contaminated water or food.

Another way of contracting an infectious disease is through a contaminated blood donation. That is where innovative blood screening technologies play an instrumental role in helping blood banks maintain reliable supplies of clean and safe blood.

Healthcare diagnostics has taken giant leaps forward in the past few decades and is now at the forefront of medical technologies that play a critical role in disease prevention and management. Building on industry-leading innovations and a rich legacy in this field, Roche is producing outstanding therapies and diagnostic tests. Roche has risen to the challenge of translating the wealth of molecular knowledge into cutting-edge tests and diagnostic solutions that provide answers and clarity to patients and healthcare professionals.

Roche Diagnostics is committed to ensuring blood safety for patients, laboratory technicians and healthcare professionals. With a broad spectrum of products and tests, the Roche Blood Safety Solution portfolio is carefully designed to bring: **reliability** by assuring patients that their blood test results are accurate and not confused with another patient's sample due to automation; **efficiency** by increasing walk-away time to free up laboratory staff for other tasks and; **safety** to both patients and laboratory technicians by ensuring blood samples are not contaminated.

Medical emergencies

As a biotech company, Roche has a long history of responding to health emergencies, such as MERS in this region, Zika around the world and AIDS. Roche introduced the first HIV-1 test in 1985.

As a leader in the field, Roche is committed to providing diagnostic test solutions for the world's most challenging emergencies. It has become evident over the years that health crises can arise anywhere, anytime and, as such, Roche remains at the frontline of defense for patients and healthcare providers.

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Don't overlook generic drug alternatives

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

Brand marketing can have a huge influence on our everyday purchases. In all types of markets, from food, cars, clothing and household cleaners, a common judgement is that generic versions are inferior to the often more expensive branded versions, even when the components are almost identical. As a pharmacist, I know the same can be said for pharmaceuticals especially when selling directly to a consumer who would request the most recognised brands despite a much higher cost. However, doctors and pharmacists are also consumers to drug companies, and can often overlook generic alternatives and prescribe more expensive brands when there are cheaper alternatives available.

But should pharmacists be allowed to automatically substitute prescriptions without the knowledge of the patient? Branded and generic products are classed as the same if the dose of the active ingredient and the formulation is equivalent. In most regions across the world, drug regulators do set strict standards for generic medication to ensure that the levels of active ingredient are sufficient enough to have the same therapeutic effects within a similar time-frame. Essentially, it should be the same product, with a slight variation on non-active ingredients which is just as effective for treatment.

A risk that does come with the varying ingredients in generics is, of course, if a patient has allergies. Many also argue that switching to generics can cause confusion to patients. For someone who has become accustomed to taking their medication in the form of a round white pill, to then suddenly be faced with a square pink pill can be very unsettling. This could be especially detrimental to those who rely heavily on routine, for example a person with Alzheimer's.

But when there is no significant difference between the two, increasing the use of generics could have a substantially positive impact on government spending. With costs of healthcare and levels of uncertainty in the economy rising, governments need to look at ways to safely cut costs fast. Here in the UK, a report called *Better Value in the NHS*, claimed that using generics has saved the National Health Service billions, and more importantly it has allowed an extra 490 million items to be prescribed to patients. As the Middle East increasingly moves towards insurance-based healthcare, and public healthcare spend is continually growing, generic medicines could be used to bring down costs and ensure affordable healthcare is available to everyone.

Several governments have already increased efforts to promote generic substitution to doctors and consumers and it seems to be working. BMI Research estimates that generic drug sales currently hold 25% of the pharmaceutical sector in the Middle East, with potential to rise to 31% by 2025. Government schemes and policies to help promote generics could encourage pharma companies to get involved helping to provide generic substitutes, sometimes even as a cheaper version of their own original drug. It is also important to encourage a culture of prescribing medicines using the international non-proprietary name instead of the branded name so that consumers can be made more aware of which active ingredient is actually benefiting them.

Even in this economic downturn, we realise more often that health really is wealth, but that is no reason to pay over the odds for something that is potentially life-saving. Ban Ki-moon, Secretary-General of the United Nations, was correct in saying that it is not enough to have effective and safe medicines if they are not affordable and available to those who need them.

Durbin's global network of suppliers gives us the capability to procure drugs across the globe. Our International Sales division currently supplies over 20,000 branded, generic and consumable products to health professionals, hospitals and medical distributors worldwide. Our experienced multi-lingual sales team are able to source pharmaceuticals and other medical products for you in any quantity at a competitive price. MEH

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

- Web address: *www.durbinglobal.com*
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Surinyach Anna /MSF

Najah El Atrash, the mother of Annas Al Atrash, has kept the clothes her son was wearing the day of his death. "These clothes are so precious to me that I refuse to wash them or give them to anybody. Why? Because the blood of Annas is on them." He was the manager of the family's shoe business and responsible for looking after their income. He also worked selling trainers in the family's shop in Jericho to tourists. On November 7, 2013, he was killed by an Israeli soldier while crossing a checkpoint by car.

Occupied minds: Helping to train psychologists in Nablus


MSF

Loraine Anderson, an MSF Clinical Psychologist, spent more than half a year in Nablus helping to teach local psychologists. She speaks about the experience of working in Palestine.

I was based in Nablus for seven months. I treated patients, trained staff and supervised students from Al-Najah University – the first Palestinian university to teach clinical psychology. MSF offered three-month student placements so they could practice their skills and apply their knowledge in a clinical setting. In total, they had eight students in the first-year cohort.

Psychology is not very well developed in Palestine. There is only one psychiatric hospital – in Bethlehem. The WHO, with the Palestinian Authority Ministry of Health, are setting up community health centres that will also include treatment for mental health problems. That's why MSF's support in training students in clinical psychology is important.

In terms of needs, we were mainly dealing with the consequences of the occupation, like trauma, grief and loss. We also treated people suffering depression and anxiety.

We provide support for grief and loss to relatives and friends of people killed by Israelis. Such deaths are not normal and it's hard dealing with the aftermath.

We also treated children who had been traumatised by the Israeli army entering their houses, searching at night or using weapons including gas bombs, or by the Israeli settlers entering their villages and being destructive.

In terms of the number of patients, quite surprisingly, I think we had more or less the same proportion of the population in need of mental health services as in Australia. There are several reasons for this – people are very resilient, they rely very much on their community, and because they have dealt with occupation for a very long time, they just cope with it.

The main problem is that Palestinians don't have access to enough services, particularly in the rural, remote or conservative areas.

The most challenging thing was scheduling the training – being responsible for organising the week and the days with the students, the translators and the supervising staff. The most rewarding thing was supervising the students. The relationship with the patients was also rewarding thanks to translation by our interpreters.

We had a team of three national psychologists and two international psychologists, each with their own interpreter, two social workers, and a medical doctor. The initial information would be taken by a social worker, then the referral would be provided to the psychologists. We received referrals from other organisations and we also had a toll-free number. The allocated psychologist would either go to the person's home, invite them to attend the clinic, or see them in a consultation room outside of Nablus, to do the initial assessment. The psychologists managed the case and we decided if a social worker or a doctor was needed, creating a multi-disciplinary treatment approach.

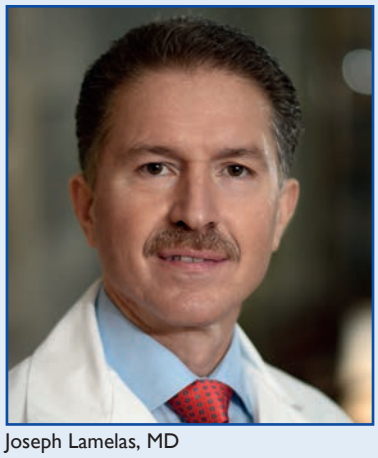
This experience will help my practice in Australia and it has inspired me to work more with refugees. MEH

MSF UAE

MSF has been in UAE since 1992 under the patronage of Sheikh Nahyan Bin Mubarak Al Nahyan, the UAE Minister of Culture, Youth, and Community Development. MSF in UAE consists of Executive, Finance, HR & Administration, Communications & Fundraising, Logistics and Desks (program manager, HR, Finance, logistics and medical referent).

Visit: *www.msf-me.org*

Pioneer in minimally invasive heart surgery joins Baylor St. Luke's Medical Center



Joseph Lamelas, MD

In January, Joseph Lamelas, MD, an internationally recognized expert in minimally invasive heart surgery, joined Baylor St. Luke's Medical Center in Houston, Texas from Mount Sinai Medical Center in Miami, Florida, where he served as the Chief of Cardiac Surgery for the past eight years.

With more than 26 years of experience, Dr. Lamelas has completed more than 14,000 cardiac surgical operations in his career, has played a significant role in advancing the field of minimally invasive cardiac surgery, as well as developed facilitating instruments. He has trained more than 700 physicians from around the world in this approach over the last 12 years.

"As an internationally renowned cardiothoracic surgeon, Dr. Lamelas brings an extraordinary mix of experience and talent that will be a true benefit to our cardiovascular program at Baylor St. Luke's Medical Center and the community," said Gay Nord, president at Baylor St. Luke's Medical Center.

While Dr. Lamelas practices all facets of cardiac surgery, his main focus over the past 12 years has been minimally invasive cardiac surgery. Dr. Lamelas has developed techniques to facilitate minimally invasive approaches for repairing simple congenital cardiac defects, removal of cardiac tumors, aortic valve surgery, mitral valve surgery, double and triple valve surgery, as well as replacing the ascending aorta without splitting the sternum.

"The procedures involve a small incision on the right side of the chest and do not involve opening the breast bone. Utilizing specialized equipment and instruments, access to and exposure of the heart chambers and valves are obtained," said Dr. Lamelas.

Minimally invasive valve surgery allows for a shorter stay in the hospital as well as a quicker return to a full and normal level of activity. Most valve surgery patients are candidates for this procedure.

"I'm proud to be able to continue my career at an institution that was there when cardiac surgery began and now be a part of its history," said Lamelas. "It will help me disseminate my knowledge and experience in cardiac surgery. In addition, I will have the opportunity to train the surgeons of the future in minimally invasive surgery and make this more of a reproducible and widely adopted technique that will benefit a larger population of patients."

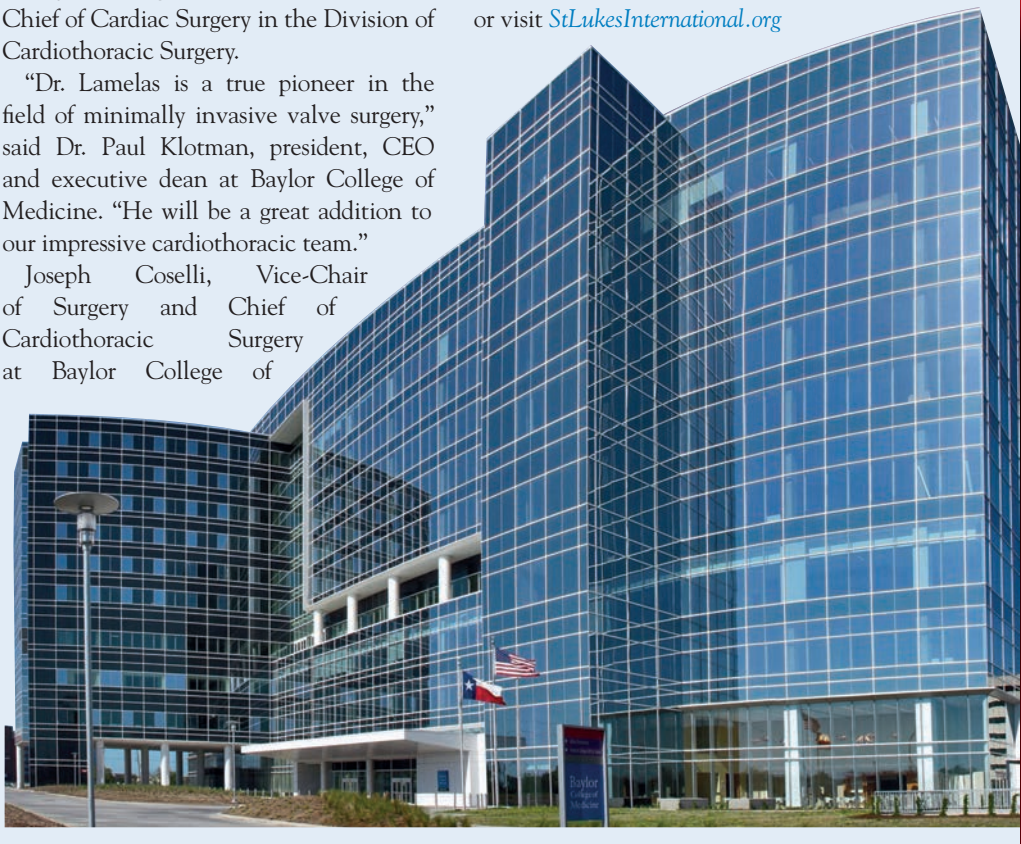
In addition, Dr. Lamelas joined the Michael E. DeBakey Department of Surgery at Baylor College of Medicine as Associate Chief of Cardiac Surgery in the Division of Cardiothoracic Surgery.

"Dr. Lamelas is a true pioneer in the field of minimally invasive valve surgery," said Dr. Paul Klotman, president, CEO and executive dean at Baylor College of Medicine. "He will be a great addition to our impressive cardiothoracic team."

Joseph Coselli, Vice-Chair of Surgery and Chief of Cardiothoracic Surgery at Baylor College of Medicine, added: "The addition of Dr. Lamelas is an enormous asset to the department of surgery, Baylor College of Medicine and the Houston community. His minimally invasive approach offers patients an important option that allows them to return to their daily lives faster."

Dr. Lamelas is board certified in thoracic surgery and a member of the American Association of Thoracic Surgeons and the Society of Thoracic Surgeons. He also is a fellow in the American Board of Surgery, American College of Cardiology, American College of Chest Physicians, and American College of Surgeons. Dr Lamelas has lectured both nationally and internationally and his work in the field of minimally invasive valve surgery has been extensively published.

■ For more information, contact Baylor St Luke's Medical Center International Services at:
international@stlukeshealth.org
or call +1 832 355 3350
or visit *StLukesInternational.org*



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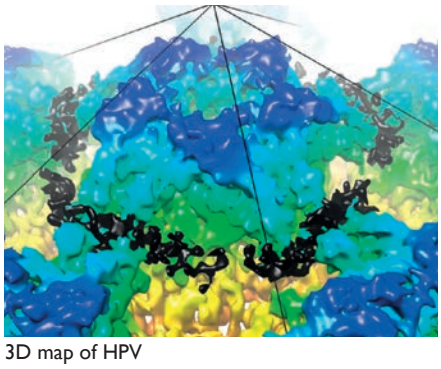
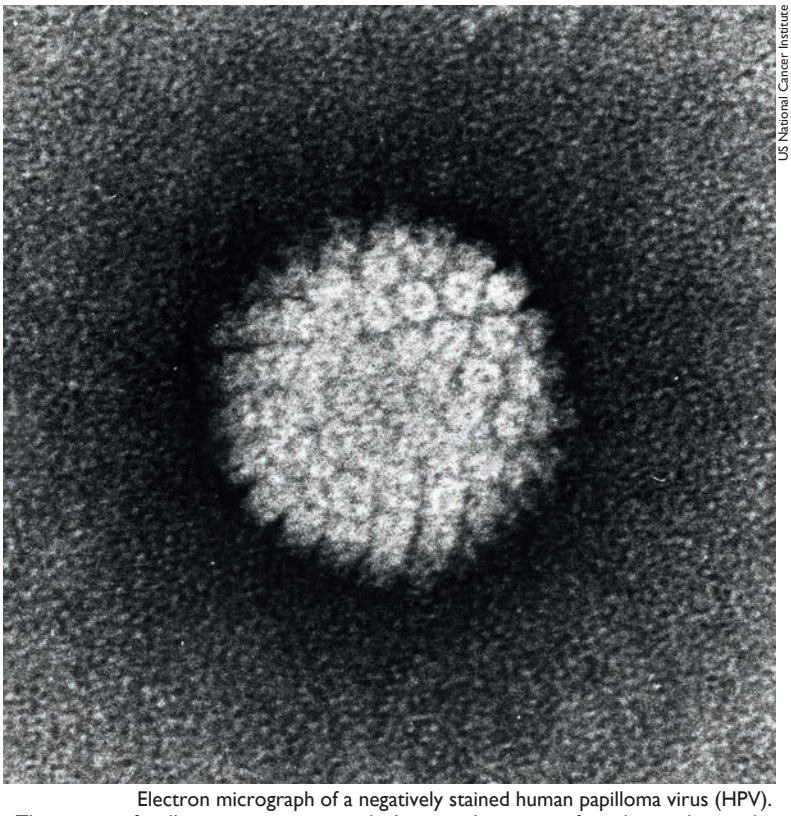
Scientists get best view yet of cancer-causing virus HPV

New details of the structure of the human papillomavirus (HPV) may lead to better vaccines and HPV anti-viral medications, according to research led by a Penn State College of Medicine researcher.

Using a new imaging technique called cryo-electron microscopy – or cryo-EM – the researchers discovered never-before-seen details of the virus that causes cervical, anal and throat cancers. The first-ever high-resolution 3-D maps of HPV reveal key characteristics of its outer shell, or capsid, and the proteins that assemble it.



3D map of HPV



US National Cancer Institute

Electron micrograph of a negatively stained human papilloma virus (HPV). This image is for illustration purposes only. It is not the image referred to in the article.

With better understanding of the HPV capsid, scientists may be able to prevent the virus from binding to receptors on human cells, a crucial step in the infection process, said Susan Hafenstein, associate professor of medicine, and microbiology and immunology. Researchers reported their results in the journal *Structure*.

Hafenstein and colleagues at Penn State College of Medicine and the University of Pittsburgh School of Medicine made a number of important structural discoveries about the virus. The researchers focused on HPV16, the strain that causes most HPV-related cancers.

Although HPV is perhaps best known as the cause of almost all cervical cancers in women, it is also a major culprit in the alarming increase of throat cancers in men, Hafenstein said. The current vaccine only protects against one strain of the virus and no effective anti-viral medications exist for people who are already infected.

The HPV shell is made up of two types of proteins, called L1 and L2. Zooming in on the virus with atomic resolution, the researchers found that there are far fewer L2 proteins than was previously thought. They also discovered that these proteins are incorporated asymmetrically in the shell.

In HPV, L1 proteins are the major structural component, while L2 proteins play a more functional role, helping to move the virus into the infected cell. Interfering with how the virus enters the cell is an attractive area of research because it presents a key target to stop the virus.

"It's a key point in the virus life cycle, and won't tolerate mutation," Hafenstein explained. "Viruses can't change and do entry a different way, typically."

Although the new findings about L2 create new challenges, they will also help researchers target the proteins better to thwart infection, Hafenstein said. The L2 proteins are nearly the same for every strain of HPV, whereas L1 proteins can differ widely from strain to strain.

The researchers also discovered that HPV capsids differ in size and that L1 proteins take on different shapes to hold the shell together. They were also able to visualize the virus binding to a cell receptor at a single site. This was in contrast to previous work using a highly simplified HPV model, which found multiple binding sites.

In the new study, the virus appeared

to change shape as it locked on to the cell. Even better resolution – something Hafenstein and her colleagues are working on – will confirm if that is the case and if those changes involve L1 as well as L2.

The improved imaging could lead to better HPV research approaches. HPV is challenging to culture and grow in the lab, so researchers who study the virus use one of three stand-ins made up of one or both types of capsid proteins. Recent research has shown that these stand-ins react differently to antibodies against the virus and to host cell receptors.

"Everyone assumed we were all studying the same thing," Hafenstein said. "It's important to try to tease out the differences between the capsids so that researchers can be better informed."

Next, Hafenstein hopes to produce higher-resolution HPV maps to learn more about L2 and its role in cell entry.

"I think that if we find out more about entry, it'll lead us to new antivirals and ways to defeat viruses," she said.

Other researchers on this project were Jian Guan and Robert E. Ashley, Department of Medicine; Stephanie M. Bywaters, Sarah A. Brendle and Neil D. Christensen, Department of Pathology,; and Alexander M. Makhov and James F. Conway, University of Pittsburgh School of Medicine.

doi: 10.1016/j.str.2016.12.001 MEH

Researchers identify cervical cancer subset that has no HPV link

Investigators with The Cancer Genome Atlas (TCGA) Research Network have identified novel genomic and molecular characteristics of cervical cancer that will aid in the subclassification of the disease and may help target therapies that are most appropriate for each patient. The new study, a comprehensive analysis of the genomes of 178 primary cervical cancers, found that over 70% of the tumours had genomic alterations in either one or both of two important cell signalling pathways.

The researchers also found, unexpectedly, that a subset of tumours did not show evidence of human papillomavirus (HPV) infection.

The study included authors from the US National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI), both parts of the National Institutes of Health, and appeared January 23, 2017, in *Nature*.

Cervical cancer accounts for more than 500,000 new cases of cancer and more than 250,000 deaths each year worldwide.

"The vast majority of cases of cervical cancer are caused by persistent infection with oncogenic types of HPV. Effective preventive vaccines against the most oncogenic forms of HPV have been available for a number of years, with vaccination having the long-term potential to reduce the number of cases of cervical cancer," said NCI Acting Director Douglas Lowy, M.D.

"However, most women who will develop cervical cancer in the next couple of decades are already beyond the recommended age for vaccination and will not be protected by the vaccine," noted Dr Lowy. "Therefore, cervical cancer is still a disease in need of effective therapies, and this latest TCGA analysis could help advance efforts to find drugs that target important elements of cervical cancer genomes in addition to the HPV genes."

An aspect of the study that is of particular interest was the identification of a unique set of eight cervical cancers that showed molecular similarities to endometrial cancers. These endometrial-like cancers were mainly HPV-negative, and they all had high frequencies of mutations in the KRAS, ARID1A, and PTEN genes.

"The identification of HPV-negative endometrial-like tumours confirms that not all cervical cancers are related to HPV infection and that a small percentage of cervical tumours may be due to strictly genetic or other factors," noted Jean-Claude Zenklusen, Ph.D., director of NCI's TCGA program office. "This aspect of the research is one of the most intriguing findings to come out of the TCGA program, which has been looking at more than 30 tumour types over the past decade."

Because immunotherapies are becoming increasingly important for cancer therapy, the investigators examined genes that code for known immune targets to see if any were amplified, which may predict responsiveness to immunotherapy. They found amplification of several such genes, specifically CD274 (which encodes the PD-L1 immune checkpoint protein) and PDCD1LG2 (which encodes the PD-L2 immune checkpoint protein). Several checkpoint inhibitors have been shown to be effective immunotherapeutic agents. In addition, the TCGA analysis identified several novel mutated genes in cervical cancer, including MED1, ERBB3, CASP8, HLA-A, and TGFBR2. The researchers also identified several cases with gene fusions involving the gene BCAR4, which produces a long noncoding RNA that has been shown to induce responsiveness to lapatinib, an oral drug that inhibits a key pathway in breast cancer. Therefore, BCAR4 may be a potential therapeutic target for cervical cancers with this alteration.

When analysing the biology behind the molecular alterations in these tumours, the researchers found that nearly three-quarters of cervical cancers had genomic alterations in either one or both of the PI3K/MAPK and TGF-beta signalling pathways, which may also provide targets for therapy. The authors noted that an important question raised by this study is whether HPV-positive and HPV-negative tumours will respond differently to targeted therapies. MEH

EKF's new POC analysers provide lab quality results

The Quo-Test® and Quo-Lab® POCT HbA1c analysers from EKF Diagnostics are now available with an integrated connectivity package including a connectivity interface box, cables and a software upgrade, allowing the analyzers to transmit patient data to the majority of Lab Information Management Systems (LIMS) or Hospital Information Systems (HIS) in use today.

The connectivity package uses the POCT1-A2 communication protocol and the in-house designed connectivity interface box to create bidirectional communication between a multitude of Lab Information Management Systems and the Quo systems. Unlike many closed proprietary data management systems, the EKF Diagnostics connectivity solution is open, allowing for easy and simple connection to whatever system the clinic is currently using.

As well as using the industry standard POCT1-A2 communication protocol, the connectivity solution also unlocks a host of new features aimed at improving security and quality control.

Previously it had only been possible to add a patient ID to each test result through use of a barcode scanner, although this process kept the routine simple, transparent and suitable for a global market we found that many hospitals and clinics needed something more. It is now possible to record an increased amount of demographic information including full patient name, date of birth and patient ID numbers using either the standard product barcode scanner or the new keyboard accessory. This additional demographic information enables patient data and their results to be linked and traced throughout the healthcare system. There is also space for additional commentary associated with each result so that other symptoms and observations can be recorded.

As well as patient details, operator IDs can now be added to each test result, significantly improving the traceability and security applied to every HbA1c reading. A controlled list of trained operators assures that only those with sufficient competency have access to the system to start taking measurements. This new feature takes away the risk that an untrained operator can access the system, or even review patient results, unless they have the proper and correct security level.

In addition to these functions, enhanced quality control is now possible with multiple user-defined QC lockout options available to POCT coordinators, ensuring that tests can only be run according to whatever quality assurance procedure is required. Even more traceability is possible as consumables and quality controls can now be added to an approval list meaning only those products that have passed incoming inspection are used.

Lab-quality results

The Quo-Test® and Quo-Lab® offer lab-quality results from just 4 µL of blood in 4 minutes. Both systems use the interference-free Boronate Fluorescence Quenching Technology (BQFT), which has similar performance to boronate affinity chromatography systems used in reference laboratories but applied in POCT setting.

Traditional clinical methods of testing HbA1c can take a few days to get results back from the laboratory whereas POCT methods allow results to be delivered to the patient almost immediately whilst sat in front of the consulting physician. With the new connectivity package, HbA1c results can also be uploaded to the consulting clinical laboratory meaning not only do healthcare professionals and patients have their results quickly they also have confidence that they have the oversight of interpretation and analysis from qualified clinical biochemists/ POCT coordinators.

Pairing lab quality results with the new connectivity solution takes Quo-Test® and Quo-Lab® to the next level in point-of-care patient management and will help EKF further its aim of making POC diabetes patient management more accessible and robust.

■ For more information, visit: *www.hba1c-test.com*

Timesco's Callisto Flare preloaded with LED single-use handles

Over the past decade Timesco has become market leader in the field of laryngoscopy with an unrivalled range of quality brands; reusable: fibre Optima, Sirius, standard Orion and single-use: fibre Callisto, Freeway and standard Europa light.

Timesco's range of laryngoscopes have been further upgraded by addition of LED light for the reusable and single-use handles and standard blades.

The single-use Callisto range has been expanded with the addition of Callisto Flare LED single-use dry cell and preloaded handles which are supplied complete with batteries. The Callisto Flare LED handles are available individually and also paired with the Callisto blades, Freeway blades as handle and blade packs, ready to use.

Timesco's Callisto and Freeway single-use laryngoscopes offer control of cross contamination, no reprocessing or autoclaving costs and convenience. In a recent study in the United States comparing costs of the reprocessing of reusable and single-use laryngoscopes it was found that the reprocessing cycle cost for reusable blades and handles was $17 and if there was a Hospital Acquired Infection the cost would increase to $27.

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

Timesco Callisto laryngoscopes, your no: 1 inexpensive, cross contamination prevention and convenient choice.

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

Hill-Rom enhances surgical solutions portfolio with launch of new mobile surgical table

In response to hospitals' need to equip operating rooms with quality medical devices at a reasonable cost, Hill-Rom designed and developed the new TruSystem 3000 Mobile Operating Table. The introduction of this surgical table enhances the Hill-Rom Surgical Solutions product portfolio by providing a cost-effective, reliable and flexible operating table.

The TruSystem 3000 Mobile Operating Table is now available in most countries in Europe, Latin America, the Middle East, Africa and Asia.

"The TruSystem 3000 Mobile Operating Table is a universal table that is suitable for various surgical disciplines," said Dr Dirk Ehlers, president of Hill-Rom Surgical Solutions. "It can be customized for different surgical procedures due to Hill-Rom's broad range of available patient positioning components and accessories, addressing hospitals' needs for higher patient acquisition and case numbers, while maintaining safety and efficiency."

The new TruSystem 3000 Mobile Operating Table features ergonomic handling, long-term reliability and patient safety. All additional components, such as head sections, leg sections, arm supports and anaesthesia frames are easy to attach and dismantle through an intuitive, easy-to-use, coupling system. The user interfaces are consistent in design, using easily recognizable icons, colours and symbols to ensure simplicity, efficiency and safety. In addition, the backlit display of the remote control enhances ease of use and safety in low-light surgical environments. The table can bear weight up to 270 kg, which covers a broad variety of individual patient and surgical needs.

"Our ideas for this table did not stop at the ergonomic and safe handling in day-to-day clinical use. We also made this table very easy to service to ensure long-term performance and reduce maintenance cost as well as keep disruption of the OR schedule to a minimum," said Dr Ehlers.

- For more information, visit: *www.hill-rom.com*

EKF Diagnostics' point-of-care HbA1c analyzers come with connectivity package to transmit data

The Quo-Test and Quo-Lab analysers from EKF Diagnostics now come with a connectivity package including a connector interface box, cables and a software upgrade, allowing the analyzers to transmit patient data to the majority of Lab Information Management Systems (LIS) in use today.

The connectivity package uses the POCT1-A2 communication protocol and unlocks a host of new features aimed at improving security and quality control.

For the first time, patient demographic information can be added to each result including name, date of birth and patient ID number. This enables patient results to be linked and traced throughout the healthcare system. There is also capacity to add commentary associated with each result so that other symptoms and observations can be recorded.

Operator IDs can also be added to each test result, improving the traceability and security applied to every HbA1c reading. A controlled list of trained operators assures that only those with sufficient competency have access to the system.

In addition to these functions enhanced quality control is available with multiple user-defined QC lockout options, ensuring that tests can only be run according to localised quality assurance procedures.

- For more information, visit: *www.hba1c-test.com*

Intersurgical makes leading devices for respiratory support

Intersurgical is a global designer, manufacturer and supplier of a wide range of medical devices for respiratory support.

They provide flexible patient solutions for airway management, anaesthesia, critical care, and oxygen & aerosol therapy primarily for use within the hospital environment but also in the home.

Some products within the extensive range include:

- i-gel® – the innovative second generation supraglottic airway device designed to create a non-inflatable, anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures whilst avoiding compression trauma.
- VariFit™ – a single patient use hospital NIV mask featuring a cushion with AIR°gel® technology and a breathable, quick release headgear, designed to fit easily to the patient and improve patient comfort.
- Pulmo-Protect™ – a low resistance with a high bacterial and viral efficiency filter designed to protect the patient and equipment during lung function tests.
- TrachSeal™ – closed suction systems which enable a clinician to clear the lungs of secretions whilst maintaining ventilation and minimising contamination with the least possible disruption to the patient and exposure to the care provider.

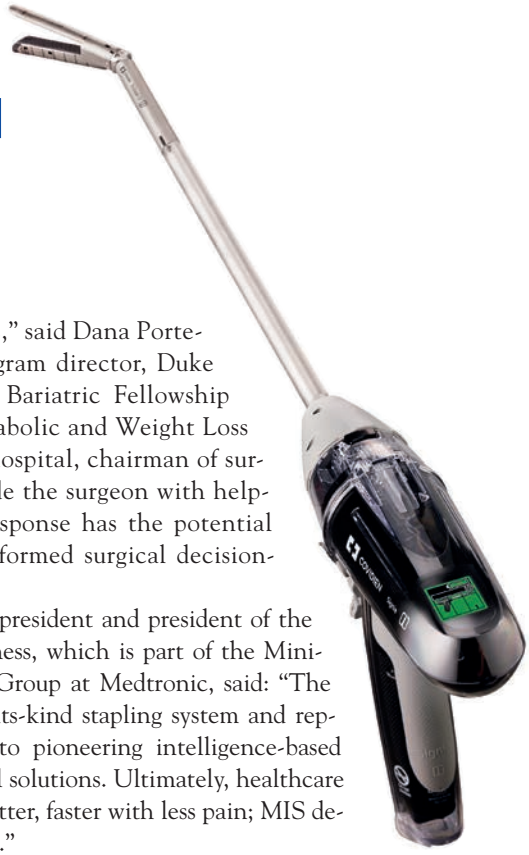
With over 30 years' experience in this area, they understand the changing and challenging clinical environments and needs of their customers and patients. They believe the best way to maintain the highest standards in design, manufacture, quality and customer care is to have complete control of these aspects of their business. Their integrated in-house philosophy means they are able to respond quickly and effectively to their customers and consistently meet their requirements.

Innovation is an important aspect of their business in all areas, helping them to deliver high quality products and services whilst allowing them to provide cost effective solutions to meet today's needs.

Their goal is to provide best practice respiratory product solutions for patients and clinicians, offering quality, innovation and choice.

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

Medtronic's new single-handed powered stapling system provides real-time feedback during surgery



Delivering on its commitment to develop and expand minimally invasive surgery (MIS) technologies and capabilities, Medtronic has launched its Signia Stapling System, which provides surgeons with real-time feedback and automated responses to that real-time data.

The Signia system includes 'Adaptive Firing' technology that measures the firing force and adjusts the stapler's speed based on tissue variability measurements, allowing for consistent staple lines.

Human tissue differs in thickness throughout the body and its organ systems. For example, tissue is thinnest at the top of the stomach and thickest at the bottom of the stomach near the small intestine. Adaptive Firing technology can detect the variability of tissue and automatically adjust the stapler's speed during MIS procedures; this allows surgeons to fire staples consistently and evenly. The Signia system also offers surgeons one-handed staple firing, allowing them to free up their other hand and stay focused on the surgical site.

"In my experience to date, I believe the articulation, rotation and firing of the Signia system provides an important new option in the performance of minimally invasive surgical procedures," said Dana Portenier, MD, FACS, co-program director, Duke Minimally Invasive and Bariatric Fellowship division chief, Duke Metabolic and Weight Loss Surgery Duke Regional Hospital, chairman of surgery. "Its ability to provide the surgeon with helpful data and real-time response has the potential to contribute to more informed surgical decision-making."

Chris Barry, senior vice president and president of the Surgical Innovations business, which is part of the Minimally Invasive Therapies Group at Medtronic, said: "The Signia system is a first-of-its-kind stapling system and represents our commitment to pioneering intelligence-based minimally invasive surgical solutions. Ultimately, healthcare should help patients get better, faster with less pain; MIS delivers on that commitment."

The Signia system is launching initially in the United States, Western Europe, and Japan. It is expected to roll out to additional global geographies during the company's fiscal year 2018.

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

Philips launches Azurion – a next-generation image-guided therapy platform

Philips has launched Azurion – a next-generation image-guided therapy platform, which forms the new core of its integrated solutions portfolio for the fast-growing image-guided therapy market.

Philips' Azurion image-guided therapy platform for interventional labs is the result of a multi-year development program conducted in close collaboration with leading clinicians in the field. This next generation platform features a state-of-the-art ergonomic design with an easy-to-use intuitive user interface, enabling clinicians to swiftly and confidently perform a wide range of routine and complex procedures in the interventional lab.

Azurion supports a full range of configurations across a broad spectrum of image-guided therapy procedures. These include configurations for high volume routine procedures and flexible configurations for advanced procedures. Harnessing vital procedural information from various sources, such as imaging systems, interventional devices, navigation tools and patient health records, Azurion provides interventional staff members with the control and information they need to perform procedures efficiently.

The Azurion platform also features over 1,000 new components, including an enhanced flat-panel detector, and Philips' newly developed ConnectOS operating system for the seamless integration of real-time information from all relevant technologies in the interventional lab.

- For more information, visit: *www.philips.com/azurion*

Professor Perena Gouma, of The University of Texas at Arlington Materials Science and Engineering Department, shows off her invention – a hand-held breath monitor that can detect the flu virus.

Scientist invents hand-held breath monitor that detects flu

By **Jeremy Agor,**
The University of Texas at Arlington

A scientist at The University of Texas at Arlington (UTA) has invented a hand-held breath monitor that can detect the flu virus.

Perena Gouma, a professor in the Materials Science and Engineering Department at UTA, published an article describing her invention in the January 2017 issue of the journal *Sensors*.

She explains in-depth how the single-exhale sensing device works and the research involved in its creation, which was funded by the US National Science Foundation through the Smart Connected Health program.

Prof Gouma's device is similar to the breathalysers used by police officers when they suspect a driver of being under the influence of alcohol. A patient simply exhales into the device, which uses semiconductor sensors like those in a household carbon monoxide detector.

The difference is that these sensors are specific to the gas detected, yet still inexpensive, and can isolate biomarkers associated with the flu virus and indicate whether or not the patient has the flu.

The device could eventually be available in pharmacies so that people can be diagnosed earlier and take advantage of medicine used to treat the flu in its earliest stages. This device may help prevent flu epidemics from spreading, protecting both individuals as well as public health.

Prof Gouma and her team relied on existing medical literature to determine the quantities of known biomarkers present in a person's breath when afflicted with a particular disease, then applied that knowledge to find a combination of sensors for those biomarkers that is accurate for detecting the flu. For instance, people who suffer from asthma have increased nitric oxide concentration in their breath, and acetone is a known biomarker for diabetes and metabolic processes. When combined with a nitric oxide and an ammonia sensor, Prof Gouma found that the breath monitor may detect the flu virus, possibly as well as tests done in a doctor's office.

"I think that technology like this is going to revolutionize personalised diagnostics. This will allow people to be proactive and catch illnesses early, and the technology can easily be used to detect other diseases, such as Ebola virus disease, simply by changing the sensors," said Prof Gouma, who also is the lead scientist in the Institute for Predictive Performance Measurement at the UTA Research Institute.

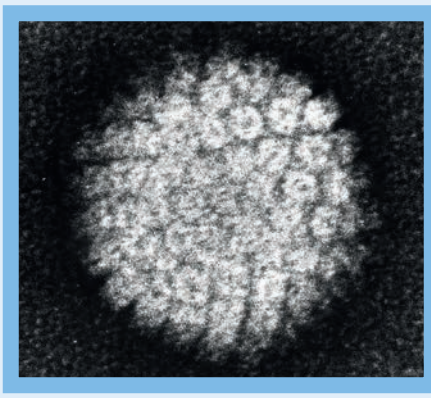
"Before we applied nanotechnology to create this device, the only way to detect biomarkers in a person's breath was through very expensive, highly-technical equipment in a lab, operated by skilled personnel. Now, this technology could be used by ordinary people to quickly and accurately diagnose illness."

Stathis Meletis, chair of the Materials Science and Engineering Department, said: "Dr Gouma's development of a portable, single-exhale device that can be used to detect diseases has implications far beyond the laboratory. This shows the impact of nanotechnology on our everyday lives, and has potential for applications related to security and other important areas as well." MEH

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ March 2017		
4th Evolving Practice of Ophthalmology Middle East Conference 2017 (EPOMEC 2017)	23 – 25 March, 2017 Dubai, UAE	*www.epomec.ae*
MSK MRI Workstation Workshop	31 March – 1 April, 2017 Dubai, UAE	*www.mskmridubai.eventbrite.sg*
■ April 2017		
13th Emirates Critical Care Conference	6 – 8 April, 2017 Dubai, UAE	*www.eccc-dubai.com*
Egyptian Society of Cardiothoracic Surgery 23th Annual Conference 2017 (ESCTS 2017)	4 – 7 April, 2017 Cairo, Egypt	*www.escts2017.com*
6th International Conference and Expo on Cosmetology, Trichology & Aesthetic Practices	10 – 11 April, 2017 Dubai, UAE	*www.cosmetology-trichology.conferenceseries.com*
6th Global Experts Meeting on Cardiovascular Pharmacology and Cardiac Medications	13 – 14 April, 2017 Dubai, UAE	*www.cardiac.pharmaceutical conferences.com*
2017 ASN Highlights and Second SEHA Nephrology in Primary Care Conference	14 – 15 April, 2017 Dubai, UAE	*www.asnhighlightsuae.com*
3rd Annual Congress & Medicare Expo on Primary Healthcare	17 – 19 April, 2017 Dubai, UAE	*www.primaryhealthcare.conferenceseries.com*
Joint 5th Emirates International Orthopaedic Congress & 1st American Academy of Orthopaedic Surgeons Middle-East Forum	20 – 22 April, 2017 Dubai, UAE	*www.uaeortho.com/5thEIOC*
2nd International Conference on Neuro Oncology and Brain Tumour	24 – 25 April, 2017 Dubai, UAE	*www.neurooncology.conferenceseries.com*
3rd International Conference on Neurological Disorders and Stroke	24 – 26 April, 2017 Dubai, UAE	*www.stroke.global-summit.com*
4th GCC Healthcare Innovation Congress	25 – 26 April, 2017 Dubai, UAE	*www.gcchealthcareinnovation*
4th International Conference on Hepatology	27 – 28 April 2017 Dubai, UAE	*www.hepatology.conferenceseries.com*
2nd Annual Mena Ophthalmology Congress	27 – 29 April, 2017 Doha, Qatar	*www.menaophthalmology congress.com*
■ May 2017		
International Medical Exhibition & Conference (Egymedica)	4 – 6 May, 2017 Cairo, Egypt	*www.egymedica.com*
Egyptian Congress Of Pediatric Pulmonology	16 – 19 May, 2017 Alexandria, Egypt	*www.egyptiancpp.org*
Advanced Diabetes Conference	19 – 20 May, 2017 Abu Dhabi, UAE	*www.icldc.ae/event/advance-diabetes-conference-2017*
25th European Congress of Obstetrics and Gynaecology 2017 (EBCOG 2017)	17 – 21 May, 2017 Antalya, Turkey	*www.ebcog2017.org*



Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
■ September 2017		
8th Arab Diabetes Forum	20-22 September, 2017 Cairo, Egypt	*www.arabicdiabeticforum.com*
International Conference on Fungal Diseases & Control	25 – 27 September, 2017 Dubai, UAE	*www.fungalinfections.conferenceseries.com*
10th World Pediatric Congress	28 – 29 September, 2017 Dubai, UAE	*www.pediatriccongress.conferenceseries.com/*
■ October 2017		
7th International Conference and Exhibition on Traditional & Alternative Medicine	3 – 6 October, 2017 Dubai, UAE	*www.traditionalmedicine.conferenceseries.com*
3rd World Congress on Climate Change and Global Warming	16 - 17 October, 2017 Dubai, UAE	*www.climatechange.conferenceseries.com/asiapacific*
4th International Conference on Rhinology and Otology	18 – 20 October, 2017 Dubai, UAE	*www.otolaryngology.conferenceseries.com*
14th Global Obesity Meeting	23 – 24 October, 2017 Dubai, UAE	*www.obesitymeeting.conferenceseries.com*
10th International Conference on Neuropharmacology and Neuropharmaceuticals	23 – 24 October, 2017 Dubai, UAE	*www.neuro.pharmaceuticalconferences.com/middleeast/*
2017 ISAM (International Society of Addiction Medicine) Conference: Addiction Medicine New Frontier	26 – 20 October, 2017 Abu Dhabi, UAE	*www.isam2017abudhabi.ae*
■ November 2017		
8th Global Obesity Conference	14 – 15 November, 2017 Dubai, UAE	*www.obesitymeeting.conferenceseries.com*
8th World Congress on Healthcare and Medical Tourism	17 – 18 November, 2017 Dubai, UAE	*www.healthcare.global-summit.com/middleeast/*
5th International Conference on Physiotherapy	27 – 28 November, 2017 Dubai, UAE	*www.physiotherapy.conferenceseries.com*
International Conference on Cancer Diagnostics	27 – 28 November, 2017 Dubai, UAE	*www.cancerdiagnostics.conferenceseries.com/middleeast*
22nd Global Vaccines & Vaccination Summit	30 Nov - 1 Dec 2017 Dubai, UAE	*www.vaccines.global-summit.com/middleeast*

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

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Saudi Health Sector Set for Boost from National Transformation Plan!

As part of the Kingdom's National Transformation Plan, the KSA will be investing, there will be a bigger role for private players, increased spending on healthcare technologies and more training programs to develop capabilities. More investments will be injected into the primary care sector as well. This **270 billion Saudi Riyal plan** will set Saudi Arabia on a fast trajectory to growth in healthcare, which is projected to be a **USD 24.7 billion market by 2020**.

Aligned with this vision and in this current climate of SMART patients, competition and outbreaks such as the recent MERS scare, **there is a crucial need for healthcare providers to keep up with the latest government developments, build the resilience and strengthen capabilities to cope with emergency situations, chronic illness, gain knowledge about healthcare insurance, and ultimately apply best practice to improve patient care**.

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Mansour Saad Al-Swaidan

Director of Patient Care System, Department of eHealth & ICT Project, Ministry of Health, Kingdom of Saudi Arabia

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

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

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

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

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

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

Find out more about our excellent outcomes and extraordinary care.

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

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

Children's Hospital of Pittsburgh of UPMC