



Daily Dose

Day 2, Tuesday 28 January 2020

The official daily newspaper of the Arab Health Exhibition

Sheikh Mohammed tour and tech dazzle on day 1

By Daily Dose Staff

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai visited the show yesterday.

His Highness Sheikh Mohammed bin Rashid toured the four-day exhibition, which is hosting more than 5,000 international companies operating in the healthcare sector that are showcasing their latest medical equipment and services.

His first stop was the pavilion of GE, where he met with its senior officials, and was briefed about the company's latest products and services. His Highness also toured the pavilions of Draeger Medical GmbH, Siemens, Phillips, Abu Dhabi Health Authority, and Dubai Health Authority, where he was briefed about various products and services.

Sheikh Mohammed expressed his happiness with the continuous organisation of the event, expressing his support to such events that serve humanity.

His Highness was accompanied by Minister of Health and Prevention, Abdul Rahman Mohammad Al Owais; Chairman of the Board and Director General of the Dubai Health Authority, Humaid Al Qutami; Director-General of the Dubai Protocol and Hospitality Department, Khalifa Saeed Sulaiman; and CEO of Dubai World Trade Centre, Helal Saeed Al Marri, along with senior officials.

Ross Williams, Exhibition Director, Arab Health, said: "Arab Health provides a pivotal platform for the MENA healthcare industry to build relations with international stakeholders, explore new business opportunities, as well as providing a stage for the leading lights of the global healthcare sector to discuss topical healthcare issues, the latest innovation and technology in the industry."



Dr Gareth Goodier, Group CEO of Abu Dhabi Health Services Company (SEHA), Arab Health 2020's Official Congress Supporter, said: "As the healthcare industry continues to evolve at a staggering pace, Arab Health has come to be recognised as a platform where leading minds from across the globe convene to share knowledge and innovation trends with one cohesive goal; to advance the provision of healthcare in the region. It's an opportunity to focus on how to meet and exceed international benchmarks and ensure we are meeting patients' and the community's needs."

"This year, we are excited to present the latest addition to SEHA's network – the Sheikh Shakhboub Medical City. With our joint venture with Mayo Clinic, this is a milestone project that is set to have a transformational impact on healthcare delivery in the UAE and wider region."


The first day of the Innov8 Talks agenda also got underway, with eight innovative SME's and entrepreneurs presenting their latest ideas. A further eight companies will present on each day with the final day hosting a 'pitch off' to a group of judges. Entrepreneurs making their bid for the perfect pitch included Biomedical's Zeus, a multi-action bionic limb for upper limb amputees; UniExo, the creator of modular exoskeletons using machine learning algorithms and doctor online-surveillance; and Kinestica's sensor-based rehabilitation systems.

Companies taking the stage over the remaining three days include SensDx, a system that detects the influenza virus at an early stage, Cardiolyse, a heart health analysing solution that enables affordable real-time remote monitoring; and OKDOK, a tele-medicine app that enables remote diagnostic/consultations for health and wellbeing.

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Arab Health 2020,
Department of Health-Abu Dhabi
(Stand: Hall 5, H5.B10)

SEHA showcases solutions for MENA's biggest challenges

Article provided by SEHA

Abu Dhabi Health Services Company (SEHA), the UAE's largest healthcare network, is exhibiting at and hosting Arab Health Conference, as an Official Congress Partner. The company's representatives will also be speaking on multiple panels to discuss the latest trends within the MENA region's healthcare sector.

Leading executives and clinicians from SEHA are attending the event, as part of Arab Health's plenary sessions. This year, Dr. Anwar Salam, Executive Director of the Medical and Technical Affairs, SEHA will shed more light and discuss infant mortality rates in the MENA region. Furthermore, Dr. Sallam will be sharing more insights on SEHA's role in continuous medical education for medical practitioners, and its academic initiatives – in medical schools - as part of the UAE's wider reform of healthcare sector.

Dr. Nasser Ammash, Chief Executive Officer, Sheikh Shakhboub Medical City (SSMC), will also be providing an overview of the new hospital – a joint venture with Mayo Clinic, covering its approach to delivering healthcare, insights on the latest applications implemented. Joining Dr.



Ammash's panel will be the Head of Cardiology at SSMC, Dr. Abdul Majeed Al-Zubaidi, who will be expanding on the hospital's strategy for treating the most prevalent cardiac diseases.

SEHA leaders will be participating on other plenary sessions dedicated to tackling

healthcare challenges facing the region. Dr. Ahmed Al-Rifai, Head of Gastroenterology and Hepatology at SSMC will be discussing liver disease in the MENA region, and Dr. Muhammad Al-Saari, Head of Nephrology at SMMC will be discussing the most pressing kidney disease

issues affecting the MENA region. Both experts will also be offering their insights on the latest diagnostics and advanced treatment in liver and kidney diseases. Similarly, Dr. Walid Zaher, Director of Research and Development, SSMC, will be speaking about Precision Medicine and the innovations emerging as a response to the needs of this field.

SEHA operates 12 hospitals with 2,644 beds, 46 Primary Healthcare Clinic, 10 Disease Prevention and Screening Center, three Mobile Clinics, one School Clinic, two Blood banks, four Dental Centers, two Employee Healthcare Centers, and one Vaccination Center. It partners with leading healthcare institutions such as John Hopkins Medicine International, as part of SEHA's mandate to deliver world-class healthcare services. Most recently, the healthcare provider partnered with U.S. non-profit organization, Mayo Clinic, to establish a joint venture to operate Sheikh Shakhboub Medical City – the UAE's largest hospital.

[Visit SEHA at stand H6.A20.](#)

First Emirati female surgeon to conduct robotic surgery in the region

Article provided by The American Hospital Dubai

American Hospital Dubai sponsored a comprehensive robotic surgery empowerment program to enhance the capability of talented Emirati surgeons, in the best interest of patient health and comfort.

Emirati surgeon Dr. Alia Obaid Al Mansoori has an extensive and comprehensive experience in obstetrics and gynecology. She is a consultant in this field who also served as senior lecturer at Dubai Girls Medical College for 16 years, with a specialization in gynecology and endoscopy. Dr. Al Mansoori expressed her appreciation for receiving an advanced specialized training in the use of the "da Vinci Xi" system. She has emphasized the importance of the optimum utilization of advanced science and technology in the medical field, which will add a great value to the health of our patients and community at American Hospital, part of Mohamed & Obeid Al Mulla Group, one of the leading pioneers of private healthcare in the Middle East.

In conjunction with the hospital launch of robotic surgery by utilizing the latest advanced technologies in the field, Dubai is the first city in the region to use the da Vinci Xi device, and Dr. Al Mansoori, the first Emirati doctor to attend the training program that will enable her to perform



robotic surgery, was fully supported by the American Hospital to attend the training program.

Additionally, Dr. Al Mansoori revealed that technological developments provided new opportunities and opened up wider surgical prospects. This is due to the fact that this surgical system, especially the unconventional surgical Robot da Vinci Xi, saves time, enhances accuracy, and assures better patient safety.

She said: "We are confident that the medical

sector will benefit a lot from scientific and technological advancement such as robotic surgery, in providing better medical services for healthier people and society. In other words, relying on surgical robots instead of open surgery greatly reduces the size of the wounds in the body and helps dealing with areas that may be inaccessible by traditional methods. Moreover, robotic surgery increases efficiency and effectiveness and maximize accuracy, especially when performing complex surgeries."

She concluded: "Practically, robotic surgery represents the future of surgeries, especially since the robotic arms are much stronger and more stable than the human hand, and the 10X magnification ensures a higher level of success in microscopic surgeries."

Dr. Al Mansoori drew attention to the fact that robotic surgeries that utilize the da Vinci Xi system are less forceful on a patient's body than conventional surgeries and causes minimal wounds, resulting in a comfortable recovery and treatment at hospitals, while reducing the bleeding that generally accompanies such a procedure.

Sherif Beshara, Chief Executive Officer of Mohamed & Obeid Al Mulla Group, said: "We

are pleased to have supervised and empowered Dr. Al Mansoori on the application of robotic surgery as we subscribe to the role of the private sector in contributing to the development of the health sector in the UAE in general and Dubai in particular. We are continuously seeking to provide support to and qualify Emirati doctors to sustain development in the UAE health sector. We are also keen at American Hospital to proceed on our path of progress to achieve medical excellence and maintain our leading position in the health sector. Our success in applying this technology inspires us to move forward with our continuing development and make every effort to reach global medical standards. We are pleased to support Dr. Al Mansoori on her journey and provide her with the necessary robotic surgery training."

The professional empowerment program for robotic surgery was completed by a fully qualified internationally certified medical team under the supervision of Dr. Hatem Moussa, American board certified, consultant general surgeon and an international robotic surgery trainer at American Hospital, who is also highly experienced in training surgeons on robotic surgeries.

[Visit American Hospital at stand CC10.](#)

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Today at a glance

Arab Health 2020 Congress

Conference	Room	Location	Start	Finish
Total Radiology	Grand Ballroom	Conrad Dubai	07:55	18:00
Obs & Gyne	The Ballroom	Conrad Dubai	08:15	17:30
Orthopaedics	Dubai D	DWTC	08:20	17:00
Surgery	Umm Al Quwain	DWTC	08:45	17:45
Midwifery	Meeting room 8 & 9	Conrad Dubai	08:15	17:00
GI Endoscopy	Abu Dhabi A	DWTC	08:40	18:00
Emergency Medicine	Ajman D	DWTC	09:20	16:40
Patient Experience	Al Ain F	DWTC	09:30	16:45
Primary Care	Al Ain J & K	DWTC	08:20	18:00
From Prevention to Innovation Conference: A SEHA-Mayo Clinic Collaboration	Abu Dhabi B	DWTC	09:00	17:40
Healthcare Infrastructure Forum	Pavilion Hall	DWTC	10:30	16:30



Arab Health Daily Dose

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Your guide to Innov8 Talks

Featuring 32 start-up companies pitching their heart out to the Innovation Committee, come and hear about the latest products making a change across the healthcare industry. With 8 pitches a day,

for 8 minutes each – this will be the competition to check out. Supreet Singh Manchanda, Managing General Partner, Raiven Capital, San Francisco, California, U.S., will be the MC of the event.

Location: Plaza Hall

The keynote address today will be on 'NanoBioMedicine: A novel approach to solve the most pressing biomedical problems of the 21st

century' by Dr Sonia Trigueros, Nano-Bio Systems Group Leader, Associated Research at Zoology Department, University of Oxford, Director, Oxford Martin Institute of NanoMedicine, Oxford, UK.

Pitches - 11:30am to 13:30pm

- Class Medical** – Class medical, simplicity that works
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- Embright Infotech** - Developed Auticare: An XR-AI based Assistive Technology Learning Platform, designed for skill training and development in high functionality Autism and related disability patients
- P4 Medical Laboratory** - P4ML's world-class analytical capabilities will change the way care is delivered to patients with the rarest of diseases. Delivering comprehensive and integrated diagnostics via MultiOMICS in Precision Medicine
- Robotech** – Bringing doctors to the patients
- SensDx** - Detects influenza virus at the very early stage of infection
- Sitekit Applications** - A connected world where people are empowered to manage their health and wellbeing
- Tempus 600** – One touch for better treatment

Innovation committee

- Ihsan Almarzooqi**, Managing Director, Glucare, Dubai, UAE
- Khalid Ghaloua Adine**, Head, Digital Healthcare, Etisalat, Dubai, UAE
- Dr Mussaad M. Al-Razouki**, Chief Business Development Officer, Kuwait Life Sciences, Kuwait
- Sarper Tanli**, Group CEO, Manzil Healthcare Services, Dubai, UAE

Gurus of the industry

- | | |
|--|---|
| <p>14:30 Envisaging the future of health tech with immersive technologies
Dr Sana Farid, X-Reality & AI strategist, Munfarid, Co-President, VRAR Association Mena Ch, Dubai, UAE</p> <p>14:50 Personalized medicine and AI
Khaled Ismail, Managing Partner, HIM Angel, Cairo, Egypt</p> <p>15:10 Performance analytics in improving healthcare outcomes
Chris Meenan, Head of Strategy for Precision Diagnosis, Philips, Baltimore, USA</p> | <p>15:30 Foresight and innovation as an operating system for the Department of Health Abu Dhabi
Dr Yousif Rashid Matar Al Zaabi, Unit Head, Foresight, Department of Health, Abu Dhabi, UAE</p> <p>16:00 Malaffi
Atif Al Baraki, CEO, Injazat, Abu Dhabi, UAE</p> |
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GSD Healthcare introduces tailor made trainings

Interview with Kamel Ghribi, Chairman of GSD Healthcare (GSDH)

By Deepa Narwani, Editor

Italy's Gruppo Ospedaliero San Donato (GSD) currently has 19 hospitals treating over 4.5 million patients each year. Founded in 1957, GSD has grown since to not only become the largest private hospital group in Italy, but is also among the leading hospital groups in Europe.

According to Kamel Ghribi, Chairman of GSD Healthcare (GSDH), the most fundamental driver of the healthcare industry today is the peer sharing of innovative scientific R&D.

Sharing medical and technical expertise facilitates the rapid development of state-of-the-art technology and avant-garde training techniques, which in turn can be extensively tested globally. Such dissemination provides the medical world with the variables necessary to deliver the most advanced and targeted therapies to patients.

In an interview with *Daily Dose*, he said: "GSD Healthcare brought an R&D and training programme to Dubai Healthcare City because we saw a cluster model of interconnected prestigious institutions such as the Dubai Health Authority and the Mohammed Bin Rashid University of Medicine and Health Sciences. Having prestigious academic institutions, public authorities, the financial sector and other esteemed entities in such close proximity, creates a critical mass that allows a long-term drive in innovative technology and treatments.

"In the same way, GSD and its flagship San



Raffaele University Hospital in Milan combines vocational training with scientific R&D, medical technology development and innovative treatment therapies that have made the hospital a point of reference in Europe."

At Arab Health, GSD is presenting a new approach towards the provision of training – tailor made training workshops and courses.

"We believe that the true value of training can only be fully realised through expert led

hands-on training carried out in small groups. Practice can only be enhanced and honed in any given field of medicine when tailored to the specific procedures that are being performed," he explained. "At GSD Healthcare, we build our courses according to the specifications and needs of the medical professional in question and deploy the services of internationally recognised physicians skilled at training teams for as little as two days right up to three weeks. Over and above our highly skilled training services, we also offer internships in Italy, thus giving participants access to full training as well as real practice on the actual clinical cases present in our hospitals."

Ghribi expressed that Arab Health allows participants to get involved in new aspects of their profession as well as allowing clinical professionals the chance to enhance their knowledge by providing them with an opportunity to see how all areas of medicine are constantly evolving. He added that it is a platform to highlight the importance of keeping up with the latest innovations, whether in the realms of diagnostic and treatment possibilities or the latest patient care guidelines and recommendations.

Efficient pathways

According to Ghribi, the healthcare industry is being driven forward by the need for new treatments, new procedures, innovative

technology and more efficient pathways that ensure every patient receives the best possible care. In order to achieve such a goal, he said, it is of fundamental importance that scientific academics and researchers work together in collaboration with medical professionals, specifically physicians, within the context of a clinical unit.

He emphasized: "By adopting such a strategy, GSD has been able to create innovative treatments in cardiac surgery and in genetic therapies such as tailor-made stem cell medicine. It is now our principal aim to disseminate and share our medical innovations and knowledge throughout the MENA region through the vehicle of locus training, which also provides an ideal platform for the exchange of medical data and information."

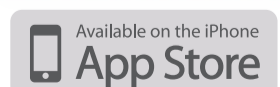
Furthermore, he highlighted that it has now become an undisputed fact that the quality of care received is not uniquely related to the quality of the physician. Therefore, GSD not only provides top medical practitioners and hi-tech therapies; it also provides Hospital Management courses in partnership with the prestigious Bocconi University in Milan.

"Having unparalleled expertise in the field of comprehensive care provision we are in the sui generis position of having the resources and experience to train hospital management teams, thus helping to deliver a high-quality service to both patient and practitioner," he concluded.



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UAE GDA paves the way for the future

By Deepa Narwani, Editor



Dr. Maryam Matar

She said: "The UAE Genetics Disorders Association (GDA) started with blood disorder initiatives, however, it is currently working on several others such as Familial hypercholesterolemia, G6PD, sickle cell, and thalassemia, among other. One of them is also the fragile x chromosome, which is related to autism. There is a specific mutation that increases the risk of that child to have autism."

The association also has a breast cancer initiative along with two international centers with which they are able to identify 21 new mutations for breast cancer, which is very essential for the management. "Previously, a patient with cancer, would be screened only for BRCA1 and BRCA2," she explained. "With our exercise, we are able to specify mutations specific to our ethnicity such as people coming from Middle East, Africa, India, Philippines, Pakistan, etc."

For instance, if there is any patient diagnosed with breast cancer in the Middle East in these ethnicities, healthcare institutions can check for the 21 mutations, which are specific to the ethnicity. The impact of that would be that their medication and chemotherapy can be modified. "We have a complete circle of chain – prevention, counselling, early detection and management. We don't do it ourselves, but have a partner who is helping us to achieve this," she added.

One of the other initiatives that makes UAE GDA unique is that under its umbrella they host the GCC Genomic Society. As part of the society, doctors from member GCC countries gather once every year at a conference, where they decide what type of project and priority of mutation needs to be focused on. Furthermore, UAE GDA is also a member of the Global Rare Diseases Commission.

She concludes: "We are working on an Epigenetics project and focusing on the impact



of sleep and gene expression of common non-communicable disorders such as diabetes, hypertension etc. Epigenetics tries to address the relationship between the environmental factor and genetic make-up.

"My advice to people is that if you cannot change your lifestyle, at least try to modify your sleeping pattern. If you have better quality of sleep, you will help your body to maintain itself during the night so that it will switch off all those

mutations that can increase the risk of obesity, hypertension, cancer etc."

Dr. Matar will be speaking on 'Role of support groups and NGO in enhancing patient voice as an important stakeholder' at the Patient Experience conference at 16:10.

OKI: Meeting printing needs of hospitals

By Deepa Narwani, Editor

Medical imaging equipment such as x-ray, ultrasound and scanners, provide clinicians with diagnostic quality images directly to their computer screens using a special DICOM (Digital Imaging and Communications in Medicine) protocol. OKI, a printer solution provider, provides high-end medical printers to meet diverse requirements and are showcasing their range of printers at the show.

The company also specializes in printers for graphic arts, and indoor and outdoor applications, among others.

Carine Haddad, Healthcare Manager, OKI Euope Limited, tells Daily Dose: "We are one of the only companies to have DICOM embedded software inside the printer. This allows users to connect it directly to the modalities such as ultrasound machines. It has been specifically designed for the medical sector and is sold to hospitals, clinics, etc."

Furthermore, the company also sells a compact printer for ultrasound devices. She says, "Our printers are being used to serve as back up to print directly in emergency cases.

"For example, we are selling the PRO9431 to hospitals, which is the biggest in the range and



allows you to connect it to an unlimited number of devices."

Haddad highlights that hospitals also need to ensure that patient needs are met. For instance, patients visiting private hospitals in the UAE are often asked for print outs of their various documents, as some hospitals don't accept soft copies and need hard copies for proof.

This is where OKI's efficient range of printers come to the rescue. The company's medical printers can also, therefore, multi-task and can be used across the various healthcare departments, to fulfill basic needs such as patient registration to providing high-quality images that enable efficient diagnosis.

"One of the next steps for us as a company is to complement our product with medical solutions. For example, we intend to provide full Hospital Information System (HIS) solutions, which provide customers a bundle offer that includes software's, printers and modalities," she comments.

The UAE is a very important market for OKI, says Haddad, as the country has established itself as a hub and all the people in and around the region refer to it as the "source of innovation".

"It is essential for us to have the UAE as a strategic market. This also makes Arab Health an important event for us as this is where we start our year and see how we can generate more business and partnerships with dealers and sellers. We promote our products here first and then take it across the Middle East," she concludes.

Visit OKI at stand S3.F50.

Non-surgical skin treatment shown

Article provided by Dr Haus Dermatology

Innovative non-surgical facial rejuvenation treatment, which delivers immediate results in lifting the skin, is being presented at the show by Dr Haus Dermatology, located in London's Harley Street Medical Area (HSMA).

Dr Haus – who runs the specialist dermatology clinic, is offering an extensive range of non-surgical aesthetic skin treatments for both men and women, and is highlighting how the sought-after 7D treatment can significantly improve skin conditions for patients in the Middle East.

The treatment, which incorporates five different lasers modes and a skin peel and masque, is effective to help improve a number of common conditions such as skin laxity, fine lines and wrinkles as well as dull skin texture.

Dr Haus said: "The 7D Treatment can be used for many different concerns. It tightens and lifts the skin, helps minimise pores, targets melasma and hyperpigmentation and gives an overall refresh for all skin types. The protocol has been perfected over many years, and we are excited to bring it to Arab Health, to showcase its unique benefits to patients in the Middle East."

Visit Harley Medical Street Area at stand H2.H30.

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ORBEYE 4K 3D Orbital Camera System

Article provided by Olympus

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Explore further benefits of ORBEYE's 4K 3D visualization: www.olympus.eu/orbeyeye or visit the Olympus stand H3.F30

VPS LIFEPharma becomes first in region to export medicines to US

Article provided by VPS Healthcare

In a major step towards transforming the region as a hub for pharmaceutical production and export, the VPS Healthcare's medicine manufacturing arm, LIFEPharma, will be exploring new avenues entering into the European and American markets.

In a first of its kind, LIFEPharma, the region's sole US FDA-certified pharmaceutical unit will become the first to enter the US market exporting conventional medicines. Initially, the company will be exporting around 25,000 bottles of Acetazolamide collaborating with Eywa, a leading pharmaceutical production company in the US. The first batch of the medicines locally produced at LIFEPharma's production plant in Jebel Ali will be exported in January. Subsequently, the unit will be manufacturing and exporting more products particularly in the cardiovascular and diuretic therapy areas.

Apart from this, LIFEPharma is in discussion to strike a deal with major leading European multinational company, XO Laboratory, based in France. Once sanctioned, the pharma manufacturer will be producing a significant number of XO's products locally in the UAE and import unique medicines such as Alendronic acid solution, Mynocycline, Alginic acid sachets and Ketoprofen/Omeprazole from France to the UAE market.

In 2019, LifePharma had signed a deal with Canadian giant Apotex, the largest producer of generic medicines in North America, to produce generic medicines to be exported to

North American markets. The pharmaceutical manufacturer has started producing a billion tablets annually to be exported to North America.

VPS Healthcare Chairman and Managing Director Dr. Shamsheer Vayalil said that LifePharma has become a crucial player in the Middle East and has contributed immensely to transform the region in becoming a hub for pharmaceutical production. "The year 2019 has seen one of our products being exported to the North American markets. It was a great achievement for us. In 2020, we will be exporting six more products to North America. We are the first in the region to do this. This year, we expect to get into more markets and improve our global footing."

"The year 2020 is of great expectations for the group. We will be witnessing groundbreaking changes in the coming years across the healthcare sector. Technological advancements and medical research are taking medicine to the next level. At VPS Healthcare, we are committed to adapt to the changes happening across the industry and provide affordable and accessible healthcare to maximum number of people. We have always strived to be the best in delivering quality care to our customers and have steadfastly adhered to the principles of compassion and commitment. We will continue to do the same while growing to attain more heights," he added.

The healthcare group is also working on more strategic partnerships to expand its landscape of operations.

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1. Ben Chew, Comparison of Dusting and Fragmenting Using the New Super Pulse Thulium Fiber Laser to a 120 W Holmium:YAG laser, AUA 2019
2. DN0034924 - URSUS Laser Lithotripter Retropulsion Design Verification Test Report (p. 4: 2) Bodo Knudsen, Super Pulse Thulium Fiber Laser Compared to 120 W Holmium:YAG Laser: Impact on Retropulsion and Laser Fiber Burn Back AUA 2019 Presentation

Spontaneous Spinal Cerebrospinal Fluid Leaks and Intracranial Hypotension

By Wouter I. Schievink, MD, Director, Microvascular Neurosurgery Program, Professor, Neurosurgery, Cedars-Sinai, Los Angeles, California

Spontaneous intracranial hypotension is caused by spontaneous spinal cerebrospinal fluid (CSF) leaks and is known for causing orthostatic headaches. It is an important cause of new headaches in young and middle-aged individuals, but initial misdiagnosis is common.

Typically, a patient presents with a new headache that occurs shortly after assuming an upright position and is relieved by lying down. Although such a positional headache pattern is well-known following a diagnostic lumbar puncture, the spontaneous onset of an orthostatic headache is not well recognized and the patient may be diagnosed with migraine, tension headache, viral meningitis, or malingering. This has been a typical scenario for many patients experiencing spontaneous intracranial hypotension. But an initial misdiagnosis remains the norm.

Clinical background and epidemiology

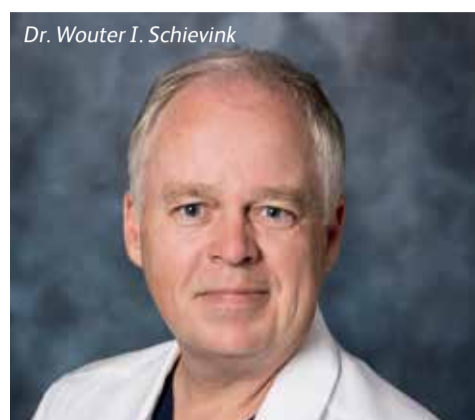
Spontaneous intracranial hypotension is caused by single or multiple spinal CSF leaks. Once considered an exceedingly rare disorder, recent evidence suggests that spontaneous intracranial hypotension is not that rare and has to be considered as an important cause of new daily persistent headaches, particularly among young and middle-aged individuals. In the past, our knowledge regarding spontaneous intracranial hypotension was derived from case reports only, and no epidemiologic data were available.

In a community-based study conducted in 1994, the prevalence of spontaneous intracranial hypotension was estimated at 1 per 50 000. In a more recent emergency department-based study (2003-2004), spontaneous intracranial hypotension was half as common as spontaneous subarachnoid hemorrhage, for an estimated annual incidence of 5 per 100 000. Spontaneous intracranial hypotension affects women more frequently than men, with a female-male ratio of approximately 2:1. Onset of symptoms typically is in the fourth or fifth decade of life, with a peak incidence around age 40 years, but children and elderly persons also may be affected.

Comprehensive population-based epidemiologic studies, however, are not yet available. In the past, spontaneous intracranial hypotension was probably more frequently underdiagnosed than it is now, and it is unlikely that there has been an actual increase in its incidence, although that possibility cannot be entirely excluded.

Because spinal CSF leaks generally do not cause any local symptoms, they remain undetected unless actively looked for in a patient suspected of spontaneous intracranial hypotension. Also, unlike CSF rhinorrhea or otorrhea, there is no risk of meningitis because the CSF is directly absorbed into the sterile spinal epidural venous plexus or paraspinal soft tissues and is therefore not exposed to the external milieu.

The precise cause of spontaneous spinal CSF leaks remains largely unknown, but an underlying structural weakness of the spinal meninges generally is suspected. A history of a trivial traumatic event preceding the onset of symptoms can be elicited in about one third of patients, suggesting a role for mechanical factors as well. The dural weakness predisposes to the formation of dural defects that allow CSF to leak into the epidural space. A wide variety of dural defects may be observed at the time of surgery, ranging from simple dural holes or rents to complex fragile meningeal diverticula or even complete absence of the dura that normally covers the spinal nerve root. The volume of the CSF leak is quite variable as well, ranging from a minimal amount of seeping CSF only detectable when applying a Valsalva



maneuver to large amounts of CSF spontaneously pouring out into the paraspinal soft tissues.

There is good evidence to suggest that a generalized connective tissue disorder plays a crucial role in the development of spontaneous spinal CSF leaks. In fact, based on physical examination alone, evidence for an underlying generalized connective tissue disorder is found in about two thirds of patients. This group of connective tissue disorders is heterogeneous, possibly affecting different components of the dural extracellular matrix, and include Marfan, Ehlers-Danlos syndromes, among many others.

Mechanical factors combine with an underlying connective tissue disorder can cause the CSF leaks. An orthostatic headache is the prototypical manifestation, but other headache patterns occur as well, and associated symptoms are common.

Clinical presentation and diagnosis

Positional headache: The prototypical manifestation of spontaneous intracranial hypotension is an orthostatic headache. Such a headache generally occurs or worsens within 15 minutes of assuming the upright position, as reflected by the revised International Classification of Headache Disorders criteria, but in some patients, this lag period may be as long as several hours. Improvement of the headache after lying down is less variable and occurs within 15 to 30 minutes. The headache may be diffused or localized to the frontal, temporal, or—most commonly—the occipital or suboccipital regions. The headache may be throbbing or non-throbbing and is rarely unilateral. Some patients use descriptive terms for their headaches, such as the feeling of “an ice cube in an empty glass” or a “pulling sensation from my head down to my neck,” offering a clue to the diagnosis. Additional clues may be the patient’s recumbent position in the physician’s office or a pillow they carry along to allow them to lie down comfortably. The initial onset of headache generally is gradual or subacute, reaching maximal intensity in several minutes to hours, but it may be instantaneous. Patients with such a “thunderclap” headache often will be suspected of having a subarachnoid hemorrhage and may undergo invasive testing, such as cerebral angiography. The severity of the headache varies widely; many mild cases probably remain undiagnosed, whereas other patients are incapacitated and unable to engage in any useful activity while upright.

Diagnostic criteria for headache due to Spontaneous Spinal CSF Leak and Intracranial Hypotension according to the International Classification of Headache Disorders:

- Diffuse and/or dull headache that worsens within 15 minutes after sitting or standing, with 1 of the following:
 1. Neck stiffness
 2. Tinnitus
 3. Hypacusia
 4. Photophobia

5. Nausea

- And at least 1 of the following:

1. Evidence of low CSF pressure on MRI (e.g., pachymeningeal enhancement)
2. Evidence of CSF leakage on conventional myelography, Computed Tomography myelography, or cisternography
3. CSF opening pressure <60 mm H₂O in sitting position
4. No history of dural puncture or other cause of CSF fistula
5. Headache resolves within 72 hours after epidural blood patching

The headache is a direct result of the downward displacement of the brain due to loss of CSF buoyancy, causing traction on pain-sensitive structures, particularly the dura. An alternative mechanism involves compensatory dilation of the pain-sensitive intracranial venous structures.

It should be noted that not all orthostatic headaches are caused by spontaneous spinal CSF leaks, and other diagnoses should be considered.

Diagnosis

Typical magnetic resonance imaging findings include subdural fluid collections, enhancement of the pachymeninges, engorgement of venous structures, pituitary hyperemia, and sagging of the brain (mnemonic: SEEPS). Myelography is the study of choice to identify the spinal CSF leak.

Primary diagnosis methods include:

- Cranial MRI
- Cranial Computed Tomography
- Myelography
- Radionuclide Cisternography
- Spinal MRI
- Lumbar Puncture

Treatment and outcome

Although data are lacking, it is often stated that many cases of spontaneous intracranial hypotension resolve spontaneously without any specific therapy. Fortunately, several options are available to treat patients with spontaneous intracranial hypotension who seek medical attention. However, none of the treatments have been evaluated by randomized clinical trials. A purely conservative approach consists of bed rest, oral hydration, a generous caffeine intake, and use of an abdominal binder. Given enough time, this treatment is probably effective in many patients. However, symptoms may be debilitating, and more timely results may be desired. Administration of steroids, intravenous caffeine, or theophylline all have been advocated as specific treatments for spontaneous intracranial hypotension, but their effectiveness is limited.

The mainstay of treatment is the injection of autologous blood into the spinal epidural space, the so-called epidural blood patch. Relief of symptoms often is instantaneous, thereby also serving a diagnostic purpose, and this is likely due to replacement of lost CSF volume with blood volume within the spinal canal. Initially, about 10 to 20 mL of blood is used, and this is effective in relieving symptoms in about one third of patients, presumably by forming a dural tamponade, thereby sealing the leak. Another mechanism of action may be restriction of CSF flow within the spinal epidural space, thereby interfering with CSF absorption. If the epidural blood patch is unsuccessful it can be repeated, and consideration should be given to a large-volume (20-100 mL) epidural blood patch.

Given the potentially high volume of injected blood, a minimum of 5 days between blood patches is advised. The volume of blood that can be injected is mainly limited by local back pain or the development of radiculopathy. I prefer to

place the blood patch at 2 separate sites, first at the thoracolumbar junction and then in the lower lumbar area, after which the patient is placed in the Trendelenburg position, either supine, prone, and/or lateral for 30 to 60 minutes, depending on the location of the CSF leak. This allows blood to travel over many spinal segments toward the site of the leak.

If epidural blood patches fail to provide relief, a directed epidural blood patch or percutaneous placement of fibrin sealant is recommended. These therapies require that the exact site of the CSF leak be known, and placement of fibrin sealant probably provides the best chance of alleviating symptoms. In my experience, about one third of patients for whom epidural blood patching has not been effective experience relief with the percutaneous placement of fibrin sealant, thereby avoiding surgery.

Surgical treatment is reserved for those patients in whom these nonsurgical measures have failed. Surgical repair of CSF leak is safe and often succeeds in providing relief for those patients in whom a structural abnormality or focal CSF leak is identified. Leaking meningeal diverticula can be ligated with suture or a metal aneurysm clip, while dural rents, holes, or other defects are repaired either directly with suture or, more commonly, by placement of a muscle pledget along with gelfoam and fibrin sealant. Rarely, intradural exploration may be required.

Intrathecal infusion of saline or artificial CSF should not be expected to seal a CSF leak but may be required as an effective temporizing measure to restore CSF volume until the leak can be permanently repaired in patients who require urgent treatment, such as those with a decreased level of consciousness.

A recurrence of headache following successful treatment of spontaneous intracranial hypotension may indicate a recurrent CSF leak, but if the pattern of headache has changed, rebound transient intracranial hypertension or dural venous sinus thrombosis should be considered.

Data on long-term outcomes are scarce, but in my experience, recurrence of a spinal CSF leak is seen in approximately 10% of patients, regardless of treatment. Outcome studies have shown that patients with abnormal brain MRI findings and a focal spinal CSF leak have an excellent prognosis, while those with normal initial MRI findings and a diffuse multilevel spinal CSF leak have a poor prognosis. Some patients have persistent symptoms following treatment, despite documented resolution of CSF leakage. Such patients may have residual altered CSF dynamics or small residual CSF leaks below the level of detection of current imaging techniques.

Conclusions

Spontaneous intracranial hypotension is not rare, but it remains underdiagnosed. The spectrum of clinical and radiographic manifestations is varied, with diagnosis largely based on clinical suspicion, cranial magnetic resonance imaging, and myelography. Numerous treatment options are available, but much remains to be learned about this disorder.

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Orthotics: Is it Science or a Sham?

By Dr. George Ampat, Consultant Orthopaedic Surgeon, Liverpool, UK and Author of *Bandaide – a self-help book to combat back and neck pain* (ISBN 0995676930)

Foot pain is very common among all populations, with estimates that 13% to 36% of people suffer from some form of foot pain. Consultations with primary care physicians in the UK identified that overall foot pain ranked the 5th most common cause for seeking medical help. That same study also identified the most common complaint among children (less than 14 years of age) was foot pain, forcing patients to seek medical help. Risk factors for developing foot pain include female gender, obesity and increasing age. Some of the most frequent causes of foot pain include Plantar Fasciitis, Metatarsalgia, Hallux Valgus, Arthritis (including Rheumatoid Arthritis), Hallux limitus and rigidus, Morton's neuroma, posterior tibialis tendon disorders and stress fractures. For people with these conditions, the resulting foot pain and associated disability can have large, negative impacts on their comfort, mobility and quality of life. Further still, foot pain can decrease balance and strength and is a contributing factor to falls. Since we rely on the use of our feet to work and exercise, good foot health is crucial in leading an active and fulfilling life.

Why is foot pain disability so high?

Evolutionarily, the human foot was designed to navigate on soft ground, for instance sand or soil. Soft ground has the ability to give way and mold around the foot, allowing for a larger area to be in contact with the ground. This larger area of contact decreases the peak pressures passing through the foot. However, fuelled by the invention of wheel, things have changed. Wheels roll efficiently on hard surfaces and, in order to accommodate this, most of our habitable locations have been converted to hard surfaces. The roads and pavements in our cities and the tiled floors in our homes are just a few examples of the firm and flat surfaces our feet now navigate. Additionally, even the majority of modern footwear has flat footbeds, further exposing the soles of our feet to flat, solid surfaces. This is where orthotics can help. Orthotics provide contoured surfaces, often with substantial arch support, which allows a wider area of contact to be made with the sole of the feet. This wider



Pronated foot

area of contact decreases peak plantar pressures. In addition, foot orthotics also change muscle activation and reduce joint loading. Both these effects in conjunction with each other and independently aid in the reduction of foot pain. These orthotics can also be placed within normal, fashionable shoes, enabling the wearer to enjoy their favorite pair in comfort.

Orthotics for specific conditions

Plantar Fasciitis

Plantar Fasciitis is a common cause of heel pain. The plantar fascia connects each of the toes to the heel bone. In plantar fasciitis, this tissue becomes inflamed. The pain is normally felt in the heel, and the first step early in the morning can be severe.

A systematic review conducted by Lewis and colleagues revealed that, within 1 to 3 months orthotics can improve the pain levels and functionality for individuals with plantar fasciitis. A randomized clinical trial, the SOOTHE trial by Whittaker, et al, studied a comparison between steroid injections and orthotics and concluded that, whilst steroid injections provided temporary relief, orthotics provided a more sustainable and longer-term benefit.

Metatarsalgia

Metatarsalgia affects the forefoot, causing pain directly beneath the metatarsal heads at the ball of the foot. The metatarsal heads contain joints which connect the toes to the foot and provide support when we run, walk or stand.

Pronated foot

Rear view of pronation corrected with insoles

These joints are therefore often under intense pressure, making them prone to pain and inflammation.

Orthotics with metatarsal pad supports have been found to reduce the pressure on the ball of the foot by shifting the weight away from high pressure areas. Manniko from Finland identified a metatarsal pad reduced pain in 84% of the participants in the study. Pain decreased by an average of 3.2 points on a 10 point numeric rating scale in all patients.

Hallux Valgus

The most frequent deformity of the forefoot, Hallux Valgus (bunion) is the malformation of the joint at the base of the big toe. Often caused by narrow toe boxes, bunions occur when the big toe



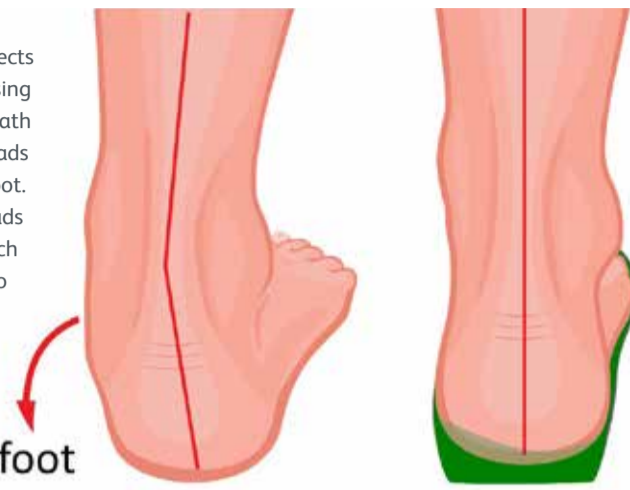
turns inwards, pointing towards the other toes. As a result, the first metatarsal and the connecting joint are forced to protrude outwards, causing the surrounding bursa to become enlarged, painful and stiff.

In patients with Hallux Valgus, total contact orthotics have been found to significantly reduce pain and improve contentedness. Orthotics have also been highlighted as an effective prevention technique. An independent study by Budiman-Mak and colleagues found that using orthotics reduced the rate of developing Hallux Valgus by 73%, in patients with Rheumatoid arthritis.

Rheumatoid Arthritis (RA)

Rheumatoid arthritis is an auto-immune disease, which causes malformation, pain and inflammation in joints. The condition occurs when the body's immune system attacks the joints and damages the cartilage. RA is the most common form of inflammatory arthritis.

A study by Kavlak et al found that patients with ankle rheumatoid arthritis who used orthotics for three months reduced their pain levels and energy expenditure while increasing their stride length and step.



Diabetes and Diabetic Foot: A rising concern in the Arab Nations?

Diabetes is a significant medical burden throughout the world. The condition affects 382 million people globally (5%) and the prevalence is rising in every country year on year. In the Arab nations, the incidence and prevalence are higher than the global average. For instance, in Saudi Arabia the prevalence is reported to be as high as 31.6%, ranking the country as the 7th highest in the world for T2DM occurrence. Additionally, Oman and Kuwait are also reported to have high prevalence rates of 29% and 25.4% respectively. When compared to the average prevalence reported in the UK, which stands at 6%, and the global average of around 5%, a stark contrast between the statistics is observable. In the International Diabetes Federation global fact sheet 2019, Sudan, Egypt, UAE, and Bahrain were also listed within the top 20 nations for diabetes prevalence, indicating that a diabetes epidemic is taking place within the Arabian nations.

Peripheral Sensory Neuropathy (PSN)

Diabetes can result in peripheral sensory neuropathy. Neuropathy is when the nerves do not function normally, and numbness and loss of sensation can occur. When sensation is lost, the protective reflex from pain is lost. The body fails to recognize constant pressure and the skin cover fails. This leads to diabetic foot ulcerations (DFU) and infection. It is estimated that peripheral sensory neuropathy is found in 82% of diabetic patients in Western Saudi Arabia (one of the highest rates in the world).

Diabetic Foot Ulcerations

Diabetic foot ulcerations (DFU) occur in 15% of all diabetics and it is estimated that 15% of these patients will have to have an amputation as a result of their ulcers.

A systematic review of nine papers found that the average prevalence of diabetic foot ulcerations within the diabetic population in Saudi Arabia was 11.85% [20]. This is almost double the global average of 6.4%.

Amputation in diabetics unfortunately leads to death. In a meta-analysis of 31 studies, the 5-year mortality rate was found to range between 53% to 100%.

Orthotics for diabetic foot ulcerations?

In a 2013 study by Fernandez et al, 117 diabetic participants, each with a history of DFU's, were prescribed custom-made orthotics.



Pronation corrected with insoles

The participants were given therapeutic insoles and footwear to reduce plantar pressure, based on a detailed biomechanical study. The orthotics aimed to disperse the pressure to the whole of the sole of the foot. Prior to the treatment, ulceration recurrence was 79% and the amputation rate was 54%. After 2 years of orthotic therapy, the reulceration rate had significantly dropped to 15%. The amputation rate was also reduced to 6%.

If an ulcer is subjected to pressure, it will remain an ulcer. Relieving this pressure will allow the healing of ulcer. Relieving the pressure is called off-loading. Modern studies have reinforced the concept that total contact casts are the most effective methods for off-loading pressure from a pre-existing diabetic foot ulcer. A systematic review by Elrayah and colleagues contained 19 interventional studies, including the data from 1605 participants with DFU's. The study found that total contact casting benefited patients in the treatment of diabetic foot ulcers. Furthermore, various forms of orthotic shoes and insoles were found to significantly reduce ulcer recurrence.

Conclusion

Foot pain is an ever-increasing medical burden throughout the world. The symptoms of painful foot conditions including Plantar Fasciitis, Hallux valgus, Metatarsalgia and RA have all been found to be reduced through the use of orthotics. Additionally, diabetes and diabetic foot ulcers are becoming a significant concern throughout the world. This is more so in the Arab nations where the epidemic of diabetes and its associated conditions is becoming an increasing social, medical and financial burden. Review of the literature shows the benefits of orthotics in prevention and avoiding recurrence. Decreasing the incidence of ulcers will decrease the incidence of amputation which should also decrease the mortality associated with it. In conclusion, prefabricated orthotics seem to be a value-based, effective treatment for many conditions affecting the foot.

References available on request.

Dr. Ampat will be speaking on 'Plantar fasciitis: Non-invasive modality of management' at 11am and 'Metatarsalgia' at 12pm at the Orthopaedics conference and on 'Orthotics and Sports Performance - sham or science?' on Jan 30 at the Physical Medicine, Rehabilitation and Sports Medicine Conference.

The Evario with scale

Workload reduction in intensive care units

Article provided by Stiegelmeyer



The optional scale determines the patient's weight without care staff having to transfer the patient from the bed with great physical effort.

The Evario hospital bed is suitable for all types of wards. Various control options, safety side systems, castors, headboards and footboards are combined to create a flexible bed, made to measure. Equipped with an integrated scale, the bed is even more suitable for use in ICUs.

The optional scale determines the weight of

a patient to the nearest 200 grams, without care staff having to transfer the patient from the bed with great physical effort. The scale can be used whatever the position of the mattress base and is operated reliably using a separate handset. If the patient's exact weight is known, it is possible to determine the necessary medication more precisely, for example. Besides the weighing

feature, the system also optionally provides an integrated Out-of-Bed function which can switch on the underbed light and can be connected to the hospital's nurse-call system. Thanks to the load cells in the chassis, the Out-of-Bed system can inform nursing staff when a patient gets up and does not return to bed in an individually set time frame. Thus, providing more safety to fall-

prone patients.

The Evario further reduces the workload of nursing staff with its effortless operation and its large height adjustment range from 35 to 91 cm, which allows back-friendly working. The bed can also be supplied, on request, with a fixed headboard which does not move when height adjustments are made. This prevents possible damage to the room furnishings.

The Protega safety side provides a tailored response to patients' needs. The wing-shaped split safety side made of high-strength plastic can be raised at the head end only or along the whole length of the mattress base, as required. Its elements at the head end move along with any backrest adjustments and thus provide ideal protection for the patient even in a sitting position.

When fitted with Protega safety sides, Evario can also be adjusted using operating panels that are integrated into the safety sides on both sides of the bed. On request, the bed can also be controlled using an LCD handset with just three buttons and different control levels for patients, nurses and technical staff.

The clear design and optional machine-washable version add to the excellent hygiene properties of the Evario. This modern bed reduces the strain on personnel, promotes the recovery of patients and, thanks to its high level of comfort and elegant appearance, improves the external perception of the hospital.

Visit Stiegelmeyer at stand SA.D30.

TECHNO CONCEPT plans to expand in Middle East

Article provided by TECHNO CONCEPT

TECHNO CONCEPT is a designer and manufacturer of specialist medical devices used in Physical Medicine and Neurorehabilitation. The company, a true "Made In France" startup, with a unique know-how resulting from 15 years of research in neurosciences, launched Vibramoov in 2016, an innovative therapeutic solution to treat motor disorders in patients who have suffered neurological damage.

Innovation is at the heart of the business

The Vibramoov technology has taken TECHNO CONCEPT to a new level by opening the doors of international markets in the neuro-rehabilitation medical devices sector by the unique and revolutionary nature of the technology it employs.

Protected by a worldwide patent for which the company obtained exclusive exploitation rights in 2014, and which was the result of a technology transfer with the CNRS of Marseille, the Vibramoov technology uses a complex method of soliciting the nervous system by "Functional Proprioceptive Stimulations" based on scientific knowledge acquired in the field of neuroscience over a period of 20 years.

By stimulating the sensitive part of the muscles in a very specific way, the device is able to "trick" the brain by causing it to receive natural movement information of the limbs even though the patient is still unable to move.

For a patient suffering from neurological damage, the aim is to ensure that (from the first days after a stroke for example) communication between the brain and the muscles of the arms

or legs remains active even though the patient is still in bed. This non-invasive technique, which has no contraindications, aims to stimulate neuroplasticity from the earliest stage, thus allowing the patient's mobility to be restored more quickly and with a higher outcome over the rehabilitation continuum.

Vibramoov was produced in response to a real global public health problem to more effectively treat the mobility impairments (loss of a patient's ability to walk or move their arms) resulting from neurological traumas, the statistics of which are constantly increasing.

The benefit to the quality of patient recovery is enormous, but equally to the economies of healthcare systems around the world.

The company has won a range of innovation awards with Vibramoov: Rotary Innovation Award – Health Category; Innovation Award at the Neuro Convention London in 2017.

Sustained international development

TECHNO CONCEPT embarked upon exporting immediately following the launch of Vibramoov in 2016. The company already has a presence in Europe and abroad (France, Germany, Italy, Poland, Switzerland, Czech Republic, Romania, Croatia, Slovenia, Russia, Ukraine, etc.) via a network of distributors. The company started prospecting in the Middle East in 2018.

Visit TECHNO CONCEPT on the France pavilion organized by Business France at stand R.K50.



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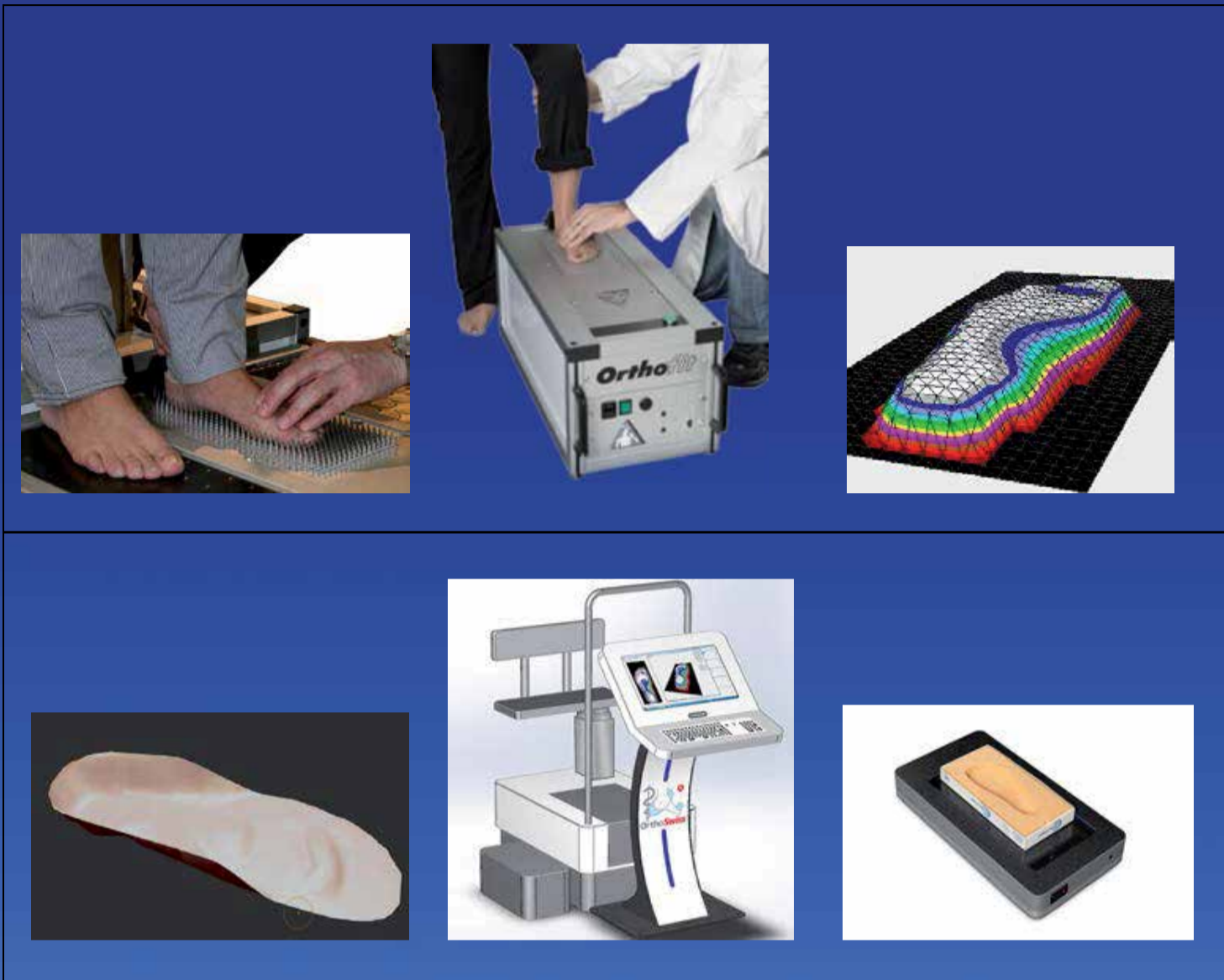
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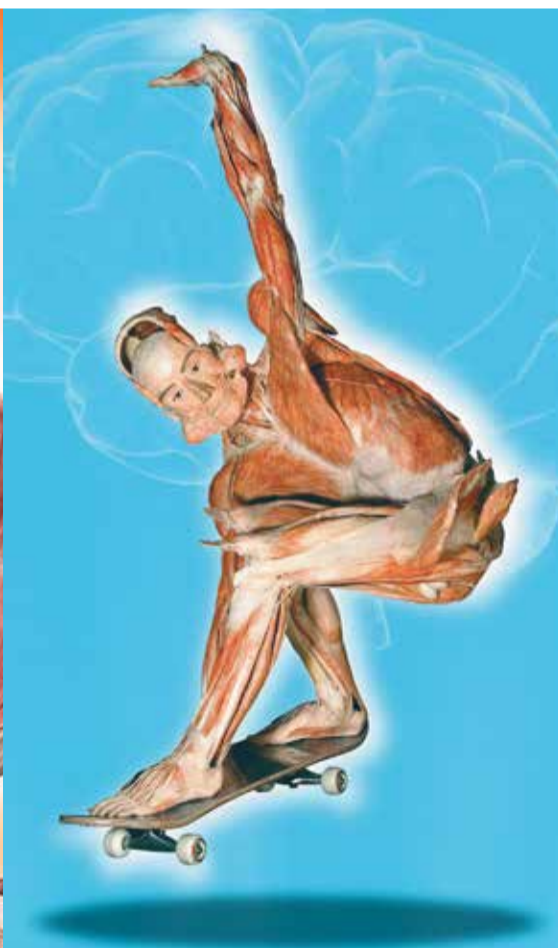
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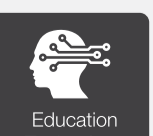
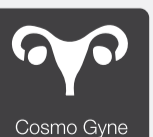
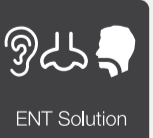
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Getting to the root of poor oral hygiene

Poor oral hygiene is linked to cardiovascular disease, dementia, arthritis, and even pancreatic cancer, says Dr. Emily Stein, CEO, Primal Health.

By Deepa Narwani, Editor

After her grandmother suffered a stroke due to poor oral hygiene, Dr. Emily Stein, CEO of Primal Health, decided to take the matter into her own hands. Armed with her microbiology and rheumatology knowledge, she started the company to make people healthier by focusing on promoting oral hygiene.

In an interview with Daily Dose, she shares: "My grandmother was living in a senior healthcare facility in the U.S. and her rheumatoid arthritis was so bad that she couldn't brush her teeth. She had significant decay, gum disease, had a couple of tooth extractions and eventually suffered a stroke. Turns out that there is a huge link between cardiovascular events and poor oral hygiene."

She says that she was a post-doc at Stanford when the incident occurred and she flew to meet her grandmother, grabbed her microbiome fluid, bio-hacked it in her apartment and figured out what ingredients worked to stop the bacteria that lived in her mouth from causing inflammation, tooth decay and gum disease.

"We came up with a novel approach and patented it. It has broad applications elsewhere as well such as for skin, agriculture or wherever microbes are causing harm. We figured out a way to tune outcomes based on going after metabolism. We are focused on dental hygiene because 80 per cent of humans have dental disease," she explains. "We all eat carbohydrates and certain bacteria can immediately convert those carbohydrates into harmful things called organic acids and other molecules that can cause



Dr. Emily Stein

leaky gums. That bacteria then escape from the mouth and go into the body, which is why oral hygiene is linked to cardiovascular disease, dementia, arthritis, and even pancreatic cancer."

To fight the disease at its root, Primal Health developed pHossident, a Proudct of USA, that is a clinically proven prebiotic dental lozenge that promotes dental health. "I made the pHossident breath mints for my grandmother, as she couldn't brush her teeth but could suck on the mints and that helps dynamically change which bacteria lived in her mouth. In our clinical work, we have shown that it can eradicate salmonella, etc., and help maintain a healthy level of bacteria that are



actually protective. The goal was to combat it through an easy way," she adds.

Primal Health also has a programme for animals, as cats and dogs tend to encounter similar dental issues. In animals, poor oral hygiene can strip away about a third of their lifespan and they can die prematurely.

She further emphasised that a lot of people are just lazy and don't realize that they need to brush often. A U.S.-based study found that if you brush your teeth only twice a day, you can lose about 10 years of lifespan. It can also significantly impact quality of life and social interactions.

Dr. Stein highlights that the company has been

getting a good response and will also be doing some work with the UK and received some interest from Greece to perform clinical work.

She says: "A lot of countries are struggling with oral disease and it is all a matter of being able to meet these people and figure out ways to work together. I looked at the statistics in the UAE and noticed that a high number of children have dental disease here. Cavities can disrupt their ability to learn but these are problems with that can be solved by just practicing good oral hygiene."

Visit Primal Health at stand H1.G19.

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By Dr GSK Velu, Chairman & Managing Director, Triviron Healthcare

By combining innovation with affordability and accessibility, Triviron Healthcare is a leading health technology enterprise that has been operating to improve health and medical care throughout the world. We consider quality healthcare a fundamental right of people and envisage making top-notch, cutting-edge healthcare technology available for people of all classes. Our team includes internationally acclaimed experts and leading scientists who innovate unprecedented health technologies suitable for the healthcare needs of today and tomorrow.

We provide technological advancements to hospitals, individual healthcare providers, independent clinics, extended care facilities and laboratories, catering to healthcare needs in multiple verticals like In-Vitro Diagnostics (IVD), Imaging & Radiology (In-vivo Diagnostics), Surgical Imaging, Critical Care & OT Solutions, Newborn screening (NBS) and Radiation Protection Products (RPP).

Kiran Medical Systems, the radiology division of Triviron Healthcare and a global leader in Radiation Protection Products, has been committed to delivering substantial innovations in the field of Advanced Imaging & Radiation Protection.

With Kiran's latest launch of ZeroLead Air Series of Radiation Protection Aprons using cutting-edge Micro-particle Technology & Satin Touch fabric with Anti-microbial Nano-Technology coating, Kiran has set a global benchmark in the Premium Radiation Protection Segment. Zerolead Air Aprons use metal micro particles and are 10% lighter than existing ZeroLead Series. Zerolead Air Series is the culmination of 4 Decades of



Dr GSK Velu, Chairman & Managing Director, Triviron Healthcare

Experience in Radiation Protection & Promise of delivering products to meet the needs of Radiologists across the world.

Building on the commitment to fight against Breast Cancer through the power of Advanced Imaging Technology and accurate diagnosis, Kiran has launched Felicia – Digital Mammography System, which is designed in such a way that the overall mammogram experience is less painful for patients. Felicia features an advanced Caesium Iodide scintillator detector with 77 micron pixel pitch that helps in delineating the smallest of calcification & delivers high quality clinical images

at a very low dose.

In line with our Vision to make healthcare affordable and accessible to everyone, Kiran will be launching a suite of more products for Breast Cancer Diagnosis which includes an Analog Mammography System and a Handheld Radiation Free Breast Cancer Screening device, which is a path-breaking innovation to improve Breast Cancer detection rates in emerging regions like India, Africa, and Latin America.

Taking another stride towards providing state-of-the-art Medical Imaging, Kiran has now launched its newest innovation in Surgical

Imaging; Elite – Mobile Surgical C-arm with motorized movements for precise imaging in Cardiovascular, Interventional Radiology, Orthopaedic and Urology applications. Elite provides superior images with higher grayscale resolution to view remarkably minute details and improves the workflow in a significant way with completely motorized & smooth movements that aid in accurate positioning. With a remote user interface on the C-Arm, choosing the parameters becomes comfortable and efficient.

With focus on offering comprehensive imaging solutions to customers, Kiran has ventured into Ultrasound with the launch of SonoRad V9 & SonoRad V10 – Whole Body Color Doppler models in value and mid segments respectively with excellent Image quality, wide applications and superior clinical value.

Triviron offers a full portfolio of solutions in Critical Care, Operating Room & Dialysis Care Products and is committed to bringing disruptive innovations in Intensive Care, Digital OR & Dialysis Care modalities.

Through a growing network of 1500+ employees, 1200+ channel partners and 11 world-class manufacturing units in India, Finland, Turkey & China, Triviron Healthcare is reaffirming its commitment to offer superior health technologies in 180+ countries saving lives and improving care. We are committed to build a sustainable business that delivers value by offering the best available health technology solutions for millions of people worldwide.

Visit Triviron at stand S1.L10.

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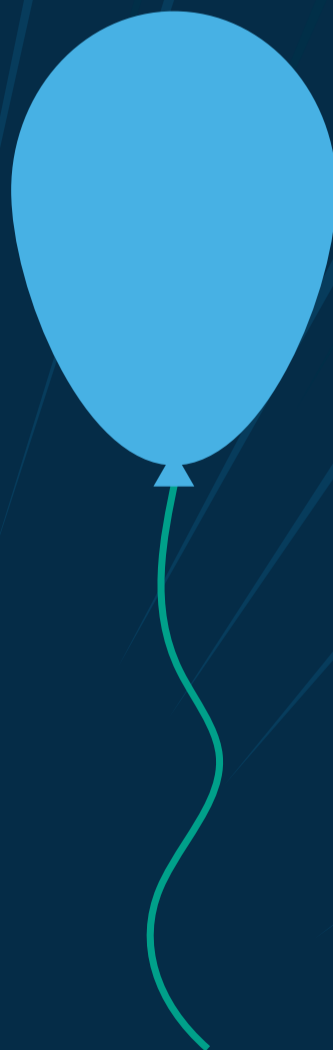
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Building the future of healthcare

**GSD Healthcare brings together pioneering scientific research
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Gruppo San Donato (GSD) is by far Italy's leading private hospital group and among the largest in Europe, with 19 hospitals, 5300 beds, over 4000 specialist physicians and more than 4.7 million individual patients treated per year.

GSD Healthcare is a branch of GSD, dedicated to providing both **educational and consulting services** worldwide. Given our broad experience in the medical and healthcare field, we put our best efforts into delivering outstanding results for clients ranging from young private clinics striving to achieve excellence up to national healthcare system regulators looking for efficiency improvements.

At GSD we believe in **building the future of healthcare**, be it improvements of our own group and services, developing relationships with governments, spreading medical expertise or helping other organizations grow in different environments. GSD Healthcare revolves around the last two mentioned, specializing in bringing and **teaching our success methods and best practices** to all our customers, with the overall target of **raising the global level of**

healthcare, accessibility and service quality.

The GSD Healthcare organizes high quality, **CME-accredited courses** in a number of locations across Dubai, UAE and whole Middle-Eastern Region. We provide short, specialized courses, with hands-on training, conducted by highly qualified professors that excel in the healthcare field.

GSD Healthcare's custom programs rely on matching the knowledge of the faculty with the **individual needs** of the client.

GSD Healthcare, through its network of Universities and partners, **designs consultancy and advisory solutions in the healthcare field**, with a systematic, practice-oriented and holistic approach. We link strategic goals with analysis and implementation of solutions.

The high level of customization is one of our main features: **we create value through tailoring programs to different needs of healthcare systems**, taking into consideration markets and various organizational contexts.

www.gsdinternational.com

The Leading Italian Hospital Group

Gruppo San Donato (GSD) is the largest Italian private hospital group. With 5300 doctors, 5500 beds, 7600 nurses & care-workers GSD treats over 4.7 million patients per year. GSD's medical excellence stems from its unique approach defined by the combination of clinical activity, higher education and scientific research. With this three-dimensional approach GSD is able to provide for the highest degree of expertise, constant development and innovation.

Scientific Research & Innovation

With its 3 research hospitals and 750 ongoing trials, GSD is constantly pushing the boundaries in the medical field by creating new treatments and procedures as well as developing avant-garde medical equipment that do not exist anywhere else in the world.

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GSD's professionals deliver high-quality, focused training to doctors and healthcare professionals in various medical fields, including hospital management accredited courses. For students, San Raffaele Vita-Salute University integrates Philosophy & Psychology courses to the Faculties of Medicine, offering future physicians a global and in-depth understanding of the individual not only physically but also mentally.

International Patient Services

According to Bloomberg's 2019 Indexes, Italy is recognized as the 2nd healthiest country in the world, having the 4th most efficient healthcare system globally. Thus, it is no wonder that GSD attracts patients from around the world seeking specialized medical care not readily available in their home country. Through our International Patients Program you can receive personal assistance throughout every step of your visit; including tailored meal plans, a comfortable and luxurious stay & even personalized tours to the beautiful Italian cities.

Personalized Medical Care

A person's cultural heritage, sentiments and experiences make up a complex entity that GSD considers as a whole. The check-up, diagnosis and treatments are tailored to the patient's personal requirements as to ensure their full comfort, well-being and complete recovery. GSD always puts their patient's well-being first.

International Corporation

AISPO and *Bambini Cardiopatici nel Mondo* are just two of the non-profit organizations that GSD is in partnership with. They share the same goal: delivering & ensuring accessible high-quality healthcare in some of the most underdeveloped & difficult to access areas of the planet. Together, they help underprivileged communities with hospital constructions, renovations as well as providing high-quality equipment. Thanks to its clinical know-how, GSD provides local staff training & scholarships in order to advance healthcare delivery and save lives.



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Leading from the front

Interview with Leader Healthcare Saudi Arabia's CEO Jamal Al-Showaikhat

By Daily Dose Staff

Today, a healthcare sector upgrade is recurring for most GCC countries. A lot of them are already in the process of revamping the system, preparing it for attracting investments and allowing healthy competition from the private sector. In the Kingdom of Saudi Arabia (KSA) overall, the private sector contribution to total healthcare spend currently stands at 25 per cent, which the National Transformation Programme (NTP) targets to raise to 35 per cent by 2020. Another recent trend that has emerged in the KSA is the focus of the Ministry of Health on having dedicated training centres inside every hospital. In an interview with Arab Health, Leader Healthcare Saudi Arabia's CEO Jamal Al-Showaikhat said: "I believe in the coming 10 years Saudi Arabia will drive the world in terms of simulation". Excerpts:

What do you think is driving the healthcare industry forward in Saudi Arabia?

Saudi Arabia is one of the biggest countries in the region. The government pays a lot of attention to healthcare. In fact, the second most important budget allocated in the government is for the health sector. I recently read an article that highlighted that by 2030 the total investment in the healthcare sector in the country is going to be more than US\$100 billion. Today, many medical centres and cities are being formed in the country. Another important topic that the Ministry of Health is focusing on is that every hospital in Saudi Arabia is being asked to have their own training centre inside the hospital. I reiterate that



Jamal Al-Showaikhat

in the coming 10 years Saudi Arabia will drive the world in terms of simulation.

Recently, Saudi Arabia's Minister of Health Dr. Tawfiq bin Fawzan Al-Rabiah inaugurated the Saudi Health Simulation Conference in Riyadh. Leader Healthcare was a Platinum Sponsor of the event because we believe that simulation is going to be a new era in the medical field in the coming years.

What would you say is the impact of healthcare simulation in healthcare in Saudi Arabia?

The impact of AI in the medical field is huge. For example, in simulation today, we see doctors, nurses, or people working in the medical field being trained in the new techniques through innovative devices. Another trending topic is that in many of the schools and colleges in Saudi Arabia, Leader Healthcare is leading the industry in driving this change of training and diversifying the accredited

programmes. We are implementing these projects in many universities where we can integrate the latest in technology.

Today, surgeries have become the only solution for different pathologies and complex cases. Therefore, it has become more critical to have surgeons that are well educated and trained on the "Cut Suit", a realistic way to simulate the look, feel, and smell effects of severe traumatic events on a live human casualty while allowing first respondents and physicians to safely perform real procedures – from the point of injury to treatment en route, and transition of care to surgical intervention. Trainees of surgery at most surgical residency programmes are usually under a lot of pressure to perform quick and efficient treatment to the injured individuals at an incident scene, as a life will directly depend on their performance and quick response. The Cut Suit offered by Leader Healthcare meets the various training needs, starting from psychological and emotional pressure, training the student's psychomotor skills and achieving excellence in performing rescue tasks in a timely manner.

Another important innovation that we have today is virtual reality where we can get people trained in their daily environments and where they can practice their various medical scenarios safely. For instance, scenarios from different site locations and incidents can be brought into your facility for the purpose of training. Furthermore, our team travels all over the world to procure and bring new technology to the region such as the Interactive Immersive Classroom.

We are working on saving more lives through

emergency medical training and also focus on wellness, beauty and lifestyle changes. We take complete care in understanding the latest market trends and providing clients with new surgical and diagnostic equipment devices for usage in areas such as Emergency rooms/Operating rooms, Ophthalmology, ENT, Aesthetic Dermatology, Plastic Surgery, Orthopaedic, models for simulation-based medical education and general home healthcare department.

How important is it for you to be present at Arab Health?

Our booth at Arab Health is one of the largest and also the Platinum Sponsors which highlights the importance of the show for us. We invite a number of delegates to attend this event from all over the World and make sure they have the best experience of the Arab Hospitality. The team makes sure to bring together all partners from leading innovations to the booth and we achieve to be known as a "one-stop solution provider".

What products will you be showcasing at Arab Health 2020? Could you shed light on your future plans?

That is to be witnessed as we have something very exciting this year! Leader Healthcare is an international brand with presence all over the GCC, South Asia and APAC. We are also looking forward to expanding more in the other Middle Eastern regions such as Egypt and Iraq.

Visit Leader Healthcare at stands PZ.K30, H4.F10, H4.F30.

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Evolucare Technologies presents high-performance solutions

Article provided by Evolucare Technologies

In 1988, EVOLUCARE Technologies is a French Healthcare IT company, leader in the development of medical information systems. The Group is offering a wide range of services satisfying the clinical, operational and financial needs of all healthcare institutions and facilities.

A dual ambition for Evolucare: Artificial intelligence and the international market

The Group serves nearly 4,500 healthcare institutions, mostly in France, and has now the strategic aim of extending its reach to the international market. Drawing on its expertise in managing patient data and organizing care, Evolucare recently began the shift towards open innovation in digital health, especially AI and IoT, to add decision-making assistance services to its initial range through the use of intelligent algorithms.

For its 5th appearance at the show, Evolucare will be presenting three of its new innovative solutions:

- **The HopitalWeb solution:** A modular, web-based EHR system covering the whole patient workflow in hospital, clinics and outpatient centers. This feature-rich and highly configurable system offers a wide range of functionalities going from online appointment-scheduling to care management, OR and anesthesia management, pharmacy and stock management, administrative and HR management. Other modules such as stretcher-bearing, home care, meal management, etc. are also embedded.
- **The OphtAI – Ophcare ophthalmology solution,** born after three years of research

in artificial intelligence, enables automated screening for diabetic retinopathy, and soon other eye diseases – AMD and Glaucoma. This algorithm, ranked one of the most efficient algorithms in the world and winner of several awards, is paving the way for mass real-time, low-cost, and better-quality screening of retinal diseases, to which patients will enjoy easier and more equitable access.

• **The RIS imaging platform** (Radiologic Information System) – PACS (Picture Archiving and Communication System) is a seamless web integrated imaging platform offering to all radiological departments and centers a wide range of cutting-edge functionalities.

Hadi Zarzour, the Group Area Manager of Evolucare, explains: "Over the last few years, our management has made it the priority to speed up our international growth. Our teams work in different geographical zones and operate in cooperation with organizations and experts in international expansion. Our strategy is premised on the skills transfer to local partners to create skills centers and, through them, meet the needs of every market in an optimal manner. Our product range is tailored to each segment and compliant with all relevant standards and regulations".

Regarding the Emirates, he added: "We are in the process of building partnerships to promote our artificial intelligence products and our web HER and Imaging platforms".

Visit Evolucare at the France Pavilion organized by Business France at stand Z2K36.

How is Malaffi transforming patient lives through connected healthcare systems?

Article provided by Malaffi

Technology has an impact on all our lives: from how we consume food, shop, and interact with one another.

For the healthcare sector, technology is helping people beyond convenience, it is helping save lives.

One way it does so is by utilising the abundance of data in the form of patient health information to empower providers and patients to make better-informed healthcare decisions. This ultimately has an impact on improving patient experience, outcomes and efficiencies. Understanding this, Malaffi, the region's first Health Information Exchange (HIE) platform, was launched in the Emirate of Abu Dhabi in 2019; established as part of the strategic priorities of the Department of Health – Abu Dhabi.

Malaffi allows providers from across Abu Dhabi to electronically, safely and securely exchange and access crucial patient information accessible in real-time. Reducing information-sourcing admin, this allows medical providers to focus more of their time on treating and healing their patients; resulting in the delivery of better-quality healthcare and improved patient outcomes. Ultimately, Malaffi places patients at the heart of care.

Enhancing the patient experience

During their healthcare journey, patients often undertake unnecessary tests, multiple doctor visits and repeat procedures for the same health issue. This is often due to the non-availability of past patient health information, such as test results or diagnoses – all of which are not shared between healthcare providers and remain inaccessible to the attending doctor and care team.

Through Malaffi, patients can rest assured that their provider has all their necessary health information, which will ultimately reduce any inconvenience for patients and their loved ones. Crucially and importantly this significantly improves their patient experience.

Malaffi will reduce the unnecessary duplication of services and the amount of time doctors and care teams spend on administrative tasks to source important patient information from other healthcare providers. It will improve patient safety by reducing medication errors; enhance patient journeys. By ensuring providers have access to key patient health information, they will be able to best coordinate care. This is especially important



for those with chronic or malignant diseases who need to see multiple doctors on a regular basis.

Providing better patient outcomes

Through Malaffi, each patient in Abu Dhabi will have a unified medical file. This file will bring together patient data, including medication, allergies, laboratory and radiology results, procedures and more. Every time a patient seeks medical support – from consultation to emergency treatment – their Malaffi file will be updated in real-time to facilitate faster and better-informed decisions and more reliable diagnoses. With 80% of serious medical errors involving miscommunication between healthcare providers during the transfer of patients from one provider to the next, healthcare providers will now have instant access to all the health information they need which can reduce misdiagnosis.

Benefits of Malaffi

- Dr. Gareth Goodier, Group Chief Executive Officer, SEHA, said: "This initiative will bring enormous benefits for our patients. As Malaffi evolves to onboard more providers and include more clinical information, we anticipate increased efficiencies within the healthcare sector over the coming years."
- David Hadley, CEO of Mediclinic Middle East, said: "Mediclinic Middle East is happy to join Malaffi, as a strategic priority of the Department of Health - Abu Dhabi. Following its implementation, Abu Dhabi will benefit from a more efficient healthcare system through the resulting reduction in medication errors and duplicate tests, as well as the introduction of emirate-wide health initiatives made possible by the centralisation of information."

Heightened data protection

Patient privacy and the security of digital health information are top priorities for the Department of Health - Abu Dhabi and Malaffi. By connecting the electronic medical records (EMR) systems of all providers in Abu Dhabi, Malaffi and providers adhere to the strict government rules and regulations around data protection and patient rights, and must comply with Emirate and federal health privacy laws that protect patient health information. These include different measures, such as ensuring that only authorised users can access patient data, and that data is encrypted and exchanged over a secure network. This ensures that a standard for the security and protection of personal health information and privacy is upheld.

Placing patients at the centre of care

To help patients better manage their health, in 2020 Malaffi will be launching a patient mobile application. As soon as they download the app, patients will have their own medical information at their fingertips. With 55% of all medical malpractice cases due to miscommunication that happens between a provider and a patient, this patient app will facilitate better communication and allow patients to be more fully engaged in their care. Patients can check their Malaffi file anytime and anywhere through the app, which also supports prevention and early detection of illnesses; in addition to providing peace of mind for them and their families. This reassures them that they are receiving the best possible care, anywhere – and at any time – in Abu Dhabi.

Not only does Malaffi deliver a variety of benefits for everyone, but also assists in improving healthcare for the whole population. It does so by providing invaluable information to the Department of Health - Abu Dhabi to help monitor the quality of care, launch health awareness and prevention programmes; and identify public health risks.

References available on request.

To learn more about Malaffi, visit the DOH stand (Hall 5, Booth H5.B10).

USA pavilion showcases a wide range of products

Article provided by Kallman

If the annual Arab Health expo reflects the state of the health and medical industry in the Middle East and North Africa (MENA), U.S. exhibitors at this year's show exemplify America's leading role as one of the region's top suppliers.

As Arab Health unveils its new sectorized floorplan to visitors tomorrow, the United States will be prominently represented in all eight of the show's newly designated market sectors with nearly 350 exhibitors — approaching 10% of the total 4,250 participating — showcasing thousands of innovative equipment, device, product and service solutions.

The UAE has been the top U.S. export market in the MENA region for the past 10 years and a critical regional hub for 1,500 American companies

doing business throughout the Middle East, Africa and South Asia, according to the U.S. Commercial Service, the trade promotion arm of the United States Department of Commerce. The perennially strong U.S. presence at Arab Health is a clear indication of how important the MENA region is to the American health and medical industry, and that countries across the region are looking for innovative U.S. partners to further their progress and ambitions, such as the UAE's Vision 2021 goal "to achieve a world-class healthcare system."

"The United States is the largest, most competitive healthcare market in the world. Propelled by the ongoing quest for better ways to diagnose and treat medical problems, U.S.

companies offer an unmatched array of proven solutions that reduce provider costs and improve the patient experience," said U.S. Ambassador to the UAE, John Rakolta, Jr. "American companies remain the leading drivers of technology and inspiration as the industry continuously adapts to this rapidly shifting marketplace."

The centerpiece of America's presence at Arab Health is the USA Partnership Pavilion, organized since 1993 by Kallman Worldwide, Inc., the show's official U.S. representative, in coordination with government agencies, including the departments of Commerce and State.

Comprised of more than 3,100 total sqm in Halls 1, 6, Saed 1 and 2, Za'abeel 5 and Rashid

Hall, the Pavilion is America's headquarters on-site: an efficient location for buyers to meet more U.S. suppliers, a high-profile showcase for American exhibitors looking to maximize their exposure and impact at the event, and a forum for all to share ideas and insights.

The Pavilion features almost 300 exhibitors representing 31 states, including 72 presenting for the first time at Arab Health. Notably 10 state departments of economic development and commerce — California, Florida, Georgia, Illinois, Maryland, Michigan, Minnesota, Missouri, North Carolina and Virginia — are hosting their own state-branded pavilions featuring state-based co-exhibitors within the larger USA space.

Where can Deep Learning take us?

By Dr. Chris Bates, Director of Research and Analytics, TPP



The promise of Artificial Intelligence in healthcare is continuing its rapid growth throughout the industry. Amongst all the hype, there remains a sense of hope that AI technology will make a significant impact in medicine. There are some striking examples of progress, for example, in radiology, in disease prevention, and in drug discovery. However, there are also some questionable claims. The lack of clarity around what AI is does not help with understanding about both the possibilities and the potential misgivings. This is true for the clinical community and for the public. How do we distinguish between advanced science and soundbites of the latest trend?

In order to start to answer this question, we need to define what AI is and isn't. So, what's the definition we should work with? Well, the original is still the best, when talking about healthcare. In 1955, John McCarthy organised a conference at Dartmouth College, New Hampshire. His aim was to develop ideas about thinking machines, for which McCarthy coined a new term, "Artificial Intelligence". The choice of term was deliberate; it perfectly encapsulated the aim of the new field but was broad enough to cover the many different approaches they discussed. The conference is now widely acknowledged as the birthplace of AI. Amongst the attendees was Claude Shannon, the father of information theory. Without his work there would be no internet. In digital health, Shannon's legacy extends across cryptography, data compression, biology, and genetics. The conference worked with the following definition: "For the present purpose, the artificial intelligence problem is taken to be that of making a machine behave in ways that would be called intelligent if a human were so behaving."

Its brilliance is in its simplicity. It takes us away from thoughts about robotics and cybernetics – still many people's first reaction to questions about AI – and moves us to thinking about tasks. If a machine can perform a task that would require intelligence if a person were doing it, then it's AI. If that task is playing high-level chess, it's AI. If the task is safely driving a car, it's AI. If it's suggesting differential diagnoses from a patient's presenting symptoms, it's AI.

Thinking this way leads us to a diverse and complex landscape for AI technology. There are different problems to consider – understanding language, image recognition, finding patterns in data, and improving logistics, for example. There are also different technical approaches – knowledge-based, probability-based, logic-based, and machine learning; and it is a landscape that is still evolving.

Unleashing the power of Deep Learning

Most of the major breakthroughs in AI over the last few years have been due to a single approach: Deep Learning. The concept of Deep Learning was first introduced in the 1980's but the core technology that underpins it was discovered decades before that. It's recently undergone a

revolution. Deep Learning has enabled self-driving cars, speech recognition, and smart web services. It has impacted almost every industry, from finance to defence, and is the reason that Google DeepMind's AlphaZero algorithm can now beat all human competition at the Chinese game of Go, something experts previously believed was over 50 years away. Deep Learning remains the fast-growing field in AI.

If the idea is decades old, then what sparked the Deep Learning revolution? In short, mathematics, computational power, and data. During the late 1980's a major new technique was discovered that unleashed the power of Deep Learning, albeit restricted at the time by a lack of data and low computational power. Of course, no more needs to be said about the explosion of Big Data, but the final piece of the jigsaw comes, surprisingly, from video game consoles. The mathematics needed for great computer graphics is the same mathematics needed to power Deep Learning algorithms – it's the calculations with matrices you might remember from high-school algebra. The development of graphical processing units, to power Fortnite and Mario Kart, inadvertently triggered an AI revolution.

In medicine, Deep Learning is certainly showing its value, swiftly infiltrating many areas within the industry. A major focus has been on medical imaging. Research teams across the world have developed algorithms for helping to detect diabetic retinopathy, pneumonia, breast cancer, and even to grade cardiovascular disease risk. These algorithms work solely on medical images and are backed up by impressive statistics. Radiology will be the first medical profession whose workflow is radically enhanced by AI.

It's reasonable to ask why the focus has been on medical imaging. Firstly, it's important; medical imaging is a key part of many diagnostic pathways, certainly for some serious, acute conditions. Secondly, intelligent image recognition spans many different industries, with many research teams working in this area. Thirdly, Deep Learning lives and dies by the data it can train on. Take a look at the United States;

for every 100 Medicare recipients over 65 years of age, there are over 50 CT scans, 50 ultrasounds, 15 MRIs and 10 PET scans, per year. Every year. It's an extraordinary amount of testing – most of which is almost certainly unnecessary – but it yields an extraordinary amount of data. If you're working in a healthcare AI team using data from the United States, then medical imaging is almost certainly one of your major projects.

For most of the world though, carrying out imaging at this scale isn't an option (nor is it really desirable). For predictive risk and early detection, it would amount to bringing in routine medical imaging, carrying a significant price tag. It would be a set of new public health screening campaigns, accompanied by complexities of patient safety and effectiveness.

For AI to have an achievable, sustainable, worldwide impact in healthcare, we need a different approach. We need to use the data held in electronic health records. In some countries there are already comprehensive, sophisticated records available, but this is seldom the case. The problem is often that the data is fragmented and can be of poor quality. To create the data sets for Deep Learning the data silos need to be broken; interoperability and FHIR-based standards are key. To get high-quality, coded, granular data, advanced terminologies like SNOMED CT are crucial. Improving the digital record infrastructure in hospitals, clinics, and across primary care, should be a core component of every country's healthcare AI strategy.

The rise of smartphone ownership has also presented a new opportunity for detailed personal data collection. This includes data recorded in personal health records, as well as continuous data collection from wearable devices. Linking this with electronic health records yields a compelling data set. Symptoms, signs, tests, medication, diagnoses, procedures, immunisations, contacts, discharges, lifestyle factors, pollution levels, social stability, financial security, and social deprivation. It doesn't take much to be convinced that this data is invaluable for both population health and personalised care pathways. It is also a data set that Deep Learning thrives on.



To progress with this approach, it's vital to frame the exact problems we want to solve; the tasks we want to use Deep Learning for. This is a key part of clinical engagement. AI needs to bring genuine benefits to doctors and nurses, benefits that can be clearly realised in day to day practice. Only by working with clinical staff can we implement complex algorithms as part of simple, clean workflow.

As an example, take the problem of early detection of undiagnosed ovarian cancer in primary care. It's a difficult task, but if a diagnosis is missed, or delayed, it can have serious consequences. Most family physicians will see five or six cases across their entire career. The condition presents with symptoms that have many other plausible diagnoses, many of which are far more common.

Advanced clinical decision support for early cancer detection is high on the priority list for many people, from prime ministers, to charities, to patients. Deep Learning algorithms, derived from the data in comprehensive electronic health records, can help. The algorithms have solid predictive capabilities, effectively crowd-sourcing the experience of hundreds of thousands of physicians. They behave intelligently on a complex task. However, working closely with family physicians on the implementation of these algorithms is essential. For example, early indications have shown that physicians favour a retrospective approach to these warnings – at the end of the day – rather than more in-consultation pop-ups and alert fatigue.

Deep Learning has also uncovered distinct clusters of diabetic patients from health record data, clusters of people at different stages of disease progression. Even better, our analysis has pointed to more personalised biochemical targets for these patients, to minimise the risk of future diabetic complications. These are just two examples; we can use this approach for many tasks in medicine, both operational and clinical.

There are of course many other aspects to consider. Ethics and governance play an absolutely central role, whatever the approach to AI. There must be the right consent models in place, strong anonymisation standards, and appropriate publicity. Establishing trust is key. We have also seen how important it is to remain cognisant of local epidemiology, local service provision, and potential bias against gender, ethnicity, and social factors. We cannot forget core scientific principles and must provide a clear evidence-base for our developments. It is also essential to track progress from the research lab into clinical practice, gathering evidence along the way.

Returning to our earlier definition, we need to concentrate on the tasks where AI can enhance healthcare by behaving intelligently. This is not about AI replacing physicians and won't be for the foreseeable future; it's about helping. There are pressures on all health systems, both financial and operational. There are significant workforce shortages and skills problems in many parts of the world. The position was beautifully summarised by Antonio Di Ieva, writing recently in the Lancet: "Machines will not replace physicians, but physicians using AI will soon replace those not using it."

If implemented properly, AI technology can increase precious face-to-face contact time between physicians and patients. It is never influenced by availability bias, confirmation bias, or fatigue. The solutions we put in place need to be focused on specific tasks that will bring benefit to those on the healthcare frontline. This is a make-or-break year for AI in healthcare. It's time to start delivering on the promise.

Bates will be speaking on 'Digital infrastructure for a 21st century workforce' at the Healthcare infrastructure forum at 11am.

The new frontiers in medicine

By Professor Mayur Lakhani CBE PRCGP FRCP FRCPE SFFMLM DCH, Immediate Past President of the Royal College of GPs, Chair of the Faculty of Medical Leadership and Management, and Practising GP, United Kingdom

I want to begin by thanking everyone for working in the healthcare sector and for their hard work. People are working under challenging conditions doing their best to deliver high-quality care for their patients. The world we are in is volatile, uncertain, ambiguous, and complex (VUCA), which makes us feel unsettled whether we are doctors, nurses, therapists, managers, or patients. However, this also presents opportunities that must be seized. After all, no one can be happy with the quality of care at the current time: citizens, payers, or physicians.

Some nations have a fractured healthcare system with variable quality and rising costs. There are systemic issues with increasing demand from a tsunami of long-term conditions, an ageing population, rising costs, and the requirement for better value. Moreover, there is a rise in consumerism with discerning and empowered patients whose legitimate needs need to be met.

Moreover, there are significant patient safety issues, such as antimicrobial resistance. The scourge of modern medicine is over-diagnosis, over-investigation, lifestyle diseases such as obesity and polypharmacy. There is a reliance on super-specialisation, which, while providing brilliant care for individual patients with single conditions, does not meet the holistic needs of people or the public health challenges of global non-communicable diseases and multimorbidity. The medical profession itself is changing, wanting more autonomy, flexible working, and control of workload to deal with the damaging effects of burnout

Medicine is an unhappy place right now. So how does healthcare evolve to meet the legitimate needs of citizens? Solutions are available with



new models of care that allow generalists and specialists to work together to provide high quality and safe, integrated care. Critical to this is an engaged and confident workforce that can lead and shape future health and care with a focus on wellbeing.

There are no simple answers but change and improvement are distinctly possible! It is possible to 'bend the curve.' The secret to success is leadership from doctors to drive forward transformation by pursuing a progressive, innovative patient-centered agenda. Conferences like Arab Health allow us to reimagine healthcare.

There are five critical components of reimagined healthcare, which I am calling the new frontiers that must be embraced. Firstly, the systematic and disruptive introduction of technology and artificial intelligence to support – not replace – doctors and nurses, especially in light of the global workforce shortage. Second, a big- data approach – including

genomics to help predictive and personalised medicine. Thirdly to reverse the power balance in medicine from doctors to patients – the concept of empowered activated patients' experts in self-care and self-management – 'the patient will see you now doctor'! Fourthly, a relentless focus on universal primary healthcare, including the wider social determinants of health. Finally, a joined-up, connected system of healthcare where generalists and specialists' providers work together seamlessly to focus on clinical excellence and outcomes – the focus being on teams and systems rather than individuals.

Research has clearly shown that countries with well-developed primary care healthcare systems have much better outcomes and patient satisfaction. Being a GP/family doctor is probably the hardest specialism in medicine. It is not an easy role, e.g., differentiating a viral illness from meningitis or migraine from a brain tumour

or panic attacks from pulmonary disease. This requires formal training to build confidence in being a family doctor.

The WHO Alma Ata Declaration in 1978 committed to the adoption of universal primary healthcare and the importance of the social determinants of health such as sanitation, housing, education, and employment. The challenge still holds and was reconfirmed in the Almaty declaration of 2018. Underpinning all five components is the need for good governance, ethics, and collaboration. We can only earn the trust of people, patients, society, and governments by demonstrating high standards of practice with accountability. And by being kind, compassionate, and courageous.

I am confident about the future. Positive change is already happening in many parts of the world. We are in an age of progress with the advent of digital and genomic innovation and people-power. I have met many inspirational medical leaders and managers who have a vision for better sustainable healthcare. But we can all do something to help and play our part. Lots of small changes can lead to significant improvements in outcomes.

Please follow my three-point plan: Be the best doctor you can be; be on the side of patients; be a leader by shaping the future. In this way, we can get Happy Doctors, Happy Patients,

Prof. Lakhani will be giving the keynote address on 'Mastering the art of general practice' and will be speaking on 'Top tips on having difficult conversations on palliative and end of life care: How long have I got doc?' as part of the Primary Conference at 15:00.



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