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Digital disruption

Arab Health 2019 recently concluded a super successful edition and generated total business worth US\$824 million. The theme of the event 'Innovation' was at the forefront of the exhibition allowing attendees to explore and immerse themselves in the latest healthcare technologies.

This digital disruption is visible all throughout the sector in the region. Frost & Sullivan (pg14) highlights that the UAE and Saudi Arabia have been leading the rollout of Artificial Intelligence (AI) in the region. Technologies such as chatbots (pg16), immersive media (pg20) and innovations in inventory management (pg22), are fast gaining traction all across the Middle East.

Furthermore, in our annual Paediatrics Special Report (pg25) we highlight the wave of technological innovation that has been impacting and improving paediatric care. We also feature leading hospitals in the U.S. and their case studies that are paving the way for change in paediatric care.

Lastly, Africa Health 2019 (pg40) is all set to take place from May 28 to 30 at Gallagher Convention Centre, Johannesburg, South Africa, and will be shining a light on all the exciting developments transforming healthcare in the continent. For instance, Bolatito Ovio, a speaker at the Africa Health Conference discusses the data challenges plaguing the continent's healthcare institutions (pg54) and shares possible solutions to tackle the problem head-on.

We hope you enjoy reading this issue and look forward to welcoming you at Africa Health 2019. Also, wish you all *Ramadan Kareem!*

Deepa Narwani



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Arab Health 2019 Generates Business Worth US\$824 Million

By Deepa Narwani, Editor

The recently concluded edition of Arab Health Exhibition & Congress generated business worth a whopping US\$824 million, according to a GRS Explori Survey. Organised by Informa Healthcare, the 44th edition of the event took place between 28-31 January at the Dubai World Trade Centre and is one of the largest healthcare events in the MENA region. Under the theme of 'Innovation', the highly successful edition of the event showcased the latest technological advances in medical equipment and devices.

Arab Health 2019 welcomed more than 4,262 exhibitors, 64 exhibiting countries, 37 country pavilions, 5,328 delegates, 84,700 visitors, with 159 countries represented, and 106,972 professional visits, across the four days of the show.

The GRS Explori Survey further found that 97 per cent of exhibitors rated Arab Health as an important platform for their business, 93 per cent were overall satisfied with the exhibition, 84 per cent will be exhibiting again next year, and 82 per cent of overall exhibitors have exhibited before. Major decision-makers right from owners/board directors/chairmen, senior managers, directors, vice presidents, executives, and senior government officials, were all present at the show, making key purchases for their businesses.

The Arab Health Congress continued its streak of attracting renowned speakers from around the world who delivered the highest quality programme of 11 Continuing Medical Education (CME) accredited conferences to local and international

medical professionals.

The event also hosted the first ever 'Innovation Hub', working alongside government entities such as the UAE Ministry of Health and Prevention, Dubai Health Authority (DHA), Department of Health Abu Dhabi and SEHA. The hub gave an opportunity for attendees to immerse themselves in the latest healthcare innovations and explore technologies including Artificial Intelligence (AI), disease management and home care devices, mobile device accessories, telemedicine platforms, among other breakthrough advancements.

The Innovation Hub was also the platform for the inaugural Innov8 Talks. It included daily free-to-attend talks with discussions led by keynote speakers and hosted a series of pitch sessions for some of the world's most creative and forward-thinking healthcare start-ups and SMEs to share and sell their ideas to an esteemed panel of judges.

Bringing data to life

At Arab Health, GE Healthcare was looking at how to partner with the public and private sector in the region in order to elevate healthcare and to help provide solutions be it technology, or non-technology solutions that deliver better outcomes. Mohie El Rafey, Chief Marketing Officer, Eastern Growth Markets, GE Healthcare, highlighted that it could be clinical, financial or operational outcomes, but ultimately outcomes that deliver better patient care.

On the sidelines of the show, he told *Arab Health Magazine*: "Healthcare globally as well as in the region is undergoing a massive transformation. There are three things causing this transformation. The first thing is data. There is so much data that exists in hospitals, but that data is fragmented and siloed, not structured. What we are doing at GE Healthcare is partnering with hospitals to bring that data to life; bring analytics around it and make it simple and easy for people to utilise. But more importantly, make it timely and bring treatments when it matters the most to patients."

El Rafey explained that the second transformation is the advent of AI. GE Healthcare has a platform called Edison where future applications are developed and embedded into devices, making it smarter and helping it to augment decision-making.

The third transformation, he shared, is around personalised medicine. How does medicine go away from being generic to more personalised? "In the future, treatments are going to be customised for you and this will be through AI enabled smart

diagnostics and smart innovations of therapies or treatments, and whether it is monitored outside the healthcare environment of the hospital to make sure your health is maintained and sustained in the long-term," he concluded.

Spotlight on clinical mobility

For Wayne Miller, Director, EMEA Healthcare Practice, Zebra Technologies, one of the biggest





Robert A. Cascella



Mohie El Rafey



Wayne Miller

challenges in healthcare is that it is a massive employer around the world and therefore Arab Health becomes the perfect platform as it allows for meeting lots of end-users and getting relevant messages across. In Zebra's context, it is clinical mobility.

Miller said: "This year at Arab Health we showcased mobility and how do we mobilise the clinician. That needs two things — a mobile device and digital patient records to do this. When people think about digital, they think about very complex systems, which they are. But they all start with a simple barcode — placing a barcode on patients' wristbands, being able to read that with a clinical smartphone and then going into patient workflows, is the start of digital technology. At the show, we wanted to remind the healthcare sector that it is not as complex as they think."

When asked about the future of clinical mobility, he emphasised: "Currently, clinical mobility is at the early stages of adoption. In a clinical setting, the smartphone has to be healthcare ready, so it's disinfectant-ready, it works the full shift for the nurse, and it's easy to scan. The UAE is a bright light in healthcare in the Middle East. I see a very bright future here and in the region for the adoption of technologies in healthcare. In fact, this region is investing a little bit ahead of what the other regions are doing."

Enhanced patient experience

In line with the theme of the show, Royal Philips displayed a range of its innovative solutions and products. These included the Philips' Ingenia Ambition 1.5T MR, which is the world's first MRI

system to enable helium-free operations. The company also showcased two new ultrasound platforms — one for cardiovascular and the other one for general imaging and obstetrics. An interesting innovation on the floor was its eICU programme, a virtual ICU that can monitor patients in the ICU remotely, so the coverage and standardisation of care across a hospital is much higher. The programme combines predictive analytics, data visualisation, and advanced reporting capabilities to deliver vital information to bedside caregivers.

Robert A. Cascella, CEO Diagnosis and Treatment, Royal Philips, said: "It was a great Arab Health this year. We feel like customer engagement was at the highest level and there were good deal discussions around our solutions businesses. We felt we had a lot of strategic discussions about larger projects that concern all of our products and all of our services.

"Our quadruple aim is that all of our products are designed to improve outcomes, lower the cost of care delivery, take some of the burden away from the staff, and enhance the patient experience. It allows us to create technology that is first time right. So, our customers and partners don't have to keep redoing imaging or interventions."

Arab Health 2020

Arab Health 2020 will take place from 27-30 January at the Dubai World Trade Centre. For the next edition, the exhibition show floor will be split into sectors according to main product categories. The change for the event would be that the exhibitor stands will be located on the show floor according to a particular product category applicable to their business.

The shift is aimed at ensuring better quality leads as the traffic within the halls will definitely surge with the relevant audience interested in the product category. Furthermore, the close proximity of related exhibitors in a hall is bound to increase the number of visitor meetings that can take place in a time frame, when compared to walking through 64,000 plus square metres of exhibition space.

The eight sectors at the show will include — Medical equipment and devices, disposables and consumer goods, imaging and diagnostics, preventive and post-diagnostic treatments, healthcare and general services, healthcare infrastructure and assets, IT systems and solutions, and orthopaedics and physiotherapy/rehabilitation. ✚

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France: A nation at the service of cutting-edge medicine

By Sangeetha Swaroop, Contributing Editor

With 13 Nobel Prizes for medicine awarded to French teams till date and enjoying one of the best life expectancies in the world at 82.8 years (UN, 2018), it is not surprising that health is a serious business that gets a lot of attention in France. This was evident at the recently concluded edition of the Arab Health Exhibition & Congress in Dubai, where more than 140 French

companies – 30 of them marking their debut – presented the very best of French healthcare excellence and innovation to an audience of 84,500 plus healthcare and trade professionals attending the event.

To showcase the exceptional strengths that France enjoys in the medical world to a competitive market and to present a coordinated offer of goods and services on a global platform, the

“French Healthcare” brand was recently launched internationally by Business France, the agency supporting the international development of the French economy, in partnership with the French Healthcare Association. Speaking on the sidelines of Arab Health 2019, Jean-Patrick Lajonchère, Special Advisor for Healthcare Export, explained that “this innovative initiative intends to promote the French vision in terms of worldwide health, and is aimed at bringing together French companies, researchers, and healthcare professionals to jointly promote their activities internationally.”

Innovative initiative

Presenting for the first time at Arab Health under the collective brand ‘French Healthcare’, he adds that the initiative has the ambition to “build momentum through a collective approach so as to boost the influence of French expertise, know-how and technologies in the healthcare industry. French Healthcare is a brand that seeks to promote French assets including its globally recognised public health model, cutting-edge research, and pharmaceutical industry, amongst others.”

Many companies had difficulty in making known to international markets that they were French, but now under the label of the new brand, the identity with France is easily recognisable.

France is renowned as an innovator in the life sciences sector and recently presented an incredibly encouraging success story for a genetic disorder with complete clinical remission of a patient with sickle cell disease with correction of hemolysis and biological hallmarks of the disease.

France, which came out number 1 in a World Health Organization report comparing 191 countries in 2000, is now taking steps to ensure that its healthcare system is more efficient and sustainable for the next 50 years. According to new reforms unveiled in September last year, healthcare spending in France is set to increase by 2.5 per cent in 2019, higher than the original target of 2.3 per cent. This amounts to an additional 400 million euros in a nearly 200-billion-euro budget.

France has a community-based healthcare system consisting of 353,000 healthcare professionals, 3,089 hospitals (1,389 public sector, 691 privately run non-profit hospitals and 1,009 private clinics), France is the top OECD (Organisation for Economic Co-operation and Development, an intergovernmental economic organisation with 36 countries as members) country for access to healthcare and has the lowest remaining balance for healthcare (the amount payable by patients) of any OECD country.

A leader in the Life Sciences

“France’s chief strengths and legacy in the healthcare and life sciences field,” he says, “stems from its formidable network of globally acclaimed medical universities and research institutions that are renowned for their innovation capacity and competitiveness.”

France places clinical research at the heart of the medical profession and four French institutions were counted as the 25 best public research institutions in the world, according to a 2017 ranking by *Reuters*. The depth of innovation in these scientific research centres are reputed for developing cutting-edge medicine which brings new solutions and benefits for people across the world. Amongst its other pioneering feats include the first partial face transplant, the first total face and eyelid transplant and 3D laser-assisted bio-printing of human tissue.

Medical technologies: A dynamic French industry

France also enjoys a solid manufacturing base with a strong culture of re-exportation, he adds, and is imbued with a technology-intensive expertise and a strong capacity for innovation. “The country is ranked 4th in the world and 2nd in Europe in terms of revenues for medical devices and technologies, covering products and equipment in a wide field ranging from syringes and in-vitro diagnostics to MRI scanners, and is 2nd in terms of market size after the U.S.,” he says.

The medical devices sector, he adds, stands out for its three-pronged growth model: innovation / internationalisation / external growth, with exports as the main driver. “According to 2017 statistics, 1,340 medical equipment and facilities providers in France generated €28 billion in revenues and 85,000 jobs in France,” explains Lajonchère. “More than half of these companies conduct R&D. This sector has strong development potential particularly due to continuous innovations, the development of eHealth and its recognised industrial, scientific and medical expertise.”

An interesting characteristic of the medical devices sector in France, he further adds, is that SMEs account for 92 per cent of its companies and growth in this sector is fuelled in large part by export. France exports €8 billion in medical devices per year, with a 5 per cent annual increase in export revenues.

French pharmaceuticals: A high performer and major exporter

Pharmaceuticals is another high-performance sector in France. According to Lajonchère, “The French pharmaceutical industry is constantly evolving

“The country is ranked 4th in the world and 2nd in Europe in terms of revenues for medical devices and technologies, covering products and equipment in a wide field ranging from syringes and in-vitro diagnostics to MRI scanners, and is 2nd in terms of market size after the U.S.”



Jean-Patrick Lajonchère

within an extremely competitive environment and a strongly dynamic context. The quality of its research, its highly-qualified staff, its renowned industrial know-how and ability to adapt to changing market needs have all made France the key player in global pharmaceutical production that it is today.”

France is the 5th largest market in the world and the 2nd largest in Europe for human medicines, he adds. “2016 statistics reveal that revenues from pharmaceuticals exceeded €54.5 billion, nearly half of which were generated by exports. In addition, the dynamic and innovative pharmaceutical industry in France boasts about one of the biggest R&D spends in the French private sector, accounting for 9.8 per cent of revenues of all pharmaceutical companies.” France is home to historical medical industries such as Sanofi and Ipsen, he adds. “Sanofi, for instance, is ranked the 3rd largest healthcare firm in the world and spent €5.5 billion on R&D in 2017.”

However, healthcare in France is not solely about a buoyant research environment, the availability of highly advanced technological devices, or medicines that meet the quality, efficacy and safety criteria required by the most exacting international standards, he asserts. “In France, the provision of healthcare is a national responsibility and is characterised by good access to high-quality care and a growing recognition of patients’ rights. Guided by the motto of the French Republic – liberty, equality and fraternity, the philosophy of French healthcare too mirrors these values. Liberty relates to the fact that you have the freedom to choose where you want to be treated, equality indicates that every individual has the same right to access to health, and as a welfare state, every individual pays for the other in the true spirit of fraternity. Thus, the three cornerstones of the French Republic are also the bedrock of the French healthcare system.”

French Pavilion at Arab Health 2019

The French Pavilion at Arab Health 2019, spread across 1,400 square metres, showcased French expertise in a wide range of fields and sectors and thus attracted large numbers of visitors. From hospital equipment and furniture including medical beds, trolleys, wheelchairs, operating lamps, ergonomic chairs and gynaecological examination chairs to ultrasound diagnostic equipment, sonography equipment, Doppler, endoscopes and radiography units, it was representative of the industry’s latest trends and advancements.

“France’s expertise in prevention, risk management and hygiene in hospitals also took centre-stage at Arab Health this year as French

Healthcare offered solutions in equipment sterilisation and disinfection, air treatment and purification, hospital waste treatment and management, ventilation system and effluent decontamination,” says Lajonchère. “Telemedicine solutions for patient monitoring and transmission of medical information were also in the spotlight at this year’s Arab Health exhibition.”

It is very important for French Healthcare to be at Arab Health, he adds. “This is a special hub for global health and trade professionals, and we value the opportunities it opens for us both in terms of expanding our market share and also in showcasing to the world the innovations in life sciences that has elevated France to emerge as a leader in world healthcare.”

Historically, France has been the leader in clinical research in haematology and cell and gene therapy while several French public research institutions are among *Thomson Reuters* 2016 Top Ten Global Innovators and the leading European health and biotechnology patent owners.

“Today, France is leading the way in new innovations in fertility technology,” says Lajonchère. “It is also funding research into new antibiotics to step up the global fight against antibiotic resistance.”

France also has a high level of expertise in the prevention, diagnosis, treatment, monitoring and education of diabetes care, he adds. “It was the pioneer in the development of artificial pancreas while in the field of oncology, France has one of the highest survival rates in the world.” ✚

Emphasis on digital capabilities

As health ecosystems are constantly adapting to new medical innovative technologies to remain competitive and emerge stronger, so too is France, which has now made health a cornerstone of its US\$1.8 billion Artificial Intelligence strategy. While the move seeks to turn France into a “start-up nation”, it also aims to prevent the scientific brain-drain that the nation is currently witnessing. By stimulating new approaches and rethinking current practices in healthcare, the government’s aim is to encourage and support projects that use new technologies that would eventually improve the quality of care for the benefit of patients.

With its emphasis on research, innovative and technological development, France is working hard to ensure that its healthcare system is not only the pillar of the welfare state but also one that prevents and protects against today’s and tomorrow’s health risks.



“Today, France is leading the way in new innovations in fertility technology,” says Lajonchère. “It is also funding research into new antibiotics to step up the global fight against antibiotic resistance.”



The road to value-based healthcare

By Deepa Narwani, Editor

A recent trend in healthcare has been the increasing shift to a value-based model that is focused on improving the quality of patient outcomes, while enhancing care and implementing initiatives that control costs.

A recent report titled '*Value in Healthcare: Accelerating the Pace of Health System Transformation*' by World Economic Forum, in collaboration with the Boston Consulting Group (BCG), highlighted that in a world characterised by an ageing population, and with more people suffering from long-term chronic disease, and increasing costs, improving healthcare value by delivering better health outcomes to patients at lower costs has become a critical imperative.

In an interview with *Arab Health Magazine*, Jad Bitar, Partner and Managing Director at BCG shared: "Today, we are starting to move away from strictly curative and preventative models to value-based healthcare. It is not only about minimising mortality and keeping you healthy, but about ensuring top outcomes not only as science or the clinicians decide but also factoring in what is important to the patient, and to the least cost possible.

"For instance, I can have a million-dollar treatment for cancer and might save five per cent. But the question is that, am I, with this additional dollar able to have an impact on the most number of people the way they want? Some individuals with cancer would prefer to go into palliative care at home and die peacefully. The opinion of the patient is paramount when you are measuring value; it's not only a clinical perspective that we need to save people at any cost. This is a new concept, which has been around for the last few years."

Bitar explained that what value-based healthcare brings to the table is a major challenge to clinicians and managers in the healthcare system. It is telling them that the way they have been operating is good, but it can be improved. Clinicians have been focused on treating diseases, but now they need to step back and think about the humans in front of them and engage with them.

The report defined value as the health outcomes achieved for defined population segments (for example, all individuals suffering from a particular disease or belonging to a specific risk group) for a given cost. It explained that value-based health system's goal is to improve outcomes and reduce costs through the provision of improved, segment-specific clinical interventions.

He said: "The clinician is no longer the unique pilot, they are co-designing, and we have seen this in the last 10 years. This is known as consumerism in healthcare where patients are becoming more and more involved in defining what they want. Today, physicians need to be ready to engage in a dialogue, and it is one of the important components of value-based healthcare."

The second factor of consideration is for the manager. According to Bitar, they have been focusing on the wrong KPIs, such as how many doctors they have, how many beds and MRI machines they have, etc. The managers tend to focus on, for instance, if the average length of stay has been reduced, but value-based healthcare says that the focus should be on outcomes.

Bitar gave the example of prostate cancer. The factors for consideration should not only be the mortality rate and how many patients survived the procedure, but other factors important to the patient such as the incontinence rate as well; after the treatment, were they able to have a quality life. It's not only about saving lives, it's more than that.

The focus of value-based healthcare is more on quality of life. When you talk about value it is not just in financial terms, but to highlight the value for all the stakeholders – for the system and clinician but for the patient too. However, it is not only about the value and benefits created, but also the cost at which the clinicians and the management are able to deliver this benefit.

According to the report, one critical enabler of value-based healthcare is health informatics – information technology software and systems, as well as methodologies for the collection, management, use and analysis of health data. The report calls for a comprehensive agenda for accelerating the development of global health informatics standards. This agenda includes a call to action for the creation of a "digital health bill of rights" that puts patient empowerment at the centre of informatics standardisation efforts. It also defines approaches for assessing current standardisation initiatives, endorsing emerging standards, developing new use-cases and publishing guidelines for the implementation and adoption of global informatics standards.

He concluded: "In the last few years since the value-based healthcare model has been adopted, we are seeing some very interesting experiments all over the world." ✦

Jad Bitar





Digital health trends in the Middle East

By Takudzwa Musiyarira, Research Analyst, Transformational Health, Frost & Sullivan

In the Middle East, NCDs have been growing in prevalence due to citizens of the region adopting more sedentary, unhealthy and westernised lifestyles.

The increasing burden of non-communicable diseases (NCDs), and an ageing population, is creating a global healthcare crisis. Living longer is associated with increased health challenges, at the cost of high medical care, and putting pressure on the limited resources available. Rising pressure to curtail healthcare costs, while managing these chronic diseases, is becoming a serious concern for governments and health authorities globally.

In the Middle East, NCDs have been growing in prevalence due to citizens of the region adopting more sedentary, unhealthy and westernised lifestyles. According to the International Diabetes Federation, Saudi Arabia and the UAE ranked 10th and 12th respectively in the prevalence of diabetes globally in 2018. As such, it has become more important to track disease trends and monitor chronic patients' adherence to treatment schedules and recovery progress.

Technology is constantly evolving across the globe, adapting to current challenges in a myriad of industries. The healthcare industry has not been immune to this transformation, with medical and digital technologies assisting in the mitigation and prevention of both communicable and NCDs.

Role of AI in augmenting healthcare workflows and decision making

Across all regions in the world, AI-based cognitive technologies are proving to be most useful for drug discovery and research, clinical decision support, and medical imaging and diagnostics capabilities. Key use cases, such as elimination of unnecessary procedures and costs; in-patient care and hospital management; patient data and risk analytics; claims processing; and optimising drug discovery processes, represent more than 80 per cent of the workflow market contribution.

Frost & Sullivan anticipates operationalising AI platforms across select healthcare workflows would result in a 10–15 per cent gain in productivity in the next two to three years. The UAE and Saudi Arabia have been leading the rollout of AI in the region, with a focus on the financial and public sector, particularly in administration, public utilities, and healthcare.

A shift in public policy

By volume, Saudi Arabia is expected to see the majority of benefits of AI; however, the UAE is seeing the bulk of the implementation in the region, with the highest investment and projects per capita. As GCC countries pursue economic diversification

(from oil towards services), the healthcare services industry will emerge as a high growth alternative in the region. Key strategies are being implemented by these countries that aim at improving their technological capabilities through AI.

An example is the UAE, which launched its first AI strategy in October 2017, with the healthcare target being to drastically reduce NCDs and other dangerous diseases by 2031. The country aims to become the global hub for AI and its governance by 2031 and has set up a ministry solely focused on the technology. The Dubai Health Authority (DHA) also introduced a smart home care project in November 2018, which involves patient monitoring as part of its DHA Strategy 2016–2021. This programme ensures home-bound patients can be monitored effectively and efficiently from their homes, without the need to visit the health facility after treatment or a procedure. AI will be useful in mining the data, achieving greater insights through analysis.

Diagnosics through multiple technological solutions

Within healthcare, the sectors which have received much attention from innovators are remote diagnostics and patient consultation. The UAE start-up technology company, Quanterium Blockchain Solutions has been one of the principal innovators in the country, using AI and Big Data, Internet of medical things (IoMT), blockchain, robotics as well as augmented reality (AR) and virtual reality (VR), with solutions such as 3D diagnostics, patient records and other healthcare management platforms. These are in line with the global trends, putting the region as a future leader in this space.

In the wake of rising medical costs, precision diagnostics has thus become more important than ever as it provides personalised care to patients, particularly chronic ones. This means that diseases can be diagnosed more accurately, an effective treatment programme can be put in place, and continuous monitoring of the patient made possible. This essentially improves the quality of care that a patient can ever receive, leading to better health outcomes and increased life expectancy.

Recently, the majority of health technology start-ups in the region have been focused on radiology solutions, with innovators designing various algorithms that use deep learning to interpret medical images, thereby accurately diagnosing diseases such as breast cancer and tuberculosis on X-rays. Global consensus is that these solutions have an accuracy of over 98 per cent and are not prone to errors that can be found with diagnostics through the human eye.

Furthermore, diagnoses can be made within minutes, cutting down on waiting times for the transfer of the captured images to a radiologist in a different location from where the radiological image was captured. With radiologists in short supply in parts of the region and the developing world, this is good news for its overall healthcare vision, expanding opportunities for radiological telemedicine in these countries.

Wearables to improve patient experience

The Middle East's wearables market is expected to grow significantly over the next few years, working with AI to track NCDs and other vital signs. Biosensors embedded within these devices continuously monitor a patient's progress, while building a database of information through Big Data that can be analysed in multiple ways, leading to greater population health insights and better patient management.

With one of the highest prevalence of diabetes in the world, Saudi Arabians can realise massive benefits by curbing growth of the disease through wearables and remote patient monitoring.

Focus on the future

Spanish-based MedLab Media Group (MMG) which created the MedsBla application is working with both the private and public sectors in Saudi Arabia to develop various customised AI solutions using natural language processing. The MedsBla application is an encrypted communication platform for medical professionals using AI to aid their decision making. With over 100,000 users globally since its launch in late 2018, this looks to be a fruitful partnership for Saudi Arabia and the Middle East.

Digital health technologies have been gaining momentum over the past few years and history suggests that exponential growth in the application of technologies such as AI, Big Data, blockchain and IoMT will be seen over the next decade, impacting almost every facet of our lives.

Conclusion

AI has emerged as a key technology applicable to multiple sectors of the economy, and various applications. When combined with other new technologies such as blockchain and IoMT, the expected benefits are exponential. With a significant amount of groundwork and investment put in by Middle Eastern governments and private companies, the region will join the ranks of the top Western countries in healthcare innovation within the next decade. ✚



Takudzwa Musiyarira

AI has emerged as a key technology applicable to multiple sectors of the economy, and has various applications.



Chatbots for healthcare: AI assistants to the rescue

By Steven Stumpf, EdD and Lizette Alvarez, MBA

Chatbots and Artificial Intelligence (AI) can seem complicated especially when trying to figure out how these tools can be applied in healthcare. Nevertheless, chatbots are the simplest pathway for any provider group or healthcare business entity to introduce the new technology into their business processes.

What are chatbots?

Anytime a customer engages with the “person standing by” on a website, and the customer is told to click on the “word balloon” in the corner (to escape wait time) it is highly likely the customer is going to talk to a chatbot. The chatbot is programmed to answer the most common questions for which the customer is seeking an answer. Chatbots replace the “live” customer service agent of past decades with an algorithm; a programme that can be quite simple or quite sophisticated.

“Having one person call one person takes a lot of human capital,” says Dr. Z. Brown of Northwell Health Solutions.

Apply chatbots to any frontline patient interaction

The applications to which chatbots are being assigned is growing and will continue to grow. Here are a few of the popular ideas for deploying chatbots:

- Virtual assistants handle simple, repetitive tasks.
- Chatbots interact with the patient/consumer using keystrokes (from laptop or phone) or voice.
- Chatbots can address each inquiry as a new or familiar inquirers (patients).
- Chatbots work with patients, healthcare centres, insurers and providers.
- Programming can be fairly simple if one uses a platform based upon natural language processing (NLP).

- Chatbot are not apps although a bot can point the inquiring party to an app.
- Chatbots collect information the user and the provider want collected.

Chatbots are one component of my Healthcare Information Technology class. Chatbots are well known to my millennial students who prefer a passive interaction. Accessing information need not have a living breathing person on the other end. When the other end is occupied by an algorithm – like a chatbot – that is even better! A decade or longer of texting and social media has closed the era of “live” conversation. Besides, chatbots can simulate conversation faster than you can say “I have a question.”

Building a chatbot is like planning an important conversation. Suppose you are going to meet with a vendor that wants to talk about fees or referrals or anything else related to business. The information is important. The encounter must be engaging, warm and polite. You want to plan ahead. Identify topics you can expect to come up. Figure how you will respond.

Apply this to a patient encounter. The steps that have preceded every patient encounter for generations are completely predictable. Most can be handled with a chatbot instead of a human.

The chatbot approach covers the same tasks. The headers – intent, action and information - are terms that define steps in building a chatbot.

How to think like a chatbot

The INTENT is the predictable conversation, which the patient will initiate. The ACTION completes the predictable activities that precede and follow the patient visit. The INFORMATION is what gets collected, which describes, summarises and logs the patient visit.

What does every patient want (INTENT)? To easily arrange meetings. Less interaction with the office is better than more. The inquiries which typify many kinds of patient behaviour are dictated by custom. These are predictable encounters.

What does the front desk want (ACTION)? Let the chatbot respond to the patient intention. The chatbot can look up dates and find open time slots. It can confirm to the patient if there have been any changes in employment or insurance coverage. If there has, the bot can fetch this after the phone call and before the appointment; easier when the employer and insurer has AI capabilities. Otherwise the medical assistant will have to make a phone call!

When the medical visit is completed, how are the records populated (INFORMATION)? Information summaries are logged in the EHR. Data can also be texted to the patient’s wearable device or to an email.

“We’re surrounded by work that is being done over

and over by humans that’s not necessarily the best use of their time,” says Greg Johnson, CEO LifeLink.

Can chatbots be warm and fuzzy?

A chatbot can be quite personable. It is all up to the programmer. Warm conversation is also predictable; even seasonal. Greetings change with generations. You may have noticed the standard “openers” or “closers” for commonplace conversations.

Popular warm greetings or sign offs include “I hope you are having a great” or “I hope all is well with you.” If you are going on a trip for business, you will almost receive the warm “safe travels.” Whatever happened to *bon voyage*?

These friendly greetings are easily programmed in a chatbot. We want the chatbot to be familiar, certainly polite, and even nice. Once we get used to engaging with a chatbot we also want it to do more for us! Looking for chatbot is a lot like shopping for any desirable product; shoes, briefcase, vehicle. Relying on chatbots can quickly become habit forming.

A local burger and fried chicken stop in Denver, U.S. implemented a chatbot this month to handle the drive-thru window. “The system takes a lot of friction out of interactions between customers and employees,” the owner said, noting that the AI was designed to sound like an amiable woman’s voice.

Innovative chatbot platform launched in UAE

Medcare, a UAE-based hospital group, recently announced the launch of its new “virtual health assistant” chatbots. The two new health assistants use advanced artificial intelligence (AI) algorithms to learn about the patient in order to personalise responses and give accurate information in real-time.

The health assistants are reportedly the only chatbots in the region that allow the patient to manage all aspects of their appointments online including booking, rescheduling and cancelling, permitted by real-time back-end database integration.

A distinctive feature of the chatbot technology is that it has been humanised to make the health assistants intuitive, patient-centric and patient-friendly. Patients will be able to “talk” to the health assistants and use this new platform throughout their entire healthcare journey. They will also be able to see lab reports online, check insurance coverage and locate the nearest Medcare facility in order to receive timely treatment.

“These friendly greetings are easily programmed in a chatbot. We want the chatbot to be familiar, certainly polite, and even nice. Once we get used to engaging with a chatbot we also want it to do more for us! Looking for chatbot is a lot like shopping for any desirable product; shoes, briefcase, vehicle. Relying on chatbots can quickly become habit forming.”

ANALOGUE / OLD SCHOOL		
INTENT	ACTION	INFORMATION
patient wants routine appointment date	office assistant checks calendar	date and time are found and confirmed
office wishes to remind patient to show up for appointment	office assistant calls patient on phone	speaks with patient or leaves message
patient shows up to check in	office assistant asks for ID, insurance card and credit card	any change in employment or insurance coverage requires a phone call
next routine MD appointment is set, lab orders are printed out	patient makes lab appt and carries referral order to lab	lab findings sent to MD and posted in EHR

CHATBOTS		
INTENT	ACTION	INFORMATION
patient wants routine appointment date	chatbot texts patient; uses calendar fetch to set date	date and time are found and confirmed
office wishes to remind patient to show up for appointment	chatbot texts reminder; asks for confirming reply	chatbot can offer new date on the fly; rule can be set for abusive cancellations, which triggers new bot or phone call!
patient shows up to check in	chatbot handles check in 24 or 48 hours ahead	chatbot collects change data and handle change in employment or insurance coverage via text
next routine MD appointment is set, lab orders are printed out	chatbot coordinates lab appointment with patient schedule; all texting	lab findings sent to MD and patient in 24 hours; MD algorithm uploads data to patient chart

“The AI never gets offended and it will just keep talking to you in a very calm and friendly voice.”

Employees that are commonly assigned these repetitive tasks may also appreciate the relief from the routine.

Can a Virtual Assistant (VA) become the perfect employee?

Conversational interaction distinguishes this interactive bot from the earliest “fetch-bots” Siri and Alexa and Google Assistant. The VA handles predictable repetitive questions. The VA can learn from the different ways in which a question is asked. The more the VA chatbot gets a question in a different form the better the bot can become at answering the question. The VA saves time and increases practice efficiency. And time is money.

A chatbot is an algorithm (commands) that can record data on the fly and make a searchable record. The record includes searchable indicators, e.g., timestamp, contact’s address/phone, call length, etc.

What exactly are chatbots? Algorithms make up chatbots. Algorithms are programmes. The greater the number of programmes/algorithms the more complex the chatbot. At the least, chatbots should replace the most simplistic time-consuming redundant tasks.

Also, consider that hardware speed, frequency of use (beyond comprehension), and the growing preference for “more passive, text-based communication” places chatbots in position to replace time intensive, active communication when called upon to respond! Better to respond when we

feel like it; when it is more convenient to the person being prevailed upon.

Chatbots leverage several basic laws of computing that guarantee their proliferation. Computing power and speed is close to becoming limitless. Moore’s Law held that CPU speed would double every two years. Once CPUs are the size of atoms speed will become irrelevant. All speeds will be immediate. Other considerations are the concepts of machine learning and deep learning. The machine learns on its own. This ability makes the chatbot astute. Independence is in the future. Alexa, Siri and Google Assistant learn from frequency of use. Each derives from a database that grows with each interaction. Speed and algorithms are part of the engines driving the AI Assistants.

Ready to welcome the new employee?

Integrating a chatbot into a new or current business model means the “programme” will function as a new employee; rapidly co-existing amongst other technologies becoming commonplace in healthcare; such as mobile apps, remote clinical devices that collect and transmit digital health data, secure clouds and more. Chatbots are attractive to small businesses and the largest powerhouses around the world. Healthcare can deploy the chatbot within a half hour of time and receive the endless benefits other sectors have rapidly seen. Adopt one? It is too simple not to. ✚

References available on request.

“A chatbot is an algorithm (commands) that can record data on the fly and make a searchable record. The record includes searchable indicators, e.g., timestamp, contact’s address/phone, call length, etc.”

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Can Immersive Media support hospitals?

By Jennifer Gombeski, Account Executive, Concept3D


Launching an interactive map with built-in asset tracking – via RFID and beacons or other technology can give staff a hospital-wide view of assets.


Hospitals easily compete with shopping malls and high-rise office buildings in size and number of people, yet hospitals are notoriously more difficult to navigate. With the sheer number of parking lots, entrances, separate and connected buildings, departments, restricted access areas, and individual offices, it can be a serious challenge for patients, guests, and even staff to find their way.

It's easy to understand the inefficiencies of having people get lost – from raising levels of anxiety to the costs of missed appointments – but there are many other implications of a facility that's difficult to navigate.

As digital wayfinding and signage improve and real-time wayfinding is being incorporated through wearables with haptic capability and other apps and hardware, we'll continue to see improvements that will benefit guests, visitors and those who work at a hospital or healthcare campus. Immersive and interactive media is one of these tools, and a powerful one at that. Below I discuss several opportunities for interactive media to support hospitals operations, patients and families.

Asset tracking

When it comes to hospital efficiency, asset tracking is one of the biggest hurdles. Beds, equipment, wheelchairs — much of what's in a hospital is designed to move, which can make asset tracking a serious challenge.

Launching an interactive map with built-in asset tracking — via RFID and beacons or other tech can give staff a hospital-wide view of assets. “Digital twinning” — terminology for the digital version of a physical object — is an approach being used in a host of other industries. With this asset tracking system, not only can staff find the location of items on a desktop or mobile device, but with an interactive map, they can find the fastest and efficient way to get to it and move it to the desired location.

On large campuses with city or private shuttles, transit tracking will provide staff and visitors a live view of where shuttles are, along with actual departure and arrival times for each stop.

Additionally, digital twins can provide data feeds to the map, such as the date and time of last maintenance and battery levels. The system also makes checking inventory much easier, as instead

of spreadsheets, a staff member can look right into a digitised room and see what's there in seconds.

Such a system can certainly improve efficiencies, but it can also improve patient care by making it easier for staff to locate critical items.

The all-important patient experience

The anxiety of a hospital visit is real and navigating a hospital building can add to the level of stress. Once an appointment is scheduled, a lot of this anxiety can be removed by sending the patient and their loved ones an interactive map and/or virtual tour that show the best parking area, entrance, and other areas of their visit.

These immersive experiences can be easily built with virtual tour software that integrates 360-degree images, to give a full experience that's even VR-ready for those with the necessary hardware. Virtual tours are a powerful way to improve your web presence and provide greater peace of mind for patients, who can now "visit" a room or area before ever arriving on site.

Additionally, these tours can also highlight on-site wayfinding, such as colour-coded signs and other marking and signage to look for to help them get to their location.

On-site tools to locate amenities such as the gift shop, dining, wheelchair pick-up points and serene outdoor spaces will make patients feel more comfortable and cared for; the more comfortable visitors are, the better the overall service provided will be.

Staff support and training

Interactive maps help both newly hired staff orienting themselves and long-time staff helping guide someone else, and many hospitals find that their staff is among the most frequent map users.

Being able to navigate the hospital is vital for anyone who will be spending a reasonable amount of time in and between the buildings. Often, hospital staff will take half an hour or more to give new regulars a thorough tour but walking the halls and hearing an explanation only sticks for a few people. After the tour, most people will still be lost for their first few days and can sacrifice a lot of time asking other staff members how to get around.

Interactive maps with integrated virtual tours allow staff members to explore the entire facility as well as the best routes for their particular needs, even before coming to work. So, whether they are seasoned professionals or right out of med school, hospital staff members can plan ahead and eliminate one part of a busy day.

Additionally, interactive media can be used for training purposes, showing staff via desktop or mobile device how best to navigate the hospital/

campus, find supply rooms, and cafeterias, among other training needs.

Energy and facility management

Once floor plans are built into the digital map, there are many additional data tracking tools that can be added to the system. Dynamic maps have the ability to show energy usage data, HVAC maps, construction, closures, routine maintenance loops, and additional facility information, all in one, highly visual hub of information.

With all energy usage and facilities data located in one space, managers can detect and diagnose issues more quickly and efficiently. And real-time video feeds can take them to a specific location, saving them a drive or walk. With data feeds linked into a location-aware system, a hospital can improve its operational costs and efficiencies. By plugging in the right data feeds, a digital map can become a smart-technology hub.

Managing facilities often involves communication to visitors and staff regarding campus happenings that might affect how they get around. This could be maintenance on a particular elevator for one day, or campus construction over several months. In any communication, links to map images that give context will increase efficiency in the messaging.

Safety and security

Hospitals can use maps to provide handicap-safe routes for visitors and patients, by altering the usual navigation services to always take elevators and ramps. Also, map administrators can actively update a map to block off and put warnings on hazardous areas. In that emergency situation, hospitals can have pre-planned routes attached to its map and anyone can have access to that emergency plan if they have a mobile phone.

Digital maps and virtual tours are more than just physical wayfinding tools. They can serve as strategic solutions that help hospitals meet internal goals for efficiency and customer and employee satisfaction. From no longer needing thousands of static maps to asset tracking to fewer missed appointments, dynamic, interactive maps have a significant role to play in the modern hospital. ✚

Oregon Health & Science University's interactive map



Once floor plans are built into the digital map, there are many additional data tracking tools that can be added to the system.

An appetite for inventory innovation in healthcare

Inventory innovation is an attractive option for hospitals seeking ever greater efficiencies

By Dr. Damien Marmion, CEO, Ingenica Solutions

In the past two years, the Dubai Health Authority (DHA) was the first organisation in the UAE to implement the GS1 barcode standards on all pharmaceutical transactions in its hospitals and health centres. Utilising the world's most widely used barcode system helps to minimise possible errors when dispensing medication. Assigning each medicine with a barcode permits the traceability of products at every stage within the healthcare supply chain and helps to eliminate counterfeit medicines, improving patient safety.

Healthcare providers can secure greater benefits through adopting these internationally recognised GS1 barcodes further, and this is certainly the case in hospitals in the UK where it is mandatory to adopt GS1 standards. Hospitals in the UK are demonstrating enormous success, implementing innovative technology, which is providing significant operational efficiencies at a critical time for healthcare. It is this appetite for inventory management and increased back office efficiency that is experiencing an increase and becoming recognised worldwide.

Ingenica Solutions has been instrumental in reshaping the British National Health Service (NHS) supply chain and procurement landscape, delivering successful projects and bringing significant benefits across the NHS; providing solutions to enable track and trace of products, people, and equipment.

The healthcare providers we work with are using our technology to enable the automation of the replenishment process, improve how clinicians, procurement and finance staff work together to choose products and services that are cost effective in the short and long term, and crucially, offer the best outcome for patients. It's encouraging for those involved in healthcare to realise that these benefits are transferrable and replicable across any healthcare organisation, in any country.

In practice

GS1 data standards are used in healthcare to enable the track and tracing of products, caregivers, locations and patients. The impact of utilising



barcoding technology in healthcare is immense, from the clear cost saving and efficiencies, the benefits that are widely recognised, to the lesser talked about but incredibly vital role it plays in supporting better patient safety and saving lives.

Inventory management is one of the pillars of the GS1 programme and really drives change, efficiency and patient safety. So, what's innovative about inventory management in healthcare?

In the past, the management of inventory in hospitals has been achieved through largely manual processes, which essentially involve checking a shelf to see if more is needed to be ordered, frequently only minutes before a planned operation. Hospitals have been highly reliant on manual input or incumbent knowledge, and are therefore expensive to run. Visibility of supplier performance in this common scenario is largely anecdotal from clinicians and so a procurement officer would have little hope of evaluating a supplier's performance over a period of time or within a department, let alone across a hospital or groups of complex hospitals. As a result, a range of informal, person reliant processes and systems emerged.

Hospitals often have many different systems managing various functions of the organisation, and often none of these will use the same data structures or integrate fully with each other. This means that usable data to understand what is happening in the organisation is difficult to patch together. Many of these systems are not built with healthcare management as their core purpose. A good inventory management system will help connect and gather data from a multiplicity of sources of validated data – providing a single robust core of management data from which to base decisions.

Real inventory management is indeed a core enabler to change in healthcare, and improvement to management of the supply chain. In healthcare



though it is far more than that, it is a core enabler to so much more; including improving patient safety, reducing the running costs of a healthcare organisation, and tracking and tracing products.

The implementation of a robust inventory management solution forces good practice in procurement and the adoption of common standard operating processes across an organisation. This opens up a host of possibilities around how a product is bought, replenished and distributed by the organisation; the internal supply chain.

As an example, we may know what supplies hospitals are buying, but do we know what supplies are actually being used? A large percentage of hospital budgets are spent on non-pay goods, which can equate to tens of millions per hospital on goods ranging from a box of tissues to high value medical implants; therefore, understanding what is actually being used is essential.

Impact of inventory management

Innovative inventory management in healthcare has a huge impact on value, not just costs, which is crucial at a time when healthcare providers across the world must maintain a constant eye on spend. Procurement has been subject to enormous scrutiny and attention, and hence new, better ways of working are now rapidly being adopted.

Overhauling inefficient tools as addressed earlier, and adopting processes used successfully for many years in the commercial sector can and is, enabling the changes healthcare so desperately needs. However, in a multi-faceted, challenging clinical environment, inventory management is more complex than in the commercial world. Standard finance applications have been shown to be too difficult to adapt to the healthcare inventory management environment, hence the development of dedicated systems.

The benefits of an innovative inventory management system extend across an entire hospital, across all departments: clinical, finance, procurement, ICT, and beyond.

Clinical

- Improves patient safety
 - Enables access to reliable and robust data to make informed decisions
 - Minimises risk of errors
- Releases clinical time back to patient care
 - Reduces clinical time spent on administrative duties

Finance

- Enables strategic financial decisions
 - Enables access to reliable and robust data to facilitate price comparison
- Enables greater financial efficiencies

- Enables understanding of the true cost of patient care
- Determines the real cost drivers across the organisation
- Provides better cost information
 - Reduces man hours on reporting

Procurement

- Improves product visibility and transparency
 - Real time access to status of stock, purchase levels, supplier performance, pricing trends
- Better stock and data management
 - Reduces wastage
 - Reduces inefficiencies

ICT

- Supports the use of GS1 data standards
 - Enables data to be compared, shared and analysed
- Flexible, robust, innovative technology

There are still some hospitals that have no reliable electronic inventory management system, relying on clinical and supply chains team local knowledge to manually create orders; an option that simply cannot support the demands and requirements of hospitals in today's healthcare environment.

The challenges for these organisations are clear; lack of data, lack of visibility and transparency across the supply chain, the cost of over and under-stocking, and wastage. All of which create inefficiencies and have a huge impact on budgets.

Healthcare providers worldwide face the same procurement and supply chain management challenges, and to resolve these common issues, which are often aggravated by inefficient practices, inventory management is core.

For instance, in the UK in recent years, as the benefits are more widely reported, there has been a real change in the value that hospitals place on inventory management. There has been exceptional progress; best practice, which is now actively being shared across the industry, across the world. Greater collaboration is also evident as hospitals work with others to take procurement and supply chain practices to the next level.

There are many well-recognised best examples to cite on inventory management; projects that have saved millions of pounds, projects that have helped return clinical staff to patient care — all projects that are easily replicable by other healthcare providers seeking to reduce spend. The British NHS is certainly a window on the world, and the long-term impact of innovative inventory management is considerable; it delivers value for money across healthcare, worldwide and improves outcomes for patients. ✚



Dr. Damien Marmion



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Special Report: Paediatrics

Paving the way for change in paediatric care

Recurrent Respiratory Papillomatosis: What are we missing?

By Dr. Hazim AlEid, Pediatric Otolaryngologist, Chairman, Department of Surgery, King Fahad Specialist Hospital, Dammam, Kingdom of Saudi Arabia, and Dr. Shatha AlGhamdi, ORL H&N Resident

Recurrent respiratory papillomatosis (RRP) is the most common benign laryngeal tumour in children. It is caused by the human papillomavirus (HPV), in particular low-risk HPV6 and HPV11; aggressiveness varies among patients. RRP has two forms – juvenile onset RRP (JO-RRP) and adult onset RRP (AO-RRP). In this article we will be discussing the JO-RRP.

JO-RRP occurs via vertical transmission during pregnancy or is acquired at birth from an HPV-infected mother; it has a more

aggressive clinical course than AO-RRP; however horizontal transmission can occur in JO-RRP thus sexual abuse should always be considered in pre-adolescent cases.

Derkay et al. estimated an incidence rate of 4.3 per 100,000 in JO-RRP. Key risk factors for JO-RRP include (being the first-born child, having a teenage mother who has genital condylomata and vaginal delivery). Surprisingly, caesarean section was not found to be protective against JO-RRP, however it's indicated on active genital HPV infection.

Children with JO-RRP are often diagnosed around three years of age; correct diagnosis might be delayed for years. Initially, children are treated for asthma, recurrent croup and reflux. JO-RRP can cause airway obstruction, hoarseness, difficulty feeding, and a child initially might present a life-threatening stridor requiring urgent surgical tracheotomy.

Diagnosis is made with clinic based flexible laryngoscopy, and



bronchoscopy to further evaluate the tracheobronchial tree.

The natural history of JO-RRP is very unpredictable and differs from patient to patient, but anecdotal evidence suggests that HPV 11 has more aggressive presentation than HPV 6 in JO-RRP.

Patients often require multiple surgeries in a short amount of time and occasionally adjuvant therapy when surgery is unable to control the disease. The goal of managing these kinds of patients is to achieve adequate airway, improve voice quality and facilitate disease remission.

Traditional management of JO-RRP has been surgical excision in the operating room under general anaesthesia, primarily with potassium-titanyl-phosphate (KTP) lasers or microdebriders, with some surgeons also using CO2 lasers or cold steel instruments.

RRP remains a difficult disease to manage; for the most severe cases of RRP, medical adjuvant therapy is available. It should only be considered if indicated in persistent airway obstruction or can cause great psychological distress despite complete surgical excision.

Treatment options

Cidofovir, is an anti-viral medication, typically injected intralesional in a four to eight-week interval for eight to 10 doses per course. Once the course is completed, often the disease is less extensive or might even go into remission. Cidofovir's main impact is to increase the interval period in between the surgical interventions rather than cure the disease. Finally, cidofovir is known to cause kidney and liver toxicity if systematically used. And intralesional might lead to malignant transformation.

Bevacizumab is an antineoplastic monoclonal antibody that blocks angiogenesis by inhibiting vascular endothelial growth factor A (VEGF-A). It showed synergistic effects when combined with angiolytic lasers (KTP/PDL). It has high reduction rate in recurrence.

While Gardasil is a Quadrivalent HPV vaccine against HPV subtypes (6,11,16,18). Most effective if administered to individuals who have not yet become sexually active. It is recommended to administer it to all boys and girls between 11-12 years of age. It also holds promise to eliminate maternal and paternal reservoir of HPV and lead to a near eradication of RRP caused by HPVs 6 and 11. Long-term results of widespread vaccination have not been established yet.

Interferon therapy is one of the first systemic adjuvant treatments used to manage RRP. The clinical efficacy of IFN therapy in the treatment



of RRP is controversial and despite positive evidence for adjuvant IFN therapy, it is rarely used due to the emergence of intralesional adjuvants, such as cidofovir and bevacizumab, which have fewer local and systemic side effects.

Lastly, RRP is a benign laryngeal neoplasm that has no cure and the mainstay of treatment is to debulk the larynx to achieve a patent airway; the nature of this disease is to recur regardless of the extent of surgery. Therefore, its preferable to leave the disease in the larynx rather than damaging the larynx to achieve a complete resection. Adjuvant medical therapy is meant to decrease the frequency of surgery.

The importance of raising knowledge among healthcare practitioners is not to be underestimated. HPV is classified as a sexually transmitted disease but RRP is not. Therefore, such patients should be dealt with in a non-threatening environment and assured that their privacy will not be violated.

To develop documentation forms to uniformly and objectively collect data from such patients will open up the floor for further advancement in communicating with sexually abused patients and to start calculating data among our society to develop preventive plans and to educate school going children about such diseases. It is also important to understand the mode of transmission and to council teenagers regarding the importance of vaccination in decreasing the chance of JO-RRP. Clinician's should also raise their index of suspicion and report any JO-RRP case; children who have been abuse can't be excluded. ✚

Test donor compatibility right here in Dubai

By Kamakshi Gupta, Dubai Health Authority (DHA)



The introduction of a new sequencing machine to test donor and recipient compatibility prior to transplant means that patients in Dubai who require a transplant will no longer need to go abroad with their potential donors to test compatibility.

The new system not only saves cost, time and enhances patient convenience but also it can be used to check compatibility for a range of transplants from kidney to cord blood and bone marrow.

Dr. Hatim Alabbas, Director of the Dubai Cord Blood and Research Centre (DCBRC) says, “This system is very efficient in detecting organ transplant compatibility compared to its previous versions. Earlier, patients used to travel abroad with many potential donors, usually family members, to check compatibility. This system is the newest version available and is much more effective compared to the earlier versions of testing”.

Dr. Alabbas highlights, “To check compatibility an HLA or Human Leukocyte Antigen process is required. Through this process, matching HLA gene alleles are detected before any organ or bone marrow transplantation. HLA identification and matching is compulsory for organ transplantation between two individuals. Previously, HLA typing low resolution was the system used, now we have the HLA typing high resolution or Next Generation Sequencing system, which is both highly effective as well as cost efficient compared to earlier versions of testing”.

Stem cells: The future of medicine

The DCBRC was established in 2006 and is the only government entity that offers public and private banking of cord blood. The centre has helped facilitate 19 transplantations for patients with conditions such as Leukaemia and Thalassemia. They have 7,000 stem cells stored at the centre

Most of the transplantations especially stem cells’ transplants have been conducted for young children with Thalassemia or Leukaemia. “The success rate has been promising. Most of the stem cells received have been from family members. We conducted stem cell transplantation for a three-

year-old Emirati girl in 2012 from the stem cells received from her brother. Today she is 10, is doing well, and her family advocates the importance of stem cell storage.”

Dr. Alabbas adds, “There has been a rise in awareness about cord blood banking. Presently, more than 80 diseases can be cured with the help of stem cells.”

He says that while there is an increase in awareness about private cord blood banking, public donation of stem cells is still a new concept. “When the cord blood belongs to the same ethnicity there are higher chances of the tissue matching, this means the chances of the body rejecting the transplant is significantly lower. Normally, the success rate of transplant is higher when the cord blood is from the same ethnic group”.

He explains that there are many Arab families in need of cord blood and sometimes the Centre is unable to find a match with the same ethnic group because of the genetic diversity.

“If a family has a history of certain diseases such as cancer, autoimmune diseases and blood disorders, we highly recommend that the mother preserves the stem cells of all her babies. This enhances the chances of getting a donor match in case any of her children need it in future.

“However, mothers who have had past pregnancies but do not have any family history of such diseases can consider public banking of cord blood once they have stored stem cells for their family. Sometimes, mothers who have stored the stem cells for the first two or three deliveries are not interested in storing the stem cells for subsequent deliveries, in such cases we urge them to publicly donate the stem cells instead of letting them get wasted, after all stem cells can save lives.

“Stem cells are the future of medicine. Preserving the stem cell is essential and the cells can be stored for 30 years. It is such a simple procedure, which has in many ways provided a form of health security for families”.

The centre provides a tour for pregnant women and families interested in preserving stem cells for their families or for the purpose of donation. ✚

Focus on preventative care

By Deepa Narwani, Editor

Having a child diagnosed with a chronic illness is a scary and an overwhelming experience for parents. Finding the right doctors, appropriate treatment plans and becoming familiar with the new terminology can often get taxing. However, the numerous advancements in technology have led to breakthrough treatments, with minimum risks to children, giving parents a much-needed peace of mind. Also, clinicians today are giving increasing prominence to preventative care.

In an interview with *Arab Health Magazine*, Dr. Amr El-Zawahry, Paediatric Lead, Women's and Children's Division, King's College Hospital London – Dubai Hills and Assistant Professor of Paediatric, Sharjah University, discussed some of the more frequent paediatric incidents seen in the UAE.

He said: "The most common cases we have seen in the past few months have been asthma, bronchitis, gastroenteritis, allergic reactions, among others. We also get a lot of surgical orthopaedic cases, sometimes two to three times per week."

Dr. El-Zawahry's consultation room is a big hit with the young ones who come in for a check-up! It has colourful cartoon characters plastered on the walls, and the charismatic doctor sometimes puts on a little music, videos, and gives the little ones some sweets, so that they feel comfortable.

When asked about the doubts that parents have when it comes to paediatric care, the doctor shared that they often need reassurance, instructions and education. "The hospital runs breastfeeding, obesity, nutritional, asthma, and allergy campaigns. We get mothers and their babies to come to the hospital and teach them and give instructions. For instance, we have lactation consultants to teach mothers how to feed," he highlighted. "Another issue a parent often worries about is the nutrition and growth of the baby and if there are any defects or abnormalities. They also need to be educated about giving vitamin D, vaccination, and misuse of medication."

Blockchain and Artificial Intelligence has started to be employed effectively in healthcare today, according to the doctor. He cited the example of cardiology, where when a murmur is heard, it can be diagnosed immediately. Also,



Dr. Amr El-Zawahry

the hospital has a Telehealth clinic and provides services such as teleradiology. For example, if you take a CT scan or MRI, within 30 minutes the staff can connect with King's College in London, as the two entities work together closely.

He concluded: "One of the most challenging aspects of my job is patient behaviour, are they and their families satisfied? You can be the most amazing doctor, but do you have the talent to deal with the patient? Today, a mother wants to know everything about the child. She will go to the Internet and ask questions, so a challenging part is to cultivate trust."

Furthermore, EOS imaging, a pioneer of 2D/3D imaging and data solutions for orthopaedics, recently installed the first EOS system in the UAE, at the King's College Hospital – Dubai Hills. The system's Micro Dose option reportedly allows to further reduce the low dose imaging, which is beneficial for children who suffer from chronic conditions such as scoliosis and require regular X-rays for their follow-up treatment. ✚

"Today, a mother wants to know everything about the child. She will go to the Internet and ask questions, so a challenging part is to cultivate trust."

Impact of machine learning on T1D outcomes

Article provided by Children's Mercy Kansas City



Dr. Mark Clements

More than 18,000 new cases of type 1 diabetes (T1D) are diagnosed among young people under age 20 in the U.S. each year, according to the American Diabetes Association. Studies show that poor disease control at any age significantly raises lifetime risk of serious complications, such as heart disease and kidney disease.

Can we predict risk of poor outcomes to begin intervention sooner?

In mid-2017, a project was launched to find out. Children's Mercy Kansas City and Joslin Diabetes Center in Boston teamed up with the machine learning-powered performance improvement company Cyft, Inc. The effort has been funded by the Leona M. and Harry B. Helmsley Charitable Trust. The team began to collect data and find opportunities to deploy machine learning to turn data into useful insights that could be provided to clinical staff at the point of treatment. Leading the effort at Children's Mercy was endocrinologist and Medical Director for the Pediatric Clinical Research Unit, Mark Clements, MD, PhD.

The basics of machine learning

The foundation of the project was machine learning, a set of mathematical tools that make it possible to detect patterns in large collections of data. Machine learning, unlike traditional statistical models, which relies on highly structured discrete data sets, can generate robust insights from a combination of discrete data, such as lab values, and unstructured data, such as free-text notes found throughout electronic health records (EHRs). These models can be used to detect and alert caregivers to opportunities to intervene with patients at risk for near-term deterioration in their health.

Collecting & processing patient data

Dr. Clements and his team developed a three-step process to create parameters for the project.

Step one: Collect data from EHR, diabetes device data, and patient-reported outcomes data dating back to 2012.

- Clinical narratives from all care team members
- Patient-reported outcomes during clinic visits
- Continuous glucose monitor, insulin pump, and glucometer data
- Data from new electronic clinic intake forms that

families complete on tablets

- Discrete data points, such as lab values, disease type and early outcomes

Step two: Define all of the possible characteristics of patients at risk of poor outcomes.

Step three: Sort through all the collected patient data using natural language processing to evaluate 17,500 features and variables that potentially contribute to a risk of deteriorating blood glucose control.

Data reveals opportunities

Of the 17,500 variables, approximately 300 were deemed significant in predicting patients who would have the highest rise in HbA1c in the next 90 days. Based on these predictions, the team is able to implement quality improvement methods to clinical care, offering immediate alternate pathways of care for those at high risk of negative outcomes. The first intervention is currently being piloted at Children's Mercy, as described below.

Predicted rise with telehealth visits

The standard of care is a clinic visit every 90 days. For patients who are predicted to have deteriorating blood sugar levels within the next 90 days, timely intervention is needed, before their next visit. The team reviewed research literature, looking for interventions likely to prevent a significant rise in HbA1c with the least disruption to the current system of care. Telehealth rose to the top of the list.

Published literature suggests that frequent contact with care providers, along with review of diabetes data, leads to better outcomes^{1,2}. The team decided to combine telehealth with more frequent visits. They designed an intervention that offers two to four extra visits between clinic visits, using video technology. The team collected data to build the predictive model that will generate weekly reports on predicted outcomes, so they can review the list of patients and implement the intervention as needed. Providers in the Diabetes Clinic agreed to take on five additional patients predicted to have a rise in HbA1c in the next 90 days.

Once the intervention has been implemented and outcomes are understood, the ultimate goal is to automatically send output from the predictive model directly into the hospital's EHR to provide real-time alerts that pop up within the system. ✚

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Children's Mercy

LOVE WILL.

Liver transplantation for pediatric metabolic diseases

Article provided by
UPMC Children's
Hospital of Pittsburgh

A 7,000-mile journey to UPMC Children's Hospital of Pittsburgh in the U.S. enabled 8-year-old Saleh Al-Sada from a Gulf country to receive the vital organ transplant needed to save his life. Yet the curative solution was always as near to him as his mother.

Young Saleh was suffering from heart failure, a consequence of a rare inherited metabolic disorder. The transplant that would restore his cardiac health involved not the heart, but the liver, and his mother Manal, a viable candidate, stepped forward to provide a portion of her own organ for her son.

Mrs. Al-Sada's gift has enabled Saleh's heart to heal and his metabolic condition to improve, and her own liver function is now fully restored. It is an example of how a living-donor liver transplant can provide a life-saving alternative for young children with serious metabolic conditions.

Metabolic disorder

Saleh and his fraternal twin, Mohammed, who does not have the condition, were born in 2007. Doctors quickly diagnosed Saleh's condition, known as propionic acidemia (PA), a potentially life-threatening disorder that presents quickly in stricken infants through poor feeding, lack of appetite, vomiting, lethargy and weak muscle tone.

As a recessive genetic disorder, PA occurs when a specific faulty gene is inherited from both parents. In people with the condition, the body is unable to break down certain amino acids and fats, which can lead to a buildup of harmful organic acids and toxins in the blood.

Through the age of 4, Saleh's health and nutrition issues required frequent hospital visits. By the time he was 5 years old, Saleh stabilized, started to eat, gained weight, and attended school. Until at the age of 7 he had an inexplicable episode of rapid deep breathing that required medical attention. Doctors said his lungs were good but found he had developed cardiomyopathy caused by his metabolic condition.

"One of the complex complications of propionic acidemia is cardiac disease, which has been reported to get better with liver transplantation," said UPMC Children's Hospital's Director of Pediatric Transplantation, George Mazariegos, MD, FACS, an expert in the field of liver transplantation as a cure for metabolic disease, whose team ultimately performed Saleh's liver transplant.

Doctors advised the family that a liver transplant might benefit Saleh. Aware of Children's reputation in liver transplantation for metabolic disease, Saleh's doctors consulted with Dr. Mazariegos and then

recommended that the Al-Sadas bring their son to Pittsburgh. Concerned about her son's frail condition, Mrs. Al-Sada asked if she could serve as the donor to expedite transplantation. Although Mrs. Al-Sada, like her husband Badr, is a carrier of the defective gene that resulted in her son's PA, she does not have the condition, and her own liver functions normally.

Transport for transplant

In 2015, the family arrived in Pittsburgh. Saleh and his mother were evaluated, and preparation for the transplant procedure began. A portion of the left lobe of Mrs. Al-Sada's liver was removed and rushed to Dr. Mazariegos and the team at Children's. Saleh's surgery was more complex, and recovery took longer, requiring temporary use of a ventilator to assist his weak lungs while his heart got stronger. However, signs of cardiac improvement were already evident after the first week. After two months, Saleh's recovery had progressed to the point where physical and occupational therapy were started to help him regain strength.

The path home

Six months after surgery, his cardiac condition and breathing were significantly improved, and his liver function was normal. As PA is a systemic disease, liver transplant does not cure the patient of the condition. "However, the pathways of the organic acids are present to a large degree in the liver, so treatment of it significantly improves with liver transplantation," Dr. Mazariegos explains, adding that Saleh's metabolic control in terms of his dietary restrictions has improved with the transplant, and he is being weaned from his medications.

Mrs. Al-Sada's left lobe will completely regenerate over time, and the portion transplanted into Saleh will grow and develop as if it was his original liver.

Liver transplantation as a treatment for pediatric metabolic diseases is increasingly proving to be a viable option – one where UPMC Children's has a proven record of success. With related living-donor transplantation, parents and family members can often be the donors, resulting in more positive outcomes due to shortened wait times and better genetic matching from healthy living donors.

According to Dr. Mazariegos, Saleh's case was innovative from the standpoint of using the liver of a donor who was also the carrier of a gene that caused the metabolic disorder, even though the mother did not have the condition.

Today, Mrs. Al-Sada's hope for her son is that he may grow up to become a doctor – like the many who were so instrumental in saving his life. ✚



Dr. George Mazariegos



Saleh Al-Sada



BEST
CHILDREN'S
HOSPITALS

& WORLD REPORT
US News

RANKED IN
9 SPECIALTIES
2018-19

Giving new hope to children with metabolic disease

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

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

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

Liver transplantation is more than a life-saving procedure; it's also an attractive approach for improving quality of life for many patients with metabolic disease. In 2004, we developed the protocol for liver transplantation for MSUD. Today, we've performed more transplants on patients with MSUD than any other center in the world. That's more than 70 patients with a 100-percent survival rate. All of these patients show normal liver function, have avoided the risk of neurological complications, and enjoy an unrestricted diet.

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

Since the inception of our program in 1981, our world-renowned experts have performed more than 1,700 liver transplants - that's more than any other center in the United States - with survival rates that exceed national averages. Additionally, we've performed more than 330 liver transplants for patients with metabolic disease, which is more than any other center, including adult facilities. Also, we're leaders in living-donor liver transplants, which eliminate wait times for a deceased donor and can provide excellent outcomes.

Find out more about our excellent outcomes and extraordinary care.

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

UPMC | CHILDREN'S
HOSPITAL OF PITTSBURGH

Source: Internal data, Hillman Center for Pediatric Transplantation

Uniting quality care with ground-breaking research

Article provided by Nationwide Children's Hospital

America's second largest children's hospital — performing more than 1.4 million patient visits per year — is also one of its best: Nationwide Children's Hospital is consistently ranked among the 10 best children's hospitals in the United States.

Founded in 1892, the hospital has a long tradition of serving the residents of Columbus, Ohio, as well as families from all 50 states and more than 68 countries.

A well-deserved reputation

The hospital's prestigious standing results from tireless emphasis on top-quality patient care, and a longstanding commitment, to being a global driver of clinical innovation, and advanced research.

Key hospital metrics include:

- Ranked #7 among U.S. children's hospitals by U.S. News & World Report
- Ranked among the best U.S. children's hospitals by U.S. News & World Report for all 10 evaluated specialties
- National Institutes of Health (NIH) research funding ranked 6th of all U.S. children's hospitals
- Magnet™ facility designation from the American Nurses Credentialing Center, awarded to only two percent of U.S. hospitals

Colorectal surgery

Experts from 10 disciplines unite to provide the world's leading colorectal, urologic and gynecologic advanced care in the Center for Colorectal and Pelvic Reconstruction (CCPR). The program offers the most experienced pediatric surgeons in the world — performing nearly 1,000 procedures per year — for conditions such as anorectal and cloacal malformations, Hirschprung disease and gastrointestinal issues. CCPR also offers sacral nerve stimulation and a renowned Bowel Management Bootcamp for children coping with constipation or incontinence.

Cardiovascular surgery

Nationwide Children's offers the world's first therapeutic Hybrid Cardiac Operating and Catheterization Suites, compatible with both interventional cardiology and cardiothoracic surgery. The Heart Center also runs the first FDA-approved human study of tissue engineering repair for congenital heart defects.

Neurodiagnostics and epilepsy

Patients requiring testing of the brain, spinal cord and peripheral nervous system now have access to the Neurodiagnostic Program's

multidisciplinary, innovative evaluation of injury and disease. Epilepsy patients also receive expert care in the hospital's Epilepsy Monitoring Unit and Level 4 Epilepsy Center, which offers 21 advanced epilepsy treatment procedures and a 100 percent surgical survival record. The Neurology program ranks 7th in the United States.

Muscular dystrophy and neuromuscular disorders

Nationwide Children's is the only center in the world that has carried out clinical trials in all three major forms of spinal muscular atrophy (SMA) and is hosting the world's first gene therapy clinical trial for SMA1. Nationwide Children's was also the first Certified Duchenne Care Center.

Gastroenterology

Disorders caused by behavioral concerns or physiological abnormalities receive critical investigation from the nation's leading experts in intestinal function. The team leads the world in gastric pacemaker experience and offers the country's only inpatient Rumination Rehabilitation Program.

Hematology, oncology and blood and marrow transplantation

Ranked 5th in the country for oncology, Nationwide Children's has one of the largest pediatric cancer programs in the United States and offers personalized and unrivalled care for brain tumor resection, blood disorders, immune system deficiencies and more. The hospital hosts the Children's Oncology Group (COG) North American biobank and is home to the worldwide Head Start 4 clinical trial (led by the hospital's Director of Neuro-Oncology, Jonathan Finlay, MD) via the National Experimental Therapeutics (NEXT) Consortium, expediting evidence-based treatment protocols for pediatric cancers.

Welcome to Columbus

With convenient access to the city's international airport, downtown food and cultural centers, arena district and more, Nationwide Children's offers global visitors a comfortable and welcoming place to call home during treatment.

MORE INFO

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Tel: +1 614 362 9127

Website: NationwideChildrens.org/Global-Patient-Services.

Location: Nationwide Children's Hospital, Columbus, Ohio, U.S.



An upstart on the global stage. A consistent leader in the U.S.

We know children deserve the best possible care, in a safe and welcoming environment. Here in Columbus, Ohio, we have it all: world-class cultural attractions, cuisine and entertainment and — most importantly — pediatric specialty care that makes us a leading destination for patients from around the world. Our innovative research and dedicated health care team develop internationally recognized programs. From hosting a worldwide clinical trial consortium for childhood neuroblastoma to renowned gene therapy research aimed at making neuromuscular disorders a thing of the past, we aim to provide the highest level of expertise and care for our patients.

Reach out to our Global Patient Services team to learn more about our unique combination of a welcoming city and remarkable care.

Learn more, refer a patient or plan a trip:
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* Based on CHA survey of utilization and financial indicators



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When your child needs a hospital, everything matters.SM

Identifying genetic risks of cancer for patients

Article provided by Cook Children's

Most of us know someone who has had cancer. That's because we are all at risk for developing the disease. Usually it's by chance. But in some cases, cancer develops because of our genetics and that means some of us are predisposed to developing different types of cancer.

The people who are already predisposed to developing the disease not only have a greater risk of developing cancer but also passing those genes on to their children.

Because of the advances in genetic testing and the importance of detection of those inherited cancer predispositions, Cook Children's has started the Genetic-Oncology Clinic.

"We are trying to educate families and patients to increase awareness," said Kelly Vallance, M.D., MPH. "But also, to catch the cancer early, know the warning signs and find the way we are able to intervene and give these kids the normal lives they deserve. We do that by catching it early and teaching them what to look for."

The Genetic-Oncology Clinic provides care and counseling to children and their families with a predisposition to cancer. The program, one of only a few in the U.S., is a collaboration among pediatric oncologists, geneticists and genetic counselors who provide education, guidance, therapy and routine cancer surveillance studies when indicated for children with a predisposition to cancer.

Patients range from newborns to adults through the Life After Cancer Program at Cook Children's.

"Research coming out now recommends that almost all pediatric solid tumor patients, as well as certain leukemia patients, have genetic testing done to see if they are at increased risk for developing

secondary malignancies," said Heather Jernigan, a hematology and oncology clinic nurse and the nurse coordinator of Genetic-Oncology Clinic since it started a year and a half ago. "We know that almost every patient who gets cancer treatment is at risk for developing secondary malignancies. What we are learning is that with some patients with genetic predisposition syndrome that risk increases."

Becky Althaus was a catalyst to making the clinic a reality. Althaus worked with Mary Kukulich, M.D., medical director of Genetics, 40 years ago. The two of them worked together for about 19 years and Althaus said that's where she was taught about genetics. She already had a Master's in nursing, and then became certified as a genetics counselor, earned her Ph.D. in genetics and a nurse practitioner. She went on to help start genetic-oncology programs in three different locations before coming full circle by joining Cook Children's and working with Dr. Kukulich again.

"Between 10 to 14 per cent of all pediatric cancers have a genetic component, so that means they have a genetic predisposition," Althaus said. "Because of that we really need to be testing most children who are diagnosed with cancer."

Genes are passed from parents to offspring and specify traits. Humans have approximately 20,000 genes. A mutation is a change in the DNA sequence that can occur in one of two types of genes:

Somatic mutations occur in body and cells and are not passed on. They weren't born with a predisposition.

Germ line mutations occur in the eggs and sperm and can be passed on to offspring. This is a hereditary gene, meaning the child was born at risk for cancer at the moment of conception.

The Genetic-Oncology Clinic sees patients who are at risk for having cancer passed on to them genetically. That can mean their siblings or other family members could be at risk for developing the same cancer, or that the patients may eventually pass the gene on to their own children. ✚

Explore Cook Children's Genetic-Oncology Clinic here: cookchildrens.org/genetic-oncology

For more information or to refer a patient visit:

Web: cookchildrensinternational.org

Phone: +1-682-885-4685

E-mail: international@cookchildrens.org





When it comes to your child's health care, you want one thing... *the best.*

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At Cook Children's, each child's team of caregivers is connected to a system of pediatric specialists, clinics, and award-winning medical center. Children see the same specialists every day while an international care coordinator focuses on all the family's needs. From flight scheduling to accommodations to recreation, our dedicated international team handles every detail.



Our specialty programs, services and procedures include:

Endocrinology and Diabetes Program

- Growth and Diabetes Clinics
- Hyperinsulinism Center
- Investigational new drug 18F DOPA

Level 4 Epilepsy Center

- Epilepsy Monitoring Unit
- Robotic surgery

Heart Center

- Cardiac MRI
- Fetal echocardiography
- 3-D technology
- Surgical repair of the most complex heart defects

Hematology and Oncology Center

- Bone Marrow and Stem Cell Transplant Program
- Investigational MIBG therapy for neuroblastoma

Urology/Genitourinary Institute

- Ambiguous genitalia/ disorders of sex development
- Anorectal malformation
- Bladder exstrophy
- Cloaca
- Hypospadias
- Kidney transplant
- Urogenital sinus

Neurosciences Center

- Deep brain stimulation
- Motion analysis lab for patients with cerebral palsy and movement disorders
- Stroke and Thrombosis program

Orthopedic Surgery

- Amniotic band
- Arthrogryposis
- Hand and foot abnormalities
- Hip dysplasia
- Limb length discrepancy

Passionate about pediatric care

Article provided by Ann & Robert H. Lurie Children's Hospital of Chicago



Ann & Robert H. Lurie Children's Hospital of Chicago provides superior pediatric care in a setting that offers the latest benefits and innovations in medical technology, research and family-friendly services. As the largest pediatric provider in the region with a 130-year legacy of excellence, kids and their families are at the center of all we do. Lurie Children's served over 212,000 individual patients in fiscal year 2018.

Lurie Children's ranks among the very best children's hospitals in the U.S. It was once again ranked in the top 10 best children's hospital by the U.S. News & World Report. These rankings are based on patient care resources, treatment, patient safety and reputation, as well as patient outcomes.

Lurie Children's also placed on the Best Children's Hospitals Honor Roll – the highest level of recognition – for the seventh year in a row. The honor roll is a designation by the U.S. News & World Report for hospitals that score in the top 10 percent in at least three specialties. We were one of 10 hospitals in the country to be given this special designation.

Pioneer in cardiology and heart surgery

Lurie Children's is ranked third in the U.S. for child cardiology and heart surgery by U.S. News & World Report. The Society of Thoracic Surgeons also rated Lurie Children's as a three-star hospital, the highest rating level awarded. Our first-year survival rate for heart transplant patients, more than 95 per cent, far exceeds the U.S. national average of 87 per cent, and our long-term survival rates are also exceptional. Each year, our cardiologists see more than 16,000 pediatric patients in outpatient diagnostic visits and treat more than 300 inpatients.

Lurie Children's is the first pediatric hospital in the country to implant the new smaller version of a total artificial heart. Eleven-year-old Jaheim Whigham of Illinois is the world's youngest person—and one of 40 worldwide — to receive this version. To save his life, Lurie Children's cardiac surgeons removed his failing heart and implanted the 50cc SynCardia Temporary Total Artificial Heart.

The device replaces both failing heart ventricles and the four heart valves. It restores blood flow to the body and the vital organs, acting as a bridge to a heart transplant.

Cancer care

Although cancer is rare in children, we treat a wide range of childhood cancers. We also have a complete array of programs and services for children with blood disorders such as Hemoglobin Disorders, Hemophilia, Thrombophilia and Sickle Cell Disease. A new inpatient unit is underway to treat more patients. The center is ranked in the top 20 by U.S. News & World Report for pediatric oncology.

Neurosurgery

Lurie Children's Division of Neurosurgery is one of the busiest in North America, seeing more than 5,000 outpatients and performing approximately 1,000 surgeries a year. U.S. News & World Report has ranked Lurie Children's in the top 15 in the nation for pediatric neurology and neurosurgery.

We offer a joint Pediatric and Adolescent Neurovascular Disease and Stroke Program with Northwestern Memorial Hospital. This partnership supports Lurie Children's efforts to assist our teenage patients in the transition from pediatric to adult care. We provide support and resources for the whole family.

Telemedicine

We offer a telemedicine service that can be used for follow-up care after being discharged from Lurie Children's, as well as for chronic care management. Using a variety of telecommunication technologies, including real-time video conferencing equipment, hospitals across the globe will be able to collaborate closely with Lurie Children's specialists who can assess the patient, review diagnostic images and data, and provide an expert diagnosis. Our specialists connect with outside organisations using Polycom videoconferencing, a secure platform that will protect patient data.

Family focused International Patient Services

Our International Patient Services (IPS) Department works with families around the world seeking specialized pediatric healthcare services. We're committed to providing family-centered care through every interaction, from referrals through treatment and the journey home. ✚

MORE INFO

To contact IPS, call +1 312.227.4550 or e-mail IPS@luriechildrens.org. To learn more about Lurie Children's and the International Patient Services, visit luriechildrens.org/international.



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Our International Patient Services Department works with families around the world seeking specialized pediatric healthcare services. We're committed to providing family-centered care through every interaction, from referrals and financial assistance, through treatment and the journey home.

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Africa Health 2019: Mapping the future of healthcare

By Deepa Narwani, Editor

It is a widely reported fact that millions of patients across Africa die or are injured every year due to unsafe and poor-quality healthcare. A recently published World Health Organization (WHO) report highlighted that within Africa, about 15 per cent of all hospital activity and expenditure was a direct result of adverse events and that the costs of treating safety failures amount to trillions of dollars each year.

According to reports, fewer than 50 per cent of Africans have access to modern health facilities. While this remains a challenge for many developing nations on the continent, countries such as Rwanda are embracing technology as a way to improve healthcare for its citizens, especially those living in remote and rural areas. The country's successes

include the use of artificial intelligence-based algorithms in mobile phones to get a diagnosis, doctors using telemedicine to consult, blood delivery by medical drones,

and a central electronic health records system ensuring data is collected accurately.

The demands on healthcare systems in the continent are also increasing as non-communicable diseases, such as cancer, hypertension, diabetes and heart disease are on the rise. A majority of these cases could be avoidable through the implementation of digital health technology, with out-of-hospital care and monitoring forecasted to reportedly grow globally by 30 per cent to cross the US\$25 billion mark in 2019.

In South Africa, for instance, almost half the population uses the Internet, including over eight million Twitter users and 16 million Facebook users. This digital revolution has unlocked a number of opportunities for the creation of online communities for large-scale engagement around complex topics such as the management of health conditions. This is where the e-patient enters. An e-patient can be described as a person that uses digital resources such as the web, smartphones or other wearables to educate themselves about their condition and navigate the health system to track and manage their health.

The South African government's initiatives to digitise healthcare have been evident in applications such as MomConnect, a cell-phone based app that provides online resources to pregnant women. Since its creation, it has gained over 1.7 million users in over 95 per cent of public health facilities to become one of the largest initiatives of its kind globally. NurseConnect is an extension of MomConnect for nurses to receive weekly information on aspects such as maternal health, family planning and new-born health.

Also, with expected year-on-year growth in medical devices of over 8 per cent between 2018 and 2024, the increased interest in South Africa from local and international manufacturing companies is on the rise. A recent report highlighted that South Africa, along with Egypt, accounts for 40 per cent of the medical devices market in Africa; and with annual healthcare spend of 8.4 per cent of GDP, South Africa's medical device market is estimated to be worth US\$1.27 billion.

Furthermore, the projections for economic



growth of 3.5 per cent in sub-Saharan Africa by 2019 bodes well for an associated rise in healthcare spend to address the increasing rate of non-communicable diseases, as well as to help attain health-related Sustainable Development Goals within the region.

With a need to shine a light on all these exciting developments transforming healthcare in the continent, the annual Africa Health Exhibition and Congress will return for its ninth edition this year and showcase the newest innovations in healthcare, right from state-of-the-art imaging equipment to cost-effective disposables; developments in surgery, to advances in prosthetics, among other health disciplines.

Taking place from May 28 to 30 at Gallagher Convention Centre, Johannesburg, South Africa, Africa Health, organised by Informa Market's Global Healthcare Group, provides a convenient platform on the continent for international and local companies to meet, network and do business in the expanding African healthcare market. The 2019 edition is expected to attract more than 10,500 healthcare professionals, with representation from over 160 countries and over 560 plus leading international and regional healthcare and pharmaceutical suppliers, manufacturers and service providers.

The free to visit event provides one of the largest collections of healthcare product manufacturers and service providers under one roof, making it a one-stop shop for all healthcare sourcing and procurement needs. On display will be thousands of products to explore, coming in from 39 countries.

Moreover, the Africa Health hosted buyers programme is one of the event's unique features that sees healthcare VIPs networking with exhibitors during scheduled meetings during the course of the three-day event. The delegation comprises of representatives from Ministries of Health, major distributors, and prominent hospitals from Sub-Saharan Africa, making sure exhibitors get maximum visibility.

Immersive educational tracks

Accompanying the exhibition are a number of business, leadership and Continuing Professional Development (CPD) conferences and workshops providing the latest insights into cutting-edge procedures, techniques and skills. The 2019 edition will be debuting four new conferences including Digital Health, Laboratory Medicine, Infectious Diseases and Physio.

Africa Health includes 18 multi-speciality conferences with CPD accreditation that provide valuable education and the newest updates in the

medical field. The varied conference tracks bring in a wide selection of healthcare professionals who visit the exhibition as well.

The conferences will feature more than 170 local and international speakers who will congregate to explore the latest healthcare advancements and practice standards through medical and non-medical conference tracks. These conferences are supported by various healthcare associations across South Africa. Also, the conference proceeds will be donated to the Reach for a Dream Foundation.

Innovation in digital healthcare will be at the forefront of discussions at the newly launched Digital Health conference. The conference will explore real-life case studies of digital health being used to enhance healthcare delivery in the day to day lives. It will cover the work that is being done in the Southern African region, as well as ways to improve digital health maturity. Some of the key topics will include: Digital health: past, present and the future; e-Patients role in a sustainable digital health system; and Rwanda health project: Digital solutions for a countrywide mHealth programme.

Back for the ninth edition is the Imaging & Diagnostics Conference that will host over 300 attendees and experts for an interesting agenda featuring insights from practitioners in the continent. It will focus on radiology as a practice in Africa and its role in medicine within this context considering the current healthcare systems and their set-up.

Also, the Africa Health Leaders Forum will be returning this year and will feature thought-leaders from across the private and public spectrum, offering actionable insights into the healthcare industry. The flagship conference showcases the most topical issues in healthcare in relation to the future of medicine as well as the wider healthcare leadership and management. ✦

For more information visit
www.africahealthexhibition.com.

Launching Medlab Africa

Co-located with Africa Health is the first edition of Medlab Africa that is committed to supporting the education of all faculty and medical lab professionals. Medlab Africa is offering two CME-accredited conference tracks and is focusing on the core lab and specialist lab units. The Conference is being led by a strong scientific committee, ensuring that current issues and innovation are at the centre of all programmes.

The conferences will feature more than 170 local and international speakers who will congregate to explore the latest healthcare advancements and practice standards through medical and non-medical conference tracks.

Robotics: A new way of doing things

By Andrew Wright, Executive Manager for Shared and Support Services, Medscheme, South Africa

Can you imagine a world, where robotics (robots that is, or “bots”), were assigned to do all the repetitive jobs in your process driven areas, making sure all humans were doing all the value adding work? Imagine a world without manual workarounds that are repetitive, boring and often prone to mistakes. Imagine having a co-worker that willingly takes on these tedious tasks and enables you to get on with work that requires a human touch.

Medscheme have been on this journey for over 12 months and have already deployed 10 robots covering 14 processes. The world as we know it is moving ever so swiftly towards working together with “bots”. This computer enabled programme is able to optimise value within the service value chain. There was a need to move to adopting Robotic Process Automation (RPA) due to the growth in the client base and the ever-increasing complexity in the healthcare business, which result in an increasing number of manual internal processes. RPA enables to automate repetitive processes freeing up the software development team to focus on core system development.

RPA enables the business to implement automation of processes with no or very limited system integration. It enables the business to address the “long tail” of IT development by using the tool to address process inefficiencies.

The RPA solution becomes a virtual workforce that manages the repetitive processes freeing up the people to focus on the work that requires thinking, judgement and decision making. The RPA solution is often referred to as a “robot” or “bot”, and these become co-workers to the humans. This means that the process automation does not require system development and the software used simply follows the steps in the process that a human would follow on the existing systems. The “bot” can be scheduled to work outside of office hours where processes can run over 24 hours and through all the days of the week.

The “bots” become part of the holistic workforce and enable humans to get back to what they should be doing – the feeling and the thinking.

Three overarching aims

Free up human capacity to perform tasks that require cognitive skills that a “bot” cannot provide. In essence this enables an organisation to improve its service delivery from the perspective of speed

of execution, fewer human errors and more personalised service where required.

Enhance operational efficiencies and reduce the cost of delivering a service. Not only does this ensure sustainability of processes but also reduces operating costs.

Increase job satisfaction for the employees of the company. The workload pressures increase year-on-year, requirements of healthcare administration become more demanding, the business solutions become more complex with increasing numbers of manual workarounds. People fear making errors and job satisfaction declines. Absenteeism rises and productivity drops. According to feedback from employees in the operational areas, the manual repetitive work no longer adds purpose to their role, and they feel like they could contribute so much more if the systems just automated these processes.

RPA is not only limited to the operational areas of the business and the system can be used in areas such as Human Capital, Claims Assessing or Finance, essentially any area of the business where processes are predictable and repetitive.

It must, however, be noted that RPA does not replace the enhancement of core systems. It is a tool for the business users to optimise processes that have not been addressed through core system changes. It is also a very useful tool in managing data transformation from one system to another. It frees up technical resources to focus on delivering new and innovative solutions rather than constantly addressing adhoc business needs or data transformation projects. RPA is secure, scalable, auditable and does not require system integration. It should be in the “tool box” of all large organisations involved in any form of administration.

RPA has been in various settings, including:

- Claims assessing
- Member underwriting and onboarding
- Hospital Benefit Management
- Tariff loading
- System change management

Simple processes that rely on structured data and are easy to map, typically yield the best results. To date efficiencies yielded have demonstrated as much as 75 per cent reduction in manual processing requirements with a 100 per cent error free rate. ✚

Wright will be speaking on ‘Robotics process automation in healthcare administration’, on May 29, as part of the Health Management Conference, at the Africa Health Exhibition and Conference.

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HOPE & HEALING

Rochester, Minnesota U.S. News & World Report 2018-2019



Patient Engagement:

A new approach for managing costs and increasing value

By Prof Morgan Chetty, Visiting Prof, Health Sciences, DUT, Chairman, IPAF, CEO KZNDHC, Durban, South Africa

The present healthcare system is not delivering value. In fact, costs are escalating at an unsustainable pace. This is an unrelenting debate at all health policy discussions.

The focus of healthcare is shifting away from the measurement of outputs and volumes of service delivery towards a focus of achieving "Value".

The concept of value has a strong economic focus as those who provide healthcare related services aim to deliver cost effective services to patients; there is also a focus on ensuring that the services delivered provides value to patients.

The costs have been broken down to focus on these components that contribute to the escalating costs: consumer price index, tariff increases; demand side factors (plus provider induced demand) supply side factors. All these add up to medical inflation.

The high healthcare costs have further been isolated to other related factors:

1. The underlying costs related to an aging population and the increasing use of healthcare services by patients with chronic conditions.
2. New advancements in technology that should decrease costs but in fact drive up costs. This is largely due to inappropriate use of technologies.
3. Lack of personal responsibility for healthcare.
4. Lack of transparent information and proper economic incentives to manage costs, quality and individual health.
5. Consumers are shielded from the real costs of healthcare and lack strong economic incentives or knowledge to select the most appropriate treatment.

The recent debate focuses on the provider reimbursement methodology. It has been mainly a fee for service model that drives demand for more medical services rather than being paid for outcomes or better care coordination.

Also, the slow up take of technology and EHR has prejudiced "physicians who have lack of information and decision support tools to allow them to follow evidenced based clinical guidelines".

So, in summary, many strategies have been implemented to stop the healthcare system from "haemorrhaging". But at a closer look at the strategies in place, the focus has been on the physicians, health systems and hospitals.

Right choice of care

We need a paradigm shift from the usual methods employed to manage costs and quality.

High on the agenda and ignored for all this time is the role of the patient as a co-manager of limited resources and high costs. I want to introduce the role of the patient as an alternate strategy to manage costs, produce better outcomes and improve quality.

The emphasis is by engaging with patients and empowering them to participate directly in managing their own healthcare by shared decision making. They make the correct choice of care and become partners with the physicians in the caring process.

Patients interests and interests of the health



system is not served if the patients receive care that is unnecessary, wasteful and harmful especially if they are unaware of this.

The chosen treatment modality may not be desired by the patients if they understood before care was delivered, the cost of care, the benefits and harm of the interventions. They need information and hard-core data to help them make the right choice of care.

It is important to reflect on the quote: “*More is not always better in healthcare.*” Patients benefit from decision aids. They benefit if the provider of care can spend the time explaining the pathology, the treatment modalities and the recovery rate.

They also need to understand upfront the success and failures of the current treatment modalities. Patients then engage being informed and participate in shared decision making. The result is a more appropriate choice, with better compliance and adherence to treatment regimes.

Their choices tend to be more in line with what is important to them. The Cochrane review in 2011, found that the use of decision aids produced a significant reduction in major elective surgeries, PSA screening and hormone replacement therapy.

Reportedly, the Lewin Group presented savings of US\$3.8 billion over five years and US\$9.2 billion over 10 years with the routine use of patient decision aids and shared decision making.

Work done by the Horizon Blue Cross Blue Shield (BCBS) programme in New Jersey in 2014, demonstrated that when members receive care from a doctor who participated in a patient centred programme, they scored higher on the quality care metrics at a cost that is 9 per cent lower than those members at a traditional doctors practice.

Robert A Marino, Chairman and CEO of Horizons BCBS, stated: “The promise of patient-centred care and value-based care to deliver better quality of care at lower costs, is no longer theoretical, it is a reality.”

The message is that there is “the need to innovate and transform healthcare to ensure patients receive more co-ordinated, better quality care at a lower cost”.

Patient centred care approach refers to an innovative approach where health insurance companies reward doctors/providers of care for meeting certain clinical quality, patient satisfaction and efficiency benchmarks.

Unlike the traditional practices based on the fee for services reimbursement strategy, patient centred practices are also financially rewarded to improve the patients care based upon National Clinical Guidelines and improve the patients experience with such services as extended hours

and more active communication. The purpose is to motivate patients with more co-ordinated and personalised care.

In many of the successful programmes, a patient focused strategy includes:

- A care coordinator who provides additional patient support, information and outreach.
- Increased wellness and preventative care based on national clinical guidelines.
- Extra wellness support and education
- Appropriate communication strategies between doctors/care coordinators and patient
- Active coordination of patient care with specialists and other providers.

In many other PCC programmes, it is demonstrated that primary care visits increased because of the trust in family doctors, decreased unnecessary referrals to specialists, and decreased demand for laboratory and radiology requests. The compliance and adherence improved and there were better recorded outcomes.

The benefits of patient centred care can be measured, and it complements and gives a holistic picture of outcomes when combined with the traditional measures obtained from administrative data metrics.

The outcomes measured from administrative data sets measures the provider productivity and cost targets. It is driven by financial targets and adherence to standardised healthcare guidelines.

When one measures the benefits of patient reported outcomes and patient experience outcomes it measures whether the care delivered benefited the patient and whether it makes a difference to their healthcare status. It is a measure of the patients’ experience, satisfaction and perception of care delivered.

It was as early as 2001 when the Institute of Medicine (IOM) in the U.S., presented its report “crossing the quality chasms”. The IOM presented an action plan for reinventing the health system to improve the nation’s health. One of the six components in achieving quality healthcare was identified as “Patient Centeredness”

A patient centred approach is a positive strategy for the future for managing limited resources and containing costs. ✚



The outcomes measured from administrative data sets measures the provider productivity and cost targets. It is driven by financial targets and adherence to standardised healthcare guidelines.



Prof Chetty will be sharing opening remarks on both days of the Healthcare Management Conference, will be part of the ‘Pharma Panel: Patient-centred vs cost-centred?’, and will be discussing ‘PROMS vs PREMS’ on May 28, at the Africa Health Exhibition and Conference.

Optimal staffing for safe patient care

Can the nursing fraternity really achieve this goal?

By M. Khoza RN, RM, Bcur, Psychology in HIV management, Oncology & Palliative Care, Port Louis, Mauritius

The challenge

For many years now, Nurse Leaders across different countries have been trying to find a solution for an ideal model for nurses to render safe patient care. This remains a top concern globally for registered nurses working in the acute care setting.

There is a growing body of research supporting the relationship between optimal staffing and clinical outcomes. I have been part of the population of nurse leaders looking for a solution at least in three different countries – South Africa, Saudi Arabia and now Mauritius. Each of these countries face different challenges due to their nursing recruitment structure.

Brief comparison

1. South Africa has the union demanding regulated nurse – patient ratios. According to them, this will result in better patient outcomes. However, this is not ideal as it lacks flexibility of staffing the nursing units according to their activities. Furthermore, this notion is not supported by the Nursing Leaders, especially in the private sector.
2. Saudi Arabia, on the other hand, depends mainly on expatriates and have only three categories of nurses, auxiliary nurse, registered nurse and midwives. The ratios are not regulated and not influenced by the unions. Most hospitals are JCI accredited, which assesses the nurse-patient ratios but are not necessarily prescriptive nor do they require any specific staffing model. Nurses are bound by their contract and they are left with no choice than to continue operations even though if they are burned out as a result of being overly stretched.
3. In Mauritius, there is a critical shortage of nurses especially in the private sector. Most qualified nurses prefer to work in State hospitals due to staff privileges and job security. The nurse-patient ratio is not regulated, the nursing units are staffed according to the activity in the units. However, this is still a challenge due to registered-nurse shortage.

On a concluding note, while taking into consideration the different proposed scenarios, it clearly reflects the fact that the trend is almost the

same, i.e.,

- Shrinking of financial resources,
- The increasing burden of disease,
- And the demand for good service.

More and more patients are aware of their rights and therefore this gives patients and relatives the bargaining power to demand a lot from nurses.

So, I ask, should we be looking at mandatory staffing norms? Is it practical? Is there any other solution in addressing this global challenge?

The Nurses perspective

Nurses are in a unique position to exploit their knowledge, skills and abilities to identify a solution to propose a convenient staffing plan that will provide for safe patient care. They should actively participate and drive conversations around nurse-patient ratios. Nurses at operational level should be given the possibility to engage in those kinds of discussions and forums. Their voices must be heard. I have been a nurse for 30 years and have dedicated the last 15 years being in management and leadership positions and I can strongly affirm the fact that we do not have the luxury to exclude the workforce in decision-making process.

If nurses continue to quit their profession due to burnout, under-staffing, and bullying, we are no closer to a solution than before. Nurses turnover is expensive, and it also poses a risk to safe patient care and excellent outcomes. Stopping nurses from leaving their jobs prematurely is now a “critical issue” for governments around the world as the problem of staff shortages is escalating, which is a great concern.

The patients

Over the past few years, the DNA/mindset of the patient has changed. Patients are health conscious and they are well versed about different healthcare topics and their rights, which makes them an active participant in the management of their health daily. The high demand for specialised or individualised care is thus increasing pressure with regards to the quality of service offered by nurses bearing in mind that the latter are already giving



For many years now, Nurse Leaders across different countries have been trying to find a solution for an ideal model for nurses to render safe patient care.



out their best. It would be highly recommendable to engage patients along with nurses in discussions forums conducted in order to get insights from both ends, which can then be taken up to bring about feasible solutions. The well-being of patients is as important to us as to them. Are we ready to afford the patient of today the space?

The health insurance (private sector)

The medical insurance rates are continuously increasing at a fast pace on a yearly basis. For insurance companies to get more patients, they build up their business cases on the positive patients' feedback collected and excellent service offered by different hospitals. Monitoring tools that measure patient experience and feedback are being used by the funders and act as motivators for hospitals to perform well and to constantly deliver excellent service, which will hereafter impact on nurses' activities.

What then?

It is evident that the issue of safe nurse -patient ratio in all the nursing unit is not going away. The questions are:

- Can it be rigid?
- Do we need legislation on this?
- How will this impact on the nurses as we are aware of global shortage?

Optimal staffing for safe patient care should be flexible. There can never be one model suitable for all. Several factors should be taken into consideration including the patient population being cared for, the layout and technology of the hospital, the activity and skill mix (different nursing categories) and most importantly the dangerously high nurses' turnover in the nursing units. ANA (American Nurses Association) advocates for minimum registered nurse -to- patient ratios that are flexible based on these factors.

What needs to be done

The governments especially Ministers of Health across the world need to hear this outcry.

1. Nursing education must be prioritised and be budgeted for accordingly.
2. Robust Private-Public Hospital partnership must be encouraged in terms of nursing practice in order to fight for a common goal which is to serve our communities better.

As a nurse leader who has a passion for the nursing profession and a duty to care, I would like to leave this platform knowing that there is a clear direction and a solution to this challenge. ✚

References available on request.

Khoza will be discussing 'Staffing model in Mauritius', as part of the Nursing Conference on May 28, at the Africa Health Exhibition and Conference.

For insurance companies to get more patients, they build up their business cases on the positive patients' feedback collected and excellent service offered by different hospitals.

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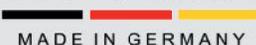


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MADE IN GERMANY

Reinventing primary care in Nigeria

By Dr. Ola Brown, CEO, Flying Doctors Nigeria

With a total population of approximately 182,200,000, Nigeria has some of the poorest healthcare outcomes in the world.

For example, the under-five mortality rate has been reported by the World Health Organization (WHO) at 117 per 1000 live births. In other words, 1 in 10 Nigerian children under the age of 5 die annually. A stratification of the causes of mortality amongst them reveals some of the chief causes, which are as follows—Malaria, Acute Respiratory Infections and Diarrhoea. These causes of mortality are worth deliberating, as they are preventable.

Child mortality is not our only problem. From the number of people that die from road traffic accidents, to the number of mothers that die during child birth to malaria deaths to malnutrition; the statistics paint an abysmal picture of Nigeria's healthcare system. As our population continues to grow at rates as high as 4 per cent the need for healthcare reform has never been more urgent.

Here we review the current primary healthcare model in Nigeria, as well as the impetus to change and address these unsettling indices.

The 'McKeown thesis', was an original and inventive idea proposed by the eminent physician-historian Thomas McKeown between 1950 and 1980. He postulated that the population growth in the post-industrialisation era was primarily

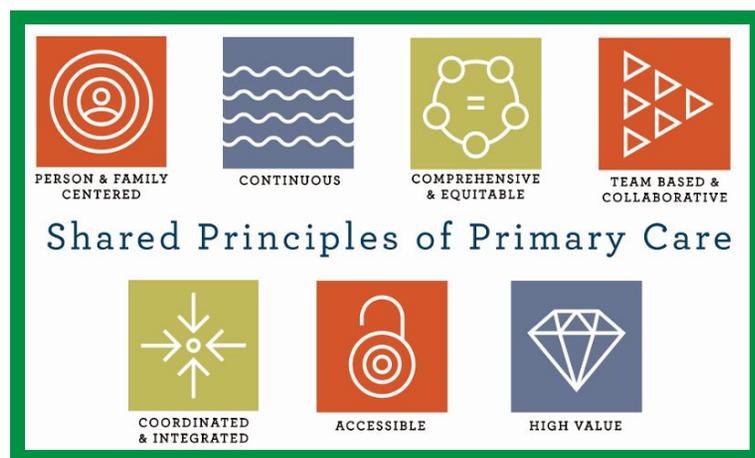
attributable to improvements in overall standards of living such as diet and nutrition, sanitation and vaccinations rather than life-saving advancements in medicine.

McKeown's postulation resonates strongly with Nigeria. Only 3.7 per cent of its GDP is utilised on health expenditure. In stark contrast, developed countries such as the U.S. and the UK utilise 17.1 per cent and 9.1 per cent of their GDP on health expenditure respectively. This cost constraint imposed on the treatment of preventable diseases can be alleviated by long-term social improvements that focus on prevention rather than treatment. This will not only translate to reduced morbidity and mortality rates, but also relieve the burden of patient load in Nigerian hospitals.

Hospitals are a big part of Nigeria's problem. Our politicians love to launch them, celebrate them, we are sentimental about them, we constantly order expensive equipment for them, but in the grand scheme of things; they don't really matter. Nigeria's hospital-dominated health system overemphasises medical interventions at the expense of public health and primary care.

Hospitals tend to focus on the very sick, sometimes using very expensive interventions to extend or improve life for a small number of individuals. This means that their potential to actively promote health is limited.

As a developing country, Nigeria has much untapped potential with regard to social reforms. Comprehensive vaccination programmes, health education, institution of basic sanitation and water-provision infrastructure are not novel ideas and have been employed with great success in other developing countries. Our focus should be on emerging technologies and social reforms which Nigeria can tap on even at this stage to achieve modest morbidity and mortality rates. These include telemedicine, remote support for paraclinical healthcare staff, institution of robust systems to manage patient journeys, protocolisation of common and easily preventable disease management guidelines and efficient



referral systems.

A preventative health system would be primary, and community-care led, and hinge on the shift in resource allocation from tertiary institutions (hospitals) to community and primary care facilities. This philosophy has recently been re-endorsed by the WHO in 2003 by means of the Declaration of Alma-Ata, which states categorically that all governments should formulate national policies, strategies and plans of action to launch and sustain primary healthcare as part of a comprehensive national health system and in coordination with other sectors. To this end, it will be necessary to exercise political will to mobilise the country’s resources and to use available external resources rationally.

Costa Rica – A case study

Costa Rica is a developing country in South America, and its citizens have access to one of the most effective primary healthcare systems in the world. The country’s unique, team-based model of primary care service delivery successfully combines preventive and curative care to provide comprehensive primary healthcare to nearly all Costa Rican citizens. The system produces better health outcomes, while spending less than most other countries in the world. In fact, Costa Rica has achieved the third-highest life expectancy in the Americas—behind only Canada and Bermuda, and well ahead of the U.S. Its infant mortality rate is half the average of Latin America and the Caribbean region.

Health reform in Costa Rica was conducted in deliberate and targeted pursuit of the country’s vision of achieving equal healthcare for all. Reforms were implemented in an iterative fashion — supported by strong measurement and monitoring — which allowed for ongoing adaptation and continuous improvement and refinement. The result of the reforms is a robust primary healthcare system, rooted in public provision of care, that supports comprehensive, continuous, coordinated, and equitable care for the entire population.

What about hospitals?

The number of hospitals in Nigeria need to reduce, not increase. The main expansion should be in primary care centres. This may seem counter-intuitive but allow me to explain why.

As healthcare advances, more can be done to treat patients that have what were previously disabling or life-threatening conditions like burns, severe injuries or strokes. But, in order to provide complex healthcare safely, professional teams

need to see sufficient volumes of patients with a particular condition. The potential benefits from specialisation are greater for some life-threatening conditions such as heart attacks and major injuries, but the safest treatments cannot be provided at small general hospitals because there are not enough patients for teams to maintain their skills. More lives can be saved if advanced services are centralised in more specialist hospitals.

There is further evidence that bypassing smaller hospitals for more central, high volume hospitals produces better outcomes for trauma patients also.

Conclusion

The importance of focusing on determinants of health that lie upstream from hospitals cannot be overstated. Health systems in Nigeria should focus on optimising resource allocation to focus on reducing the disparity in health-access and quality of health within the majority, rather than extending life for the minority.

The quality of tertiary healthcare is critical, but it should not come at the expense of public and primary healthcare. ✚

References available on request.

Dr. Brown will be a panellist at the ‘Keynote panel: 2020 and beyond - top concerns for healthcare leadership and how to address them’, as part of the Africa Health Leaders Forum on May 30 at the Africa Health Exhibition and Conference.

EVIDENCE THAT SPECIALIST CENTRAL TRAUMA CENTRES SAVE LIVES

SOURCE	DESCRIPTION	FINDINGS
Bulger et al (2002) – USA	Severe head injury care – ‘aggressive’ vs ‘nonaggressive’ centres.	‘Aggressive’ management of head injury associated with decreased risk of mortality (adjusted odds ratio 0.59).
Coats et al (2000) – UK	Modelling development of trauma system in London.	Modelled the theoretical proportion of patients with intercapital haemorrhage who would have reached specialist trauma services within 4 hours = 25% if taken to local hospital, vs 90% if taken direct to specialist centre.
Cooper et al (1998) – Australia	Comparison of management of road traffic fatalities at trauma centres vs non-trauma hospitals in Victoria.	Essential deaths less frequent in trauma centre (20%) vs other hospital groups (40%-62%); similar trends for high severity injuries. Recommends trauma system with bypassing arrangements.

How Costa Rica Developed one of the best primary care systems in the world

- STEP 01 Healthcare agencies merged under one roof
- STEP 02 Entire country was divided in 104 primary health zones
- STEP 03 Multi-disciplinary teams assigned to each community
- STEP 04 Use of big data for monitoring

By Dr Ola Brown



From one to more to many:

The power of connected healthcare

Article provided by Med-e-Mass, South Africa

Medical care is changing from treating symptoms and diseases in isolation to an approach that is holistic, functional and patient centric. Similarly, healthcare management is moving from treating a patient during an episodic event, to understanding a full patient history to develop protocols and integrated care models that facilitate population health management. The future is connected care and it is within our grasp.

“Our focus is the patient’s journey through the healthcare system, and harnessing the value that data analytics can bring to serving patients and practitioners alike,” says Dilip Naran, head of solutions at Med-e-Mass, a company in the Altron group that provides technology solutions to the healthcare industry.

Naran’s description of a patient’s tech-aided healthcare journey seems futuristic but, he says, most of the components exist already with only a few more dots waiting to be connected.

The personal electronic health record

It all starts with the individual. Let’s call her Sophia and imagine that she is troubled with severe and regular headaches.

Having decided to get to the bottom of the issue, Sophia goes online to find a GP. She accesses her chosen practice’s patient portal and creates a profile for herself by providing her demographic details and medical insurance information. This process enables Sophia’s personal electronic health record (EHR), which securely and centrally stores her health information. A master patient index identifier is assigned to Sophia’s details, allowing her to be uniquely identified in the future. The practice receives Sophia’s information automatically and with her consent, thus obviating the need for paper forms that have to be captured into the practice management system.

Having booked an appointment online, specifying the reason for her visit, Sophia arrives for her consultation and identifies herself biometrically. The system recognises her and the GP, Dr. Moonsamy, is notified via the electronic diary that she has arrived.

As Dr. Moonsamy has a view of both Sophia’s main medical complaint and her relevant health history, the consultation is off to an immediate and constructive start. The EHR is set up to meet the workflow of a normal consultation, making it easy for Dr. Moonsamy to update it. This adds

the diagnosis and applicable ICD10 code into the EHR, and prescribes medication using e-scripting software linked to it. The application completes the consultation workflow by automatically billing Sophia's medical scheme and sending her an invoice for the portion of the claim for which she is liable.

"EHRs create seamless connectivity between the patient and practice in a way that enhances the quality of human interaction," says Naran.

The health information exchange

While the niftiness of an EHR at practice level is undeniable, the real power of connected care emerges in the next phase of Sophia's journey.

Although she takes her medicine diligently, the headaches persist, and she returns to Dr. Moonsamy. The GP decides that further investigation is needed and sends Sophia for an MRI scan and blood tests. The results cause Dr. Moonsamy sufficient concern to refer Sophia to a neurologist.

As the neurologist can access Sophia's master patient index through a secure platform known as a health information exchange, he can see the laboratory results and MRI report that was ordered by Dr. Moonsamy and now form part of her EHR. The health information exchange is a secure platform that centrally stores the master patient index and can be accessed by designated healthcare practitioners. Without this platform, the neurologist would likely have ordered his own set of tests, duplicating much of what the GP had already done. Instead, he now has all the information necessary to fully consider Sophia's situation and prescribe focused and effective treatment options.

"With this technology, treatment can continue efficiently and with the appropriate focus as a patient moves through the healthcare chain," explains Nicolette Mudaly, product manager: health information exchange, at Med-e-Mass. "Our goal is to eliminate the current inefficiencies that cause increased costs, patient dissatisfaction and, at times, sub-optimal healthcare outcomes."

Of critical importance is the fact that the exchange is based on patient consent. In our example, Sophia has to give explicit permission for the neurologist to access the information on her patient record.

"The health information exchange can change the current dynamics in the healthcare industry, enabling better clinical outcomes that improve patient satisfaction and create a more efficient and functional healthcare system," says Mudaly.

Data analytics for the greater good

Data and the ability to share it, has resolved Sophia's headaches. Similarly, data can be used

to solve population health headaches on a macro scale. This is where data analytics enter the frame.

Sophia visited two providers and information was shared between them seamlessly. "By analysing her data, we can now take management actions around Sophia, especially if her headaches indicated a chronic condition that requires specific interventions," says Paul Saunders, product manager: data analytics at Med-e-Mass. "This is possible by plugging Sophia's information into the master patient index, and comparing her to other patients with similar conditions."

The result is invaluable information at the disposal of the healthcare ecosystem that manages Sophia's care.

The medical scheme, for instance, needs to understand how much resources she will require in future, and whether or not she falls in a high-risk category. Given the specifics of her condition, the scheme can also match Sophia to the doctors best suited to treat her condition.

The start of her treatment is taken as the baseline measure. As Sophia returns for her scheduled check-ups, other measurements are added and fed back into her EHR. The doctors and medical scheme can measure how successful they are at managing Sophia by capturing events like hospitalisations.

"The providers need to know if the patient gets better and remains better, hence we have to measure outcomes," says Saunders. "The holy grail in population health management is how to generate value through better outcomes at a lower cost."

It has already been proven that the sharing of information between the doctor, the patient and the medical scheme drives down relapses and hospitalisation and puts the patient on a far better trajectory than people with similar conditions being treated according to traditional models.

In addition, the data gathered for each individual patient contributes to the master patient index and the wealth of information it contains. "Care gaps can be identified, and we can drill down in populations to find higher risk patients," says Saunders. "Machine learning models allow you to manage risk better and reduce overall costs in the healthcare system you are responsible for. We know this, because we are already providing such population health perspectives to a number of clients."

Sophia's story can soon be a reality in South Africa, and not only in private healthcare. As the government pushes forward with the National Health Insurance (NHI) project, population health management becomes ever more important, along with quality and efficient care regardless of whether a patient enters the public or private healthcare system. Technology is the only way to achieve this. ✦

Naran will be a speaker at the Healthcare Management conference at Africa Health Exhibition and Conference.

Future of healthcare in Africa

By Dr. Amit Thakker, Chairman, Africa Healthcare Federation, and Joelle Mumley, Marketing & PR, Africa Health Business, Kenya



Africa faces critical challenges in health. Thirty-six percent of the population lives on less than one dollar per day. The continent has 14 per cent of the world's population and, yet, only 3 per cent of the world's health workforce. Population growth is exponential. Africa carries 25 per cent of the global disease burden and has had a 20 per cent increase in non-communicable diseases (NCDs) between 2010 and 2020. Only 30 per cent of Africa's population has access to primary healthcare. In the face of these many obstacles, the private sector becomes an essential contributor to the way forward.

As the engine of growth, the private sector provides innovative and efficient solutions that are designed specifically for the African context. Businesses, as opposed to governments and donors, tend to look at the way things could be, rather than getting stuck in the bureaucracy and policy of the way things are now. Out of necessity, private sector generally has an acute awareness of what the real needs of their customers are, meaning they are often the most well-equipped to meet those needs.

Additionally, the private sector's footprint in health is continually increasing, not only in the areas of healthcare that have traditionally been attributed to them, such as pharmaceutical manufacturing. Their influence is cross-cutting, affecting every industry within the healthcare sector. When it comes to service provision, the focus has historically been on public sector, but this thinking is outdated, with almost half of the African population now receiving healthcare services from private sector clinics.

One of the main barriers to receiving quality healthcare is the issue of affordability. There may be quality healthcare services available, but the cost

can be prohibitive for the majority of the population. The private sector has plenty of room to grow in this area. Too many people across the continent have to pay out of pocket for treatment, often leading to entire families falling into poverty. Sudan has an out-of-pocket health expenditure of 74 per cent, the highest in the continent. Creative solutions are needed to solve these incredibly complex problems and, although the government needs to be responsible for taking care of the poorest segments of the population, the private sector is best placed to design and implement solutions that make healthcare affordable for the majority of the population.

The area where the private sector has most thrived is technology. Whether it's the production of medical equipment and supplies, capitalising on the technology that already exists (like mobile phones) and applying it to the health sector, or making strides toward the use of blockchain in data management, the private sector has taken the lead and pushed medical advancement forward at a rapid rate. With technology, Africa has the opportunity to leapfrog the progress of more developed regions. For example, avoiding the need for road infrastructure by delivering blood or medications by drone. Or using mobile phone technology to connect a doctor in London with an X-ray technician in rural Uganda. These technological advancements will both increase quality and reduce costs.

The private sector also has a role to play in transitioning Africa from a curative to a preventative focus on healthcare. With the increased percentage of the disease burden falling under the category of NCDs and preventative illnesses, the private health sector, along with strategic partners (such as in the media and education sectors), can influence behaviour change that will keep the Africans of the future living healthier, more productive lives.

Despite the many challenges this continent faces, if public and private health sectors can capitalise on what they each do best, supporting each other and working in tandem, there are many reasons to be hopeful about the future of healthcare in Africa. If Africa's youthful population can maintain their health and continue contributing to the economy, we could see transformational growth in every area of society. The private sector has much to offer, but it will take an enabling environment as well as strong investment from private sector organisations. ✦

Dr. Thakker will be a Moderator at the Keynote panel: '2020 and beyond - top concerns for healthcare leadership and how to address them', on May 30 as part of the Africa Health Leaders Forum, at Africa Health Exhibition and Conference.

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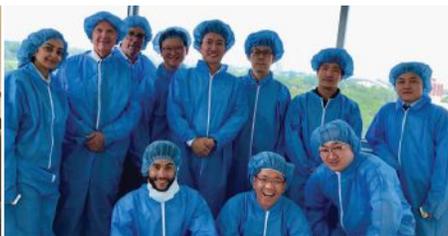
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AT THE FOREFRONT
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Solving Africa's healthcare data problem

By Bolatito Ovio, Executive Director, Helium Health, Lagos, Nigeria

Data is the currency we use to purchase our dominance on the earth.

The human race as we now know it is at least 200,000 years old. We are able to determine the beginning of our species' existence because of the data gathered and analysed by archaeologists. In the time humans have been on earth, we have gone from being killed by seemingly innocuous plants and animals, to creating treatment and prevention plans that defeat the deadliest of creatures. It can be argued that we have become the most dominant living organism not because we are the most anatomically advanced, but because we collect, analyse and utilise data better than any other species.

Data is the currency we use to purchase our dominance on the earth. Countries with high levels of development have invested more in collecting and processing data about vital sectors like health, education and the economy. For example, the 2010 U.S. census came with a US\$13bn price tag.

This significant investment provided data, which helped guide the U.S. government's allocation of US\$675bn to 132 different programmes that benefited its citizens,

including health insurance. To achieve that similar levels of development, especially in the African health sector, we must band together to fix our data problem.

The data problem

According to the African Union, Africa accounts for 24 per cent of the world's disease burden but contributes only 1 per cent to the total amount of money governments spend on health. There are a number of reasons for this but the lack of accurate data to guide the pockets of governments and private donor agencies is one with the most compounding effect.

It is nearly impossible to overemphasise the importance of valid data to decision makers. For governments and private stakeholders, there are certain blocks of data they rely on to take action. Some of these data blocks concern issues affecting health like birth, death and the environment. Unfortunately, Africa remains behind in gathering the most basic demographic data. In 2013, no African country had completely and accurately registered all the vital data blocks affecting health.

For most African governments, the allocation of funds to solve public health issues, is done with little or no data, preventing the planning, monitoring and evaluation of such projects. The implementation of critical public health projects without sufficient data insights is caused by analogue data collection systems' inefficiencies ranging from poor data sourcing and classification, to human bias and errors. What has happened as a result is that we have calcified a healthcare system powered by guesstimates, oblivious to important trends, and misinformed about the effectiveness of previously implemented policies.

Take Nigeria's fight against polio for instance. While the world raced to eradicate polio by the year 2000, Nigeria's progress was hampered by a lack of data amongst other things. When Nigeria eventually became the last African country to be declared polio free in 2014, the disease returned less than two years later in 2016, costing the country an additional US\$28 million to restart the





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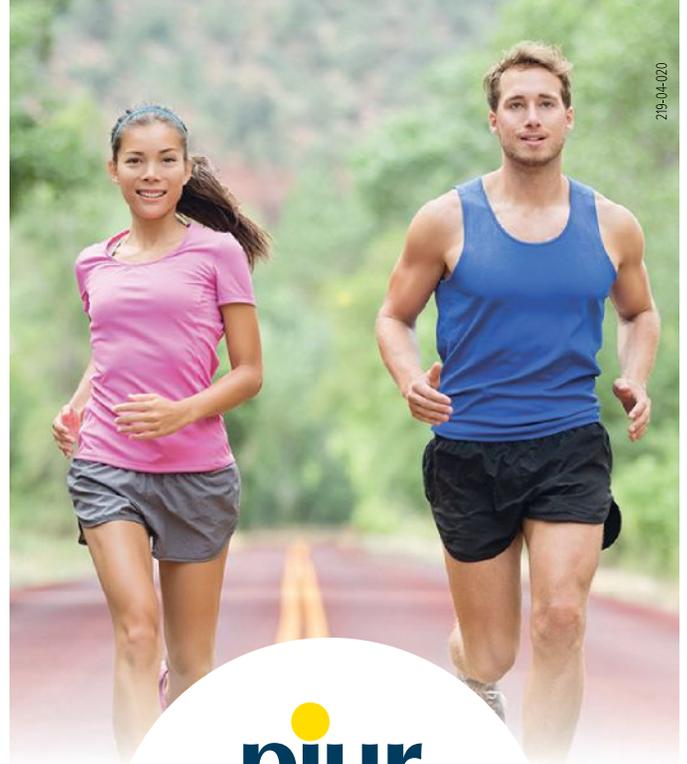


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For example, only five African countries track national birth dates with a 90 per cent accuracy or higher. Eleven countries track the same data with a 75-80 per cent accuracy and an additional five countries track birth rates with 20 per cent accuracy.

fight against polio. Research carried out by the American National Center for Biotechnology Information (NCBI) showed that one of the predominant means of health data collection is via household surveys. It also showed that very few countries in Africa had a proper system that allowed for seamless tracking and monitoring of vital health data. For example, only five African countries track national birth dates with a 90 per cent accuracy or higher. Eleven countries track the same data with a 75-80 per cent accuracy and an additional five countries track birth rates with 20 per cent accuracy. The other African countries tend to track birth rates based on calculations from mothers' responses to questions in household surveys.

Worse still, only four African countries track mortality rates with a system covering 75 per cent of the population or higher. Even in African countries with manual systems that generate considerable data, the information is rarely used because of concerns about bias and quality. Furthermore, because much of the information required by healthcare stakeholders is generated outside the health sector via agencies in charge of population censuses and civil registration systems, a lot of the data is not readily available for those who need it, when they need it.

Frustrated by the lack of access to quality, timely data in East Africa, the Bill and Melinda Gates Foundation and PATH, an international non-profit global health organisation, created a

Data Use Partnership with the governments of Tanzania, Ethiopia and Malawi. These partnerships were formed to fund national health information systems that would provide government agencies and global non-profits with crucial data needed to continue tackling public health challenges in the region. Without data gotten through the Data Use Partnerships, the commitment of over US\$300 million made by The Gates Foundation to facilitate the success of various public health programmes in Tanzania would be utilised without direction, and thus, have limited impact.

Building the solution

When my co-founders and I started Helium Health in 2016 to combat Africa's healthcare data challenges, we knew we had our work cut out for us. Whatever solution we came up with had to circumvent the challenges of a manual system, or it would be ineffective. So, we turned to technology.

We soon realised that incorporating technology was not enough. Our solution also had to be easy to use, adaptable to accommodate a range of healthcare practices, and built to function amidst the unique challenges of healthcare environments within Africa such as poor Internet connectivity. We created a system that aggregates and analyses information from a plethora of data points to provide private and government healthcare stakeholders with intelligence necessary to make healthcare decisions.

Government agencies are able to get all the aggregated data from different healthcare centres at the stroke of their fingers. They are able to identify trends, allocate money to fix issues and obtain actionable feedback.

In 2011, the Journal of Pharmacy and BioAllied Sciences published a scathing report on Africa's "poorly developed" healthcare system. In the article, they suggest that developing a system well-grounded in medical intelligence and making it the backbone of a country's health sector is necessary to achieve successful healthcare coverage. With the myriad of challenges facing the African continent, from booming populations in West Africa to the rise of non-communicable diseases like diabetes in North Africa, now is the time to create strong data practices on which we can build resilient, nimble health systems that can support the world's youngest population. ✚

Ovio will be discussing 'Millennial leadership development in Africa's healthcare ecosystem', on May 30, as part of the Africa Health Leaders Forum, at Africa Health Exhibition and Conference.

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UChicago Medicine performs historic back-to-back triple-organ transplants

Article provided by UChicago Medicine

We never in our wildest dreams imagined both would take place at virtually the same time.

Two 29-year-old patients from Michigan and Illinois are recovering following back-to-back triple-organ transplants to replace their failing hearts, livers and kidneys, marking a first in U.S. healthcare history.

The two surgeries, which lasted more than 17 and 20 hours each from December 19 to 21, were performed by a team at the University of Chicago Medicine. According to federal statistics, this marked the first time a U.S. hospital has ever performed more than one of these complex procedures within one year, much less within 27 hours. These cases are the 16th and 17th time this type of triple-organ transplant has been performed in the country.

With the addition of these two cases, no other institution in the world has performed more of these procedures. UChicago Medicine also performed heart-liver-kidney transplants in 1999, 2001, 2003 and 2011.

“Rare transplant cases like these provide a unique and memorable legacy for that donor and the donor’s family,” said Kevin Cmunt, president/CEO at Gift of Hope Organ & Tissue Donor Network, a not-for-profit organ procurement organization that coordinates organ and tissue donations and provides donor family services and education in Illinois and Northwest Indiana. “We at Gift of Hope take pride in collaborating with our esteemed transplant centers, like the UChicago Medicine, that helps bring the gift of donation to even more families”

While the UChicago Medicine teams had spent nearly two months preparing for these cases, they hadn’t planned for the near-simultaneous occurrence of two triple-organ transplants.

“We never in our wildest dreams imagined both would take place at virtually the same time,” said John Fung, MD, a transplant surgeon and co-

director of the UChicago Medicine Transplantation Institute. “Pulling this off can feel like trying to perform a high-wire ballet in the middle of running a marathon. But we were always confident in our patients as well as our team’s abilities.”

UChicago Medicine has a long history of breakthroughs in transplantation dating back to 1904, when cardiac surgeon Alexis Carrel developed the technique for joining severed ends of blood vessels together. This procedure is what made organ transplantation possible, and Carrel received a Nobel Prize in 1912 for his work. The medical center continued advancing the field by pioneering the study of bone marrow transplantation and performing the first successful living-donor liver transplant in the world, first segmental and split-liver transplants in the U.S., and the first pancreas transplant in Illinois.

The patients

Sarah McPharlin, a 29-year-old occupational therapist from Grosse Pointe Woods, Michigan, received her first heart transplant when she was just 12 after contracting a rare inflammatory condition of the heart called giant cell myocarditis. But a variety of complications over the next 17 years led to failure of her transplanted heart. Fluid began to accumulate in her legs and abdomen, damaging her liver and kidney. She consulted with transplant teams at several other hospitals, all of which told her they’d be unable to perform the necessary triple-organ transplant. She was eventually referred to UChicago Medicine.

McPharlin was admitted in early November. By that point, her legs and stomach were swollen from so much excess fluid that she could no longer wear her own shoes or clothing.

“Since we are such a positive family, I don’t think I realized how sick and uncomfortable I really was,” she said. “But now, I feel better. It’s amazing how such simple things we all take for granted can feel so good.”

Two prior donor offers had been accepted for McPharlin, by UChicago Medicine. While various issues prevented each of those transplants from taking place, they gave the transplant team a chance to fine-tune their daunting surgical plan, which ultimately would be needed for not one but two multi-organ patients.

Daru Smith, 29, was first diagnosed with multi-system sarcoidosis five years ago. The rare and difficult-

Sarah and Daru holding hands



to-diagnose condition causes clusters of inflammatory cells to form in organ tissues, which can sometimes lead to an irregular heart rhythm and even heart failure. In addition to impacting his heart, sarcoidosis led to significant liver and kidney dysfunction.

The truck driver from Chicago's South Side was hospitalized November 8 after an upper respiratory infection turned into pneumonia. His heart function had fallen to 15 percent.

"We had Sarah, who we had just listed on the transplant waiting list, and then came Daru, who was also just 29," said Nir Uriel, MD, director of heart failure, transplant and mechanical circulatory support at UChicago Medicine, who is managing the medical care for the patients. "We felt the team was in the mindset that the triple organ transplant can be doable and that we can also help Daru, too."

The surgeries

As Christmas Day neared, anxiety built. Then, on December 18, the first call about matching organs came for Smith. A day later, the same call about a match came for McPharlin. Surgical teams from UChicago Medicine were dispatched to two different hospitals — one in Illinois and one out of state — to retrieve the sets of organs.

In each case, Smith and McPharlin's new organs came from a single deceased donor. While finding a match for three organs is significantly more challenging than finding a match for a single organ, physicians typically prefer to use single donors for multi-organ transplants because it is easier for a body to accept foreign tissue from one source.

"The real heroes are the donors," said Talia Baker, MD, surgical and program director of the hospital's liver transplant program. "It's always amazing to me that in the face of whatever unknown tragedy just happened to them, these donor families are able to have the peace of mind to consider donation and to give a gift of life to complete strangers."

Smith's surgery began at 3:07 p.m. December 19 and took 17 hours and 11 minutes to complete. McPharlin's surgery began at 6:04 p.m. December 20, lasting 20 hours and 23 minutes.

Both triple transplant surgeries followed a similar pattern:

- The heart transplants were performed first by Valluvan Jeevanandam, MD, the health system's chief of cardiac surgery, who has now performed the heart transplants in all six of the institution's heart-liver-kidney surgeries.
- That was followed by the liver transplants, performed by Baker.
- Finally, the two patients received a new kidney during the last stage of the surgery, which was performed

by Yolanda Becker, MD, director of the kidney and pancreas program and the immediate past-president of the United Network for Organ Sharing (UNOS).

"The element of time adds pressure to what we do because we have only about four to six hours once the heart leaves the donor, while the other organs can last a little longer," Jeevanandam said. "A triple transplant magnifies the complexity and coordination of the process because the heart needs to go in first and be maintained while the other teams work to get the liver and then the kidney in."

The order in which the organs were transplanted was specifically chosen to minimize blood loss. (Each patient wound up receiving between 6 and 10 units of blood, along with plasma during the surgeries.) But the sequence also meant it was essential that each patient's new heart be delicately procured and transplanted to minimize any trauma, keeping it as strong as possible to sustain Smith's and McPharlin's bodies through the next two portions of their marathon surgeries.

"We had a 22-person operating room team of surgeons, nurses, anesthesiologists and others who rotated in and out — relay style — as each case progressed," Becker said. "We had prepared for each surgery to take between 24 and 32 hours. Instead, each surgery took significantly less time as the teams efficiently worked together."

What's next

Both patients remain hospitalized. After discharge, they will be closely monitored, coming in for regular checkups for at least the next year.

After they're released from UChicago Medicine, the patients and their families plan on having a meal together at a local restaurant.

Smith is eager to spend time with his 3-year-old son, who he calls "my life motivation," and hopes to explore a career change as well as the possibility of becoming a motivational speaker.

"I look at it as a new beginning for me," he said. "I don't usually do the 'new year, new you' stuff. But this is honestly going to be a new year and a new me."

McPharlin is looking forward to being outside in the sunshine. Ultimately, she hopes to return to work along with her hobbies of skiing and sailing and "just kind of being a typical 29-year-old."

"I want my donor's family to know I appreciate the generous decision they made during their time of grief," she said. "Organ donation works because of this selflessness. I'm so grateful for the opportunity and want to do my best to live life to its fullest as a sign of respect for the gift they gave me." ✦

For more information, visit www.uchicagomedicine.org/global

A triple transplant magnifies the complexity and coordination of the process because the heart needs to go in first and be maintained while the other teams work to get the liver and then the kidney in.



Dr. John Fung, Co-director of the UChicago Medicine Transplantation Institute



Dr. Valluvan Jeevanandam, Chief of cardiac surgery

Aging GCC population to drive regional pharma market

By Cara Turner, Brand Director – Pharma, for UBM EMEA the event organiser

CPhI Middle East and Africa, the leading global event for the pharmaceutical industry, returns to the Abu Dhabi National Exhibition Centre (ADNEC), from 16-18 September 2019, following a successful launch in the UAE capital last year.

The three-day showcase is once again expected to welcome over 4,900 suppliers and buyers from the industry and 294 local, regional and international exhibitors from more than 35 countries, where one of the hot topics of discussion on the show floor is expected to be the implications of an aging population on the pharma industry.

According to UN research figures it is estimated that the MENA population will increase from 443 million to a staggering 654 million by 2050. Looking at those figures in more detail, the population of the GCC countries will grow from 53 million today to over 71 million by 2050.

It is estimated there will be almost 18 million people over the age of 60 years, living in the GCC by 2050, representing 25 per cent of the total population, a significant increase over the current number which is reckoned to be just over two million. The issue of an aging population is not confined to the GCC, it is a global issue. In Italy, Greece and Spain, for example, the over 65s alone will account for 35 per cent of their total population by 2050.

So, this not only presents regional governments with major fiscal challenges, allocating sufficient amounts to their healthcare budgets over the next 20-30 years, but it also presents pharma-related companies with opportunities to grow in tandem

with market demand, which is currently worth in excess of US\$ 40 billion, further underscoring the importance of this event.

As the region's leading platform for bringing together pharma ingredients, product manufacturers, suppliers and buyers, in addition to addressing the demands of an aging and growing population, the event provides the perfect platform to address and discuss other key market growth drivers in the region.

These include obesity and chronic diseases such as diabetes, cardiovascular disease and oncology; private medical insurance that all expatriate residents must carry; and medical tourism and the development of domestic manufacturing.

Supported by Abu Dhabi Chamber of Commerce and Industry, the event is set to attract attendees from the Middle East and Africa (MEA), of which the MENA region accounts for 4 per cent of the global pharma market, and the rest of the world.

The exhibition space at CPhI is broken down into five distinct sectors of the pharmaceutical industry:

- CPhI: Brings together buyers, manufacturers and suppliers of pharmaceutical ingredients
- FDF: Meet with manufacturers from every aspect of the finished dosage supply chain
- ICSE: Connects the pharma community with CRO and CMO companies and technologies
- P-MEC: Showcases the newest pharmaceutical machinery, equipment and technology providers
- InnoPack: Hosts the latest innovations in packaging, integrated solutions and drug delivery systems

The exhibition will also feature Live Pharma Connect, a free service open to visitors and exhibitors allowing both parties to make pre-arranged pharma specific, mutually beneficial meetings during the event.

Running in parallel to the exhibition will be a range of content sessions addressing the latest trends in the market, a range of keynote addresses, as well as a host of networking opportunities.

For registration or further information please visit www.cphi.com/mea.



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Huawei's Telemedicine Solution offers medical care anytime, anywhere

Article provided by Huawei

King Salman Armed Forces Hospital (KSAFH) is the largest hospital within the North Western Region of the Kingdom. KSAFH aspires to become a reference model for medical services delivery in the Kingdom. The hospital already provides a number of specialties with the highest levels of healthcare and safe medical practice.

North Western Region is home to almost a million residents who are at least 1,800km away to the closest metropolitan area, which has access to most of the healthcare specialist facilities. In addition, attracting qualified healthcare staff to the region is a major challenge resulting in higher operational costs as well as un-even distributed healthcare resource allocations across KSAFH medical specialties.

Majority of the resident population has limited access to specialized healthcare facilities, with the nearest well-equipped hospital approximately 1.5-hour flight time.

Regional remoteness impacts clinical staff to meet Continuous Medical Education (CME) credits resulting in more days off to meet travel time requirements. Further, due to lack of adequate network connectivity multi-disciplinary medical consultation meetings had to be conducted face-to-face.

To address the challenges, KSAFH selected Huawei to implement its Telemedicine Solution. The Telemedicine solution was developed to extend the reach of quality healthcare to remote locations for providing remote expert consultation, remote medical education, remote monitoring and patient referral management. The Telemedicine Solution has the capability to offer medical care anytime, anywhere with the same level of interaction across multiple parties as if they are present in close proximity to each other.

During Phase 1, a key feature implemented was "Remote Expert Consultation". The Solution connects doctors and patients across different cities providing a user near real-life face-to-face consultation experience through HD audio and video, just as if they were in the same room.

Patients and doctors at KSAFH are enabled to share medical information and patient symptoms with specialist doctors in real time to provide medical advice and treatment guidance. With this, patients got the opportunity to share their health issues with remotely located specialized doctors and obtain prompt medical consultation. In addition, local doctors were able to consult with their specialty trained physicians as and when required for safe medical practice. Further, for specialized



cases where patients needed to be transferred to other hospitals and experience long wait times for scheduling appointment with specialist doctors, became a thing of the past. Remote Expert Consultation, therefore eliminated wait-times improving quality of care for the residents of North West region.

The Solution is also equipped with a fully enabled mobile cart to facilitate “Mobile Ward Rounds”. Telemedicine Mobile Carts allow medical consultation remotely without the need to shift the patients into the Telemedicine Consultation Room. And the cart is enabled with UPS system that makes it a fit device for critical medical usage and the device integrates with doctor’s workstation to provide a seamless user experience. The uses of telemedicine Mobile Cart extend far beyond the Mobile Ward Round since the cart is equipped with two monitors, one dedicated for video-conferencing, second for displaying medical data that includes:

- Remote Monitoring
- Home Care
- Long Term Care
- Medical Training
- Remote Communication

For Phase 2, KSAFH and Huawei have planned the construction of a new facility to enhance the utilization of Telemedicine Solution. The new facility will have a diagnostic room specifically designed for multiple physicians to provide second opinion on-demand. Further, the new facility would enhance medical training with the rollout of new multimedia classrooms for online lectures and remote seminars. HD audiovisual recording capabilities of the solution will also provide archival and playback on-demand for the hospital. The solution provides the scalability to integrate across multiple remote virtual primary care clinics to enhance healthcare access to PHCs across the Kingdom.

The Telemedicine Solution is a major milestone to change the model of care for the residents of North



“We owe a major responsibility to the citizens in the region. In a remote area within a large country, quality healthcare accessibility is a big challenge, and we embarked on a journey to fix just that. We personally witnessed a live demonstration of the telemedicine solution and we knew this is what we needed. Huawei understood our needs and aims thoroughly, and our experience with them has proved that we have made the ideal choice of partner. The solution has sparked a healthcare revolution in North West region, and we look forward to achieve upcoming phases of our journey,”

said Major. Abdulrahman Alodhayb,
CIO KSAFH, Alodhayb@nwafh.med.sa



West region to enhance the quality of care, provide improved healthcare access and continuity of care.

The solution was introduced in a total of six medical centers across the region including:

- Air Defense Medical Center
- Al Salama Family Medical Center
- Al Razi Family Medicine Center
- Main Airbase Medicine Center
- Women Health Center
- Armour Medicine Center

Overall, the clinics have experienced a 30 per cent increase in percentage of cases resolved remotely as a result of the telemedicine solution. In the span of three months, nearly 3,000 patients benefited from the telemedicine solution. KSAFH has set a benchmark for utilizing technology for transforming healthcare service delivery. The expert consultation request, which once used to take days can now be provided on-demand as and when required. ✚



In the know

New Case Series Investigates the Combined Use of Masimo SedLine® Brain Function Monitoring and O3® Regional Oximetry During Cardiac Surgery

Article provided by Masimo

A series of four clinical cases has recently been published in the Canadian Journal of Anesthesiology. Researchers at the University of Montreal found that combined use of Masimo SedLine® brain function monitoring and O3® regional oximetry assisted their understanding and management of cerebral desaturations during cardiac surgery.¹

Drs. Etienne Couture, Alain Deschamps, and André Denault hypothesized that the addition of processed electroencephalography (pEEG) using Masimo SedLine's processed EEG parameter, the Patient State Index (PSi), to a previously developed clinical management algorithm based on Masimo O3 near-infrared spectroscopy (NIRS), could help guide the management of cerebral desaturation episodes. In this series of case studies, they describe the impact of combining the modalities on the clinical management of four patients undergoing cardiac surgery. The researchers then outline a series of scenarios that enumerate possible causes of desaturation based on various combinations of changes in NIRS and pEEG, as well as changes in related monitoring data available via SedLine, such as the density spectral array (DSA) and spectral edge frequency (SEF). Possible causes include a change in cerebral blood flow, cerebral hypoperfusion, cardiogenic shock, hypoxemia, a change in the anesthetic state, hyperthermia, and seizure. In the four cases, more insight into the likely cause of a desaturation episode helped guide how clinicians responded during surgery.

The researchers concluded, "Combining both NIRS and pEEG allows for a much more nuanced understanding of the etiology of cerebral desaturation. Future studies are needed to investigate if the combination of both modalities

is more prognostic than each alone. Every cerebral oxygen desaturation is not equal."

Dr. Denault commented, "By combining NIRS and pEEG we were able to have a better appreciation of the significance of brain desaturation, and using Masimo O3 and SedLine in particular to obtain those measurements provided a number of advantages. The additional brain monitoring parameters available through Masimo SedLine, such as the DSA and SEF, play an important role in our protocol, helping to provide additional insight. And, perhaps most significantly, both SedLine and O3 can be used simultaneously on the same Masimo Root® monitoring hub, making it easier to view and interpret the combined data and thus streamlining our use of the desaturation protocol and workflow during surgery."

About Masimo

Masimo (NASDAQ: MASI) is a global leader in innovative non-invasive monitoring technologies. Our mission is to improve patient outcomes and reduce the cost of care. In 1995, the company debuted Masimo SET® Measure-through Motion and Low Perfusion™ pulse oximetry, which has been shown in over 100 independent and objective studies to outperform other pulse oximetry technologies.² Masimo SET® has also been shown to help clinicians reduce severe retinopathy of prematurity in neonates,³ improve CCHD screening in newborns,⁴ and, when used for continuous monitoring with Masimo Patient SafetyNet™ in post-surgical wards, reduce rapid response activations and costs.⁵⁻⁷ Masimo SET® is estimated to be used on more than 100 million patients in leading hospitals and other healthcare settings around the world,⁸ and is the primary pulse oximetry at 9 of the top 10 hospitals listed in the 2018-19 U.S. News and World Report Best Hospitals Honor Roll.⁹ In 2005, Masimo introduced rainbow® Pulse CO-Oximetry technology, allowing non-invasive and continuous monitoring of blood constituents that previously could only be measured invasively, including total hemoglobin (SpHb®), oxygen content (SpOC™), carboxyhemoglobin (SpCO®), methemoglobin (SpMet®), Pleth Variability Index (PVi®), and more recently, Oxygen Reserve Index (ORi™), in addition

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to SpO₂, pulse rate, and perfusion index (Pi). In 2014, Masimo introduced Root[®], an intuitive patient monitoring and connectivity platform with the Masimo Open Connect[®] (MOC-9[®]) interface, enabling other companies to augment Root with new features and measurement capabilities. Masimo is also taking an active leadership role in mHealth with products such as the Radius-7[®] wearable patient monitor, iSpO2[®] pulse oximeter for smartphones, and the MightySat[™] fingertip pulse oximeter. Additional information about Masimo and its products may be found at www.masimo.com. Published clinical studies on Masimo products can be found at <http://www.masimo.com/evidence/featured-studies/feature/>.

ORi[™] has not received FDA 510(k) clearance and is not available for sale in the United States. The use of the trademark Patient SafetyNet is under license from University HealthSystem Consortium.

Masimo O3 is not currently indicated for somatic use. ✚

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Ospedale San Raffaele is a clinical-research-university hospital, part of Gruppo San Donato, the leading hospital Group in Italy. It has **more than 50 clinical** specialties and over 1 300 beds, and its emergency department counts around 67 000 annual admissions. Research at Ospedale San Raffaele focuses on integrating basic, translational and clinical activities to provide the most advanced treatments to patients. The hospital counts on over 1 800 medical doctors, scientists and technicians, and on the state-of-the-art facilities and technology platforms. Ospedale San Raffaele is recognized as a **global authority in molecular medicine and gene therapy**, and is at the forefront of research in many other fields, standing out for **the deep interaction between the clinical and scientific areas** – this makes the transfer of scientific results from the laboratories to the patient's bed easier. Its mission is to improve knowledge of diseases, identify new therapies and encourage young scientists and doctors to grow professionally.

Ospedale San Raffaele is among the few centers in the world that **performs pancreatic islet transplantation** (i.e. the cells in the pancreas that produce insulin) to treat type 1 diabetes patients who do not respond to conventional therapies. The transplant aims at recreating the function of insulin-producing cells in a host organ (e.g. the liver). This technique has made huge progress along the years, but it still has some limitations, involving immunosuppressive regimens and rejection risks like all transplants. Researchers at the **San Raffaele Diabetes**

Research Institute (DRI) are currently studying **new treatment perspectives using stem cells**, differentiating insulin-producing from pluripotent stem cells. In the future, this may allow to rely on an endless source of cells that produce insulin and to modify such cells so that the immune system does not recognize and attack them.

The research stands out to find **treatments for genetic blood diseases**, too. The Hematology and bone marrow transplantation unit works side by side with the San Raffaele Telethon Institute for Gene Therapy (SR-Tiget) to **find a cure for thalassemia major**, the most serious form of the disease, causing chronic anemia and provoked by a defect in the production of hemoglobin. At the time being, conventional treatment consists of regular transfusions of red blood cells associated to iron chelation therapy. Patients who can rely on a bone marrow donor and are in good condition can undergo transplantation - that is currently the unique curative therapy. The doctors and researchers are trying to **set up a treatment to correct the defective gene causing the disease** – first, stem cells are extracted from the blood of the patient, then they are provided with the corrected gene and infused back into the patient's bone marrow. The healthy gene is carried into the cells by a genetically engineered virus which is modified so it becomes harmless. Once the corrected stem cells are in the bone marrow, they start producing healthy and functional red blood cells. The treatment is currently an experimental protocol involving ten patients, which showed encouraging preliminary results.

Colon Cancer: Call for a lifestyle change

Article provided by RAK Hospital

Among the many non-communicable diseases prevalent in the UAE, colorectal cancer is a cause of concern. Studies show that colon cancer is the third-most common cancer in men and the second-most common in women among the UAE residents. What is even more alarming is that the condition, which was once considered ‘the ailment of the old’, is now being diagnosed in younger people below the age of 40.

Every year March is observed as a colon cancer awareness month and it is important to highlight the fact that too many people are getting this disease and dying from what is essentially preventable by screening for it. Preventive strategies are an essential part of reducing the burden of colon cancer, as most people will not have any symptoms till the later stages of the disease.

Some of the symptoms for bowel cancer are a change in bowel habits, blood in the stools, weight loss, reduced appetite, sometimes abdominal pain/discomfort and bloating, difficult defecation or narrower stools, tiredness, anaemia and so on, but most of the times the cancer is asymptomatic. The known risk factors for colon cancer include age – since a majority of cases are seen in the over 50-years age group; family history of colon cancer and a diet that is low in fruits, vegetables, fibre and high on red meat and processed food. Lack of physical activity, smoking and alcohol consumptions can also increase the risk of cancers. Moreover, patients suffering from Ulcerative colitis or Crohns disease are at a higher risk of being

diagnosed with colon cancers.

“The success rate of treatment depends on the size and stage of the tumour, including any spread to the lymph nodes or other organs, but by and large if detected and treated early, the 5-year survival rates are much better. However, prevention of colon cancer or early detection by screening tools should be mainstay to fight against the disease. The nature of the disease (progression from adenoma to invasive cancer over a period of time) gives us an opportunity to screen for polyps and early cancers and treat this successfully,” said Dr. Syed Naveed Azam, who has recently joined RAK Hospital as a senior Consultant Gastroenterologist.

A colonoscopy offers the best opportunity to not only detect cancers and polyps but also to remove the polyps before they become cancerous. The screening programme for colon cancer has been shown to reduce the incidence of the cancer; the rates in the U.S. have dropped by 30 per cent in the last 10 years among the over 50 years age group due to the wide uptake of colonoscopy screening. Unfortunately, in other countries, including the Arab states, the incidence is increasing and there is an urgent need to tackle this problem.

RAK Hospital’s Gastroenterology Department is fully equipped for any medical emergencies, as well as providing colonoscopy/screening and diagnostic and therapeutic treatment to the patient. Besides colon-related ailments, the department deals in medical management of diseases of the oesophagus, stomach, small and large intestine, liver and pancreatic disorders. It further provides endoscopy of oesophagus, stomach and duodenum, and ERCP (Endoscopic Retrograde Cholangio-pancreatography).

The hospital further offers more than 30 specialised clinics and specialties. With full-fledged services available in cardiology, paediatrics, maternity, interventional cardiology, joint replacement surgeries, bariatric surgeries, advanced laparoscopic surgeries and rehabilitation, among others, RAK Hospital provides patient-care across a wide spectrum of ages and nationalities. ✚



Survey by Leading U.S. Hospital Cleveland Clinic Shows Need to Prioritize Heart Health Awareness in GCC

Article provided by Cleveland Clinic

Leading heart physicians at U.S.-based Cleveland Clinic say there is a clear need for greater heart attack awareness in GCC, after a 2018 survey found many residents identified stroke symptoms of as those of a heart attack, and most could not identify a correct first response to a heart attack.

Heart disease is the No. 1 cause of death around the world. Cleveland Clinic has been ranked America’s No. 1 hospital for cardiology and cardiac surgery for 24 years in a row by US News & World Report.

Most people could identify two symptoms – “pressure, squeezing, fullness or pain in the center of your chest” and “shortness of breath” – as symptoms of a heart attack. Only in two countries did more than 70 percent correctly identify pain in the chest – Bahrain with 74 percent and Oman with 73 percent.

“The first symptoms of having a heart attack is chest pain, shortness of breath, most of the time there is pain in the upper left arm, back pain, nausea, and also one of the first symptoms is sweating,” said Maan Fares, M.D., cardiologist and vice chairman of global patient services at Cleveland Clinic.

In Saudi Arabia, 52 percent of people, or about half of those surveyed, correctly recognized this as a symptom, and only 49 percent of men. The results for other countries were 62 percent in Kuwait and 64 percent in the UAE. Those correctly identifying shortness of breath as a symptom ranged from 48 percent in Oman to 64 percent in Bahrain.

When asked to identify heart attack symptoms, a significant number instead chose stroke symptoms, including around 40 percent across the region who selected “sudden numbness or weakness of face, arm or leg” and around 20 percent who selected “slurred speech,” both of which are symptoms of a stroke.

In a separate question asking what was the “thing to do first” in the event of a possible heart attack, fewer than half correctly identified “call an ambulance” – widely considered by doctors as the fastest way for a patient to start receiving proper care. Figures ranged from just 36 percent in Saudi Arabia and Oman, to 43 percent in the UAE, 46 percent in Kuwait, and 48 percent in Bahrain.

Between 8 percent and 12 percent said they would chew an aspirin as a first response – with the common

headache tablet known to slow blood clotting and reduce the severity of a heart attack until help arrives.

“If you are experiencing symptoms of heart attack, a patient has to realize there is need to call an ambulance. It is important to go the hospital and have the opportunity to treat the patient in the best way possible to make the heart function properly. Time is very important in order to avoid having chronic heart disease in the future,” Dr. Fares added. “The other things that the patient can do at home, take one to two pills of aspirin to help thinning the blood. The other things that the patient can do – taking the nitroglycerin pill under the tongue in order to alleviate the pain until they make it to the hospital.”

Around 1 in 10 said they would call their physician or drive to the hospital – either driving themselves or having someone else drive. Doctors say both courses of action are likely to delay treatment and place the patient at greater risk of serious heart damage or death.

Patients travel to Cleveland Clinic, located in Cleveland, Ohio, U.S., from around 185 countries every year for treatment, including locations in Weston, Florida.; Las Vegas, Nevada.; Toronto, Canada; Abu Dhabi, UAE; and London, England to open in late 2020.

Survey methodology

Cleveland Clinic’s survey of the general population to gathered insights into perceptions of heart disease. This was an online survey conducted among a nationally representative sample, consisting of 2,557 adults, 1,536 male and 994 female 18 years of age and older, in GCC countries. We have weighted the numbers to be nationally representative. This online survey was conducted by YouGov between January 3 and 10, 2018. ✚



Dr. Maan Fares



In the know

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Article provided by Henry Ford Health System

30,000 employees, 100 years of service, 6 hospitals, 1 you

As a premier academic healthcare system, Henry Ford Health System (HFHS) is recognized internationally for excellence in patient care, research and teaching. From performing firsts in heart surgery and organ transplantation in Michigan to being one of seven healthcare providers in the U.S. chosen to lead a research consortium in precision medicine, the Detroit-based healthcare system has been at the forefront of improving the health and well-being of the diverse communities served, which includes the largest Arabic population in the U.S.

The system was founded in 1915 by American automotive pioneer Henry Ford. Following his lead, Henry Ford Health System has spent the last century improving medicine, providing world-class care and advancing research efforts to find unique solutions for patients.

World-class care

Providing exceptional care to patients through research and using the most advanced therapies available, Henry Ford Health System is driven to examine and explore the medical advancements of tomorrow. Some of the services and features offered include:

- The Henry Ford Medical Group, one of the largest group practices, with more than 1,900 physicians and researchers in over 40 specialties.
- One of the largest multi-organ transplant centers in the U.S.
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- Pioneering treatment using robotic technology for prostate cancer and kidney surgeries.

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for more than 20 universities and schools.

HFHS is also the first in the world to use an advanced FDA-approved radiation therapy that uses real-time magnetic resonance imaging and linear accelerator delivery to image and treat cancer patients simultaneously.

The Henry Ford Cancer Institute's new Detroit facility will be a world-class cancer destination center that will provide a seamless experience tailored to each patient's unique journey.

International leaders

Henry Ford Health System's impact on healthcare extends around the globe. HFHS' world-class health professionals offer leading medical expertise, innovative tools and technologies, and transformative practices to national and international colleagues. They also work in partnership with healthcare professionals in India and Saudi Arabia to share and adopt the latest innovations, as part of the overall mission to continuously evolve as a healthcare leader.

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More than just a patient

Henry Ford Health System aims to be every patient's trusted partner in health. Each day, the doctors, physicians, nurses and support staff strive to treat each patient entirely, focusing on both health and wellness. They manage patient care with compassion and comfort and provide treatment that is as individual as the person they are caring for. ✦



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