

Beating diabetes

A stack of sliced fruits including orange, apple, kiwi, and another apple slice, with a dynamic splash of orange juice erupting from the top. The background is white.

New findings challenge consensus on insulin-producing beta cells – they can recover with weightloss

Nobel Prize

Two researchers share award for landmark discovery in fight against cancer

HealthTech

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In the News

- Heads of State commit to combatting noncommunicable diseases
- Call for action to raise awareness about Non-Alcoholic SteatoHepatitis
- Even mild physical activity immediately improves memory function
- WHO issues first-of-its-kind guidance to reduce unnecessary caesareans



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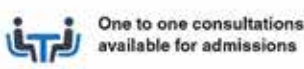
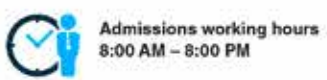
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Prognosis

Reversing diabetes

The high prevalence of type 2 diabetes in the Middle East is well known and it is good to see a concerted effort by health ministries and the private healthcare sector to encourage better eating habits and to live a more active life – two key lifestyle behaviours that can be changed to prevent the onset of type 2 diabetes, particularly in children. In this issue, in our focus on Lifestyle Diseases, we look at diabetes and a number of newly published research papers on the disease.

Of particular interest, is a follow on to the landmark Diabetes Remission Clinical Trial (DiRECT) that revealed that type 2 diabetes can be reversed in some adults by following an intensive weight management programme. The researchers now show how and why a strictly controlled diet can reverse type 2 diabetes. Importantly, the results challenge the current medical consensus that insulin-producing beta cells in the pancreas is irreversibly lost in people with type 2 diabetes.

Indicative of the forward-thinking UAE ministry of health, Fahed Al Hammadi, Acting Assistant Undersecretary of the Green Development and Climate Change Sector at MOCCA, the UAE's Ministry of Climate Change and Environment, issued a statement recently regarding the urgent need to adapt to the impact of climate-related health risks in the region. He noted that the primary impact is in the form of heat stress, carbon pollution and climate-related infectious diseases. He said with an understanding and assessment of these impacts, the UAE is now well positioned to come up with ways to adapt to them.

The World Health Organisation plays a crucial role in galvanising global public health leaders to work in unison to combat disease which is not bound by political borders. The organisation regularly issues important news on developments and progress in this regard. To give this better coverage we have started a dedicated news section – News from the World Health Organisation. In this issue we look at, among others, new guidelines issued by the WHO to prevent unnecessary Caesarean sections; and a new initiative they have launched to treat children with cancer.

Also in the issue, we run a report from the UK which looks at their thriving health technology sector and its many innovations which play an important role in healthcare around the world.

As in each issue of *Middle East Health*, you'll find a wealth of healthcare news, biomedical research developments and other healthcare topics of interest.

Callan Emery

Editor

editor@MiddleEastHealthMag.com



Publisher

Michael Hurst
michael@middleeasthealthmag.com

Editor

Callan Emery
editor@middleeasthealthmag.com

Editorial and Production

Trident Communications
www.TridentComms.media

Editorial Consultants

Dr Gamal Hammad, Dr Peter Moore, Harry Brewer

Middle East Editorial Office

PO Box 72280, Dubai, UAE
Telephone: (+9714) 391 4775
editor@middleeasthealthmag.com

Marketing Manager

Foehn Sarkar
Telephone: (+9714) 391 4775 || Fax: (+9714) 391 4888
marketing@middleeasthealthmag.com

Subscription & Admin Manager

Savita Kapoor
Telephone: (+9714) 391 4775 || Fax: (+9714) 391 4888
savita@middleeasthealthmag.com

Advertising Sales

PO Box 72280, Dubai, UAE
marketing@middleeasthealthmag.com

Americas, France

Joy Sarkar
P O Box 72280, Building No.2
2nd Floor, Dubai Media City
Dubai, United Arab Emirates
Tel: +971 4 391 4775 Fax: +971 4 391 4888
joy@middleeasthealthmag.com

Japan

Mr Katsuhiko Ishii
Ace Media Service Inc
12-6, 4-chome, Adachi-ku, Tokyo 121-0824, Japan
Tel: +81-3-5691-3335 || Fax: +81-3-5691-3336
Email: amskatsu@dream.com

China

Miss Li Ying
Medic Time Development Ltd,
Flat 1907, Tower A, Haisong Building, Tairan 9th Road,
Futian District, Shenzhen, China 518048
Tel: +86-755-239 812 21 || Fax: +86-755-239 812 33
Email: medic8@medictime.com

Taiwan

Larry Wang
Olympia Global Co Ltd
7F, No.35, Sec 3, Shenyang Rd, Taichung
Taiwan 40651 || P O Box: 46-283 Taichung Taiwan 40799
Tel: +886- (4)-22429845 || Fax: +886- (4)-23587689
Email: media.news@msa.hinet.net



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middle east monitor

Update from around the region



King's College Hospital London in the UAE partners with National Reference Laboratory

King's College Hospital London in the UAE (KCH UAE) and National Reference Laboratory (NRL) in Abu Dhabi have signed an exclusive partnership for the provision of comprehensive medical laboratory services by NRL to all KCH UAE medical and surgical facilities, including their new state-of-the-art 100-bed specialist facility scheduled to open in Q1 2019 at Dubai Hills and their newly opened medical centre at Dubai Marina.

NRL's extensive experience in laboratory planning, installation, operations, oversight and management as well as their comprehensive test menu of 4,700+ tests, will ensure all KCH UAE patients in the country have access to world-class laboratory testing services and expertise.

The cornerstone of this new venture is the recognition by KCH UAE and NRL of the crucial role that accurate and fast high-quality laboratory results play in positive patient outcomes.

Abdul Hamid Oubeisi, Chief Executive Officer of National Reference Laboratory, said: "Our priority in this joint venture is to deliver the finest levels of healthcare to each patient served, starting with high-quality diagnostic tests which inform patient treatment plans and guide patient

management. As a renowned laboratory provider in the region, we are pleased to collaborate with a hospital of such internationally distinguished levels of patient standards who share our values of the provision of reliable and speedy laboratory results, and the use of cutting-edge technology."

Dr Gowri Ramanathan, Consultant Obstetrician and Gynecologist, Specialist in Fetal Medicine, and Chief Medical Officer at KCH UAE, said: "Patient experience is at the heart of what we do at King's. We are delighted to partner with a laboratory provider that is equally as passionate about placing the patient at the heart of their own work. Our physicians only prescribe when it is necessary and best for the patient, as part of our dedication to King's evidence-based care approach. In doing so, we require efficient and reliable laboratory results, and by having an on-site laboratory using cutting-edge technology we can ensure that we receive the most accurate and timely information. In turn our patients receive the best possible care."

This partnership expands NRL's network of laboratories in the UAE to a total of eleven, including two NRL-owned referral laboratories and nine on-site hospital or medical centre laboratories managed by NRL on behalf of its clients. In addition, NRL offers referral testing to a host of clients nationally and regionally.

Adapting to climate change to mitigate impact on health

"We are already feeling the impacts of climate change in all aspects of our lives. Given the current projections, such impacts will continue to grow in intensity and frequency, and adaptation is the only viable response strategy." These are the words of Fahed Al Hammadi, Acting Assistant Undersecretary of the Green Development and Climate Change Sector at MOCCA, the UAE's Ministry of Climate Change and Environment.

Al Hammadi made the statement following a comprehensive assessment by the ministry of climate adaptation in the health context in the UAE. Through sur-

veys and a stakeholders' workshop, MOCCA outlined the direct and indirect climate-related health risks and the existing and possible actionable solutions for public health adaptation.

Officials from the Ministry of Health and Prevention (MOHAP), Department of Health - Abu Dhabi, Dubai Health Authority, as well as representatives from the private sector and academia contributed their insights at a recent workshop in Dubai.

"This assessment of climate-related health risks is the first brick in the wall to identify the current impacts of climate change on various sectors and comes up with ways to adapt to these impacts. Such assessments will help us understand the bigger picture and act accordingly."

Dr Hussein Abdul Rahman Al Rand, Assistant Undersecretary for Centers and Health Clinics, MOHAP, said: "We are pleased to join forces with the Ministry of Climate Change and Environment to confirm that the National Climate Adaptation Program is delivered as planned. It is crucial to take concrete action to mitigate and adapt to climate change impacts and build national capacities that can effectively tackle these impacts. In order to ensure a comprehensive overview, we need to capitalize on the research and experiments carried out by other nations as well as the data generated across the UAE.

"In this context, MOHAP has long worked on raising public awareness of the climate-related health risks and enhancing the health system across the country to ensure the UAE is well-poised to adapt to climate change. The recent assessment reveals the burden of climate-related diseases, which should be monitored and addressed. These include diseases associated with carbon pollution, such as cardiovascular and respiratory diseases, climate-related infectious diseases, malnutrition, and heat stress, which leads to reduced labour productivity and spiralling health costs."

Health experts concluded that the direct and indirect impacts of climate change on human health in the UAE are primarily seen in the form of heat stress. This results in reduced labour productivity, particular-

ly for outdoor labourers, and mortality or morbidity due to heat stroke.

They also noted that the multiple initiatives that have been carried out as part of environmental health and occupational safety policies are relevant – either directly or indirectly – to climate adaptation in the health sector. They highlighted the Ministerial Order No. 401 of 2015 that determines the afternoon working hours of labourers employed outdoors to reduce heat exhaustion and heat stress.

Another finding is that despite the existence of adaptation-related initiatives for climate risks, there is still room for more climate-focused adaptation policies and programs. Health experts proposed multiple actions to help address high and medium risks. Proposed actions include enhancing early warning systems and developing heat alert plans, especially for outdoor labourers during extreme heat events, and developing the capacity of clinics and health stations to recognize and respond to labour concerns on reduced productivity due to climate-related factors.

Furthermore, they recommended that more research needs to be undertaken on the effects of climate change on labour productivity, in addition to strengthening enforcement of existing initiatives such as the Safety in Heat and midday break programs. They also suggested enhancing monitoring and evaluation to objectively assess results, and mainstream climate change adaptation through reorienting existing programs on environmental health and occupational safety to better highlight their adaptation components.

To reduce climate change impacts and pave the way for green economic diversification, the UAE has adopted various policies at the federal and emirate levels to facilitate the transition from a hydrocarbon-dependent economy to a sustainable knowledge-based economy in line with the UAE Vision 2021.

The assessment findings correlate to those of the Leaders' Roundtable: Climate Change and Public Health held on the sidelines of the 73rd Session of the United Nations General Assembly (UNGA 73).

The roundtable touched on the non-communicable disease (NCD) dimension of the climate-health nexus, given that many greenhouse gas emission sources are key drivers of NCDs.

Abu Dhabi Health Services Company appoints new Group CEO

Abu Dhabi Health Services Company (SEHA), has appointed Dr Gareth Goodier, as the new Group Chief Executive Officer. Established in 2007, SEHA is the UAE's largest healthcare network.

Announcing the appointment, Salem Rashed Al Nuaimi, Chairman at SEHA said; "At SEHA we have a vision to elevate the quality of healthcare through innovation and skills, and we are confident that we have the right leaders to realize our ambitious goals. Dr Gareth Goodier brings a wealth of international experience from the most advanced health systems in the world and has a track record of developing talent and staying ahead of the healthcare innovation curve."

With a distinguished career spanning three decades, Dr Goodier has worked in senior management positions in Europe and Australia. His international leadership in healthcare systems and delivery has also included major projects for the World Bank in Kuwait and Lebanon as well as advising several governments on systems management and innovation. Most recently, Dr Goodier served as the inaugural Executive Chair at Melbourne Biomedical Precinct.

In previous roles Dr Goodier has also held leadership positions at academic hospitals including Cambridge University Hospitals, Royal Brompton and Harefield Hospitals, in the UK, and Royal Melbourne Hospital, Royal Perth Hospital, Women's and Children's in Perth, in Australia. In all roles he has consistently elevated quality of healthcare, upskilled talent, and driven the adoption of modern, innovative methods.

Speaking on his appointment, Dr Goodier said; "I am humbled and honored to



Dr Gareth Goodier, the new Group CEO of SEHA

play a role in driving this mandate forward. Together we will create a healthier UAE. We must remain committed to delivering high-quality services to every patient who walks through our doors whether they live in our cities or the most remote regions of the Emirate."

This appointment will also see a renewed focus on the development and upskilling of SEHA's 18,000 employees, as well as efforts to attract UAE nationals to clinical and non-clinical careers in healthcare industries. In raising the levels of patient care and quality of service, SEHA will look to adopt industry leading innovative practices that will drive the organization into the future. SEHA's network of facilities covers the Emirate of Abu Dhabi, Al Ain Region and Al Dhafra Region.

Mid-east pharma company Julphar enters oncology market

Julphar, one of the largest pharmaceutical manufacturers in the Middle East and Africa, has entered the oncology market through a license and supply agreement with Russia's leading biotechnology company, BIOCAD.

Julphar will be partnering with BIOCAD and Health Authorities to register three leading specialized products to the UAE, which are used to treat breast cancer, B-cell non-Hodgkin's lymphoma, chronic lymphocytic leukemia, colon cancer, lung cancer and glioblastoma.

Commenting on the announcement, Jerome Carle, General Manager of Julphar, said: "We are delighted to be partnering with BIOCAD in the UAE market as they have a proven track record and they support our core values. Entering the oncology market is a huge step forward for Julphar.



“It will enable us to continue to focus on delivering healthcare solutions that make a real difference to people’s lives.”

Cancer is one of the biggest health burdens in the UAE. According to a report issued last month by the World Health Organization’s (WHO) International Agency for Research on Cancer (IARC), breast cancer accounted for more than 20% of the total 4,707 new cancer cases in the UAE in 2018.

“Cancer can be a very costly illness, placing a considerable financial burden on families,” added Carle.

“With the launch of these products in the local market, we would like to ensure that as many people as possible have access to life-saving medicines. When patients choose Julphar they can rest assured that they are consistently receiving high quality, safe and effective products.”

Dmitry Morozov, CEO of BIOCAD, said: “Access to international markets is the number one priority of our company. That’s why we consider our cooperation with one of the largest pharmaceutical companies in the Middle East a turning point in our international business development not only in the United Arab Emirates, but also the Middle East and North Africa region (MENA) in general.

“Moreover, medicines produced by BIOCAD are competitive in their effectiveness as well as the price. Therefore, the presence of Russian innovative drugs in the UAE will help make important biological therapies widely accessible to patients.

“We are glad our products will increase access to treatment of the most severe types of cancer for more patients in the UAE than before.”

Julphar is one of the largest pharmaceutical manufacturers in the Middle East and Africa and for almost four decades, the company has been delivering high quality, innovative and affordable pharmaceutical products to more than 50 countries on five continents. Julphar’s business is centered on three core business units – Julphar Diabetes Solutions, General Medicines and its consumer division, Julphar Life – which target major therapeutic segments including gastrology, pain management, wound care, antibiotics and cardio-metabolism.

New Mediclinic hospital opens in Dubai

Mediclinic Parkview Hospital, the new 182-bed inpatient and outpatient facility in Dubai opened its doors to the public in September, six months ahead of schedule.

Part of Mediclinic Middle East, one of the UAE’s largest and most respected private healthcare operators, Mediclinic Parkview Hospital joins Mediclinic City Hospital and Mediclinic Welcare Hospital as the group’s third hospital in Dubai and seventh in the UAE.

The project, which took two and a half years to build, is the largest greenfield construction project by value ever undertaken by Mediclinic International, Mediclinic

Middle East’s South Africa-based parent company that is listed on the London Stock Exchange. As with all other Mediclinic facilities, the hospital will focus on clinical excellence, offering patients a range of comprehensive consultant-led primary, secondary and tertiary level healthcare services, highlights of which include:

- Priority outpatient appointments for children
- 24/7 paediatric specialist availability in the Emergency Department
- Comprehensive maternity services
- Level III NICU
- Dedicated breast unit with female team
- Plastic and reconstructive surgery services
- Weight reduction programme

Mediclinic implements InterSystems TrakCare for unified healthcare information

InterSystems, a global leader in health information technology, announced that Mediclinic Parkview Hospital has successfully implemented InterSystems TrakCare as its unified healthcare information system.

Mediclinic Middle East is on schedule to deploy TrakCare across all of its hospitals and clinics in the UAE through 2019.

TrakCare Electronic Medical Record System (EMR) enables the group’s care providers to have a holistic view of each patient’s clinical, administrative, and financial information at any given time. The EMR system supports MCME medical staff in their decision-making while creating more opportunities to offer patients an enhanced experience and seamless care journey as they spend less time waiting and avoid unnecessary tests.

“At Mediclinic, our mission is to deliver excellent patient care and measurable quality clinical outcomes. We believe in utilizing technology to achieve these goals and transform care delivery,” said Donna Lunn, Chief Information Officer at Mediclinic Middle East. “We are pleased with the successful and timely TrakCare implementations at both Mediclinic Parkview Hospital and Mediclinic Ibn Battuta, one of our clinics, and look forward to deploying TrakCare across the rest of our hospitals and clinics in the UAE.”

Michel Amous, InterSystems Managing Director for the Middle East, Italy, and India, said: “Aligned goals, unified leadership and governance along with hard work and dedicated joint teams are the best recipe to achieve timely and successful EMR implementation. InterSystems would like to congratulate the Mediclinic Middle East team for their amazing leadership and dedication to the eHealth program. This is an excellent example of a successful EMR implementation.”

Hepatitis C

The Summit also discussed recent updates and developments in the fields of hepatitis C virus (HCV) and hepatitis B virus (HBV).

An estimated 170 million people are infected with hepatitis C virus (HCV) worldwide. The Middle East and North Africa (MENA) region has the highest prevalence of HCV infection in the world, affecting more than 20 million people in Arab countries. However, HCV is curable if people are screened, diagnosed and treated. The World Health Organisation has put clear targets to scale up testing efforts to ensure that 90% of those with hepatitis C are aware of their condition, and that 80% of them are treated by 2030.

Dr Mohamed Al Zaabi, Consultant Transplant Hepatologist and Gastroenterologist Zayed Military Hospital, Abu Dhabi stated: "Many people are often faced with barriers to testing and linkage to care. These barriers often include lack of awareness, knowledge and understanding that can lead to stigma and discrimination. Therefore, focused testing for most affected populations such as people who inject drugs, people who were born between 1945 and 1965, individuals transfused before 1992, sexual partners and close family of people who are hepatitis C positive, and healthcare workers would lead to the solution of the problem. Success is possible if the access to HCV testing is increased and more people get tested."

To support screening and HCV elimination efforts in the UAE, Dubai Health Authority (DHA) announced in July the inclusion of free screening and treatment for Hepatitis C under the basic benefit plan of the Dubai Mandatory Health Insurance Scheme. In addition, 'Ready to Be Hepatitis C Cured' campaign run by EGHS and MOHAP, and supported by DHA was launched in March, in the effort to raise awareness about the hepatitis C and provide better disease management solutions to the patients and their families, with the ultimate goal to eradicate hepatitis C in the UAE.

Out of all viral hepatitis deaths, approximately 47% is attributed to Hepatitis B (HBV). For some patients, chronic HBV is a lifelong disease that requires long-term or potentially indefinite therapy. Because chronic HBV endures, management of the condition must account for the changing needs of patients. Therefore, the experts at the International Hepatology Summit focused on evolving epidemiology of HBV patients as well as added value of the latest therapies in the treatment of HBV and current treatment guidelines.

David Hadley, CEO of Mediclinic Middle East, said: "I am delighted that Mediclinic Parkview Hospital has opened so far ahead of the original schedule, which is testament to the superb collaborative effort of all those involved in this huge project. The launch of this state-of-the-art facility will take healthcare in the UAE to a whole new level and shows the true depth of Mediclinic's confidence in the UAE's burgeoning private healthcare sector."

Barry Bedford, Hospital Director of Mediclinic Parkview Hospital, said: "Our team of internationally-trained doctors has been carefully selected to meet the requirements of the area's unique demographic profile. The expertise of our doctors is supported by state-of-the-art technology and equipment including a 3T MRI, 264-slice CT and Cath lab. We look forward to welcoming our first patients to Mediclinic Parkview Hospital and demonstrating to them the Mediclinic philosophy of 'Expertise you can trust'."

Call for Action to raise awareness about Non-Alcoholic SteatoHepatitis

A regional coalition led by the Emirates Gastroenterology and Hepatology Society (EGHS), Saudi Association for the Study of Liver Diseases and Transplantation (SASLT), and European Association for the Study of the Liver (EASL) signed a Call to Action to raise awareness about a 'silent killer' called NASH (Non-Alcoholic SteatoHepatitis). A severe form of Non-Alcoholic Fatty Liver Disease (NAFLD), NASH affects more than 10% of the global population with high incidence in the Middle East.

The Call for Action was announced in October on the sidelines of the 3rd International Hepatology Summit (IHS 2018) endorsed by the Emirates Gastroenterology and Hepatology Society.

Dr Samer El-Ali, Medical Director, Gilhead Sciences Eastern Europe and Middle East said: "Due to the continuous rise of the NASH epidemic across the globe and particularly in the Middle East, it was of utmost importance to build a coalition

of key stakeholders, particularly hepatology and metabolic disease experts in the region, to spread awareness and help to address patients' unmet need. Our ambition is to establish a strong consensus to drive progress and better support people affected by NASH across the region, as well as support the healthcare community in the Middle East effectively identifying and treating this widespread, severe and 'silent' liver disease."

Overall global prevalence of NAFLD is estimated at just over 25%, with the highest prevalence in the Middle East reaching almost 32%, while NASH prevalence among NAFLD patients reaches almost 60%. NASH is closely related to the triple epidemic of obesity, pre-diabetes, and diabetes, and can be defined as the liver manifestation of the metabolic syndrome. It is heavily influenced by lifestyle (e.g. chronic excessive calorie intake, sedentary lifestyle) and is distinct from other fatty liver diseases caused by alcohol abuse or medication side effects. It is a chronic yet silent disease, which means that most patients live with it for several years without

experiencing any symptoms and are mostly unaware of their liver condition. NASH can progress to more serious disease stages, such as advanced fibrosis, cirrhosis, liver failure or liver cancer, and will soon become a leading cause of liver transplant.

Dr Maryam Al Khatry, President of the Emirates Gastroenterology and Hepatology Society, and one of the leaders of the coalition, said: "Non-Alcoholic SteatoHepatitis patients with fibrosis have a higher risk of progression to cirrhosis, end stage liver disease and hepatocellular carcinoma (liver cancer). Therefore, it is critical to resolve NASH in NASH patients with fibrosis before it has a chance to lead to cirrhosis or cancer and associated life-threatening outcomes. To achieve this, it is our role to lead the awareness and education efforts to early identify patients at risk of progressing to most advanced stages of NASH, such as obese patients, diabetes patient and those suffering from other metabolic disorders, and educate them to adopt a healthy lifestyle based on weight loss to reach the appropriate body mass index." MEH

worldwide monitor

Update from around the globe

A child under 15 dies every five seconds around the world – UN report

An estimated 6.3 million children under 15 years of age died in 2017, or 1 every 5 seconds, mostly of preventable causes, according to new mortality estimates <<https://uni.cf/child-mortality>> released by UNICEF, the World Health Organization (WHO), the United Nations Population Division and the World Bank Group.

The vast majority of these deaths – 5.4 million – occur in the first five years of life, with newborns accounting for around half of the deaths.

“Without urgent action, 56 million children under five will die from now until 2030 – half of them newborns,” said Laurence Chandy, UNICEF Director of Data, Research and Policy. “We have made remarkable progress to save children since 1990, but millions are still dying because of who they are and where they are born. With simple solutions like medicines, clean water, electricity and vaccines, we can change that reality for every child.”

Globally, in 2017, half of all deaths under five years of age took place in sub-Saharan Africa, and another 30% in Southern Asia. In sub-Saharan Africa, 1 in 13 children died before their fifth birthday. In high-income countries, that number was 1 in 185.

“Millions of babies and children should not still be dying every year from lack of access to water, sanitation, proper nutrition or basic health services,” said Dr Princess Nono Simelela, Assistant Director-General for Family, Women and Children’s Health at WHO. “We must prioritize providing universal access to quality health services for every child, particularly around the time of birth and through the early years, to give them the best possible chance to survive and thrive.”

Most children under 5 die due to preventable or treatable causes such as complications during birth, pneumonia, diarrhea, neonatal sepsis and malaria. By comparison, among children between 5

and 14 years of age, injuries become a more prominent cause of death, especially from drowning and road traffic. Within this age group, regional differences also exist, with the risk of dying for a child from sub-Saharan Africa 15 times higher than in Europe.

“More than six million children dying before their fifteenth birthday is a cost we simply can’t afford,” said Timothy Evans, Senior Director and Head of the Health, Nutrition and Population Global Practice at the World Bank Group. “Ending preventable deaths and investing in the health of young people is a basic foundation for building countries’ human capital, which will drive their future growth and prosperity.”

For children everywhere, the most risky period of life is the first month. In 2017, 2.5 million newborns died in their first month. A baby born in sub-Saharan Africa or in Southern Asia was nine times more likely to die in the first month than a baby born in a high-income country. And progress towards saving newborns has been slower than for other children under five years of age since 1990.

Even within countries, disparities persist. Under-five mortality rates among children in rural areas are, on average, 50 per cent higher than among children in urban areas. In addition, those born to uneducated mothers are more than twice as likely to die before turning five than those born to mothers with a secondary or higher education.

Despite these challenges, fewer children are dying each year worldwide. The number of children dying under five has fallen dramatically from 12.6 million in 1990 to 5.4 million in 2017. The number of deaths in older children aged between 5 to 14 years dropped from 1.7 million to under a million in the same period.

“This new report highlights the remarkable progress since 1990 in reducing mortality among children and young adolescents,” said UN Under-Secretary-General for Economic and Social Affairs Liu Zhenmin. “Reducing inequality by assisting the most vulnerable newborns, children and mothers is essential for achieving the target of the

Sustainable Development Goals on ending preventable childhood deaths and for ensuring that no one is left behind.”

Global health organizations commit to new ways of working together to promote SDGs

Eleven heads of the world’s leading health and development organizations signed a landmark commitment to find new ways of working together to accelerate progress towards achieving the United Nations’ Sustainable Development Goals.

Coordinated by the World Health Organization, the initiative unites the work of 11 organizations, with others set to join in the next phase.

The commitment follows a request from Chancellor Angela Merkel of Germany, President Nana Addo Dankwa Akufo-Addo of Ghana, and Prime Minister Erna Solberg of Norway, with support from United Nations Secretary-General Antonio Guterres, to develop a global action plan to define how global actors can better collaborate to accelerate progress towards the health-related targets of the 2030 Sustainable Development Agenda.

“Healthy people are essential for sustainable development – to ending poverty, promoting peaceful and inclusive societies and protecting the environment. However, despite great strides made against many of the leading causes of death and disease, we must redouble our efforts or we will not reach several of the health-related targets,” the organizations announced at the World Health Summit in Berlin in October. “The Global Action Plan represents an historic commitment to new ways of working together to accelerate progress towards meeting the 2030 goals. We are committed to redefine how our organizations work together to deliver more effective and efficient support to countries and to achieve better health and well-being for all people.”

The group has agreed to develop new ways of working together to maximize resources and measure progress in a more transparent and engaging way. The first phase of the plan's development is organized under three strategic approaches: align, accelerate and account.

- **Align:** The organizations have committed to coordinate programmatic, financing and operational processes to increase collective efficiency and impact on a number of shared priorities such as gender equality and reproductive, maternal, newborn, child and adolescent health.

- **Accelerate:** They have agreed to develop common approaches and coordinate action in areas of work that have the potential to increase the pace of progress in global health. The initial set of seven "accelerators" include community and civil society engagement, research and development, data and sustainable financing.

- **Account:** To improve transparency and accountability to countries and development partners, the health organizations are breaking new ground by setting common milestones for nearly 50 health-related targets across 14 Sustainable Development Goals. These milestones will provide a critical checkpoint and common reference to determine where the world stands in 2023 and whether it is on track to reach the 2030 goals.

The Global Action Plan will also enhance collective action and leverage funds to address gender inequalities that act as barriers to accessing health, and to improve comprehensive quality health care for women and girls, including sexual and reproductive health services.

The organizations that have already signed up to the Global Action Plan for Healthy Lives and Well-being for All are: Gavi the Vaccine Alliance, the Global Fund to Fight AIDS, Tuberculosis and Malaria, the Global Financing Facility, UNAIDS, UNDP, UNFPA, UNICEF, Unitaid, UN Women, the World Bank and WHO. The World Food Programme has committed to join the plan in the coming months.

The final plan will be delivered in September 2019 at the United Nations General Assembly.

- For more information: www.who.int/sdg/global-action-plan

Abundance of electronic health information requires organising system

The rate at which electronic health data is accumulating is unprecedented, a Johns Hopkins health informatics expert notes in a review published 12 October 2018 in the *New England Journal of Medicine*. To best make use of available information for personalized or precision medicine purposes, health organizations should consider using ontologies, a means of naming and organizing the information into categories for easier retrieval.

"We're in a profoundly information-intensive age," says Christopher G. Chute, M.D., Dr.P.H., Bloomberg Distinguished Professor of Health Informatics, and a professor of medicine, public health and nursing at Johns Hopkins. "Clinical organizations will be able to use their data more effectively if they adopt and embrace standard ways of naming and labelling clinical information."

Johns Hopkins Medicine alone has multiple petabytes of stored health information, says Dr Chute, who also is chief research information officer for Johns Hopkins Medicine and deputy director of Johns Hopkins' Institute for Clinical and Translational Research. A petabyte is the equivalent of 1.5 million compact discs.

Although electronic health records document many types of data, Dr Chute says, it may not be easy to extract information needed to put patients into subgroups to deliver more tailored care, a goal of personalized medicine. Some information may become "trapped" in documents in a PDF format and therefore more difficult to transfer into other formats for analysis. Furthermore, some electronic record systems don't have good interoperability with others.

The increasing use of wearable health

devices and biomonitoring, as well as advances in medical digital imaging, will lead to even more growth in the volume of clinical data, Dr Chute says. Ontologies can help organize and analyze vast quantities of data that are too large for individual physicians to manage.

"Think of ontologies like a hierarchy," Dr Chute says. If an ontology classifies a virus as an infectious agent, and infectious meningitis as a type of meningitis due to an infectious agent, it would conclude that viral meningitis is a subclass of infectious meningitis. "Physicians are overwhelmed with clerical data entry, and we need informatics tools and resources in the electronic health record to harvest that information to unburden physicians from entering it in a structured way," he says. Some programs are becoming available to help cull information and summarize it automatically. For example, a conversation between a patient and physician could be recorded and put through a speech-to-text program to pull out relevant information about patient symptoms.

Johns Hopkins has historically been focused on precision medicine, and the Johns Hopkins inHealth program has launched several precision medicine centers of excellence, including centers for multiple sclerosis, prostate cancer, heart failure, genetics and arrhythmias. One part of inHealth, the Precision Medicine Analytics Platform, is a joint venture of Johns Hopkins Medicine and the Johns Hopkins Applied Physics Laboratory, which aims to apply rigorous data analysis and systems engineering practices to revolutionize the diagnosis and treatment of disease.

Dr Chute is one of three authors of the NEJM review, with Melissa A. Haendel, Ph.D., of the Oregon Clinical and Translational Research Institute at Oregon Health & Science University, and the Linus Pauling Institute and the Center for Genome Research and Biocomputing at Oregon State University; and Peter N. Robinson, M.D., of the Jackson Laboratory for Genomic Medicine and the Institute for Systems Genomics at the University of Connecticut.

- doi: 10.1056/NEJMra1615014



Heads of State commit to combatting noncommunicable diseases

Heads of State and Government at the UN General Assembly meeting in September have committed to 13 new steps to tackle noncommunicable diseases including cancers, heart and lung diseases, stroke, and diabetes, and to promote mental health and well-being.

“World leaders have taken a set of landmark steps to beat NCDs,” said Dr Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization. “These add up to a historic opportunity to promote health, save lives, and grow economies.”

World leaders agreed to take responsibility themselves for their countries’ effort to prevent and treat NCDs. They also agreed that these efforts should include robust laws and fiscal measures to protect people from tobacco, unhealthy foods, and other harmful products, for example by restricting alcohol advertising, banning smoking, and taxing sugary drinks.

They committed to implement a series of WHO-recommended policies to prevent and control of NCDs – such as public education and awareness campaigns to promote healthier lifestyles, vaccinating against HPV virus to protect against cervical cancer and treating hypertension and diabetes. WHO estimates that implementing all these policies could generate US\$350 billion in economic growth in low and lower-middle-income countries between now and 2030.

Other specific commitments focus on halting the rise of childhood obesity, promoting regular physical activity, reducing air pollution and improving mental health and wellbeing.

The political declaration reaffirms WHO’s global leadership of the fight to beat NCDs and promote mental health, and urges the Organization to continue working closely with key partners, including government, civil society and the private sector.

In particular, it calls on food manufacturers to take several actions. These include reformulating products to reduce salt, free sugars and saturated and industrially pro-

duced trans fats, using nutrition labelling on packaged food to inform consumers, and restricting the marketing of unhealthy foods and beverages to children.

On the sidelines of the UN General Assembly meeting, WHO renewed the appointment of Michael R. Bloomberg as the Organization’s Global Ambassador for NCDs and injuries. Bloomberg was first appointed in 2016. During his second term, Bloomberg will continue to support global, national, and local efforts to protect people from NCDs and injuries. He will take forward important initiatives such as building the Partnership for Healthy Cities and promoting investment in NCDs and injuries prevention.

Additionally, the WHO appointed philanthropist, humanitarian and health advocate Ray Chambers as its Ambassador for Global Strategy.

This new role is designed to support WHO’s work to mobilize the international community to advance the global health agenda, including achieving global health targets set out in the Sustainable Development Goals.

“It is an honor to support the World Health Organization’s mission to ensure everyone in the world, no matter where they come from, how much they earn or what their age and gender may be, can lead the healthiest life possible,” said Chambers. “This requires action and engagement from many partners, led by governments, to prioritize public health by advancing universal health coverage to ensure health for all.”

Chambers previously served as the United Nations Secretary-General’s Special Envoy for Health in Agenda 2030 and for Malaria. Prior to 2016, he held the role of UN Secretary-General’s Special Envoy for Financing the Health Millennium Development Goals, working with multiple funding partners to support international efforts to deliver health care and monitor the impact of such efforts.

Through his ambassadorship with WHO, Mr Chambers will be raising awareness about the role played by WHO to promote health, serve the vulnerable and keep the world safe.

A key area of activity for Chambers will be to advocate for the mobilizing of resources to meet global health targets, working closely with governments, donors and the private sector.

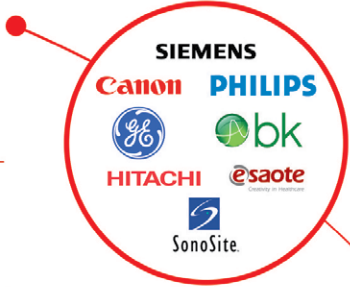
WHO has also launched its third NCDs Country Profiles report to assess national progress in meeting targets to prevent and control NCDs. The report found that the risk of premature death from one of the four main NCDs had declined to 18% in 2016, a relative reduction of 5% from 2010. But the rate of progress is unlikely to meet the Sustainable Development Goal target of a one-third reduction in premature deaths from NCDs by 2030. The report also found that significant gaps remain in health services and access to medicines and technologies to manage NCDs.

Siemens, Storz in sales partnership

Siemens Healthineers and Storz Medical have announced plans to enter into a sales partnership agreement. As part of their collaboration, the two companies plan to market each other’s systems to give their customers, and their customers’ patients, access to the latest technologies for diagnostic imaging in urology and non-invasive and minimally invasive therapy. The combination of mobile C-arms in the Cios family from Siemens Healthineers and the shock wave lithotripsy system MODULITH SLK from Storz Medical is ideally suited for the removal of stones from the entire urinary tract using powerful extracorporeal shock wave lithotripsy.

“Working with Siemens Healthineers, we can make our expertise in urology available to a broader range of customers and offer comprehensive solutions,” said Dr Gerold Heine, CEO of Storz Medical.

Peter Schardt, head of X-ray Products at Siemens Healthineers, said: “The planned agreement highlights the great importance of urology to both companies. Together, we can facilitate access to the best possible diagnostic and therapy solutions for our customers and their patients.” MEH



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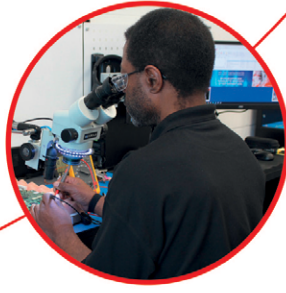
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WHO launches first investment case to save up to 30 million lives

The World Health Organization has published its first investment case, setting out the transformative impacts on global health and sustainable development that a fully-financed WHO could deliver over the next five years.

The investment case describes how WHO, working together with its Member States and partners, will help to save up to 30 million lives, add up to 100 million years of healthy living to the world's population and add up to 4 per cent of economic growth in low and middle-income countries by 2023.

Achieving these results would require an investment of \$14.1 billion from 2019 to 2023, representing a 14% increase in WHO's base budget over the previous five-year period (the \$14.1 billion estimate includes a \$10 billion base budget, \$2.5 billion for humanitarian response and \$1.6 billion for polio eradication. The 14% increase refers to the increase in the base budget only, not the overall budget). These investments would help achieve the "triple billion" targets of WHO's General Programme of Work: 1 billion more people benefitting from universal health coverage; 1 billion more people better protected from health emergencies; and 1 billion more people enjoying better health and well-being.

"This is the first time we have estimated the results we could achieve and the impact we could deliver with the right resources," said Dr Tedros Adhanom Ghebreyesus, WHO Director-General. "Our investment case isn't only about investing in an institution, it's about investing in people, and in the healthier, safer, fairer world we all want."

The investment case shows how a stronger, more efficient, and results-oriented WHO will serve and guide governments and partners in their efforts to improve the health of their populations. It highlights new mechanisms to measure success, ensuring a strict model of accountability, and sets

ambitious targets for savings and efficiencies.

"WHO is the only international organization that enjoys universal political legitimacy on global health matters," Angela Merkel, Chancellor of Germany, says in the investment case.

The document highlights the vital work WHO does in providing up-to-date, evidence-based health guidance to support countries in improving the health of their population.

"As it embarks on its eighth decade, the World Health Organization is as essential and central as ever," said Paul Kagame, President of Rwanda. "It has a unique role in developing new norms and standards, and sharing life-saving tools and technologies."

The investment case also emphasizes WHO's focus on equity, gender and rights-based approaches that aim to close gaps in health service coverage and empower individuals and communities to ensure no one is left behind.

"WHO's leadership is essential to placing UHC at the forefront of the global development agenda," said Dr Jim Yong Kim, President of the World Bank Group.

The investment case outlines WHO's critical role as a partner, convener, and driving force in coordinating efforts across the global health arena.

"We look forward to working with the World Health Organization, governments and partners around the world to build strong primary health systems as an essential step to achieving health for all," said Bill Gates, Co-Chair of the Bill & Melinda Gates Foundation.

WHO kicks off global initiative to treat children with cancer

WHO has announced a new effort - the WHO Global Initiative for Childhood Cancer - with the aim of reaching at least a

60% survival rate for children with cancer by 2030, thereby saving an additional one million lives. This new target represents a doubling of the global cure rate for children with cancer.

The aims of the initiative are two-fold: to increase prioritization of childhood cancer through awareness raising at global and national levels and to expand the capacity of countries to deliver best practice in childhood cancer care. Concretely, WHO will support governments to assess current capacities in cancer diagnosis and treatment including the availability of medicines and technologies; set and cost priority cancer diagnosis and treatment programmes; and integrate childhood cancer into national strategies, health benefits packages and social insurance schemes.

Cancer is a leading cause of death for children, with 300 000 new cases diagnosed each year among children aged 0-19 years. Children with cancer in low- and middle-income countries are four times more likely to die of the disease than children in high-income countries. This is because their illnesses are not diagnosed, they are often forced to abandon treatment due to high costs, and the health professionals entrusted with their care lack specialized training.

The WHO Global Initiative for Childhood Cancer, which involves development of a WHO technical package to help scale-up capacities within national health systems, will be achieved with support from a host of partners. Among them is St. Jude Children's Research Hospital in the United States, the first WHO Collaborating Centre on childhood cancer, which has committed US\$ 15 million to supporting implementation of the initiative.

The initiative was announced on the heels of the Third Global High-Level Meeting on Noncommunicable Diseases, which convened heads of state and min-



WHO calls for urgent action to end TB

ists to prompt more urgent action on noncommunicable diseases – among them cancer, diabetes, heart and lung diseases – which kill 41 million people each year. The event is a milestone in furthering achievement of the Sustainable Development Goals (SDGs), in particular SDG target 3.4 to reduce premature mortality from noncommunicable diseases by one third by 2030.



WHO Global Initiative for Childhood Cancer
www.who.int/cancer/childhood-cancer

WHO issues first-of-its-kind guidance on non-clinical interventions to reduce unnecessary caesarean sections

Many caesarean sections are undertaken unnecessarily, which can put the lives and well-being of women and their babies at risk – both in the short and the long-term.

Worldwide, caesarean section rates have been steadily increasing, without significant benefit to the health of women or their babies. In recognition of the urgent need to address the sustained and unprecedented rise in these rates, WHO has published new guidance on non-clinical interventions specifically designed to reduce unnecessary caesarean sections.

First of its kind

The new guideline, WHO recommendations on non-clinical interventions to reduce unnecessary caesarean sections, incorporates the views, fears and beliefs of both women and health professionals about caesarean sections. It also considers the complex dynamics and limitations of health systems and organizations and relationships between women, health professionals and organization of health care services. The key recommendations include:

- Educational interventions for women and families to support meaningful dialogue with providers and informed decision-making on mode of delivery (i.e. providing childbirth

Fewer people fell ill and died from tuberculosis (TB) last year but countries are still not doing enough to end TB by 2030, warns the WHO. Although global efforts have averted an estimated 54 million TB deaths since 2000, TB remains the world's deadliest infectious disease.

WHO's 2018 Global TB Report, released in New York 18 September 2018, calls for an unprecedented mobilization of national and international commitments. It urges political leaders gathering next week for the first-ever United Nations High-level Meeting on TB to take decisive action, building on recent moves by the leaders of India, the Russian Federation, Rwanda, and South Africa. Nearly 50 Heads of State and Government are expected to attend the meeting.



Dr Tedros Adhanom Ghebreyesus, WHO Director-General

“We have never seen such high-level political attention and understanding of what the world needs to do to end TB and drug-resistant TB, said Dr Tedros Adhanom Ghebreyesus, WHO Director-General. “We must capitalize on this new momentum and act together to end this terrible disease.”

To meet the global target of ending TB by 2030, countries need to urgently accelerate their response – including by increasing domestic and international funding to fight the disease. The WHO report provides an overview of status of the epidemic and the challenges and opportunities countries face in responding to it.

Status of the TB epidemic

- Overall, TB deaths have decreased over the past year. In 2017, there were 1.6 million deaths (including among 300 000 HIV-positive people). Since 2000, a 44% reduction in TB deaths occurred among people with HIV compared with a 29% decrease among HIV-negative people;
- Globally, an estimated 10 million people developed TB in 2017. The number of new cases is falling by 2% per year, although faster reductions have occurred in Europe (5% per year) and Africa (4% per year) between 2013 and 2017;
- Some countries are moving faster than others - as evidenced in Southern Africa, with annual declines (in new cases) of 4% to 8% in countries such as Lesotho, Eswatini, Namibia, South Africa, Zambia, and Zimbabwe, thanks to better TB and HIV prevention and care. In the Russian Federation, high level political commitment and intensified TB efforts have led to more rapid declines in cases (5% per year) and deaths (13% per year)
- Drug-resistant TB remains a global public health crisis: In 2017, 558 000 people were estimated to have developed disease resistant to at least rifampicin – the most effective first-line TB drug. The vast majority of these people had multidrug-resistant TB (MDR-TB), that is, combined resistance to rifampicin and isoniazid (another key first-line TB medicine).
- WHO estimates that a quarter of the world's population has TB infection.

The TB response: Challenges and opportunities

Access to care and prevention:

- Underreporting and under-diagnosis of TB cases remains a major challenge. Of the 10 million people who fell ill with TB in 2017, only 6.4 million were officially recorded by national reporting systems, leaving 3.6 million people undiagnosed, or detected but not reported. Ten countries accounted for 80% of this gap, with India, Indonesia and Nigeria topping the list. Less than half of the estimated one million children with TB were reported in 2017, making it a much higher gap

NEWS FROM THE World Health Organisation



► (Continued from previous page)

in detection than that in adults.

- Treatment coverage lags behind at 64% and must increase to at least 90% by 2025 to meet the TB targets.

- To urgently improve detection, diagnosis and treatment rates, WHO, the Stop TB Partnership and the Global Fund launched the new initiative in 2018, Find. Treat. All. #EndTB < www.who.int/tb/joint-initiative >, which set the target of providing quality care to 40 million people with TB from 2018 to 2022.

- Only around half of the estimated 920,000 people with HIV-associated TB were reported in 2017. Of these, 84% were on antiretroviral therapy. Most of the gaps in detection and treatment were in the WHO African Region, where the burden of HIV-associated TB is highest. Only one in four people with MDR-TB were reported to have received treatment with a second-line regimen. China and India alone were home to 40% of patients requiring treatment for MDR-TB, but not reported to be receiving it. Globally, MDR-TB treatment success remains low at 55%, often due to drug toxicity making it impossible for patients to stay on treatment. WHO recently issued a Rapid Communication on key changes to treatment of drug-resistant TB based on the latest scientific evidence. These changes should result in better treatment outcomes and more lives saved. WHO is already working with countries and partners to roll out these changes.

- The Organization predicts that at least 30 million people should be able to access TB preventive treatment between 2018 and 2022, based on new WHO guidance. Although preventive treatment for latent TB infection is expanding, most people needing it are not yet accessing care. WHO strongly recommends preventive treatment for people living with HIV, and children under 5 years living in households with TB. Related new guidance was issued by WHO in 2018, to facilitate greater access to preventive services for those who need it.

Financing for implementation and research

- One of the most urgent challenges is to scale up funding. In 2018, investments in TB prevention and care in low- and middle-income countries fell US\$3.5 billion short of what is needed. The report flags that without an increase in funding, the annual gap will widen to \$ 5.4 billion in 2020 and to at least US\$ 6.1 billion in 2022. A further \$ 1.3 billion per year is required to accelerate the development of new vaccines, diagnostics and medicines.

“It is unacceptable that millions lose their lives, and many more suffer daily from this preventable and curable disease,” said Dr Tereza Kasaeva, Director of WHO’s Global TB Programme. “We need to join forces to root out this disease that has a devastating social and economic impact on those who are ‘left behind’, whose human rights and dignity are limited, and who struggle to access care. The time for action is now.”

WHO is guiding national and global actions to reach everyone with care, including those with TB, through a transformative health agenda and push towards Universal Health Coverage. This includes proactive engagement with civil society and other key stakeholders to jointly help countries get on track to end TB.

training workshops for mothers and couples, relaxation training programmes led by nurses, psychosocial couple-based prevention programmes, psychoeducation for women with fear of pain or anxiety).

- Use of clinical guidelines, audits of caesarean sections, and timely feedback to health professionals about caesarean section practices.

- Requirement for second opinion for caesarean section indication at point of care in settings with adequate resources.

- Some interventions aimed at health organizations are recommended only under rigorous research such as collaborative midwifery-obstetrician model of care (i.e. a model of staffing based on care provided primarily by midwives,

with 24-hour back-up from an obstetrician who provides in-house labour and delivery coverage without other competing clinical duties) or financial strategies (i.e. insurance reforms equalizing physician fees for vaginal births and caesarean sections).

Inequality and risks

While many women in need of caesarean sections still do not have access to caesarean section particularly in low resource settings, many others undergo the procedure unnecessarily, for reasons which cannot be medically justified.

Caesarean birth is associated with short- and long-term risks that can extend many years beyond the current delivery and affect the health of the woman, the child and future pregnancies. These risks are higher in women with limited access to comprehensive obstetric care. Caesarean sections are also costly, and high rates of unnecessary caesarean sections can therefore pull resources away from other essential health services, particularly in overloaded and weak health systems.

Understanding the context

There are many complex reasons for the increase of caesarean section rates, and these vary widely between and within countries. Before implementing any intervention to reduce rates, research should be done which identifies and defines why rates are increasing in the particular setting, as well as what the locally relevant determinants of caesarean births are, as well as women and providers’ views and cultural norms.

In addition, interventions to reduce rates that do not address the complex, multi-faceted reasons for the increase of rates, will be likely to have limited impact. Interventions that have multiple components are likely to be more successful and are therefore more desirable.



WHO recommendations: non-clinical interventions to reduce unnecessary caesarean sections

www.who.int/reproductivehealth/publications/non-clinical-interventions-to-reduce-cs

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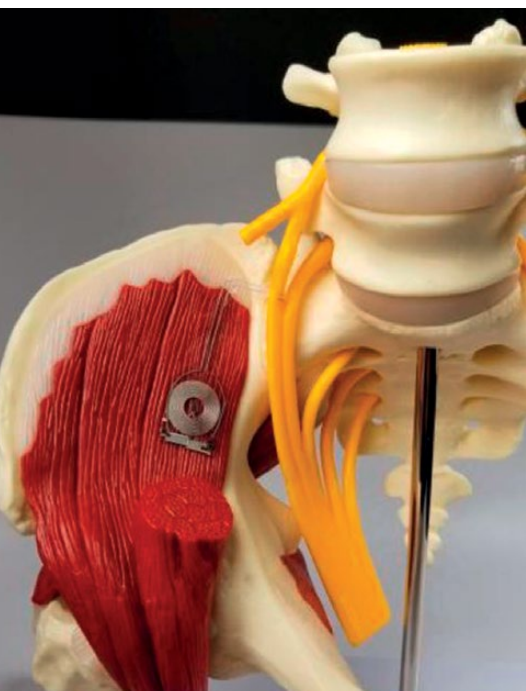
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the laboratory

Medical research news from around the world



The bioelectronic device speeds nerve regeneration and naturally absorbs into the body after a week or two.

Researchers develop the first bioelectronic, implantable, biodegradable device that speeds nerve regeneration

Researchers at Northwestern University and Washington University School of Medicine have developed the first example of a bioelectronic medicine: an implantable, biodegradable wireless device that speeds nerve regeneration and improves the healing of a damaged nerve.

The collaborators – materials scientists and engineers at Northwestern and neurosurgeons at Washington University – developed a device that delivers regular pulses of electricity to damaged peripheral nerves in rats after a surgical repair process, accelerating the regrowth of nerves in their legs and enhancing the ultimate recovery of muscle strength and control. The size of a dime and the thickness of a sheet of paper, the wireless device operates for about two weeks before naturally absorbing into the body.

The scientists envision that such transient engineered technologies one day could complement or replace pharmaceutical treatments for a variety of medical conditions in humans. This type of technology, which the researchers refer to as a “bioelectronic medicine”, provides therapy and treatment over a clinically relevant period of time and directly at the site where it’s needed, thereby reducing side effects or risks associated with conventional, permanent implants.

“These engineered systems provide active, therapeutic function in a programmable, dosed format and then naturally disappear into the body, without a trace,” said Northwestern’s John A. Rogers, a pioneer in bio-integrated technologies and a co-senior author of the study. “This approach to therapy allows one to think about options that go beyond drugs and chemistry.”

Rogers is the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering and Neurological Surgery in the McCormick School of Engineering and Northwestern University Feinberg School of Medicine.

The research is published in the 8 October 2018 issue of the journal *Nature Medicine*.

While the device has not been tested in humans, the findings offer promise as a future therapeutic option for nerve injury patients. For cases requiring surgery, standard practice is to administer some electrical stimulation during the surgery to aid recovery. But until now, doctors have lacked a means to continuously provide that added boost at various time points throughout the recovery and healing process.

“We know that electrical stimulation during surgery helps, but once the surgery is over, the window for intervening is closed,” said co-senior author Dr Wilson “Zack” Ray, an associate professor of neurosurgery, of biomedical engineering and of orthopaedic surgery at Washington University. “With this device, we’ve shown that electrical stimulation given on a scheduled basis can further enhance nerve recovery.”

Over the past eight years, Rogers and his lab have developed a complete collection of electronic materials, device designs and

manufacturing techniques for biodegradable devices with a broad range of options that offer the potential to address unmet medical needs. When Ray and his colleagues at Washington University identified the need for electrical stimulation-based therapies to accelerate wound healing, Rogers and colleagues at Northwestern went to their toolbox and set to work.

They designed and developed a thin, flexible device that wraps around an injured nerve and delivers electrical pulses at selected time points for days before the device harmlessly degrades in the body. The device is powered and controlled wirelessly by a transmitter outside the body that acts much like a cellphone-charging mat. Rogers and his team worked closely with the Washington University team throughout the development process and animal validation.

The Washington University researchers then studied the bioelectronic device in rats with injured sciatic nerves. This nerve sends signals up and down the legs and controls the hamstrings and muscles of the lower legs and feet. They used the device to provide one hour per day of electrical stimulation to the rats for one, three or six days or no electrical stimulation at all, and then monitored their recovery for the next 10 weeks.

They found that any electrical stimulation was better than none at all at helping the rats recover muscle mass and muscle strength. In addition, the more days of electrical stimulation the rats received, the more quickly and thoroughly they recovered nerve signalling and muscle strength. No adverse biological effects from the device and its reabsorption were found.

“Before we did this study, we weren’t sure that longer stimulation would make a difference, and now that we know it does, we can start trying to find the ideal time frame to maximize recovery,” Ray said. “Had we delivered electrical stimulation for 12 days instead of six, would there have been more therapeutic benefit? Maybe. We’re looking into that now.”

By varying the composition and thickness of the materials in the device, Rogers and colleagues can control the precise number of days it remains functional before being absorbed into the body. New



versions can provide electrical pulses for weeks before degrading. The ability of the device to degrade in the body takes the place of a second surgery to remove a non-biodegradable device, thereby eliminating additional risk to the patient.

“We engineer the devices to disappear,” Rogers said. “This notion of transient electronic devices has been a topic of deep interest in my group for nearly 10 years – a grand quest in materials science, in a sense. We are excited because we now have the pieces – the materials, the devices, the fabrication approaches, the system-level engineering concepts – to exploit these concepts in ways that could have relevance to grand challenges in human health.”

The research study also showed the device can work as a temporary pacemaker and as an interface to the spinal cord and other stimulation sites across the body. These findings suggest broad utility, beyond just the peripheral nervous system.

• doi: 10.1038/s41591-018-0196-2

Two common antipsychotic drugs ineffective for delirium in intensive care

Critically ill patients in intensive care units (ICUs) did not benefit from two antipsychotic drugs used to treat delirium, according to a large clinical trial funded by the National Institute on Aging, part of the US National Institutes of Health. The multi-site team that conducted the trial found no evidence that treatment with antipsychotic medicines – haloperidol or ziprasidone – affected delirium, survival, length of ICU or hospital stay or safety. The findings from the Modifying the Incidence of Delirium USA (MIND USA) study were published online 22 October 2018 in *The New England Journal of Medicine*.

“This is strong evidence from what we consider a ‘gold standard’ clinical trial showing that these two antipsychotics don’t work to treat delirium during a critical illness,” said NIA Deputy Director Marie A. Bernard, M.D. “Antipsychotics have often been used to treat delirium. The evidence from this study suggests the need to reexamine that practice.” Bernard is also

NIA’s senior geriatrician.

Delirium is an acute disturbance in attention and awareness with symptoms that can include disorganized thinking and agitation. Millions of hospitalized patients experience delirium. It can affect patients of any age but is more common among older adults who experience major illness – especially involving an ICU stay – or have major surgery. Delirium is also associated with higher ICU costs and multiple adverse outcomes, such as longer hospital stays, long-term cognitive impairment and death.

Antipsychotic medications have been used to treat delirium in ICU patients for 40 years without definitive understanding of their effectiveness. To address the question of benefit versus risk of the use of antipsychotics for delirium, the MIND USA investigators, led by E. Wesley Ely, M.D., M.P.H., professor of medicine at Vanderbilt University Medical Center, Nashville, Tennessee, associate director of Research for the VA Geriatric Research Education Clinical Center, and co-director of the CIBS (Critical Illness, Brain dysfunction, and Survivorship) Center, screened nearly 21,000 patients at 16 U.S. medical centres. Of the 1,183 patients on mechanical ventilation or in shock enrolled, 566 became delirious and were randomized into three groups: those who received intravenous haloperidol, ziprasidone or placebo (saline). The researchers then measured for endpoints including delirium and coma duration, time on mechanical ventilation, successful discharge from ICU and hospital, as well as 30- and 90-day mortality.

Researchers found no significant difference in duration of delirium or coma among those participants on haloperidol or ziprasidone compared to placebo. Similarly, there were no significant differences among participants on either antipsychotic medication compared to placebo in 30-day and 90-day mortality or time on the ventilator, or in the ICU and hospital.

The study population included participants with a wide range of ages, conditions and admission diagnoses. Overall, they had a 73-percent 30-day survival rate and 64-percent 90-day survival rate, which re-

fects the severe nature of their illnesses. The research team also found no evidence of major harm from the antipsychotics, but did note other research suggesting safety concerns – including increased mortality – associated with antipsychotic use in non-ICU geriatric populations.

“This research joins other important studies on delirium showing that there clearly is need for improvement in treating and managing this complicated condition,” said Molly Wagster, Ph.D. chief of the Behavioral and Systems Neuroscience Branch in the NIA’s Division of Neuroscience. “Large randomized trials like this can inform clinicians and help guide care.”

• doi: 10.1056/NEJMoa1808217.

New initiative launched to speed development of cures for sickle cell disease

The US National Institutes of Health has launched a new initiative to help speed the development of cures for sickle cell disease, a group of inherited blood disorders affecting around 20 million worldwide. The Cure Sickle Cell Initiative will take advantage of the latest genetic discoveries and technological advances to move the most promising genetic-based curative therapies safely into clinical trials within five to 10 years.

“Our scientific investments have brought us to a point where we have many tools available to correct or compensate for the defective gene that causes sickle cell disease. We are now ready to use these tools to speed up our quest for a cure,” said Gary H. Gibbons, M.D., director of NIH’s National Heart, Lung, and Blood Institute (NHLBI), which is leading the effort.

Sickle cell disease results from a single genetic mutation that causes a person’s red blood cells to form an abnormal, sickle shape. These sickled cells can clog the blood vessels and deprive cells of oxygen. In turn, this lack of oxygen wreaks havoc on the body, damaging organs, causing severe pain, and potentially leading to premature death.

Decades of basic research on sickle cell disease have laid the groundwork for novel genetic approaches to cures, such as the ge-



netic editing of bone marrow cells, which have shown great promise in animal models and in some small-scale human studies. In addition, the NHLBI Production Assistance for Cellular Therapies (PACT) program has been working with researchers to manufacture cellular therapeutic products, including genetically modified cells, that can be used safely in clinical trials with patients.

NIH spends approximately \$100 million on sickle cell disease research each year. Through this initiative, NHLBI seeks to support the development of cell and genetic therapies resources, clinical trials, comparator analyses of different management strategies, data repositories and resources, and patient and advocate engagement activities related to curative therapies for this condition. Already in 2018, NHLBI committed an additional \$7 million to jumpstart the initiative's research and engagement infrastructure.

NHLBI has named hematologist Edward J. Benz Jr., M.D., President and CEO Emeritus of Dana-Farber Cancer Institute, as the Initiative's executive director, and the Emmes Corporation, a contract research organization with specialized expertise in clinical trials, gene and cell therapy development in preclinical studies, as its coordinating center.

The initiative and its research partners will establish a US-based national data warehouse of genetic therapies for sickle cell disease and conduct comparative analyses of therapeutic approaches to assess both clinical and cost effectiveness.

Currently, the only cure for sickle cell disease is a bone marrow transplant, a procedure in which a sick patient receives bone marrow from a healthy, genetically-compatible sibling donor. However, transplants are too risky for many adults, and only about 18 percent of children with sickle cell disease have a healthy, matched sibling donor.

Even mild physical activity immediately improves memory function

People who include a little yoga or tai chi in their day may be more likely to remember where they put their keys. Researchers at

the University of California, Irvine and Japan's University of Tsukuba found that even very light workouts can increase the connectivity between parts of the brain responsible for memory formation and storage.

In a study of 36 healthy young adults, the researchers discovered that a single 10-minute period of mild exertion can yield considerable cognitive benefits. Using high-resolution functional magnetic resonance imaging, the team examined subjects' brains shortly after exercise sessions and saw better connectivity between the hippocampal dentate gyrus and cortical areas linked to detailed memory processing.

Their results were published 25 September 2018 in *Proceedings of the National Academy of Sciences*.

"The hippocampus is critical for the creation of new memories; it's one of the first regions of the brain to deteriorate as we get older – and much more severely in Alzheimer's disease," said project co-leader Michael Yassa, UCI professor and Chancellor's Fellow of neurobiology & behaviour. "Improving the function of the hippocampus holds much promise for improving memory in everyday settings."

The neuroscientists found that the level of heightened connectivity predicted the degree of recall enhancement.

Yassa, director of UCI's Center for the Neurobiology of Learning and Memory and the recently launched UCI Brain Initiative, said that while prior research has centred on the way exercise promotes the generation of new brain cells in memory regions, this new study demonstrates a more immediate impact: strengthened communication between memory-focused parts of the brain.

"We don't discount the possibility that new cells are being born, but that's a process that takes a bit longer to unfold," he said. "What we observed is that these 10-minute periods of exercise showed results immediately afterward."

A little bit of physical activity can go a long way, Yassa stressed. "It's encouraging

to see more people keeping track of their exercise habits – by monitoring the number of steps they're taking, for example," he said. "Even short walking breaks throughout the day may have considerable effects on improving memory and cognition."

Yassa and his colleagues at UCI and at the University of Tsukuba are extending this avenue of research by testing older adults who are at greater risk of age-related mental impairment and by conducting long-term interventions to see if regular, brief, light exercise done daily for several weeks or months can have a positive impact on the brain's structure and function in these subjects.

"Clearly, there is tremendous value to understanding the exercise prescription that best works in the elderly so that we can make recommendations for staving off cognitive decline," he said.


- doi:10.1073/pnas.1805668115

Early stage clinical trial of new antimalarial drug begins

Enrollment has begun in a Phase 1 clinical trial to test the safety of a new investigational drug designed to treat malaria, as well as its effect on the human body. The first-in-human study is sponsored by the National Institute of Allergy and Infectious Diseases (NIAID), part of the US National Institutes of Health (NIH), and is being conducted at the Duke University School of Medicine in Durham, North Carolina.

In 2016, an estimated 216 million new malaria cases and 445,000 deaths occurred, primarily among children living in sub-Saharan Africa, according to the World Health Organization. Although several approved treatments for the mosquito-borne disease exist, increasing drug resistance among the malaria-causing parasites is diminishing their effectiveness.

"The increasing problem of drug resistance demands that we continue to find new and effective treatment options for malaria infection," said NIAID Director Anthony S. Fauci, M.D.

- For more information about this study, visit [ClinicalTrials.gov](https://clinicaltrials.gov) and search identifier NCT03490162. 

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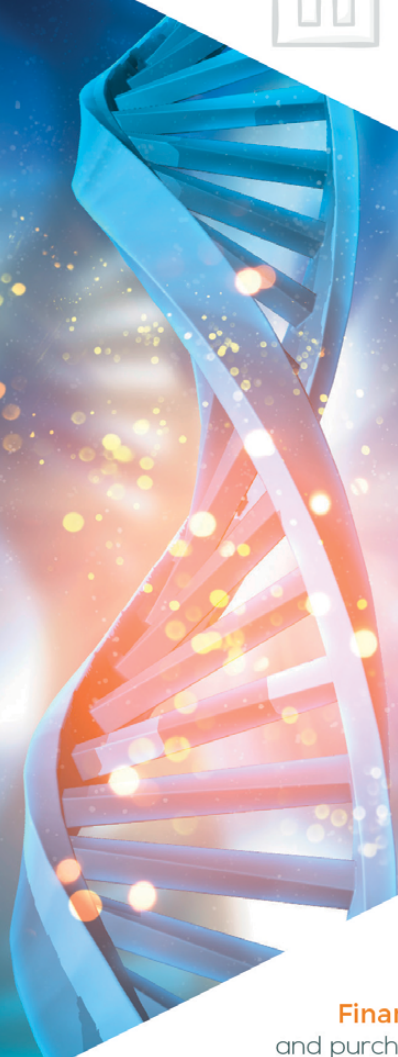
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James P. Allison (left), Professor at University of Texas MD Anderson Cancer Center, Houston, and Tasuku Honjo, Professor at Kyoto University, have been jointly awarded the 2018 Nobel Prize in Physiology or Medicine.

Researchers honoured for key discovery in fight against cancer

This year's Nobel Prize in Physiology or Medicine was awarded jointly to James P. Allison and Tasuku Honjo for their discovery of cancer therapy by inhibition of negative immune regulation.

Cancer kills millions of people every year and is one of humanity's greatest health challenges. By stimulating the inherent ability of our immune system to attack tumor cells this year's Nobel Laureates have established an entirely new principle for cancer therapy.

James P. Allison studied a known protein that functions as a brake on the immune system. He realized the potential of releasing the brake and thereby unleashing our immune cells to attack tumours. He

then developed this concept into a brand new approach for treating patients.

In parallel, Tasuku Honjo discovered a protein on immune cells and, after careful exploration of its function, eventually revealed that it also operates as a brake, but with a different mechanism of action. Therapies based on his discovery proved to be strikingly effective in the fight against cancer.

Allison and Honjo showed how different strategies for inhibiting the brakes on the immune system can be used in the treatment of cancer. The seminal discoveries by the two Laureates constitute a landmark in our fight against cancer.

Cancer comprises many different dis-

eases, all characterized by uncontrolled proliferation of abnormal cells with capacity for spread to healthy organs and tissues. A number of therapeutic approaches are available for cancer treatment, including surgery, radiation, and other strategies, some of which have been awarded previous Nobel Prizes. These include methods for hormone treatment for prostate cancer (Huggins, 1966), chemotherapy (Elion and Hitchins, 1988), and bone marrow transplantation for leukaemia (Thomas 1990). However, advanced cancer remains immensely difficult to treat, and novel therapeutic strategies are desperately needed.

In the late 19th century and beginning of

the 20th century the concept emerged that activation of the immune system might be a strategy for attacking tumour cells. Attempts were made to infect patients with bacteria to activate the defence. These efforts only had modest effects, but a variant of this strategy is used today in the treatment of bladder cancer. It was realized that more knowledge was needed. Many scientists engaged in intense basic research and uncovered fundamental mechanisms regulating immunity and also showed how the immune system can recognize cancer cells. Despite remarkable scientific progress, attempts to develop generalizable new strategies against cancer proved difficult.

Our immune system

The fundamental property of our immune system is the ability to discriminate “self” from “non-self” so that invading bacteria, viruses and other dangers can be attacked and eliminated. T cells, a type of white blood cell, are key players in this defence. T cells were shown to have receptors that bind to structures recognized as non-self and such interactions trigger the immune system to engage in defence. But additional proteins acting as T-cell accelerators are also required to trigger a full-blown immune response. Many scientists contributed to this important basic research and identified other proteins that function as brakes on the T cells, inhibiting immune activation. This intricate balance between accelerators and brakes is essential for tight control. It ensures that the immune system is sufficiently engaged in attack against foreign microorganisms while avoiding the excessive activation that can lead to autoimmune destruction of healthy cells and tissues.

A new principle for immune therapy

During the 1990s, in his laboratory at the University of California, Berkeley, James P. Allison studied the T-cell protein CTLA-4. He was one of several scientists who had made the observation that CTLA-4 functions as a brake on T cells. Other research

teams exploited the mechanism as a target in the treatment of autoimmune disease. Allison, however, had an entirely different idea. He had already developed an antibody that could bind to CTLA-4 and block its function. He now set out to investigate if CTLA-4 blockade could disengage the T-cell brake and unleash the immune system to attack cancer cells. Allison and co-workers performed a first experiment at the end of 1994, and in their excitement it was immediately repeated over the Christmas break. The results were spectacular. Mice with cancer had been cured by treatment with the antibodies that inhibit the brake and unlock antitumor T-cell activity. Despite little interest from the pharmaceutical industry, Allison continued his intense efforts to develop the strategy into a therapy for humans. Promising results soon emerged from several groups, and in 2010 an important clinical study showed striking effects in patients with advanced melanoma, a type of skin cancer. In several patients, signs of remaining cancer disappeared. Such remarkable results had never been seen before in this patient group.

Discovery of PD-1 and its importance for cancer therapy

In 1992, a few years before Allison’s discovery, Tasuku Honjo discovered PD-1, another protein expressed on the surface of T-cells. Determined to unravel its role, he meticulously explored its function in a series of elegant experiments performed over many years in his laboratory at Kyoto University. The results showed that PD-1, similar to CTLA-4, functions as a T-cell brake, but operates by a different mechanism. In animal experiments, PD-1 blockade was also shown to be a promising strategy in the fight against cancer, as demonstrated by Honjo and other groups. This paved the way for utilizing PD-1 as a target in the treatment of patients. Clinical development ensued, and in 2012 a key study demonstrated clear efficacy in the treatment of patients with different types of cancer. Results were dramatic, leading

to long-term remission and possible cure in several patients with metastatic cancer, a condition that had previously been considered essentially untreatable.

Immune checkpoint therapy for cancer today and in the future

After the initial studies showing the effects of CTLA-4 and PD-1 blockade, the clinical development has been dramatic. We now know that the treatment, often referred to as “immune checkpoint therapy”, has fundamentally changed the outcome for certain groups of patients with advanced cancer. Similar to other cancer therapies, adverse side effects are seen, which can be serious and even life threatening. They are caused by an overactive immune response leading to autoimmune reactions, but are usually manageable. Intense continuing research is focused on elucidating mechanisms of action, with the aim of improving therapies and reducing side effects.

Of the two treatment strategies, checkpoint therapy against PD-1 has proven more effective and positive results are being observed in several types of cancer, including lung cancer, renal cancer, lymphoma and melanoma. New clinical studies indicate that combination therapy, targeting both CTLA-4 and PD-1, can be even more effective, as demonstrated in patients with melanoma. Thus, Allison and Honjo have inspired efforts to combine different strategies to release the brakes on the immune system with the aim of eliminating tumour cells even more efficiently. A large number of checkpoint therapy trials are currently underway against most types of cancer, and new checkpoint proteins are being tested as targets.

For more than 100 years scientists attempted to engage the immune system in the fight against cancer. Until the seminal discoveries by the two laureates, progress into clinical development was modest. Checkpoint therapy has now revolutionized cancer treatment and has fundamentally changed the way we view how cancer can be managed. MEH



Diabetes research

The annual meeting of the European Association for the Study of Diabetes (EASD) was held in Berlin, Germany in October. Several important and interesting studies were presented at the meeting. *Middle East Health* reports.

Pros and cons of gastric bypass surgery in obese individuals with type 2 diabetes

New research presented at this year's annual meeting of the European Association for the Study of Diabetes (EASD) in Berlin, Germany, reveals that while gastric bypass (GBP) surgery offers obvious benefits in obese individuals with type 2 diabetes (T2D), there are also a range of potential adverse events that require monitoring and potential treatment.

The research conducted by Vasileios Liakopoulos and colleagues from the Department of Molecular and Clinical Medicine,

University of Gothenburg, Gothenburg, Sweden sought to evaluate the long-term effects of GBP in obese patients with T2DM, in particular regarding the risks of postoperative complications.

Previous studies have looked into the effects of GBP, but there is limited information about the long-term impact on obese individuals with T2D. Having this information should allow doctors to make more informed decisions when selecting candidates for surgery, and give them a better understanding of the kind of follow-up and support that needs to be made available to patients.

The authors investigated postoperative outcomes from GBP in a nationwide cohort obtained by merging data from the Scandinavian Obesity Surgery Registry, the National Diabetes Register, and national databases. They matched patients with T2D who had undergone GBP with those who had not been treated surgically for obesity, based on factors including sex, age, and body mass index (BMI). The cohort for the study consisted of 5321 T2DM patients who underwent a GBP operation, and 5321 control subjects who did not, with both groups being followed for up to 9 years to evaluate outcomes.

The study found that all-cause mortality risk was reduced by 49% after GBP, the risk of cardiovascular disease fell by 34%, and there were positive effects on severe kidney disease. A number of short-term complications were significantly more likely following the operation with rates being 2 to 9 times higher than in the control population (gallstone & gallbladder disease [2.5 times higher risk], gastrointestinal ulcer/reflux [5.4 times], bowel obstruction [9.5 times]). Abdominal pain (5.5 times more) and gastrointestinal conditions occurred more frequently in the surgery group and often required additional surgery (HR 3.3 times increased risk).

The authors found that GBP increased the risk of anaemia by 92% and made patients 3 times more likely to suffer from malnutrition. In addition, individuals who underwent the operation were 33% more likely to be given a psychiatric diagnosis, and abused alcohol at a rate three times higher than the control group.

The authors state that: "This nationwide study confirms the benefits but also describes the variety of adverse effects after bariatric surgery in obese persons with type 2 diabetes."

They conclude that: "In order to maximise the benefit and minimise the risk of unfavourable results after bariatric surgery, a thorough and long-term follow-up and support of these patients appears vital. Better selection of patients for such surgery could probably also improve results."

Study reveals how weight loss can put type 2 diabetes into remission

In 2017, the landmark Diabetes Remission Clinical Trial (DiRECT) revealed that type 2 diabetes can be reversed in some adults by following an intensive weight management programme, but no-one knew why. Now, new research being presented at this year's European Association for the Study of Diabetes (EASD) Annual Meeting in Berlin, Germany (1–5 October) suggests that remission is dependent on whether insulin-producing beta cells in the pancreas are able to recover and function normally.

The finding challenges current medical consensus that beta-cell function is irreversibly lost in people with type 2 diabetes.

The study led by Professor Roy Taylor from Newcastle University in the UK provides further evidence that losing fat from around the liver and pancreas is key to putting type 2 diabetes into remission, but suggests that remission can only be achieved if it results in improved function of pancreatic beta cells so they can restart their insulin production. Insulin is a hormone produced by beta cells in the pancreas that helps glucose in the blood enter cells in the muscle, fat, and liver to be used as energy.

The DiRECT trial included 298 adults age 20-65 years who had been diagnosed with type 2 diabetes in the past 6 years. The study, published in *The Lancet* in 2017, examined whether a new weight management programme consisting of a low-calorie diet (825-853 kcal/day for 3-5 months), followed by reintroduction of healthy food, and long-term support to maintain weight loss. Results showed that nearly half of the participants (46%) following the weight management programme achieved diabetes remission at 1 year compared, compared with six (4%) in the control group.

In this new study, Professor Taylor and colleagues investigated exactly how weight loss can put type 2 diabetes into remission and why it works for some people and not for others. They examined fat content in the liver and pancreas, and beta-cell function in a subset of 58 participants from DiRECT—including 40 responders (people in remission) and 18 non-responders (people not in remission) over 12 months. The responders had been living with type 2 diabetes for less time than non-responders (average of 2.7 years vs. 3.8 years).

Over the study period, both groups lost a similar amount of weight (16.2 kg for responders vs. 13.4 kg for non-responders), leading to similar reductions in fat content in the liver and pancreas and average triglyceride concentrations.

However, only the responders showed early and sustained improvement in beta-cell function. After losing weight, the beta

cells of people in remission started to work properly again, but there was no change in the amount of insulin being made by non-responders.

"Our findings suggest that the longer someone has lived with type 2 diabetes, the less likely the function of their beta cell is likely to improve", says Professor Taylor. "The clinical message is clear: the new effective weight loss approach should be advised for all with type 2 diabetes, especially at the time of diagnosis".

The authors acknowledge several limitations including that most participants were white and British, so the results might have less generalisability to other racial and ethnic groups, who tend to develop diabetes with less weight gain. They also note that the participants were only evaluated for 12 months, and longer-term follow-up is underway.

Cases of type 1 diabetes diagnosed after the age of 30 are frequently misdiagnosed as type 2 diabetes

Also at EASD, researchers from the University of Exeter, Exeter, UK, revealed that many cases of type 1 diabetes (T1D) diagnosed after the age of 30 are not being properly identified and are frequently misdiagnosed as being type 2 diabetes (T2D), potentially leading to delays in receiving appropriate treatment.

UK Prime Minister Theresa May is a high-profile example of someone who was initially thought to have T2D, only to later return to her doctors when the medications for T2D did not work. She was subsequently diagnosed with T1D.

This new research sought to determine the prevalence and characteristics of T1D occurring after the age of 30 in patients with insulin-treated diabetes.

T1D is characterised by the rapid and severe loss of insulin production as the cells in the pancreas which produce the hormone are attacked and destroyed by the body's own immune system. Individuals with the disease lose the ability to make their own insulin and therefore require regular doses of insulin to control their blood glucose, either in the form

of injections or via a pump, and unlike many people with T2D, cannot manage their condition through diet, exercise and blood sugar monitoring alone.

The researchers characterised T1D as being the rapid onset of insulin dependence within 3 years of initial diagnosis, together with a severe deficiency of insulin production by the pancreas. They analysed a population cohort of 583 individuals who had insulin-treated diabetes that had been diagnosed after the age of 30. The characteristics of their disease were compared with other participants who still produced some insulin, as well as with 220 individuals with severe insulin deficiency that was diagnosed before the age of 30.

The study found that 21% of those with insulin-treated diabetes who were diagnosed after the age of 30 had severe

insulin deficiency, confirming Type 1 diabetes. Out of this group, 39% did not receive insulin when they were initially diagnosed, with 46% of those individuals self-reporting that they had T2D. A rapid progression to insulin dependence was

highly predictive of late-onset T1D with 84% of those with the disease requiring insulin within just one year.

Among participants who became insulin dependent within 3 years, 44% developed a severe deficiency of their body's own

Clinicians should be aware that the majority of patients needing insulin within 3 years of diagnosis will have Type 1 diabetes, even if they were initially thought to have type 2 diabetes and did not need insulin at diagnosis. Getting the right diagnosis is important for these patients to receive the right education and treatment.

Diabetes may begin more than 20 years before diagnosis

Early signs of type 2 diabetes can be identified more than 20 years before diagnosis, according to new research presented at this year's European Association for the Study of Diabetes (EASD) Annual Meeting in Berlin, Germany (1-5 October).

The Japanese study tracked over 27,000 non-diabetic adults (average age 49 years) between 2005 and 2016 and found that increased fasting glucose, higher body mass index (BMI) and impaired insulin sensitivity were detectable up to 10 years before the diagnosis of diabetes as well as prediabetes.

"As the vast majority of people with type 2 diabetes go through the stage of prediabetes, our findings suggest that elevated metabolic markers for diabetes are detectable more than 20 years before its diagnosis", says Dr Hiroyuki Sagesaka from Aizawa Hospital in Matsumoto, Japan who led the research, along with Professor Mitsuhiro Komatsu, Shinshu University Graduate School of Medicine, Matsumoto, Japan and colleagues.

Previous research suggests that risk factors like obesity and elevated fasting glucose may be present up to 10 years before someone is diagnosed with diabetes.

However, the time point at which individuals who go on to develop diabetes and those who don't first become substantially different from each other was not known until now.

Sagesaka and colleagues assessed the trajectories of fasting blood glucose, BMI, and insulin sensitivity in individuals who developed diabetes and prediabetes separately. At the start of the study, 27,392 non-diabetic individuals had a fasting glucose and average blood glucose (HbA1c) measured and were followed until a diagnosis of type 2 diabetes or prediabetes, or the end of 2016, whichever came first.

Over the study period, 1067 new type 2 diabetes cases were identified. Findings showed that on average, several risk factors were more common among individuals who went on to develop type 2 diabetes compared with those who didn't. In particular, BMI, fasting glucose, and insulin resistance were increased up to 10 years before diagnosis, and these differences widened over time.

For example, mean fasting glucose: 10 years before diagnosis - 101.5 mg/dL developed diabetes vs 94.5 mg/dL those who didn't; 5 years before diagnosis - 105

mg/dL vs 94 mg/dL; and 1 year before - 110 mg/dL vs 94 mg/dL.

Of 15,778 individuals with normal blood glucose at the initial health exam, 4781 went on to develop prediabetes over the study period, and the same abnormalities, although to a milder degree, were present at least 10 years before diagnosis of prediabetes.

The research has important implications given that an estimated 425 million adults (aged 20-79 years) were living with diabetes in 2017, and this is predicted to rise to 629 million by 2045.

"Because trials of prevention in people with prediabetes seem to be less successful over long term follow up, we may need to intervene much earlier than the prediabetes stage to prevent progression to full blown diabetes. A much earlier intervention trial, either drug or lifestyle related, is warranted," says Dr Sagesaka.

This is an observational study, so no firm conclusions can be drawn about cause and effect, and the authors point to several limitations including that the length of time between diagnosis of prediabetes and diabetes is not known, so the entire timeline of diabetes evolution remains to be clarified.

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Nadir, 58 years old
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insulin. Their clinical, biochemical, and genetic characteristics were found to be comparable to those of participants who had been diagnosed before the age of 30. In contrast, patients who retained some insulin production had substantially lower T1D genetic risk scores, antibody positivity (linked to the immune response that damages pancreatic cells), and a higher body mass index (BMI).

Where insulin treatment had been delayed, the patients were found to be on average older (48 years vs 41 years for those who received insulin immediately), and only 50% had self-reported as having T1D, compared to 96% of individuals who had been given insulin upon initial diagnosis. These patients were also much more likely (29% vs 7%) to have been given oral hypoglycaemic drugs in an attempt to control their disease.

Lead researcher Dr Nick Thomas said: "Type 1 diabetes leading to severe insulin deficiency has similar clinical and biological characteristics to that occurring at younger ages, but is frequently not identified.

"Clinicians should be aware that the majority of patients needing insulin within 3 years of diagnosis will have Type 1 diabetes, even if they were initially thought to have type 2 diabetes and did not need insulin at diagnosis. Getting the right diagnosis is important for these patients to receive the right education and treatment."

Low-calorie sweeteners disrupt gut bacteria

New research presented at this year's EASD reveals that consumption of low-calorie sweeteners (LCS) can change the types of bacteria found in the gut, in association with impaired regulation of glucose levels.

The research was conducted by Associate Professor Richard Young and colleagues from Adelaide Medical School and the Centre of Research Excellence in Translating Nutritional Science to Good Health, University of Adelaide, Australia, together with researchers from the South Australian Health & Medical Research Institute, Adelaide, and Flinders University South Australia. The study looked at the effects of LCS on gut microbes and how the body absorbs and regulates glucose.

Previous studies of disease origins indicate that a regular high intake of beverages sweetened with LCS is linked to an ▶

EASD, ADA issue new consensus guidelines on managing hyperglycaemia in type 2 diabetes

New recommendations include specific drug classes for some patients and enhancing medication adherence

Following a review of the latest evidence – including a range of recent trials of drug and lifestyle interventions – the European Association for the Study of Diabetes (EASD) and the American Diabetes Association (ADA) have produced an updated consensus statement on how to manage hyperglycaemia (high blood sugar) in patients with type 2 diabetes. The consensus paper is being co-published in *Diabetologia*, the journal of EASD, and *Diabetes Care*, the journal of the ADA, during the annual meeting of EASD in Berlin, Germany.

The new recommendations, which update their previous 2015 guidance, include additional focus on lifestyle management and diabetes self-management education and support. For those with obesity, efforts targeting weight loss, including lifestyle, medication and surgical interventions, are recommended. With regards to medication management, for patients with clinical cardiovascular disease, a sodium-glucose cotransporter-2 (SGLT2) inhibitor or a glucagon-like peptide-1 (GLP-1) receptor agonist with proven cardiovascular benefit is recommended. For patients with chronic kidney disease or clinical heart failure and atherosclerotic cardiovascular disease, an SGLT2 inhibitor with proven benefit is recommended. GLP-1 receptor agonists are generally recommended as the first injectable medication.

Briefly, the new recommendations include:

- Providers and healthcare systems should prioritise the delivery of patient-centred care
- Facilitating medication adherence should be specifically-considered when selecting glucose-lowering medications. (Ultimately, patient preference is a major factor driving the choice of medication. Even in cases where a patient's clinical characteristics suggest the use of a particular medication based on the available evidence from clinical trials, patient preferences regarding route of administration, injection devices, side effects or cost may prevent their use by some individuals)
- All patients should have ongoing access to diabetes self-management education and support
- Medical nutrition therapy (healthy eating advice and strategies) should be offered to all patients
- All overweight and obese patients with diabetes should be advised of the health benefits of weight loss and encouraged to engage in a programme of intensive lifestyle management, which may include food substitution
- Increasing physical activity improves glycaemic control and should be encouraged in all people with type 2 diabetes.
- Metabolic surgery is a recommended treatment option for adults with type 2

(Continued over page) ▶



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increased risk of developing type 2 diabetes (T2D), but the underlying mechanism of how this happens is unknown. The authors had recently showed that adding LCS to the diets of healthy non-diabetic subjects for two weeks was enough to

cause a clinically relevant increase in how their bodies responded to the consumption of glucose. It remains unclear, however, whether gut dysbiosis (a change in the balance of bacteria) also contributes to the observed abnormalities in blood

glucose levels, as has been observed in studies on rodents.

A group of 29 non-diabetic subjects with an average age of 30 years and average body mass index of 24 kg/m² were recruited for the study. Fifteen participants were randomised to consume a placebo, while 14 consumed an LCS combination (92mg sucralose and 52mg acesulfame-K) equivalent to drinking around 1.5 litres of diet beverage per day. The dose was administered in the form of capsules which were taken 3 times per day over a 2-week period. Stool samples were taken before and after LCS treatment to determine the types and species of microorganisms present.

The study found that LCS-treated individuals exhibited a greater variation in the types of microbes present in their faeces along with a significant reduction in the good-health-associated bacterium *Eubacterium cylindroides*. Populations of beneficial bacterial species which help to ferment food also decreased, while there was a rise in the abundance of 11 opportunistic gut bacteria.

In addition, the team observed a decrease in the population of *Butyrivibrio* bacteria that was correlated with a drop in the release of the hormone GLP-1, which helps to control blood glucose levels. Finally, there were changes in the abundance of microbial genes involved in the metabolism of simple sugars like sucrose and glucose.

The authors say: “In healthy non-diabetic subjects, two weeks of low-calorie sweetener supplementation was sufficient to disrupt gut bacteria and increase the abundance of those which are normally absent in healthy individuals. The observed decrease in fermentative bacteria populations and changes in the pathways used by bacteria to harvest energy predicted a deterioration in the body’s ability to regulate glucose.”

They conclude: “Our findings support the concept that such sweeteners worsen blood sugar control in healthy subjects by disrupting the regulation of glucose uptake and disposal, as well as from changes in the balance of gut bacteria. This highlights the clinical relevance of dietary low-calorie sweetener patterns to overall blood sugar control.” MEH

► Consensus report (Continued from previous page)

diabetes and (1) a BMI of 40 or over (or 37.5 or over in people of Asian ancestry) or (2) a BMI of 35.0 to 39.9 (32.5-37.4 kg/m² in people of Asian ancestry) who do not achieve durable weight loss and improvement in comorbidities with reasonable non-surgical methods.

- Metformin continues to be the first-line recommended therapy for almost all patients with type 2 diabetes
- The selection of medication added to metformin is based on patient preference and clinical characteristics, including presence of cardiovascular disease, heart failure and kidney disease. The risk for specific adverse medication effects, particularly hypoglycaemia and weight gain; as well as safety, tolerability, and cost, are also important considerations.
- Regarding medication management, for patients with clinical cardiovascular disease, a sodium-glucose cotransporter 2 (SGLT2) inhibitor or a glucagon-like peptide 1 (GLP-1) receptor agonist with proven cardiovascular benefit is recommended. Individual agents within these drug classes have been shown to have cardiovascular benefits.
- For patients with chronic kidney disease (CKD) or clinical heart failure and atherosclerotic cardiovascular disease, an SGLT2 inhibitor with proven benefit should be considered
- GLP-1 receptor agonists are generally recommended as the first injectable medication, except in settings where type 1 diabetes is suspected
- Intensification of treatment beyond dual therapy to maintain glycaemic targets requires consideration of the impact of medication side-effects on comorbidities, as well as the burden of treatment and cost

The panel say that the lack of evidence over specific combinations of glucose-lowering therapies remains an issue, and more research is needed.

They say: “As the cost implications for these various approaches is enormous, evidence is desperately needed. Different models of care are being implemented globally. Defining optimal cost-effective approaches to care, particularly in the management of patients – including those with multi-morbidity – is essential.”

They add: “New questions arise from the recent cardiovascular outcomes studies. Do the cardiovascular and renal benefits of SGLT2 inhibitors and GLP-1 receptor agonists demonstrated in patients with established CVD extend to lower-risk patients? Is there additive benefit of use of GLP-1 receptor agonists and SGLT2 inhibitors for prevention of cardiovascular and renal events? If so, in what populations? Addressing these and other vital clinical questions will require additional investment in basic, translational, clinical and implementation research.”

They conclude: “The management of hyperglycaemia in type 2 diabetes has become extraordinarily complex with the number of glucose-lowering medications now available. Patient-centred decision making and support and consistent efforts to improve diet and exercise remain the foundation of all glycaemic management. Initial use of metformin, followed by addition of glucose-lowering medications based on patient comorbidities and concerns is recommended as we await answers to the many questions that remain.”

- To read the full consensus report see: doi: 10.1007/s00125-018-4729-5

Knee pain – causes, risk factors and treatment



■ By Dr Rik Kundra
Consultant Orthopaedic Surgeon
and Head of the Knee Center,
Neuro Spinal Hospital, Dubai

Knee pain is a common symptom that affects all age groups. Usually it settles with simple measures such as rest, use of anti-inflammatories and ice packs as needed. Knee pain can result from many causes such as arthritis, trauma, infection and overuse.

Knee pain may present with associated symptoms including knee swelling (effusion), stiffness, locking, giving way and joint weakness. There may also be other joints affected, such as the hands or the hips. Rarely, knee pain can be due to radiation of pain from the lower back (lumbar spine).

Causes

Arthritis – this is a very common cause of knee pain, particularly in older age groups. Usually osteoarthritis (wear and tear) is the cause, but there are also inflammatory causes including rheumatoid arthritis and gout. Therefore, accurate diagnosis by a knee specialist is important.

Sports injuries – these occur across all age groups. The bones, ligaments, tendons and cartilages in the knee can be affected depending on the mechanism of injury.

Anterior cruciate ligament (ACL) in-

juries tend to occur in those who participate in pivoting sports such as soccer, rugby and basketball.

Meniscal tears affect the shock absorber cartilage of the knee and can lead to mechanical locking of the knee. It is important to preserve the meniscus by repairing tears whenever possible as this may help to maintain some shock-absorbing function of the meniscus tissue.

Tendinopathies occur due to irritation of the major tendons at the knee. They tend to be common in runners, skiers and those who participate in jumping sports. The patellar and quadriceps tendons are affected most often. These conditions can be difficult to treat and accurate specialist diagnosis is essential along with a multidisciplinary approach.

Fractures can also occur around the knee and usually are due to high-velocity trauma such as a road traffic accident or collision sports. However, in older age groups, conditions such as osteoporosis become more prevalent and can cause fractures from relatively low-velocity trauma.

Kneecap problems can also lead to knee pain as well as knee instability. Problems can include a high-riding kneecap (patella alta), altered shape of the joint (dysplasia) and patellofemoral pain syndrome.

Risk factors

Increased body weight – this can dramatically increase the rate of wear of the joint as it places extra stress across the joint surfaces especially during activities such as climbing stairs.

Participation in certain sports – especially those involving pivoting (soccer) or high impact through the knee (running, basketball).

History of knee injury – previous trauma such as a cruciate ligament or meniscus injury places the knee at higher risk of future problems, such as arthritis.



It is important to maintain good knee health to avoid many of the above knee problems. This can be aided by maintaining optimal body weight, ensuring good nutrition and making sure muscles around the knee are as strong and flexible as possible.

Treatment options

Physiotherapy – addresses muscle imbalance, weakness and helps to improve joint position sense around the knee.

Injections (including orthobiologic options such as platelet-rich plasma and stem cell) – these can help with many knee conditions such as early arthritis, tendon injuries and cartilage injuries.

Arthroscopy – can be used to treat meniscus injuries, with meniscal repair preferable whenever possible. Ligaments such as the ACL are usually arthroscopically reconstructed, but it is also possible to repair the ACL in select cases using innovative, minimally-invasive techniques.

Joint preservation surgery for knee arthritis – involves correcting any knee malalignment such as bowing/knock knees with osteotomy surgery. Any focal cartilage defects in the knee can also be treated by resurfacing if needed. Orthobiologic injections can also be given to further improve pain relief.

Joint replacement surgery – both partial and total joint replacements are available. These are used when more conservative treatments for knee arthritis have been exhausted.

Multidisciplinary management is crucial to achieve the best outcome for the patient.

• For more information, visit: nshdubai.com



Pharmacy education in the UAE - Are we moving in the right direction?



By Sherief Ibrahim Mohamed
Ahmed Khalifa, Dean,
College of Pharmacy

Pharmacy education in the modern world focuses on providing students with knowledge, skills and attitude that enable the graduates to perform the role of the pharmacist as a healthcare professional, working side by side with rest of the healthcare team. Since the pharmacy profession today is about patient care and putting patients first, any modern pharmacy curriculum around the world will provide a balance of courses and experiences that enables the pharmacy graduate to fulfill the noble role of the pharmacist in providing the best possible patient care, as it relates to the safe and effective use of medicine.

A general belief is that the pharmacist's role beyond dispensing medication may be unnecessary and expensive and can be covered by physicians or nurses. Experience around the world has shown otherwise. The pharmacist role in patient care has been shown to reduce medication errors that often lead to serious health problems. It also leads to less patient suffering and a reduced social and economic burden where patients are expected to require less

hospitalization, emergency room visits and hospital readmissions.

At Gulf Medical University, we are keep up to date with the everchanging requirements of the healthcare industry and believe in equipping our graduates with the skills, knowledge and experience they need to be job ready from the very first day – so they hit the ground running upon their graduation. Hence, we have designed the only undergraduate Doctor of Pharmacy program in the country where the program features:

- 1) Learning how to access credible knowledge quickly, instead of memorizing
- 2) Evaluating information and determining its suitability for use in a specific case
- 3) Providing a solid foundation in biomedical and pharmaceutical sciences
- 4) Integration of pharmaceutical sciences into pharmacy practice
- 5) Practicing pharmacy skills in a simulated environment
- 6) Early exposure to clinical practice
- 7) Devoting more than 20% of the curriculum to experiential learning
- 8) Understanding, evaluating and performing pharmacy research
- 9) Team-based learning (TBL) to enhance and reinforce learning in an exciting and interactive environment where students learn from each other
- 10) Inter-professional education where students from different healthcare disciplines engage in simulated and real problem solving exercises to prepare them for inter-professional collaborative practice after graduation.

The educational philosophy that brings about excellence in pharmacy education and subsequent improvement of the practice of the pharmacy profession comes

naturally at GMU as it is a medical university that has its own hospitals, clinics and pharmacies in an academic health system.

Engaging students

Clinicians in our healthcare facilities have teaching assignments with the College of Pharmacy. Pharmacy students learn from clinicians by engaging in a shadowing experience and then by performing skills under supervision.

Professors from the College of Pharmacy are licensed pharmacists providing patient care in GMU associated healthcare facilities. This link is extremely crucial and valuable as it immerses pharmacy students in a rich learning environment where they work with academic clinicians and clinical academicians. We believe that this system and the natural learning environment provides the best experience for students to achieve the required competencies.

Whether healthcare is being paid by the government, insurance company or a patient (out of pocket), spending money on pharmacy services will cut down on the overall cost of care. A recent survey conducted in United States, has shown that for every dollar spent on pharmacy services, there is a saving of three dollars.

It is about time that pharmacy educators, practitioner, regulators and healthcare providers meet and talk to each other about offering value-added services to the communities. The outcome will reduce the cost for healthcare payers and above all provide better healthcare to everybody.

• For more info, contact:
email: pharmd@gmu.ac.ae
call: +971 6 7431333
web: www.gmu.ac.ae 

Diabetic foot – the warning signs

Do not underestimate wounds on your feet

One out of every five diabetics in the world goes to hospital because of ulcers on their feet – so-called diabetic foot. Even more astounding, most of these diabetics only discover they are diabetic after they develop ulcers on their feet. Associate Professor Emre Özker, a cardiovascular surgeon and wound care specialist at Acibadem Altunizade Hospital, in Istanbul, says that approximately one out of every four diabetics will suffer from a foot ulcer at least once in their lives.

“Research shows that diabetes has become an even more deadly disease than many types of cancer. Ulcers on the feet can cause many problems, ranging from amputation to loss of life,” Prof Özker warns.

He points out that when there is an infection or ulcer on the foot of a diabetes patient, the patient should not think that it’s small enough to heal by itself – they should consult a doctor without delay.

He explains that because the immune systems of diabetics are weakened, bacteria, that are not strong enough to cause infections under normal conditions, can lead to long-term infections that are hard to handle in diabetes patients.

“Additionally, regulation of the blood glucose levels of diabetics becomes more difficult during infections. In turn, poorly regulated blood glucose levels prevent the cells from fighting infections and the body’s defenses become even weaker. In cases of infection, patients should consult a doctor, use special tools that will prevent them from applying pressure on their ulcers, and start treatment with

effective antibiotics following blood tests and examination of the ulcer.”

Treatment

Since almost half of the diabetes patients have constricted arteries, it is necessary for antibiotics to be administered intravenously to be more effective. Once treatment of the infection begins, and depending on the case at hand, the wound should be cleaned, dead tissue removed and any vascular problems treated.

Prof Özker points out that such treatment requires a multi-disciplinary medical team and immediate treatment is essential to prevent the condition deteriorating, which could result in the patient having the limb amputated.

Prof Özker says that many patients have come to him saying: “It was just a tiny wound, but it turned into this in only 10 days!”

In response to this he explains that dryness of the skin on the feet can progress and lead to cracks and cuts. The dry skin and cracks are also points of entry for fungus and other infectious agents. Eventually, the patient is unable to feel any of the adverse conditions developing on his feet because the nerves become damaged as well. Since he cannot feel even a pin pricking his skin, he only becomes aware of foot ulcers when these lead to visible damage or the infection progresses severely. Therefore, even conditions which do not yet involve ulcers, such as skin dryness, cracks and callous areas on regions which receive pressure, are considered to be within the scope of diabetic foot.



Associate Professor Emre Özker
Cardiovascular Surgeon & Wound Care Specialist
Acibadem Altunizade Hospital

New treatments for diabetic foot

Prof Özker says several new treatments for diabetic foot have been developed recently. “The most prominent among these are the injection of epidermal growth factors into wounds and the use of topical agents. PRP (platelet-rich plasma) applications and PRF (platelet-rich fibrin) applications, which are similar to the former, are also new effective treatments,” he says.

6 steps to prevent diabetic foot

1. Keep your feet clean and moisturized
2. Have a specialist treat the callous skin and cracks on your feet
3. Do not neglect your medications, diet, and exercise in order to keep your blood glucose under control
4. Get your feet measured and undergo gait analyses to have custom insoles and shoes manufactured for you
5. Check your feet for development of new ulcers, especially between the toes and on the soles
6. Do not neglect periodical doctor visits.
 - For more information, call Acibadem Altunizade Hospital on: +90 216 544 4664
Or visit: www.acibademinternational.com



The UK Pavilion, Arab Health

Don't underestimate the importance of HealthTech

The UK's HealthTech sector is broad and diverse. From sticking plasters to MRI machines, robotic assisted surgery to knee implants, diagnostics to digital health, the industry is at the cutting edge of technology. It enables healthcare professionals to improve quality of life, deliver effective services, and improve patient outcomes. By **Paul Benton**, Managing Director, International, ABHI.

The importance of the UK's HealthTech sector cannot be understated. With demographic trends challenging health systems worldwide, HealthTech will play an increasingly significant role in all of our lives. It is no coincidence then, that the sector is the biggest employer within the UK's Life Science industry. With over 97,000 people plying their trade right across the UK, the industry continues to grow year-on-year.

Whilst these figures are well spread across single-use devices, orthopaedics and assistive technology, the single biggest employer, with over 10,000 people, is digital health. In the past year alone 1,100 extra jobs were created, representing an increase of 11% on the previous year. In total, 54% of all these companies were formed in the last 10 years alone, bringing sharply into focus its burgeoning nature. As populations get older and cases

of chronic conditions rise, further strain will be added to our hospitals, resulting in a need to deliver much of our care outside of the traditional hospital environment. HealthTech, through monitoring devices, advanced diagnostic algorithms and AI, will become even more important.

Of course, we can't talk about healthcare in the UK without mentioning the NHS. Free at the point of care, it is comfortably the world's biggest single-

payer system. As an organisation, rivaling behemoths like the U.S military and Walmart with its size, its data pool is arguably its biggest strength. By utilising its sheer size, organizations in the UK are able to work with hospitals to increase their efficiency and take better decisions.

However, it's not just the NHS that is well known. The UK's HealthTech sector is internationally renowned for its creativity, research, and outstanding talent. From the ground-breaking invention of the hip replacement and the use of ultrasound in modern medicine, to the development of the CT scanner and development of the first multi-articulated prosthetic hand, it has a well-deserved reputation for turning innovative ideas into pioneering medical breakthroughs, which in turn become trusted healthcare solutions. Thanks to regular collaboration with the UK's many outstanding medical and healthcare institutions, the sector is thriving.

Association of British HealthTech Industries

Representing the industry in the UK is the Association of British HealthTech Industries. As the voice of the sector, ABHI show the value of health technology and overcome barriers to people benefitting from it. The association works to shape how data and technology will transform healthcare in the future and improve the lives of patients, and are experts in regulation, helping their 275 member companies understand the latest developments. The ABHI also encourages growth and helps HealthTech companies connect with new customers around the world.

On the topic of international support, ABHI lead dedicated HealthTech missions to key markets, such as the USA, the Middle East, China and India, which help companies establish links that supports their growth outside of the UK. Alongside the USA trade missions, the ABHI has also created the ABHI Innovation Hub at the Dell Medical School in Austin, Texas, connecting UK companies with the local infrastructure and network to develop their US business.

The association also hosts six UK Pavilions at trade exhibitions around the globe. At these pavilions, companies can exhibit their products, meet with

new business contacts in dedicated partnering areas and take advantage of networking events by ABHI. ABHI's biggest pavilion, year after year, can be found in the Middle East, the region frequently highlighted as a priority market for UK companies.

Exports to the Middle East

A survey by ABHI, conducted in 2017, found that over half of members predicted their exports to the Middle East to increase throughout the next five years. As economies and societies in the Middle East grow, alongside life expectancy figures, there is a big demand for innovative UK HealthTech products.

Research suggests that governments across the region are also looking to stimulate sectors outside of oil. With tourism booming, increased funding for health suggests the sector will continue to grow alongside it, making it an attractive market for UK companies. It is estimated that the HealthTech market size in the Middle East and North Africa (MENA) region is set to hit US\$11 billion by 2021.

ABHI, every year, also hosts the UK Pavilion at Arab Health. Bringing along with them 150 companies of all shapes and sizes from the UK, the pavilion is a hub of activity in January, and 2019 is shaping up to be no different.

A range of companies will be exhibiting their latest innovative products, whilst developing new and existing business relationships with a variety of stakeholders at the show.

Simulated operating theatre

Taking centre stage at the UK Pavilion will once again will be a state-of-the art simulated operating theatre. It celebrates collaborations between healthcare providers, clinicians and healthcare technology companies, allowing visitors to watch Britain's best surgeons in action. At the 2018 show, several surgical masterclasses were demonstrated on the pavilion, in-



The simulated operating theatre at the UK Pavilion, Arab Health

cluding the ground-breaking Ozaki procedure for reconstruction of a diseased aortic valve by Royal Brompton & Harefield Hospitals Specialist Care (RB&HH)'s Cesare Quarto. Dubai's Deputy ruler, Sheikh Hamdan bin Rashid Al Maktoum, also visited the pavilion, witnessing HCA Healthcare UK's leading Consultant Spinal Surgeon Colin Nnadi.

Commenting on the exhibition, ABHI's Managing director, International, Paul Benton added: "As Arab Health goes from strength to strength, ABHI, yet again, are anticipating a busy 2019 show. The last 12 months have been particularly exciting for us, with a completely new brand and identity for the association, the pavilion is going to be a real focal point for UK innovation. We've got a really exciting and diverse group of companies joining us for the week which is testament to just how highly the UK's HealthTech sector values the Middle East."

Benton continued: "When we consider the substantial investment into public health from the Government of the UAE, and wider Middle East, opportunities for UK companies providing value-based healthcare solutions are significant. With so many companies planning to increase their presence in the region, Arab Health is the ideal platform to drive this growth and the UK Pavilion promises to be a hive of activity."



Harley Street Medical Area

Many patients choose to travel to the UK for treatment. The UK is an optimum destination for Middle Eastern patients seeking the latest cutting-edge technologies and clinical expertise. An example of this is at London's prestigious Harley Street Medical Area, a collective of hospitals, clinics and specialists who deliver outstanding patient care through pioneering treatments and cutting-edge technologies. The Howard de Walden Estate, the guardian of the Harley Street Medical Area, has been supporting and nurturing medical excellence in this historic part of London for 200 years. The area has over 5,000 medical specialists and over 250 clinics working within 92 acres of Marylebone, central London. It brings together a community of medical professionals who provide access to the best medical treatments and services in the world and are at the forefront of advancing global medical practices in the City of London.

Speaking on behalf of the Harley Street Medical Area, Simon Baynham, said: "The Middle East is an important market with many patients from the region coming to London for treatment. We are extremely excited to be returning to Arab Health 2019 with most of the area's world class clinics and hospi-

tals. The ABHI always create a brilliant environment for us to demonstrate our work, network and showcase world-class healthcare in action."

Edgbaston Medical Quarter

The Edgbaston Medical Quarter (EMQ) is another UK centre of medical excellence looking forward to exhibiting at Arab Health 2019. Located in the heart of the UK, EMQ in Birmingham is a hub for medical and healthcare excellence.

Just 80 minutes from London by train with direct international flights to all major global destinations including the UAE, the area has witnessed a healthcare revolution and is now Europe's biggest centre for focused clinical trials and boasts 64% of the city's healthcare economy.

As well as offering patient's cutting-edge healthcare treatments, it is also a leader in health innovation – making tomorrow's innovations a reality today. EMQ's growing healthcare and life sciences community is supported by internationally renowned training and educational facilities. The area has attracted world-renowned hospitals and practitioners. It provides some of the best places to be treated particularly in oncology, trauma, diabetes and fertility.

Patients choose Edgbaston, Birmingham, for their treatment because of its healthcare excellence, ease of access, value and the fact Birmingham's medical facilities sit alongside thriving leisure and lifestyle communities. Friends and family can enjoy award-winning places to eat and a host of arts, leisure and sports facilities. It also is a culturally diverse and welcoming city, with beautiful green open spaces which are the perfect place to relax and recover.

- ABHI and the UK Pavilion can be found at Arab Health 2019, Hall 7.



Aerial view of Edgbaston, Birmingham

Innovative 3D imaging reduces x-ray exposure



Royal Brompton & Harefield Hospitals Specialist Care provide pioneering diagnostics and treatments to international patients with heart and lung conditions. Many of our consultants are world leaders in their field and offer some of the most sophisticated treatments available anywhere across the globe.

Dr Sabine Ernst, consultant cardiologist at Royal Brompton & Harefield Hospitals Specialist Care, has developed an innovative structured 3D mapping technique to reduce radiation exposure during invasive catheter ablation procedures. This is an exciting development as many arrhythmias can now be treated with minimal or zero radiation exposure.

Electrophysiologic procedures are performed in patients with cardiac arrhythmias presenting symptoms of a fast or irregular heart rhythm. During a catheter ablation procedure, the faulty rhythm is treated

to allow the regular rhythm to take over. Whilst this procedure is a curative treatment, it is performed using conventional X-ray imaging to visualize where the catheters are in the heart.

In recent years, electroanatomical mapping systems have been developed to create 3D images that help to locate the catheters within the heart during the procedure. These mapping systems need special catheters equipped with sensors to allow exact localisation of the catheter. Using the 3D mapping systems substantially allows for a reduction in the use of X-rays.


This is important, as exposure to X-rays cumulate over a patient's life time and are associated with an increased risk of developing cancer later in life. When possible, it is therefore important to apply all measures that can reduce the overall radiation exposure to a patient during an ablation procedure.

Zero radiation catheter ablation procedure
The innovative structured approach, developed

by Dr Ernst, implements 3D reconstructions from cardiac magnetic resonance (CMR) imaging or computed tomography (CT). These 3D roadmaps are used to take detailed images of an individual's heart and allow substantial reduction of the total radiation time.

For a growing number of patients needing to undergo an invasive catheter ablation procedure, the exposure to X-ray radiation can therefore be zero, or reduced to just a few seconds. As a result, young patients and female patients with childbearing potential are benefiting the most, whilst it is the only possible way to treat pregnant women with drug-refractory arrhythmia.

Dr Ernst explains: "With a zero radiation approach the patient's lifetime 'radiation bill' is not added to with potential harmful radiation, thereby the cancer risk is not altered by the ablation procedure. We hope many more patients will benefit from this technique".

• To refer a patient, email: privatepatients@rbht.nhs.uk or to find out more visit: rbhh-specialistcare.co.uk 



World leaders in heart and lung care

Royal Brompton & Harefield Hospitals Specialist Care provide pioneering diagnostics and treatments to private patients from across the world with advanced heart and lung conditions.

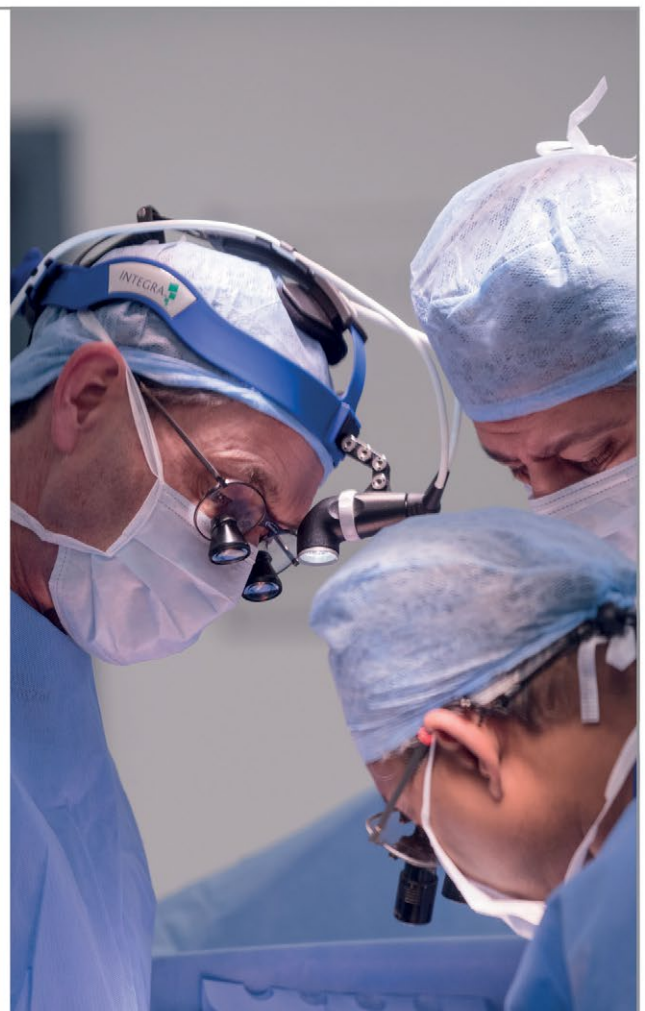
The specialist care team provide short-notice private appointments with our world leading consultants and access to advance diagnostics.

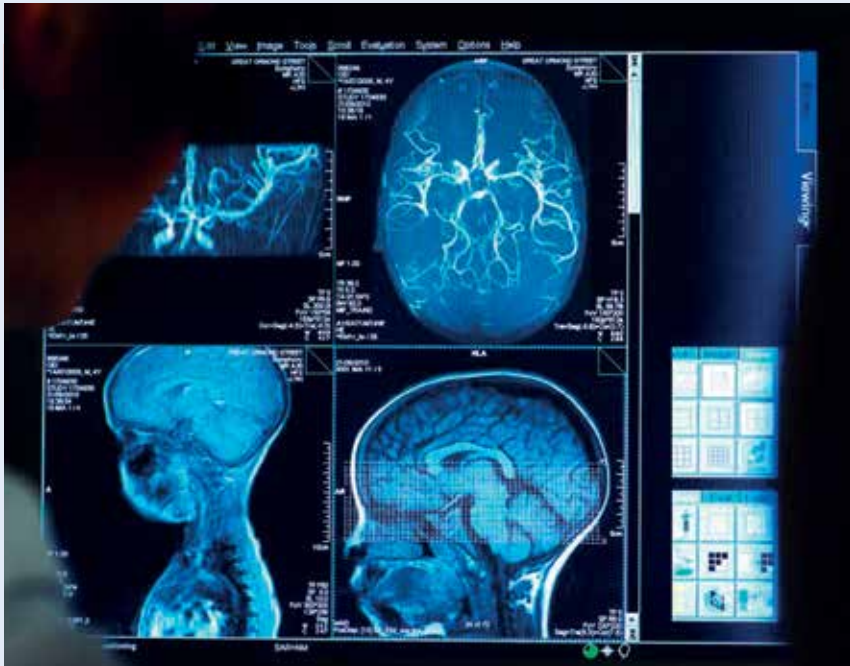
Harefield Hospital's superb new private facilities continue to provide innovative treatments and diagnostics so that patients receive the very best in care and clinical expertise.

Patients visiting our outpatients and diagnostics centre in the Harley Street medical area have access to state-of-the-art diagnostics, including a PET scanner with Rubidium Cardiac PET.

For more information

Call (+44) 20 3131 5749 or visit www.rbhh-specialistcare.co.uk





GOSH is offering a pioneering treatment for epilepsy called laser interstitial thermal therapy

Great Ormond Street Hospital for Children offers pioneering laser ablation for epilepsy

Great Ormond Street Hospital for Children (GOSH) in London is a globally renowned children's hospital, championing innovation across more than 60 clinical specialties and providing ground-breaking treatments for the rarest and most complex conditions.

GOSH is offering a pioneering treatment for epilepsy, called laser interstitial thermal therapy (or laser ablation), which will be available to international patients at GOSH from January 2019. GOSH expects to be the first hospital in the region EMEA to be providing paediatric laser ablation treatment.

Epilepsy is one of the most common chronic neurological disorders in the world. It affects 1% of the global population and the World Health Organisation (WHO) estimates that 4.7 million people in the WHO Eastern Mediterranean Region, which covers 9 countries including the GCC, suffer from epilepsy.

"Epilepsy is a disorder of the brain in which there is a tendency to have recurring seizures," Mr Martin Tisdall, Consultant Paediatric Neurosurgeon at GOSH, explains. "An epileptic seizure is an uncontrolled and synchronised electrical discharge in the brain. There can be a wide range of seizure symptoms depending on the area of the brain in which the electrical

discharge takes place. Because of this there are many different types of seizure." There are at least 40 different types of seizure types and people can have more than one type.

"Laser ablation is a technique designed to destroy abnormal brain tissue in an extremely targeted manner, whilst causing minimal damage to overlying or surrounding healthy tissues," Mr Tisdall says. "It is a method for treatment of epilepsy-causing or malignant lesions in deep and difficult to access areas of the brain."

Using a state-of-the-art laser, GOSH surgeons will be able to destroy the abnormal tissue with heat – directly targeted at the lesion. Real time imaging, provided by the new intra-operative MRI at GOSH, allows surgeons to see the lesion during the laser treatment and thus protect surrounding healthy tissue.

"Due to the minimally invasive nature of this procedure, patients will be able to be discharged after a one-night stay," Mr Tisdall explains. "This is opposed to the 10 to 14 night stay currently required for patients who have traditional open surgery for similar conditions."

Laser ablation is uniquely able to treat a range of complex conditions, including hypothalamic hamartoma (HH). HH is a rare, benign lesion where an abnormal mass of tissue has grown adjacent to the



Mr Martin Tisdall, Consultant Paediatric Neurosurgeon at GOSH

hypothalamus. It can have a huge effect on a child's quality of life. HH affects approximately 1 in 200,000 young people. Traditionally HH is complex to manage as it requires open surgery through a narrow corridor deep in the brain. Laser ablation offers a new non-invasive technique for children with HH. The technique has already been shown to have better outcomes for patients and a quicker recovery time.

Not only will GOSH be the first paediatric centre in the UK to offer laser ablation, but the expert neurosurgery team at the hospital will also be undertaking ground-breaking research. The team will be looking into the cognitive and endocrine outcomes of patients who have had laser ablation. This has never before been studied and the team understand that this piece of work is vital to the continued success of the treatment.

GOSH has a world-leading neurosurgery team and has one of the largest paediatric epilepsy surgery programs in the world. The neurosurgery department provides a tertiary service both nationally and internationally for children with disorders of the brain and spine that require surgical management. GOSH performs approximately 140 epilepsy operations per year with a serious adverse event rate of less than 1%. MEH



Great Ormond Street Hospital for Children

Great Ormond Street Hospital for Children (GOSH) in London is a globally renowned paediatric hospital, championing innovation and providing **ground-breaking treatments for the rarest and most complex conditions.**

Providing world-class care, GOSH has over **60 clinical specialities and sub-specialities** under one roof. GOSH's expert team of world-leading consultants come together to deliver **personalised 360-degree, multi-speciality care** for every child.

The hospital is committed to providing a nurturing and family-centred experience. The International and Private Patient Service at GOSH is uniquely tailored to support families coming from the Middle East. Our multi-lingual team are in place to ensure a smooth and efficient patient experience.

GOSH is dedicated to helping children from around the world fulfil their potential through international collaboration, education, innovation and research.

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

Great Ormond Street Hospital for Children
International and Private Patients Service
Dubai Health Care City, P.O. Box: 505050, Dubai, United Arab Emirates (UAE)
+971 4 3624722 | gulfoffice@gosh.nhs.uk | www.gosh.ae

From hospital to taking on the world: say hello to the GCC's newest superheroes

Great Ormond Street Hospital for Children (GOSH) in London, in partnership with the GCC-based initiative Superhope, have fulfilled the dreams of severely ill children by transforming them into their superhero alter-egos. As GOSH treats 1,500 children from the Middle East every year for rare and complex conditions, Superhope was tailored towards empowering these children during their time in hospital.

All of the children were receiving treatment for haematology and oncology conditions at the London-based hospital when they took part in GOSHxSuperhope; a project which aims to look beyond a child's medical condition and bring their inner superhero to life. Superhope uses Positive Mental Attitude (PMA) to help children, who are fighting complex conditions, strengthen their road to recovery.

The heroes met with best-selling London comic book artist, Amrit Birdi, to help them create their superhero personas. His sketches, unbeknown to the children, were transformed into real-life costumes by children's costume studio, Atelier Spatz. As soon as they were ready, the children were surprised with their bespoke costumes, as well as a professional photo and video shoot led by globally-renowned talent including photographer Phil Haynes; digital compositor, Roy Peker and post production studio, Featherwax.

Not only did the patients experience an improvement in PMA, but both families and staff involved found that the project had a positive impact.

Speaking about what the experience meant for Kuwaiti superhero Latifa (also known as Butterfly), her grandmother said: "The Superhope initiative has had a very positive effect on Latifa and our whole family. Latifa needs something to encourage her and this initiative made her, and our family, so happy. She became a butterfly queen, very beautiful!"

Mother of Kuwaiti superhero ReFroze (Retaj) added: "It is a beautiful initiative for us, and Retaj was so excited and happy! She felt so proud that she could be an ice princess and she kept talking about that for several days."



Latifa from Kuwait wears her Butterfly superhero costume as part of the Superhope initiative



Kuwaiti paediatric patient Retaj plays her superhero ReFroze

Commenting on the project, Dr Giuseppe Barone, Consultant Paediatric Oncologist at GOSH, said: "As doctors, we always emphasise how important a holistic approach to recovery is. It was great to see the real difference this campaign has made in improving the PMA of the children during their time being treated at GOSH. Being in hospital is often a traumatic experience for any child and their family, so to be able to spread some real joy and magic on the wards during their recovery has been truly incredible."

Trevor Clarke, Director of the International and Private Patients Service, commented: "We are delighted to have been able to collaborate with Superhope and offer our families at Great Ormond Street Hospital for Children this unique opportunity. We are committed to delivering a nurturing and family-centred experience that supports our world-class treatment and care. Superhope and other pro-

grammes like it that run at GOSH are our way of supporting our families and offering children a positive experience during their treatment here."

Tarik Batal and Basma Masri, who launched Superhope in Dubai in 2014, added: "It was truly a pleasure to have executed our first campaign in London with such an incredible team and we look forward to future collaborations together."

Both GOSH and Superhope look forward to future collaborations and bringing Superhope to more children from the GCC region who are being treated at GOSH.

Great Ormond Street Hospital for Children in London is a globally renowned children's hospital, championing innovation across more than 60 clinical specialties and providing ground-breaking treatments for the rarest and most complex conditions.

• For more information about Superhope, please visit: www.gosh.ae/superhope 



Fig 1A: PSI cutting guides (Visionaire, Smith & Nephew)



Fig 1B: Total knee replacement performed with PSI to avoid and correct the femoral deformity.



Fig 2A: Pre-operative radiograph of a loose infected right total hip replacement with bone and soft tissue destruction.



Fig 2B: Reconstruction with a patient specific acetabular component and proximal femoral replacement, restoring the anatomic hip centre of rotation.

Patient-specific hip and knee replacements

■ By James Donaldson
Consultant Orthopaedic Surgeon
Joint Reconstruction Unit
Royal National Orthopaedic Hospital, Stanmore

Patient-specific hip and knee replacements are a relatively modern concept and are increasingly being used in an effort to improve clinical and functional results, and long-term implant survival.

Patient-specific instruments (PSI) are custom made on a case-by-case basis, specific to both the anatomy of the patient and the surgical plan created by the surgeon. Each patient requires pre-operative cross-sectional imaging with either a low dose CT scan or MRI. Computer software is then used to generate a virtual, or 3D printed, model of the patient's anatomy, which allows the surgeon to accurately plan the position, size and orientation of the implant. Once the plan is finalised engineers work with the surgeon to design the patient specific instrumentation and / or implant to be used during the surgery.

Knee arthroplasty

In the knee, customized cutting blocks are manufactured from a pre-operative three-dimensional model of the knee and lower limb. This allows the surgeon to plan the procedure in great detail making adjustments to the proposed bony cuts in

any plane (sagittal, coronal and axial). Custom cutting guides, that accurately fit the patient's anatomy, are then 3D printed and sterilized for surgical use (Fig 1A).

The PSI guide can take into account bony deformities (Fig 1B) or abnormal knee shapes and sizes. The guide allows the joint to be prepared to accommodate a pre-determined implant size in the optimal position. The proposed benefits include a more reproducible and accurate postoperative alignment, decreased surgical operating time, faster patient recovery and a more efficient surgical procedure.

Hip arthroplasty

PSI again aims to improve the accuracy of the surgical procedure and reconstruct the hip to as near normal as it can be. More accurate positioning of both the femoral and acetabular components should result in improvements in the patient's functional outcome and recovery, as well as reduce potential complications including leg length inequality, abnormal muscle tension, dislocation and peri-prosthetic fracture.

Similar to the knee, patient specific cutting blocks and guides are created to cut the femoral neck and to optimize the acetabular preparation and cup implantation. Orientation, size, rotation, offset and leg length can all be optimized


during the delivery of the pre-operative patient specific surgical plan.

Revision surgery

Revision hip and knee reconstruction is becoming increasingly common and brings with it its own unique surgical challenges. Bone loss, infection, component malposition, soft tissue and muscle deficiency all add an extra element of complexity.

Greater accuracy and the execution of a more detailed pre-operative plan are crucial in the revision setting. Advances in technology and implant design allow a bespoke solution for individual patients to be made, making use of available bone and filling defects with porous bone-adhering titanium. In this way many joints can now be reconstructed that may have previously been deemed unreconstructable (Fig 2).

The surgeons on the Joint Reconstruction Unit at the Royal National Orthopaedic Hospital receive referrals nationally and see some of the most complex primary and revision hip and knee cases in the UK. They have unparalleled experience with cutting edge technologies, both from an academic and clinical perspective, including patient specific instruments and components.

- Private patient enquiries can be made via: www.rmohprivatecare.com 

Complex lower limb reconstruction



Mr Panos Gikas (centre) in theatre

Mr Panos Gikas is a Consultant Joint Reconstruction and Sarcoma Surgeon based at the Royal National Orthopaedic Hospital. He completed his medical and post-graduate training in London then completed a Seddon Travelling Fellowship in orthopaedic oncology at the Royal Prince Alfred Hospital in Sydney where he further developed his specialist skills in management of bone and soft tissue tumours and complex joint reconstruction. In addition, he has also completed a clinical fellowship in Geneva in developing the use of the anterior muscle sparing approach to the hip joint before taking up a consultant post at the world renowned Royal National Orthopaedic Hospital.

He specialises in complex lower limb reconstruction following failed joint replacement, utilising cutting-edge techniques and prostheses in order to achieve the best possible outcomes for

patients, for many of whom this is their last chance at limb salvage.

“My particular focus within this highly specialised area of orthopaedic surgery is complex pelvic and knee reconstruction, using bespoke designed patient-specific prostheses. Surgery such as this is indicated in patients who have previously undergone primary hip replacements which have now failed, or patients who have undergone multiple failed revision operations or patients with

infected prostheses that require revision. These patients unfortunately suffer from persistent and progressive symptoms such as debilitating pain and reduced mobility, often resulting in being wheelchair-bound due to their failed prosthesis. Their bone quality is often poor and there is usually a high degree of bone loss which makes salvage surgery technically very challenging,” Mr Gikas says.

“In my practice this type of surgery involves careful assessment of the patient’s anatomy using advanced imaging techniques followed by meticulously

of reconstructive surgery performed at RNOH in a patient with a failed revision hip replacement and significant bone destruction in the pelvis, with his prosthesis migrating to sit on the bladder wall. He received a bespoke hemipelvic replacement and went from being wheelchair-bound before surgery to mobilising independently post-operatively.

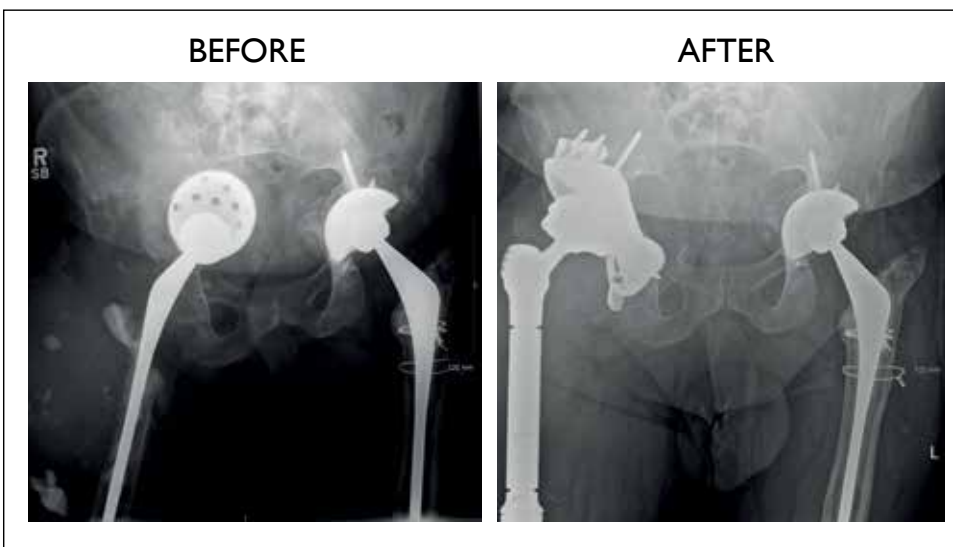
It is important to highlight that even after successful surgery the most important factor in good recovery is a strict rehabilitation programme to ensure early mobilisation and strengthening.

At the RNOH our Physiotherapy Team is specially trained to care for complex patients such as these and are vastly experienced in tailoring rehabilitation to meet and exceed patients’ goals for recovery.

At the Royal National Orthopaedic

Hospital, we have successfully carried out a vast number of similar reconstructions around the hip and knee joints for patients with a range of problems: failed replacements, infections, tumours, complex anatomy. With improving techniques and implant technology, as well as the support of my team at RNOH we are able to provide a chance for patients who are often told there are no further options available to them.

• Private patient enquiries can be made via: www.rnohprivatecare.com



designed prostheses to match the patient’s anatomy perfectly. These designs go through multiple stages of surgical and bio-engineering review and refinement prior to being manufactured. As well as matching the shape of the prosthesis to the patient’s bone, the final product is also specially modified with bio-active coatings and surfaces to promote new bone growth to integrate the prosthesis with the patient’s bone to ensure a strong and stable end result.”

The images show just one example



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Taiwan Medicare filled several halls at the Taipei World Trade Center

Taiwanese innovation

Middle East Health was invited to Medicare Taiwan held from 21-24 June this year. The event serves as a platform to showcase some of the country's innovative medical technology, devices and healthcare services. We spoke to a representative cross-section of exhibitors.

Medicare Taiwan, the Taiwan International Medical & Healthcare Exhibition, incorporates SenCARE, the Taiwan International Senior Lifestyle and Health Care Show. The event, organised by the Taiwan External Trade Development Council (TAITRA), was held at the Taipei World Trade Center and hosted 248 exhibitors, both local and international, in 506 booths. The post show report recorded that there were more than 50,000 visitors.

During the opening ceremony, Walter Yeh, President and CEO of TAITRA, noted that there had been a strategic change for this year's show to include products and devices from the medical and healthcare industries as well as smart medical technology systems and services.

As a result, the exhibition showcased a complete ecosystem of medical services, hardware and software products in the medical and healthcare industries.

From a business perspective, he said more than 240 one-on-one procurement meetings were scheduled at the exhibition. Compared to last year's show, the procurement meeting participation rate doubled, which bodes well for the future growth of this event and its importance to the medical industry in Taiwan.

New additions to this year's show included the 'Factory of Intelligent Additive Manufacturing Medical Devices (FoiAM)', a platform that focuses on the

design and making of 3D-printed implantable medical devices developed by Taiwan's Industrial Technology Research Institute. This platform provides medical device vendors with efficient and customized medical manufacturing services.

It was also noted that this year TAITRA collaborated with the Taiwan Medical and Biotech Industry Association to create the first 'Emergency Room Scenario Station'. The station provided simulations of real exam rooms, operating rooms, and recovery rooms and with a total of 75 products provided by 24 Taiwanese companies. This served as a showcase for a wide range of made-in-Taiwan emergency medical equipment and devices.

Taiwan is well known around the world as a producer of premium quality OEM devices for the medical and other industries. However, several Taiwanese companies have been successful in the international market with selling products under their own brand names, which are now internationally recognised, such as Asus, Advantech, Giant, HTC, Trend Micro, Transcend and others.

We spoke to several Taiwanese medical manufacturing companies that are selling their products under their own brand on the international market.

Extracorporeal Shock Wave Lithotripter with smart tracking

We spoke to Lite-Med, the developer of

award-winning Extracorporeal Shock Wave Lithotripter with Auto Dual Module Localization System. Lite-Med won the 2018 Taiwan Excellence Gold Award for this product.

Walt Hsu, the General Manager of Lite-Med explained that they decided to research and develop the Extracorporeal Shock Wave Lithotripter because the country was relying on importing these high-end devices. They thought it would be better to develop one locally. With their advanced research and development they have made one of the most advanced Extracorporeal Shock Wave Lithotripter in the world.

The Extracorporeal Shock Wave Lithotripter is used to treat kidney stones by using shock waves to break the stones into tiny fragments and keep the urinary tract unobstructed for proper functioning of the urinary system. It is a non-surgical treatment. Once the stones have been fragmented into 'stone dust' they are small enough to be passed in the urine.

Lite-Med's device incorporates a number of innovative advances on the traditional devices. It has a computer-aided automatic X-ray and ultrasound dual localisation system, which enables the patient to be treated in a prone position, no matter where the stone is located. Also, the system keeps track of the stone which can move during the patient's respiration,

ensuring that the shock wave hits the stone with much greater accuracy. This Real-Time Stone Tracking System records the stone movement trajectory and computes the required treatment table movement which will be computer guided to center the stone at the shock wave focal point. This increases the stone hit rate from around 45% to more than 90%. The device also incorporates a Real-Time Ultrasound Stone Aiming System which ensures the shock wave is only fired when the stone enters the focal zone.

These tracking systems elevate Lite-Med's Extracorporeal Shock Wave Lithotripter to one of the most advanced such systems available worldwide.

- For more info, see: www.lite-med.com

Somnics iNAP for obstructive sleep apnea

Huang Chen-Ning, Chief Technology Officer of Somnics, explained how their award-winning iNAP device works. The appropriately named iNAP is a sleep therapy system designed to provide a comfortable sleep experience for people who experience obstructive sleep apnea (OSA).

Unlike traditional CPAP machines this device works without a facial mask or noisy machine. Instead it uses a memory-fit soft oral interface and pocket-sized console. The system uses an intuitive user interface with built-in rechargeable battery making



Huang Chen-Ning, Chief Technology Officer of Somnics, at their Taiwan Medicare booth exhibiting their innovative iNAP device for obstructive sleep apnea.

it perfect for travelling as well as home use.

The iNAP works during sleep by creating negative pressure within the oral cavity. A gentle vacuum pulls the tongue toward the upper palate and pulls the soft palate forward. By stabilizing the tongue and soft tissues in a front position, patency of the upper airway near the pharynx can be maintained to provide unrestricted breathing and uninterrupted sleep. The iNAP allows the person to breathe through the nose naturally without blowing air into the body while sleeping. The iNAP console is silent when negative pressure is reached and maintained, allowing the person to sleep peacefully.

The iNAP has won several awards, including the prestigious iF Design Award 2016; the Product of Outstanding Interest (POINT) Award at the European Respiratory Society (ERS) International Congress in London, 2016; and the renowned Bronze 'A' Design Award in 2016, in Scientific Instruments, Medical Devices and Research Equipment Design Category.

- For more info, see: www.somnics.com

The lightest electric folding chair in the world

Among several well-designed wellness products made by DK City are two brilliant rechargeable electric folding chairs. The Zinger is the lightest electric folding chair in the world. It weighs just 18kgs and with its unique control system it can reach a maximum speed of 9.5km/h. The control system is easy to learn and it has a super slow mode for first-time users. It comes with an anti-theft key for the battery pack.

The Joy Rider electric chair has an agile joystick control system and an electromagnetic brake which guarantees a safe ride, even on slopes. It has adjustable anti-tip wheels and fixed armrests. Its brushless motor ensures it is quiet.

Both chairs are fun to use and are designed to help people regain their mobility when out and about. Their design makes it really simple to unfold, fold and pack in the trunk of a vehicle.

- For more info, see: www.dkcity.com



Amberley Liu and Emily Li demonstrate the convenience of the Zinger and the Joy Rider

Patient lifts designed to suit all needs

Apex Health Care manufactures a range of mobile patient lifts.

The Apex King Patient Lift is good for everyday use and can accommodate all of the most common lifting needs in a hospital. It has a 3 or 4 hangar bar with 4-point hand control to make it safe and easy to position the patient from the floor to sitting position or to a laying position on the bed. Its low profile makes it easy to slip the legs under a patient bed when required.

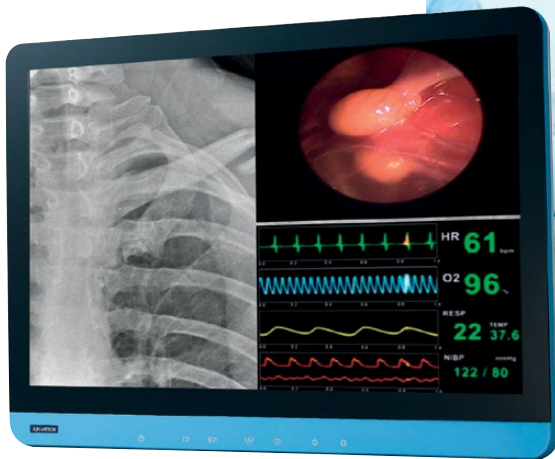
The Advance model is lightweight and can be folded into a compact size for easy storage.

The Stand-Aid Lift is made with reinforced steel for heavy lifting. It can lift patients weighing up to 200 kg. It is fully adjustable and has great ergonomic design for comfortable and safe use.

The APC model is designed to lift the patient from a sitting to a standing position. It is made with a high-tension aluminium alloy frame and has powered legs for easy manoeuvrability as well as an auto start and auto stop operation mode. It also comes with an optional wireless infrared or cable handset for operating the lift.

- For more info, see:

www.apexcare.com.tw



A modern operating room equipped with medical grade computers and equipment

Technological advances and trends in critical care

Innovations in critical care, including intensive care unit (ICU) and surgical/operation procedures, have helped hospitals and healthcare facilities provide better patient care and offer more comfort to those who need it. Moreover, doctors and other personnel now have easier access to information such as x-rays and other medical imaging as well as remote monitoring of the health status of patients. In addition to improved care, more automation can also potentially reduce healthcare costs.

Traditionally, technologies including medical-grade computers are IT focused with modifications made to meet the needs of critical care. These include environmental regulatory requirements and electromechanical compliance. Furthermore, users are now demanding safer and more reliable products along with improved ease of use. In this article we will examine the various requirements and challenges manufacturers of medical-grade computers and devices will be facing in order to compete in this market. We will also study the new advancements and trends of future medical-grade computers.

1. Growing demand and challenges in critical care

a. Innovations in medical computing

More and more hospitals and facilities rely on technology to improve services and remain competitive. Faster silicon processors in smaller packaging have made medical devices more portable and lightweight. For example, x-ray machines have been replaced by digital imaging devices that provide faster results without processing film. Patient monitoring can be done

remotely around the clock in hospitals or at home. Portable ultrasound devices provide immediate results so expectant mothers can instantly see the baby she carries. Medical-grade computers will also pack more features in an all-in-one design.

b. Hurdles and challenges

Most IT and computing companies are experts in hardware and software, but they may not fully understand the user requirements in the critical-care industry, which can be complicated. Medical professionals who are experts in patient care are unlikely to have an IT or technology background. And the hospital/facility administrators who oversee the medical staff are primarily concerned with achieving quality care and operational efficiency with limited budgets.

2. Technological advancements and trends

The two main factors set to impact the development of future medical computing devices are EU regulations and technological advancements. The EU EMC and environmental regulations have influenced manufacturers worldwide to produce better and safer products. Technological advancements enable developers to manufacture superior integrated products with an improved biometric user interface (UI), resulting in enhanced functions and environmentally safe devices. Over the coming years, the following are expected to become six major trends in critical care product development:

- a. Increased demand for intuitive UIs
- b. Future medical devices will be required to meet more demanding EMC requirements

- c. Environmental and regulatory requirements will be mandatory
- d. More medical devices will deploy touchless technology
- e. Future devices will have ambient light sensing and control capabilities
- f. More biometric user-interfaces will be used
 - Face detection
 - Normalization
 - Feature extraction
 - Face recognition

In general, a facial recognition algorithm obtains a person's face image with a digital camera and measures the matrix or distances between various parameters including eyes, nose, mouth, face outline and jaw bones. It then compares it with the data already installed in the database. It can be summarized as eye size and depth of socket, nose dimension, cheekbones shape and jawline length.

3. Conclusions

The demand for better critical care service will continue to grow as the population starts to age globally. More innovative medical devices and medical grade computers will be introduced. There will be an increasing effort to balance between producing quality products that meet user demands, regulatory agency requirement and cost reduction. MEH

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11

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Speakers



19

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Speakers:



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Consultant Urological Surgeon
London, UK



Dr. Carlo Bettocchi
Professor of Urology
Bari, Italy



Dr. Dean Elterman
Urologist Professor
Toronto, Canada



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● For more information, visit: www.aueltd.co.uk

Magnetic surgical system approved for bariatric procedures in US

Levita Magnetics has received US FDA clearance for an expanded use of the first-of-its-kind Levita Magnetic Surgical System for use in bariatric procedures. Initially indicated for use in gallbladder removal procedures, the shaftless Magnetic Surgical System reduces the number of incisions necessary for the indicated procedures.

The Levita System is designed to facilitate access and visualization of the surgical site, while minimizing invasiveness. In conventional laparoscopic procedures, shafted surgical instruments are introduced by fixed-position trocars inserted

through incisions in the abdomen. The use of trocars is associated with risks relating to major bowel and vessel injury, incisional pain, bleeding, scarring, hernias and infection. In addition, shafted instruments can impair surgeon visualization by cluttering the operative field, cause instrument collisions, and restrict movement as a result of their fixed pivot point. The shaftless Levita System reduces the number of incisions and trocars necessary, while also providing surgeons the ability to move instruments without the constraints of a fixed-position pivot point.

The system, which consists of an ex-

ternal magnet placed on the skin that controls a shaftless detachable grasper, enables instruments to move without the constraints of a fixed-position pivot point, and facilitates access and visualization of the surgical site.

In the United States, the Levita Magnetic Surgical System is indicated to grasp and retract the body and the fundus of the gall bladder in laparoscopic cholecystectomy procedures and the liver in bariatric procedures to facilitate access and visualization of the surgical site in patients with a BMI range of 20-60 kg/m².

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

Siemens introduces new MRI for cardio exams

Siemens Healthineers has launched their new Magnetom Sola Cardiovascular Edition, a 1.5 Tesla MRI scanner designed for cardiovascular examinations.

Philipp Fischer, General Manager Cardiology at Siemens Healthineers, said: “We think there is huge potential in incorporating cardiovascular MRI in clinical treatment pathways and making a significant difference to patient care. Magnetom Sola Cardiovascular Edition incorporates our very latest technologies with the specific aim of providing the maximum diagnostic information in cardiovascular examinations. This leads to faster, more reliable, and definitive diagnoses for a larger number of patients with underlying ischemic, structural, and arrhythmogenic conditions. This in turn enables us to deliver vital outcome-related information for therapy decisions

and thereby optimize patient treatment pathways. The patient benefits from fast access to the right treatment, avoiding the need for unnecessary examinations or procedures. Not only can this reduce cost, it may also improve the treatment outcome, which is in the interests of both the patient and the healthcare provider.”



Magnetom RT Pro edition for Magnetom Sola

Siemens Healthineers unveiled the Magnetom RT Pro edition for Magnetom Sola – a version of the company’s new 1.5 Tesla (1.5T) magnetic resonance imaging (MRI) scanner that is designed for assistance in radiation therapy (RT) treatment planning. In addition to BioMatrix technology, which addresses patients’ anatomical and physiological differences to overcome unwanted exam variability, the new scanner includes hardware and software that supports optimal treatment planning.

The Magnetom RT Pro edition for Magnetom Sola has an all-new magnet as well as a system architecture designed for extremely high performance and long-term stability. The RT Dot engine predefines RT strategies, automatically corrects for image distortion to improve spatial integrity, and automatically reconstructs axial images to enable direct processing of all data in RT planning software.

Additionally, RESOLVE software reduces distortions associated with MR diffusion imaging by a factor of three, enabling the use of these images in the dose planning process for the linear accelerator. An interface with RT positioning lasers supports accurate patient positioning.

The scanner’s new, dedicated RT post-planning software, syngo.via RT Image Suite, permits the calculation of synthetic computed tomography (CT) images derived from MR images. These synthetic CT images provide essential information for patients with brain and prostate tumors that typically had been acquired with CT, eliminating the need for patients to lie on the treatment bed for two separate imaging sessions. Syngo.via RT Image Suite is also new to the RT Pro Edition for Magnetom Sola, the 1.5T scanner for assistance in RT planning.

Compressed Sensing Cardiac Cine

Siemens Healthineers has incorporated into the MRI scanner their award-winning Compressed Sensing Cardiac Cine, an application which accelerates MRI scanning sequences so that cardiac function can be measured while the patient is breathing freely. Previous scanners required patients to hold their breath for up to 20 seconds several times during the process. This means that the benefits of the gold standard are now available to new groups of patients, including individuals with irregular heart rates (arrhythmia) or difficulty breathing (dyspnea), who were previously not eligible for CMR.

The MyoMaps application from Siemens Healthineers provides quantitative information on the tissue composition of the cardiac muscle. This can be used to diagnose diseases of the heart muscle, scar tissue and edema at a very early stage of the condition, allowing the right treatment option to be chosen for the patient as soon as possible. Many clinical symptoms such as myocarditis can even be detected without using contrast agents, says Siemens.

Also included in the scanner is the Cardiac Dot Engine, a unique software package introduced by Siemens Healthineers, which provides step-by-step guidance for standardized diagnostic cardiac MRI exams. The Cardiac Dot Engine, based on artificial intelligence algorithms, allows users to navigate confidently through the cardiovascular MRI scanning process.

● For more information, visit:
www.healthcare.siemens.com



Future Healthcare returns to London in 2019

Organised in association with the UK International Healthcare Management Association, Future Healthcare is the UK's only exhibition and conference showcasing healthcare products and services to a global audience. Taking place at Olympia London from 18-19 March 2019, Future Healthcare gathers more than 4,000 buyers from 65 countries for two days of education, networking and cross border purchasing.

Event Director, Dawn Barclay-Ross in announcement of the 2019 edition said: "Following a hugely successful launch event last year, Future Healthcare 2019 will once again be a major meeting of key buyers, innovators, thought leaders, practitioners and policy makers in healthcare from all over the world. They come to London to promote collaborative thinking and development, to find the technological solutions needed to support sustainable healthcare systems and to understand how to better serve future generations of patients."

Hosting 4,000 buyers from 65 countries, Future Healthcare 2019 is a unique opportunity for healthcare products and service providers to showcase their solutions on a global scale.

"Gathering thousands of buyers from

around the world, Future Healthcare 2019 is a fantastic springboard for suppliers to find new business on the international stage," Barclay-Ross said.

The 2018 event gathered senior buyers from the likes of Cleveland Clinic, Ministry of Health Oman, Moorfields Private Hospital, Horsens Hospital Denmark, Nelson Mandela Clinical Service for Africa, and NHS trusts from across London and the UK.

Exhibition of 350 brands


From healthcare providers and training establishments to equipment and product suppliers and technology experts, visitors can expect to see the very latest products and services from over 350 brands in the exhibition. The show floor will also play host to Dorson Wests Public Policy Project, where you can get right into the heart of UK government intentions and plans for the future of healthcare. The exhibition will also feature the Thrive Wearables Zone – a showcase of the latest advancements in wearable technology, and; the Health Tech Theatre – a series of 10-minute presentations from pioneers of exciting innovations in the healthcare sector.

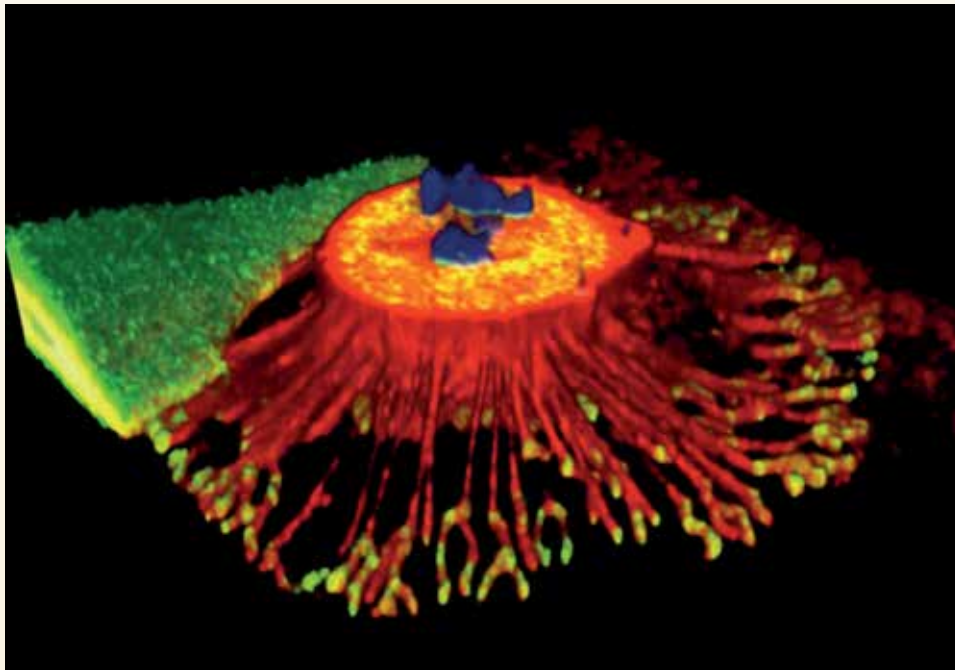
World-class conference

More than 60 expert speakers will take to the stage over two days to address the central theme of 'embracing innovation in healthcare delivery'. Sessions will address the current healthcare technology landscape, how to scale innovation, look at the experiences of big spenders such as China and Japan, and tackle the global view of future healthcare delivery.

The 2019 line up of speakers include: Matt Hancock, UK Health Secretary; Stephen Dorrell, Chair of the NHS Federation; Simon Stevens, Chief Executive of NHS England; Sam Shah, Director for Digital Development, NHS England; Dr Amanda Begley, National Director of NHS Innovation Accelerator; Stephen Hill, Mobility Partner Executive, Healthcare EMEIA for Apple; and Paul Jobson, Managing Director of UKIHMA.

• For further information on exhibiting or visiting Future Healthcare 2019, visit: www.futurehealthcareuk.com

The exhibition is free of charge for pre-registered visitors and there is now an early bird rate in operation for the conference – delegates can save £200 by booking before 30 November. 



Three-dimensional projection of a cancer cell that has been rounded to undergo cell division and adheres to the substrate with reticular adhesions. Blue – Chromatin (DNA); Red – Cell's outer shell (membrane); Green/Yellow in the bottom of the cell – Reticular adhesions. The image was created by John Lock, using a confocal microscope.

Researchers discover new structure in cells

A new structure in human cells has been discovered by researchers at Karolinska Institutet in Sweden in collaboration with colleagues in the UK. The structure is a new type of protein complex that the cell uses to attach to its surroundings and proves to play a key part in cell division. The study is published in the journal *Nature Cell Biology*.

The cells in a tissue are surrounded by a net-like structure called the extracellular matrix. To attach itself to the matrix the cells have receptor molecules on their surfaces, which control the assembly of large protein complexes inside them.

These so-called adhesion complexes connect the outside to the cell interior and also signal to the cell about its immediate environment, which affects its properties and behaviour.

This new type of adhesion complex has

a unique molecular composition that sets it apart from those already known about.

The researchers call the newly discovered cell structure 'reticular adhesions' to reflect their net-like form.

"It's incredibly surprising that there's a new cell structure left to discover in 2018," says principal investigator Staffan Strömblad, professor at the Department of Biosciences and Nutrition, Karolinska Institutet. "The existence of this type of adhesion complex has completely passed us by."


The newly discovered adhesion complex can provide answers to an as-yet unanswered question – how the cell can remain attached to the matrix during cell division. The previously known adhesion complexes dissolve during the process to allow the cell to divide. But not this new type.

"We've shown that this new adhesion complex remains and attaches the cell during cell division," says Prof Strömblad.

The researchers also show that the newly discovered structures control the ability of daughter cells to occupy the right place after cell division. This memory function was interrupted when the researchers blocked the adhesion complex.

The study was done on human cell lines mainly using confocal microscopy and mass spectrometry. Further research is now needed to examine the new adhesion complex in living organisms.

"Our findings raise many new and important questions about the presence and function of these structures," says Prof Strömblad. "We believe that they're also involved in other processes than cell division, but this remains to be discovered."

• doi: 10.1038/s41556-018-0220-2 

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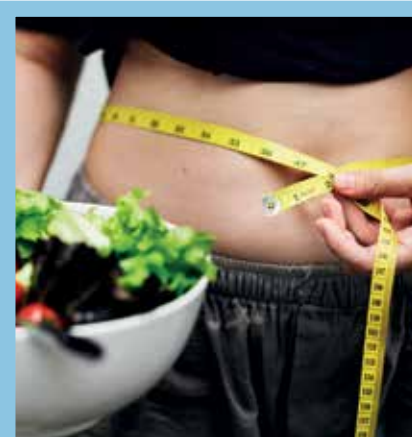
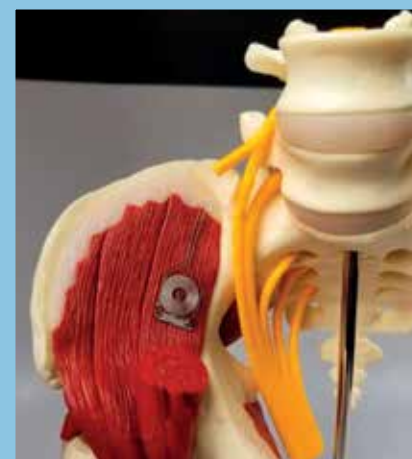
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Agenda

Selected schedule of regional medical meetings, conferences and exhibitions



Event	Date / City	Contact
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■ November 2018

22nd World Congress on Pediatrics, Neonatology & Primary Care	12-13 November 2018, Dubai, UAE	https://neonatalcare.pediatricsconferences.com/
International Patient Experience Symposium	12-14 November 2018, Abu Dhabi, UAE	https://pxsymposium.com
7th International Conference on Chronic Obstructive Pulmonary Disease (COPD)	15-16 November 2018, Dubai, UAE	https://copd.healthconferences.org
The 4th Annual International Neonatal Medical Congress	15-17 November 2018, Dubai, UAE	https://go.evnt.com/244596-0
International Paediatric Medical Congress	15-17 November 2018, Dubai, UAE	https://go.evnt.com/235756-0
3rd Annual Sports Medicine Conference	16 November 2018, Abu Dhabi, UAE	https://www.conferences.ae/ehome/index.php?eventid=321382&
Advanced Medicine Congress	16 -17 November 2018 Abu Dhabi, UAE	http://www.icldc.ae/event/advanced-medicine-congress#Home
MENA Pharmaceutical Manufacturing Congress	27-29 November 2018, Riyadh, KSA	info@pharmamanufacturingmena.com

■ December 2018

World Brain Congress	5-7 December 2018. Dubai, UAE	brain@memeetings.net
12th International Conference on Orthopedics and Sports Medicine	10-11 December 2018, Dubai, UAE	https://orthopaedics.healthconferences.org
19th Annual Conference on Inhalation Toxicology	13-14 December 2018, Dubai, UAE	https://inhalationtoxicology.conferenceseries.com
12th World Pediatric Congress	13-15 December 2018, Abu Dhabi, UAE	https://pediatrics-congress.conferenceseries.com/
13th Annual Conference on Dementia and Alzheimer's Disease	13-15 December 2018, Abu Dhabi, UAE	https://dementia.neuroconferences.com
8th World Conference on Women's Health and Breast Cancer	17-18 December 2018, Abu Dhabi, UAE	womenshealth@memeetings.com
3rd World Liver Congress	17-18 December 2018, Abu Dhabi, UAE	https://liver.gastroconferences.com

Agenda

Selected schedule of regional medical meetings, conferences and exhibitions

Event	Date / City	Contact
January 2019		
ESE Clinical Update	11-12 January 2019, Abu Dhabi, UAE	http://icldc.ae/event/ese-clinical-update-2019#Home
26th Cancer Genomics Congress	21-22 January 2019, Dubai, UAE	https://cancergenomics.cancersummit.org
3rd World Congress on Eye and Vision	25-26 January 2019, Dubai, UAE	https://vision.opththalmologyconferences.com
2nd World Congress on Nutrition and Obesity	25-26 January 2019, Dubai, UAE	https://obesityprevention.nutritionalconference.com
4th World Kidney Conference	30-31 January 2019, Abu Dhabi, UAE	https://kidneycongress.nephroconferences.com
February 2019		
The Arab International Paediatric Medical Congress	14-16 February 2019, Dubai, UAE	https://tinyurl.com/yakt3mng
2nd World Congress on Traditional and Complementary Medicine	22-23 February 2019, Abu Dhabi, UAE	amyjones2018@gmail.com
March 2019		
World Congress on Depression	18-19 March 2019, Dubai, UAE	https://orthopaedics.healthconferences.org
19th Annual Conference on Inhalation Toxicology	13-14 December 2018, Dubai, UAE	https://depressioncongress.neurologyconference.com
Middle East Heart Congress	18-20 March 2019, Dubai UAE	https://heart.cardiologymeeting.com



List your conference:

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

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