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The Official Magazine

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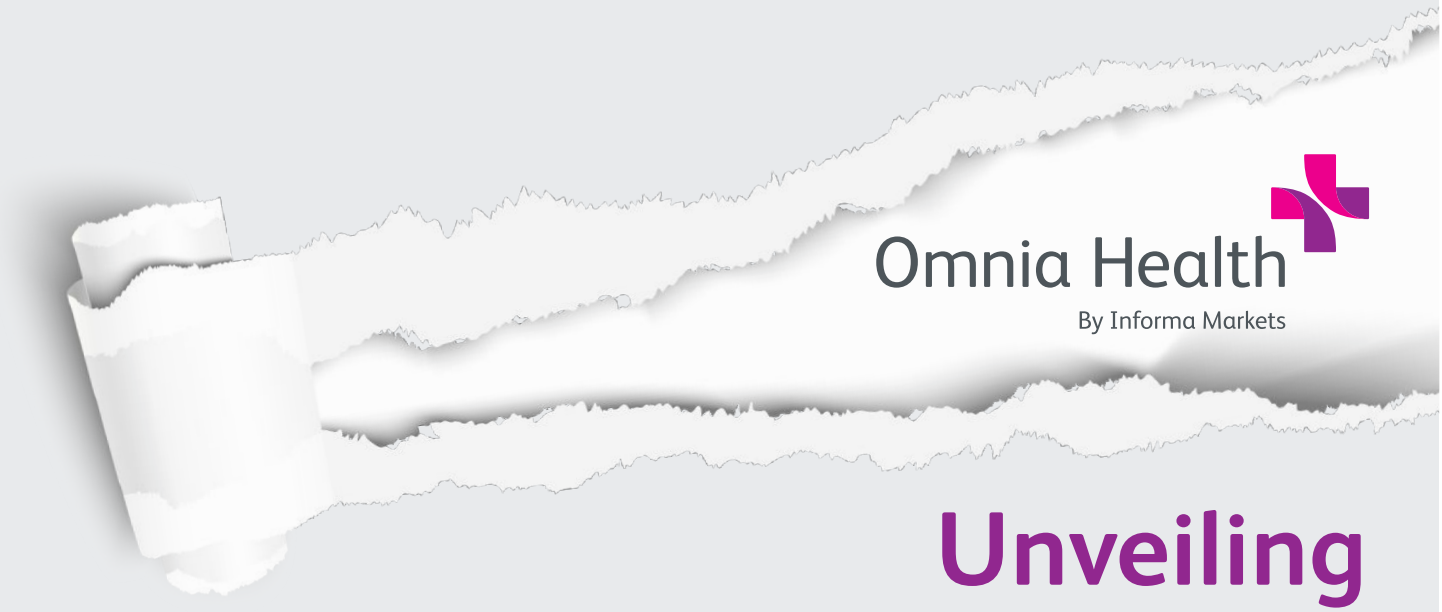

Unveiling
Arab Health Magazine's brand new look in 2020

Turn to page 08 to find out more

Arab Health 2020:
Where the world of healthcare meets

(pg 06)

Driving value creation in UAE hospitals *(pg 20)*

The rise of femtech and SHEconomy *(pg 42)*

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Culture of safety

Welcome to the September/October edition of Arab Health Magazine! In this issue, we take a deeper dive into Arab Health 2020 that is expected to welcome over 4,250 exhibiting companies, 55,000 attendees and will showcase the latest innovations in healthcare. Find out about all the latest show developments in store on *pg 06*.

From 2020, Arab Health Magazine will have a brand-new look and will be renamed as Omnia Health Magazine. The print and digital mediums of the publication will continue reporting the latest advancements transforming the healthcare industry and feature exclusive content around all our international shows. Take a sneak peek on *pg 08*.

We also take a look at how design can impact lifestyle and promote health, via healthcare facilities in the Middle East *(pg 14)* and how DHA's DXH initiative has given a great boost to the city in international health tourism markets, with over 337,000 medical tourists visiting last year *(pg 44)*.

Furthermore, the 15th edition of Patient Safety Middle East is all set to take place between October 24 to 26 at the Le Méridien Hotel & Conference Centre, Dubai. As an accredited conference, the show is a leading event that addresses issues that hospitals and other healthcare organisations need to be informed of in the critical area of patient safety, in the region. The Patient Safety special in the issue *(pg 48 to 65*) features the event's conference speakers who shed light on topics that will be discussed at the show.

For instance, Dr. Rakesh Suri, CEO, Cleveland Clinic Abu Dhabi, emphasises on why safety must always be the highest priority for hospitals and healthcare providers and how reinforcing it requires leadership support and ongoing process improvement *(pg 50)*. We look forward to welcoming you at the show and hope you find this issue informative.

Deepa Narwani

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Contents

Arab Health 2020:

Where the world of healthcare meets

The 45th edition of the annual exhibition will open the doors in 2020 with a revamped look.

By Arab Health Magazine Staff

Arab Health, the annual industry-defining platform where the healthcare industry meets to do business with new customers and develop relationships with their existing clients, will be split into 8 sectors according to main product categories for 2020. The exhibition, combined with accredited medical conferences, has continued to grow and bring investment and new technologies into the Middle Eastern healthcare community for 45 years.

Taking place between 27 to 30 January 2020, at the Dubai World Trade Centre and Conrad Dubai Hotel, the free to attend show has established itself as an important platform to conduct healthcare business in the MENA region. This is illustrated in the fact that the upcoming edition of the event is expected to welcome over 4,250 exhibiting companies, 55,000 attendees from 159 countries, over 5,350 delegates, and will host 37 country pavilions and 15 conferences.

Since it was established, Arab Health has showcased the latest innovations in healthcare, from state-of-the-art imaging equipment to some of the most cost-effective disposables, to developments in surgery as well as advances in prosthetics. The exhibition has defined itself as the one-stop-shop for all healthcare sourcing and procurement needs by bringing a variety of healthcare product manufacturers and service providers under one roof with thousands of products to explore.

The show is the largest gathering of healthcare and trade professionals in the MENA region and is the perfect place to meet new customers and develop relationships with existing clients from across the globe. It allows companies to increase their international presence, generate new business, network with industry leaders and potential buyers and showcase products to an engaged audience.

Furthermore, many exhibitors benefit from market testing that they carry out while exhibiting to gain general and healthcare industry opinion about their offerings. Companies also use this opportunity to stay abreast of the industry's latest trends and advancements and keep ahead of the competition in one of the fastest-growing medical destinations.

Arab Health provides a beneficial experience for all dealer and distributor job functions – from senior management of larger organisations that are looking to connect with key industry players, sales and business development professionals tasked with expanding their product portfolios and entrepreneurs hoping to source the next 'big product' to supply in their country.

The event is expected to welcome over 4,250 exhibiting companies and 55,000 attendees from 159 countries.

Sectorisation

For 2020, the Arab Health exhibition show floor will be split into sectors according to main product categories to improve the show floor navigation thus enhancing visitor experience. This move has been made to increase traffic within the halls by attracting a relevant audience interested in a particular product category, thereby increasing quality leads.

The show floor will be divided into the following sectors: 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.

Arab Health Congress

Healthcare professionals can improve their knowledge and skills through educational opportunities available at the event through conferences, workshops and training sessions. A wide variety of dedicated Continuing Medical Education (CME) accredited conferences provide professionals with the opportunity for growth in multiple fields and disciplinaries. The upcoming edition will feature 14 CME conferences, 1 non-accredited educational

forum, 400 plus international and regional speakers, and over 5,300 delegates.

With the aim of bridging the gap in medical knowledge, these carefully designed conferences will upgrade attendee knowledge through immersive educational tracks and provide the very latest updates and insights into cutting-edge procedures, techniques and skills. The sessions will take place at the Dubai World Trade Centre and the Conrad Dubai Hotel.

For instance, the newly introduced **Midwifery Conference** will focus on the contemporary role of the Midwife and will present an excellent opportunity to explore the challenges presented within this profession. Some of the other newly introduced accredited conferences include GI Endoscopy, Patient Experience, Primary Care, Anaesthesia and Pain Management, and Physical, Rehabilitation and Sports Medicine.

Returning for its 20th edition is Arab Health's T**otal Radiology Conference**, which is a four-day scientific meeting, will shed light on the latest advances in medical imaging, accurate imaging diagnosis and improvement of care quality for radiology patients. While the 12th edition of the **Obs & Gyne Conference** is a four-day multi-focus event highlighting the fields of general Obs & Gyne as well as reproductive health, maternal health, minimally invasive surgery, foetal medicine, gyne-oncology and imaging. The agenda features local and international speakers providing the latest updates in the treatment, management and diagnoses of a range of disorders.

Construction is a trending topic in the healthcare sector with numerous projects being planned or under construction throughout the GCC. The ageing population, market competition, and the need to continually raise the bar in the delivery of care have kept healthcare organisations vigilant. While balancing these dynamics with financial resources has proven to be challenging, companies are confidently forging ahead with initiatives that are benefiting the entire sector. Arab Health will be hosting the **Healthcare Infrastructure** conference this year to draw attention to the future of the healthcare infrastructure industry. The complimentary four-day non-CME conference will cover essential topics such as public, private partnerships, specialised healthcare facilities, healthcare facility accreditation and will provide crucial updates about healthcare projects in the GCC.

Innovation Zone and Innov8 Talks

Innovation is taking centre stage in healthcare and everyone right from start-ups to small companies and larger tech and pharmaceuticals, are getting involved in bringing new technologies to the market. These innovations are being designed to improve the quality of care while lowering costs and speeding up the time to diagnose and treat a patient.

After a successful run at Arab Health 2019, the Innovation Zone will be back again in 2020. It is a dedicated area for visitors to immerse themselves in the latest healthcare innovations. The zone comprises of two key sections – Innovation Showcase and Innov8 Talks.

The Innov8 Talks will be returning with new content, products and pitches and will be a great place to share new ideas and discuss how innovations can be brought to life. Over 32 companies will be participating at the upcoming edition.

The concept behind Innov8 Talks is that each company will have 8 minutes to pitch their innovative concept to a panel of judges. Companies can be as creative and engaging as possible to showcase their innovative product. The stage gives participants a chance to share how they can improve the healthcare industry to an audience of potential investors, and to network with a wide selection of industry experts. The keynote speech will be given by Dr. Maulik Majmudar, Chief Medical Officer, Amazon.

The upcoming edition will feature 14 CME conferences, 1 non-accredited educational forum, 400 plus international and regional speakers, and over 5,300 delegates.

For more info visit *www.arabhealthonline.com*

Arab Health Magazine to be renamed as Omnia Health Magazine

Here is a sneak peek into our brand-new look in 2020!

At Informa Markets – Healthcare Group, our vision is to become the 'Global Information Hub' for the B2B healthcare industry and with more and more people logging in online to consume industry news and developments, we felt it's time to make a change and embrace the digital future.

From 2020, *Arab Health Magazine*, the GCC's leading healthcare publication, will be rebranded as *Omnia Health Magazine*. This move has been made to establish the magazine as the official publication for all the events under the Informa Markets – Healthcare Group. The print and digital mediums of the publication will continue reporting the latest advancements transforming the healthcare industry and feature exclusive content around all our international shows such as Arab Health, Medlab Middle East, Africa Health and FIME, among others.

Omnia Health will bring out two print issues with digital extensions and four exclusively digital magazines, along with topical supplements and 12 dedicated e-Newsletters that will be circulated to a global audience. Additionally, the most recent news and developments from across the globe will be reported weekly on **www.omnia-health.com/news** and promoted on our social media channels.

Omnia Health Magazine strives to provide commentary and analysis to key decision-makers

in the healthcare industry. The B2B publication will cover topics related to the Investment, Management, Economics and Technological aspects of healthcare. Both our print and digital platforms have been designed to deliver the latest news in the industry and will offer a crucial insight into the trade.

The brand-new website *(pictured)* has been designed to focus on the user experience and will offer engaging content and optimised design and text that is user-friendly, to make it more accessible and interactive. The website will also feature embedded videos, webinars and whitepapers to give a more visual and engaging experience. It will host up-to-date analyses and reports on market developments and provide constant updates on new projects, products and technologies that will make it a must-read for healthcare professionals.

Omnia Health's online content platform will complement the digital Omnia Health Global Medical Directory that features products from leading medical and healthcare companies from around the world. Omnia Health is on the path to becoming a powerful business intelligence tool that will support all stakeholders in the healthcare industry grow.

Currently, Omnia Health is coming together, evolving, changing and growing, and we hope you'll be part of our exciting journey!

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Insight into Saudi Arabia's transforming healthcare landscape

By Deepa Narwani, Editor

Shehzad Jamal

A recent report titled *Healthcare in Saudi Arabia Opportunities in the Sector* by Knight Frank highlighted that the prevailing picture in the country is one that offers several prospects to existing operators/investors and new entrants, hence there is a possibility to unlock a significant growth potential by fulfilling existing and future gaps. In an interview with *Arab Health Magazine,* Shehzad Jamal, Partner, Healthcare and Education, Knight Frank, underlined that in the context of the growing healthcare demand in the Kingdom of Saudi Arabia (KSA), government initiatives call for greater participation of the private sector in healthcare as emphasised in the National Transformation Plan (NTP). He also shed light on the technological transformations changing the industry. Excerpts:

What do you think is driving the healthcare industry forward in Saudi Arabia? Are there any current trends you would like to highlight?

The healthcare sector in KSA is undergoing continuous changes and in the right direction. In my opinion, the top three factors that will drive the sector forward are:

Demographic profile: This factor is often overlooked, because of the general perception that

KSA is a country with a young demographic profile. However, in the next decade, the country will see a structural shift in its population composition resulting in a significant increase in the population above the ages of 40 and 60. This will drive demand for healthcare services, and the nature of services, spend per patient, duration of care and type of specialisations will significantly change compared to what the industry is seeing today.

Government initiatives and policies: This includes factors such as the National Transformation Programme 2020, including the mandatory health insurance for private sector employees and planned coverage of public sector employees that will improve the overall propensity to spend on healthcare. This will tilt the scale towards the private sector as patients increasingly prefer the private sector on account of the quality of care, efficiency and reduced lead times for appointments. The private sector will gain more prominence and have more opportunities for investment, as the government sector moves away from being a healthcare service provider to a regulator.

Tech: Technology, in general, has helped improve the service delivery of healthcare. However, there are some technologies that are disrupters, and will change how healthcare can be delivered. For example, the use of telemedicine and wearable health monitors; if these are allowed to be more mainstream it will change how business is conducted. The healthcare operators will need to reconsider how to reconfigure their hospitals and other outpatient facilities as the volume of patients coming to hospitals with minor conditions or follow up visits may reduce. In addition to the reconfiguration of their healthcare facilities, the healthcare operators will also need to consider the investment in IT infrastructure to support these platforms.

Could you share some key insights from Knight Frank's *Healthcare in Saudi Arabia Opportunities in the Sector* report?

The healthcare sector in KSA is poised for growth on account of the demographic shift and increased insurance coverage. The population dynamic alone shows that there can be an expected increase in the burden of lifestyle diseases and associated comorbidities that would result in a demand for specialised medical and surgical care.

There is a visible gap in the infrastructure available versus what is required in the healthcare sector, which is a sufficient business case for investment in healthcare. Primary research conducted by our team revealed the following:

- Healthcare services in high demand include orthopaedics, obstetrics and gynaecology, IVF, ENT, gastroenterology, cardiology/cardio surgery and ophthalmology.
- Healthcare services with capacity constraints: rehabilitation, oncology, orthopaedics and cosmetic surgery – there is significant outbound medical tourism for these services.

What are the major healthcare market segments that are likely to expand in the coming year, and why is this so?

I see two segments within the healthcare sector that are likely to expand multi-fold:

a) preventive care (wellness driven) and
b) medical care (long term care, rehabilitation and geriatric care).

The population of KSA is susceptible to non-communicable diseases (diabetes and obesity) due to sedentary lifestyle and unhealthy food choices, which unfortunately are more accessible in terms of cost and availability. In developed countries as well as the GCC, the wellness concepts of nutrition management, active lifestyle, healthy living etc., are catching up. We are observing the increasing interest of investors in this sphere, and believe it is a very promising segment.

In a similar vein, the anticipated demographic changes with the population between 40-59 years and above 60 years is set to increase by almost 1.5 and 3 times respectively. We expect an increase of interest from government authorities, operators and investors alike in niche segments such as long-term care, rehabilitation and geriatric care. For European and North American countries, which have stepped in the era where healthcare sector concerns skewed towards the ageing population, these concepts are widely spread and are implemented as successful business models.

What are some of the current issues the GCC's healthcare industry faces and what are the possible solutions?

The issues faced by the healthcare sector is broadly similar across the GCC, such as reliance on foreign qualified healthcare resources, lack of certain specialised healthcare services (forcing people to travel abroad for treatment), lifestyle diseases, lack of a quality primary care facilities especially in rural areas, which leaves tertiary care overburdened with patients.

To ensure steady improvement in the health sector, it is imperative to encourage private sector investment. This will create competition, which in turn improves quality of services, efficiency in the system etc. However, there needs to be a

The population dynamic alone shows that there can be an expected increase in the burden of lifestyle diseases and associated comorbidities that would result in a demand for specialised medical and surgical care.

Research highlights that growing general public awareness of healthcare shows an increasing inclination of the population seeking preventive care.

strong mechanism in place that should ensure an oversupply situation will not arise as that would be detrimental. The government must analyse the sector and identify gaps within the different healthcare specialties. This will allow the private sector to channel their investment to serve these segments. This will not only reduce the investment risk within the healthcare sector but also build the overall healthcare capacity of these countries holistically.

To draw private sector interest, further concentration is required on the following:

- **Investor friendly legislation and schemes:**
  - Increased private sector participation by the introduction of PPP schemes (with clear structures), tax holidays, low-cost credit etc.
  - Foreign Investment: Expedite company formation process for foreign firms, permit repatriation of profits, assist visas for specialist staff to overcome human capital issues etc. We understand that the Saudi Arabian General Investment Authority (SAGIA) is playing a promising role in this.
- **Capacity to spend:** Expedite the implementation of mandatory insurance for Saudi nationals employed in the public sector. This will shift the quantum of care towards the private sector and help reduce the burden of healthcare from the shoulders of the government. These matters need to be addressed now because as the population starts ageing, the cost of care will increase and then implementation and shifting of care to the private sector may become challenging.
- **Healthy lifestyle awareness campaigns:** Although GCC governments have been professing this for some time, a concentrated initiative is required, targeting all age groups and society at large to promote a healthy lifestyle as the way of life.
- **Increased use of technology:**
  - Telehealth: The potential in this area is immense and can pave the way for collaboration of domestic healthcare operators with other internationally renowned healthcare providers. The practical advantage of this method of care is that it provides immediate access to healthcare professionals, restricts travel to a healthcare service provider on a need basis and reduces the burden in the outpatient department of healthcare facilities. In critical cases, the use of telehealth may also result in the saving of lives as real-time specialist guidance can be provided to stabilise a patient in healthcare facilities, which do not have adequate specialists
  - Technology wearables: These instruments can constantly track a person's vitals and provide complete data allowing physicians to provide holistically proactive care rather than reactive treatment. This is more cost-effective and better for the entire system.

Is Saudi Arabia emphasising prevention?

Several government-driven initiatives are already changing the dynamics of the sector and contributing to reshaping the healthcare landscape in the Kingdom. What is important is to understand how the general public is responding to such ideas and how that is resulting in opportunities for investment.

Our research highlights that growing general public awareness of healthcare shows an increasing inclination of the population seeking preventive care and for reactive measures, they are preferring centres of excellence over general hospitals.

This trend presents an opportunity for existing and new market participants to introduce:

- Windows for preventive care services such as screening programmes, genetic studies to understand the disease predisposition among others, which has proven long term health and economic benefit for patients and the overall health system of a country.
- Development of centres of excellence in areas of their core strength especially in medical conditions relating to oncology, orthopaedic and lifestyle-related diseases.

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Health by design: How design can impact lifestyle and promote health, via healthcare facilities in Middle East

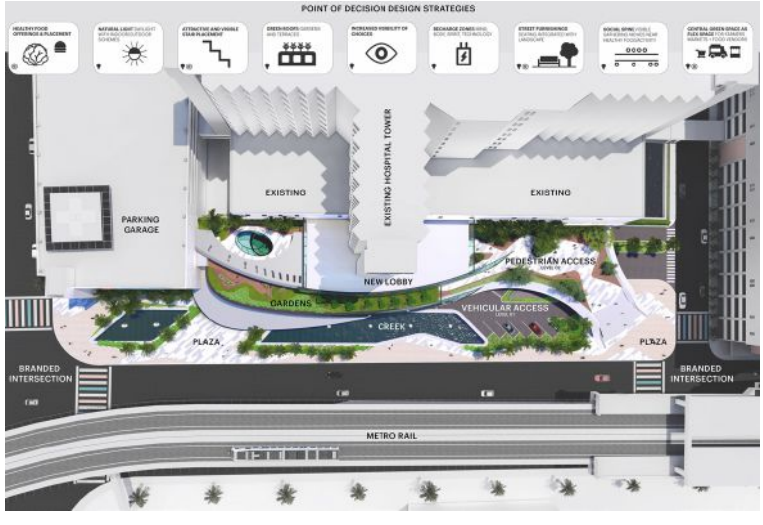
By Upali Nanda and Ben Gonzalez, HKS

Unhealthy behaviours are really a consequence of unhealthy environments and unhealthy prompts within these environments.

An obesity epidemic

In 2015, a news article in *CNN Abu Dhabi* proclaimed an obesity epidemic in the Middle East showcasing a young boy who weighed more than 600 kgs and had to be forklifted from his apartment to get medical help. The article announced that obesity and diabetes rates in the Middle East are staggering, particularly in the Gulf region – Kuwait, Saudi Arabia, Bahrain, and the United Arab Emirates. The article went on to suggest that perhaps the luxurious lifestyle and the abundant availability of food without an equal focus on physical activity could be at the heart of the problem.

The United States has also struggled with the obesity epidemic for many years. More than one-third of American adults are now obese, which has nearly doubled since the 1960's, and another third are overweight (National Center for Health Statistics, 2016). The issue is urgent because we know that physical health can impact mental well-being as well. Depressed and obese people are far more likely to become obese or depressed, respectively, over time (Luppino et al., 2010). Many initiatives are being supported nationwide to focus on health and well-being and encourage a healthier lifestyle. What if our environments, and the buildings we live in, are the hurdle towards this goal?



A design opportunity

Public health research for many years has held that unhealthy behaviours are really a consequence of unhealthy environments and unhealthy prompts within these environments. In 2016, the AIA supported the Center for Advanced Design Research and Evaluation, Planning4Solutions and HKS architects to study how design could influence people to make healthier decisions. The team concluded that while there were many design strategies that could create a healthy environment, we need to focus on the "points of decision" where people make choices about their physical activity or diet and influence the decision at that point.

The following are some of the design strategies this study found that can nudge people to make healthier physical activity and diet choices in college settings:

- Increase visibility of healthy choices
  - A well-placed staircase in lieu of elevators.
  - A smartphone app that prompts us when there is a park or a health food store.
  - Signage.
- Enhance walkability
  - Well-maintained walkways.
  - Greenery, gardens, multi-use fields, sheltered picnic areas, public plazas.
  - Quality street lighting.
  - Mixed-use development that includes appealing and accessible healthy food options and other amenities.
- Improve transportation infrastructure
  - Bike lanes and bike share/parking facilities.
  - Easy access to public transportation system.
- Increase availability of healthy food options
  - Easy access to fresh produce such as supermarkets, farmer's markets, and community gardens.
  - Healthy "grab 'n go" options in vending machines and cafeterias.

These strategies involve various scales of environmental design ranging from information design to urban realm. The research recommends a detailed analysis of the users and different personas to assess how to create better point of

decision design. Given the unique culture in the Middle East, for example, perhaps a compelling point of decision prompt would be to have healthy lifestyle options in places where there are large social and family gatherings. Large Middle East families tend to visit patients in hospitals. Perhaps developing educational programmes in the main lobby that teach healthy cooking options or exercising will allow them to spend time in the hospital while learning. Given that more than half of the population is in school, a similar programme can be developed for schools in order to educate and improve the health of the population now and in future generations. The unique climate needs to be taken into account to ensure that activity and hydration options are planned together, while remaining culturally sensitive.

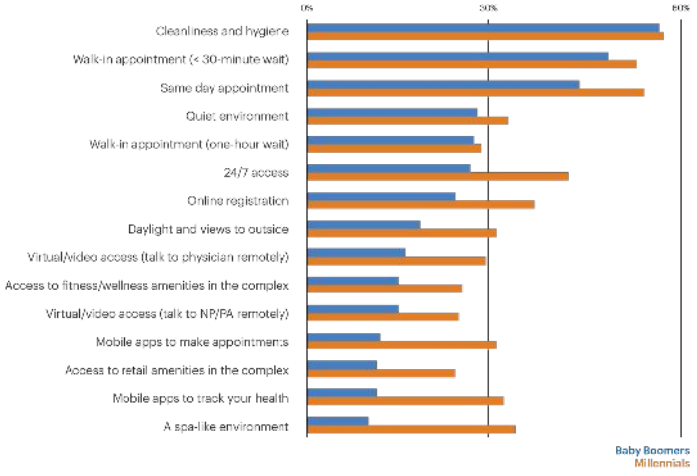
The role of healthcare facilities, and a generational desire for health and wellness amenities

For healthcare facilities, this approach to designing everyday places has to be woven into the rubric of the complex environments we design. Hospitals and critical care institutions can often have unhealthy options in their own cafeterias, have inadequate options for rest and exercise for family members, and are rarely, if ever, thought of as health destinations. Perhaps it is time to change that and make hospitals in the Middle East the symbol of health and well-being.

This is particularly timely given the focus on population health to reduce the cost of healthcare globally. In Clinic 20XX, a study conducted by CADRE, HKS and JE Dunn, population health and telehealth were identified as two trends that are likely to be the most sustainable. In many ways these trends are re-shaping the traditional care delivery points.

Additionally, the research found a much stronger affinity in younger generations (millennials compared to boomers) for health and wellness amenities in health facilities.

WHAT ATTRIBUTES MAKE A CLINIC MORE APPEALING FOR FUTURE VISITS? (TOP BOX SCORE)



A new paradigm: Healthcare facilities as health destinations

In conclusion, there is a need for healthier environments, but there is also a growing awareness and expectation from the patients to live healthy and be treated in health promoting environments. As designers we can keep the following tenets in mind, while designing any healthcare facility:

1. During master planning, ensure planning for pedestrian friendly environments that promote engagement with nature.
2. Consider creating a "health neighbourhood" around healthcare facilities, especially those in the community so they can become a health destination rather than a "sickness" destination
3. Carefully consider diet choices and health food availability in designs. Create appealing environments around healthier options and provide sensory cues at key points of decision.
4. Promote stair use for ambulatory patients by creating attractive, accessible stairs that are strategically positioned at key points of decision.
5. Make health and well-being a core focus of healthcare facilities by designing facilities that are warm, environment-friendly, well-lit, integrated with nature and actively promote healthier choices.

Population health and telehealth were identified as two trends that are likely to be the most sustainable.

THE EXPANDING CARE CONTINUUM

Information Source: Couvillion, M., Kraus, S., & Waters, L. (2013) [15]

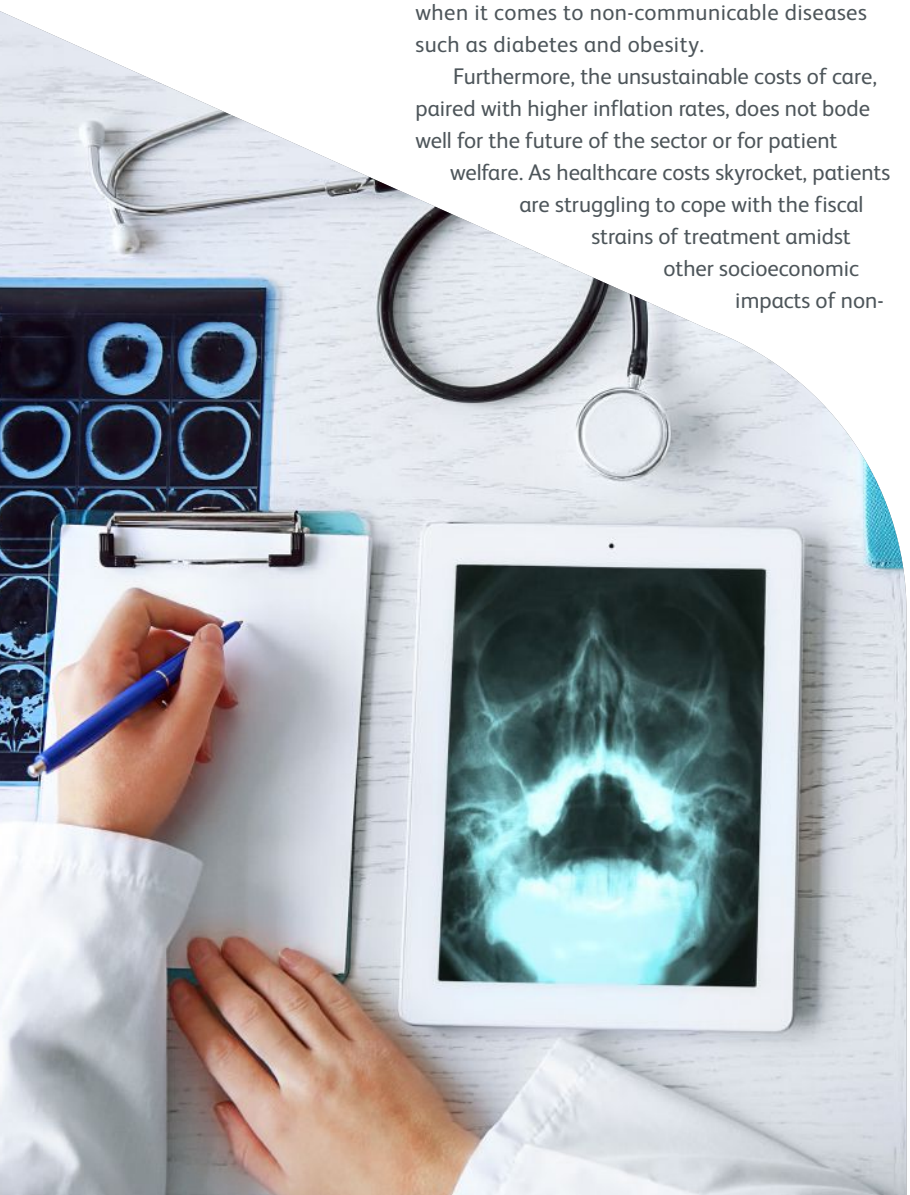
How governance can make UAE a global leader in healthcare

By Jad Bitar, Managing Director and Partner and Emile Salhab, Managing Director and Partner, Boston Consulting Group Middle East

More than 36 per cent of children in the UAE are obese, which is double the global average.

In today's modern setting of transformative technologies, the tremendous surge in information and data is revolutionising healthcare globally and in the UAE. The country's healthcare system has evolved significantly in the last decade under the governance of a federal regulator – Ministry of Health (MoH) – and two Emirate-level regulators – the Abu Dhabi Department of Health (DOH) and Dubai Health Authority (DHA). Despite this, the country's healthcare sector still faces significant challenges, some of which are driven by the multiplicity of stakeholders and interest groups. Adding weight to these organisational complexities, the country faces a heavy challenge when it comes to non-communicable diseases such as diabetes and obesity.

Furthermore, the unsustainable costs of care, paired with higher inflation rates, does not bode well for the future of the sector or for patient welfare. As healthcare costs skyrocket, patients are struggling to cope with the fiscal strains of treatment amidst other socioeconomic impacts of non-communicable diseases. This is creating an air of uncertainty for those under care, especially given the fact that chronic diseases are often long in duration.



The exorbitant costs of non-communicable diseases, including lengthy and expensive treatments for diseases such as obesity, are weighing down the healthcare sector's ability to successfully combat premature deaths. According to the World Health Organization (WHO), 30 per cent of the world's population is obese or overweight, with figures being more alarming in the Middle East. To date, more than 36 per cent of children in the UAE are obese, which is double the global average. Additionally, a study by the University of Washington's Institute for Health Metrics and Evaluation revealed that 66 per cent of men and 60 per cent of women in the UAE are obese.

Examples like this reiterate the importance of the healthcare industry to the UAE's future development. Moreover, the country aims to achieve a high-quality healthcare system, both regionally and globally (e.g. Dubai Plan 2021), in which effective industry governance will be essential, especially in line with the UAE's National Agenda. However, the fragility of the healthcare system and the strain of costs on patients' need to be overcome in order for a healthier outlook to prevail.

As such, the UAE has a tremendous opportunity to take a fresh look at its health sector governance; to not only achieve set goals and position the UAE healthcare system as regional (and global) leader, but also to guide the transformation of the sector in a way that all stakeholders can contribute. Our research has demonstrated that although specific governance challenges differ depending on contextual factors, nearly all health systems confront a common set of problems – which includes:

1. The healthcare environment is changing so rapidly that even best-in class systems present gaps in governance.
2. The evolution of governance systems has created overlapping responsibilities that lead to unclear accountability and conflicting directives from competing regulatory entities.
3. The relevant regulatory agencies often lack

the expertise and capabilities required to cope effectively with today's challenges.

Redesigning the UAE's healthcare system should focus on driving the existing governance system to operate more effectively in a way that is comprehensive, clear and simplified.

Let's not forget that the UAE has been on the forefront of healthcare transformation in the region when it separated operational institutions from supervisory and regulatory bodies. Such efforts reinforce the overarching role of the MoH as a regulatory and monitoring authority.

The Emirate of Abu Dhabi has led by example in distinguishing healthcare management from healthcare regulation. It has done this by carving out the General Authority of Health Services into three entities: the Abu Dhabi Health Services Company (SEHA), an independent public joint stock company that owns and operates all public hospitals and clinics across Abu Dhabi; Daman, an insurance company; as well as the Department of Health, which regulates the public and private healthcare sectors.

Dubai has taken tangible steps, with Law No. 6 and Decrees No. 17 and 18 of 2018 leading to restructuring the internal management of the DHA on par with global standards, specifically in terms of organisational units and their roles and specialties.

Seven principles of effective governance design

An effective healthcare governance system will define the rules and regulations to drive "appropriate" behaviours for actors in the system and will monitor performance in order to optimise the health value for the entire population. To bring this system to life, there are seven design principles that should inform any effort to redesign health sector governance:

1. Nationally holistic: Sector-wide governance of the health system.
2. Accountable: Clear roles and responsibilities, efficient allocation of resources and capabilities, system-wide monitoring, compliance, and enforcement.
3. Trusted: Data-driven decision making that is transparent, objective, and properly governed.
4. Dynamic: Agility to respond to needs and requirements promptly and effectively.
5. Complementary and cooperative: Encouragement of collaboration and cooperation.
6. Strategic and focused: Pragmatic and practical regulation and change.
7. Population centric: Equitable and outcome-driven to empower the population.

While some of these principles may sound obvious, the logic underlying them and the way they work together to create a coherent governance-operating model is essential. What's more, these high-level principles will serve as a constant reference point in efforts to design the details of the governance system.

Four steps in redesigning health sector governance

The UAE's roadmap to transforming its healthcare sector will require a specific and clear roadmap communicated to all stakeholders to ensure alignment and minimise disruption. The roadmap should hinge on four basic steps:

1. Assess healthcare system performance in terms of global benchmarks: Benchmarking other health system best practices for governance, as well as how these practices can be adapted to the UAE's national context.

2. Define goals: The UAE needs to establish a baseline for current system performance and the existing governance model. For example, there is an urgent need for a sustainable, effective and trusted healthcare delivery model, while managing costs by reducing "leakages" in the system.

3. Redesign the governance model: Ensuring complementarity between federal and emirate regulators where a clear division of roles among the seven design principles will have multiple benefits, including improved steering of the system, lower overall costs, and increased cooperation.

4. Plan for implementation: As well as separating operational and regulatory functions, policy decisions in the UAE should also focus on strengthening prevention and wellness. The curative aspect of the system has improved significantly in the last decade. It's time to integrate health prevention and maintenance in the governance of the system. Moreover, the further separation of operations and governance, if done effectively, can reap benefits to the population and the economy. Restructuring efforts have proven vital not just in increasing efficiency, but also towards reducing costs, size, units, departments and levels in the restructured institution, and improving overall competitiveness.

Globally, even the best-governed health systems can benefit from a renewed focus towards addressing critical gaps in the healthcare environment. In the UAE, this approach will be particularly beneficial. The result will be a more efficient, more responsive system that provides high-quality services to industry stakeholders, to the nation's citizens, and to the transformative visions outlining the nation's future progress.

References available on request.

Jad Bitar

Emile Salhab

The UAE has been on the forefront of healthcare transformation in the region when it separated operational institutions from supervisory and regulatory bodies.

GCC healthcare regulators need an upgrade to foster private sector participation

Highlighting profound changes that Saudi Arabia is currently going through in order to build an attractive ecosystem for private healthcare investment, while listing tools the regulator might want to consider.

In Saudi Arabia, the private sector contribution to total healthcare spend stands at 25 per cent, which the NTP targets to raise to 35 per cent by 2020.

By Arnaud Bauer, Managing Director and Dr. Madiha Qazi, Senior Manager, Advention Business Partners – Middle East

Governments and FDI agencies of all countries in the GCC are aligning and preparing themselves via new regulations and laws to attract more investment, as dependence on oil and its products is progressively being reduced. Good examples are energy industry plans underway in the Gulf, namely, Dubai Energy Strategy 2030, Oman's Energy Master Plan, the National Transformation Programme in Saudi Arabia and Vision 2030, which are testament to this shift in dependency.

Of this 'shift', healthcare sector upgrade is recurring for most GCC countries. A lot of them are already in the process of overhauling the system, preparing it for attracting investments and allowing healthy competition from the private sector. In Saudi Arabia overall, the private sector contribution to total healthcare spend currently stands at

25 per cent, which the National Transformation Programme (NTP) targets to raise to 35 per cent by 2020 for this KPI. This will have to be done at a relentless yet thought through pace, considering private providers only account for 54 per cent of clinics in the Kingdom (vs. 46 per cent for Ministry of Health {MoH}), and 24 per cent of hospital beds (vs. 60 per cent for MoH and 16 per cent for other Government organisations). While the overall governance of MoH is shifting gradually by clearly separating regulatory and delivery function and creating independent provider networks with operational autonomy and greater accountability, little is known on how to 'clearly' flag the sector 'attractive' for private investors.

Exploration of existing conducive factors quickly highlights features, which can directly drive the required change. An example is how Saudis are power users when it comes to technology. Look at gaming, social media, and e-commerce and the numbers will tell you that Saudi Arabia is always on the top 10 either in terms of number of users, spending and early adoption.

When applied to a sector such as healthcare delivery, the clear winners include digital health: offering tools for patient self-service, prevention, unified patient records and workforce efficiency. Another one rightfully being public private partnerships (a variety of models to execute), which can facilitate private sector involvement through ownership and/or management of MoH hospitals and services; and lastly innovative medicine, which focuses on out of hospital care, which can easily be integrated into the new model of care being implemented currently.

While there is now clear recognition of how change needs to happen at the regulatory level to allow for a healthcare system to develop, which encourages vigorous competition, while aiming at delivering high quality healthcare – it remains a challenge due to several factors. These include little or no guidance from the regulator identifying demand-supply imbalances, redundant investor approach to investment, and foremost no 'push' from the top (only until recently) to enhance service quality in this sector.

Some recent examples to counter the above-mentioned include the 'one doctor for every patient' initiative in Dubai. Similarly, a different example is being laid by The National Unified Procurement Company (NUPCO) in Saudi Arabia, which is expected to expand its services to private healthcare providers by providing strategic value-added services; development of a communications platform run by the Saudi Arabian General Investment Authority (SAGIA), to promote Venture Capitalists (VCs) to gain license in three hours only, and initial conversations on the development of a new model of care for Oman, among others.

Hence, to succeed in attempt of privatisation and diversification of the economy in general, most GCC countries need to get creative. Efforts such as:

- Scaling and phasing planned mega projects in line with anticipated market demand;
- Differentiating the offer from current and planned competing schemes in the region;
- Building a legal and regulatory environment that enables the foreign investment required to deliver these projects, are critical foundations for success. Together these can further privatisation, encouragement of small/medium enterprises and international influx, which can considerably reduce the cost burden GCC countries' finance while boosting private sector contribution and job creation.

To bear the fruits in full, reforms must be viewed as a perpetual, fast-paced effort across policy making, planning, and executive branches. Dubai is converting this methodology into constructive steps to develop 'sector' specific policies targeted at attracting private investors into the market. Long term goals have been aligned to tick bigger boxes – such as diversification of economy into a reliable sector with slow but sure returns. In addition, these are intended to help 'raise' the standards of service direly needed in the region and offer protection to investors that they are looking for.

A specific example from Dubai Health Authority (DHA) is the recent announcement to introduce the 'Certificate of Need' policy for the healthcare sector, which aims to do all of these in one go. This piece of regulation, once in place, is expected to attract private investment, plug the demand-supply gaps in the sector and drive quality of care up. However, several critical factors such as development of a unified payer's ecosystem, robust capacity planning, and incentives (such as exclusivity to operate, enhanced reimbursement, etc.) offered to ensure the least financially attractive services are still being invested in are absolute necessities for its success.

This approach is 'truly' in tune with today's age of accelerating regulation and scrutiny, where the regulator understands that financial and human capital are required to build strong infrastructure, which is then turned into long-term asset, and that the private sector due to several reasons is far more suitable to take lead. It can create value and contribute to the bottom line, 'quality' in this instance; and that the new Certificate of Need programme effectively delivers on that aspect.

Dr. Madhia Qazi

Arnaud Bauer

Driving value creation in UAE hospitals

By Ray Berry, Director, Healthcare, Alvarez & Marsal Middle East

Ray Berry

Value creation is where corporate strategy and corporate finance are aligned to support shareholder returns; not to be confused with value-based healthcare, which is a reimbursement mechanism that leverages clinical quality measures to incentivise the healthcare industry.

While a balanced approach to both shareholder returns and clinical quality is critical to the success and advancement of healthcare, the UAE has undertaken tremendous initiatives to accelerate quality infrastructure and sustainability in the region, such as attracting new players to the market, evolving regulatory reforms, and increasing health insurance penetration. Enterprises with a short-term view may regard these initiatives as a risk to shareholder returns.

As the Middle East healthcare industry evolves, there are four key ideas to ensure your healthcare business thrives and provides shareholders with returns and, more importantly, delivers on the mission of the healthcare industry; to treat, cure, or rehabilitate society.

Consider your place on the value chain

Horizontal and vertical integration of the value chain can provide competitive benefits and maximise returns. In the region, much of the integration activity seems to be horizontal to increase market share as the key driver of value creation (e.g. hospitals acquiring long-term care providers and specialty services or building more healthcare facilities). Assuming sound due diligence is completed, both vertical and horizontal integration can drive significant value creation. If we look to other markets, we see radical movements such as healthcare systems acquiring health insurers and health insurers acquiring healthcare providers and, even, healthcare providers launching their own pharmaceutical/medical consumable companies. One interesting example receiving media coverage is CivicaRx, a not-for-profit pharmaceutical venture, kick started by hospitals struggling with the high prices and supply challenges affecting availability of life-saving medications imposed by pharmaceutical companies.

Proactively address concentration risk

It's easy to point out concentration risk scenarios such as when specific payers dominate the market driving up premiums and impacting provider cash-flows. A second common example in the region is hospitals operating in a specific city/country without tapping into volume opportunities or the maturity of developed markets. While the UAE is a thriving economy, there are still opportunities in the healthcare space to ensure the market is kept competitive, stable, and transparent for investors. If we look to a local Middle East enterprise that has successfully de-risked on a country level, it would be NMC Healthcare, which operates in 19 countries across four continents. While resolving concentration risk doesn't need to be on a global scale or trigger a state of panic, it simply needs to be targeted toward a scenario that drives shareholder returns and/or reduces volatility. Types of concentration risk to consider for your business are country, product/service line, payer, patient mix, supplier/distributor, and credit risk.

Use the phrase "What if" during your strategic capital planning process

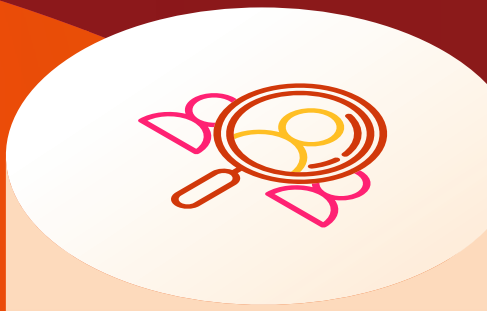
In the last two years, Abu Dhabi and Dubai have released investment guides, which outline where and how to deploy capital in the healthcare sector. For health systems looking to deploy capital, it can be tempting to build a new facility, purchase new radiology equipment, or invest in marketing efforts. Capital requests tend to randomly pop up in different departments so before approving capital requests be sure to understand their urgency and viability. For mid to long term plans, call the appropriate internal stakeholders to the table to pressure test financial models. When pressure testing a financial model, it'll be important to ensure costs are well detailed, understand if costs are redundant, account for unintended costs/

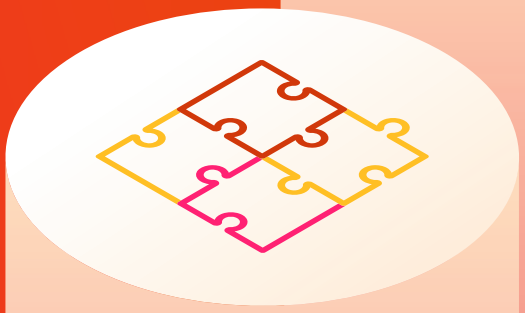
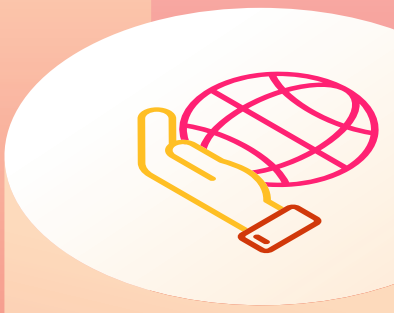
inefficiencies caused by new projects, identifying capital financing options, and build in other sensitivity levers. By asking "What if", you'll be able to come up with relatively accurate scenarios that support decision making and ultimately return invested capital.

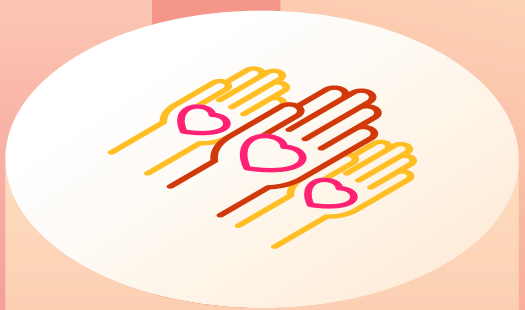
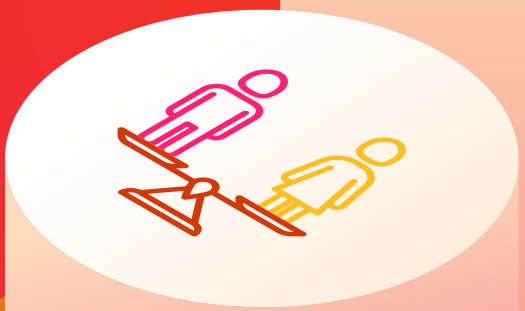
Create a value creation management culture

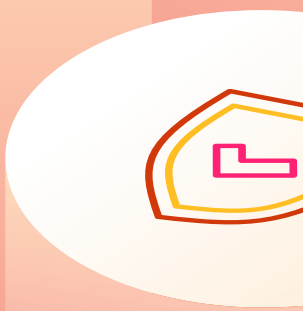
Educating your enterprise and arming them with financial acumen will certainly pay dividends. The healthcare workforce is generally not well-versed on corporate finance concepts. To develop a value creation culture, make the concepts very pragmatic. First, start by drafting a list of decisions per department, walk each department through how to assess their own business needs, and create capital request procedures that force the thought process. The classic example would be purchasing advanced radiology machinery (e.g. CT or MRI). Preemptively leverage the finance team to demonstrate to the radiology team the type of research, data, assumptions, and decisions that need to be assessed such as volume forecasts, depreciation, payer mix, maintenance costs, financing costs, and manpower costs. This approach, of course, is not limited to one department, it should be used to educate any department that makes significant capital requests.

In conclusion, driving value to shareholders and patients alike is critical for the advancement of healthcare while delivering value to shareholders can and should be consistent with delivering value to patients. Growth, risk, capital planning, and management culture are only a few ways to drive value creation. As health systems in the UAE consider more robust value creation strategies, I hope these often overlooked or unrecognised approaches help your healthcare business navigate the evolving market and deliver on its mission.





Ransomware:
A persistent threat in healthcare

By Deepa Narwani, Editor

The overall impact of cyberattacks on hospitals and healthcare systems is estimated to be nearly six billion per year.

A recent report discovered that the potential value for a patient healthcare record on the Dark Web is over a thousand dollars. Alarmingly, the latest Mimecast Email Security Risk Assessment (ESRA) found that one in every 350 emails received by the healthcare industry were impersonations, compared to the average of one in every 4,290 emails for other industries.

Moreover, Ponemon Institute's 2018 *Cost of a Data Breach Study* reported that "for the eighth year in a row, healthcare organisations had the highest costs associated with data breaches, costing them US$408 per lost or stolen record, nearly three times higher than the cross-industry average (US$148)." Furthermore, Black Book Market Research found that the overall impact of cyberattacks on hospitals and healthcare systems is estimated to be nearly six billion per year.

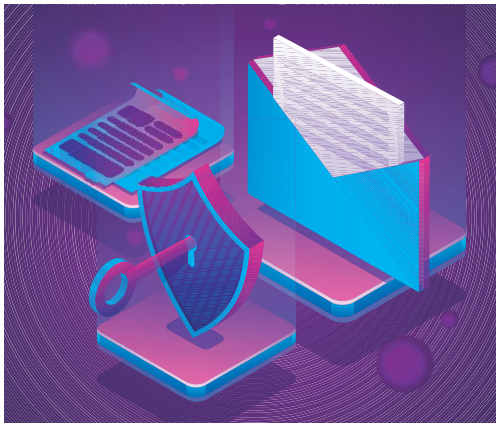
Everybody uses emails. However, healthcare is like many other industries that haven't invested or taken cybersecurity seriously over the years, Jeff Ogden, General Manager – Middle East, Mimecast, highlighted in an interview with *Arab Health Magazine*.

He said: "An email leak or a data breach has reputational impacts, as well as risk to individuals. You can't change records in healthcare as it includes personal information and health data that can be used to create targeted cyberattacks."

Ogden stressed that almost 70 per cent of the attacks seen in healthcare is ransomware. "Losing records or ransomware means that perhaps a procedure or an operation that was planned for the day couldn't take place. Or there was a process of recovery that delays the operation, which could impact revenue and reputation," he explained.

The Middle East and the UAE have invested heavily in healthcare. It is a hot spot for medical tourism and many overseas brands and institutions are present here along with local government institutions. According to Ogden, these factors have made the healthcare industry a big focus in the region, however, it is still a bit behind in putting the appropriate technologies in place to secure the infrastructure.

Healthcare is reportedly the only industry where the predominant threat of a data breach is internal staff. "For example, one of the things that happens is that consultants can often be sub-contracted



by several institutions. Sometimes it's easier for them to email records, either to the patient or to themselves or other consultants for additional information, making it extremely complex to control those patient records," he explained.

The consultants have to move records around and are instructed that these have to be online, protected and encrypted, and sometimes burnt to a CD. However, that doesn't always happen as sometimes patients insist that they can't collect their records and ask for it to be emailed. And once it's outside the system, it is out of the control of the facility.

Ogden said: "Mimecast's ESRA measures the level of security the organisation has in their emails. About 11 per cent of malicious emails come through a typical organisation. In healthcare, we are seeing that it is over 16 per cent and it is a big number. The risk and cost of a breach in the industry are significantly higher."

To combat this situation, Mimecast is doing a lot of work to educate users and have restricted what they can send in and out. "We are teaching people to understand the difference between a legitimate email and one that isn't. We do a lot of education and have the Mimecast Awareness Training (MAT) where we can teach people to look for signs such as how the header, content and subject for suspicious emails can look like. Everyone across the board gets training. Our services are also Health Insurance Portability and Accountability Act (HIPAA) and GDPR compliant. We also do two-factor authentication that makes the system far more secure," he concluded.

Jeff Ogden

ESSENTIALLY **BETTER**

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Planning a hospital: What to prepare before designing

By Amy Porteous, Senior Healthcare Architect, ARC International Design Consultants, Lisbon, Portugal

Amy Porteous

Hospitals are arguably some of the most demanding and challenging buildings to design. They house a diverse range of specialist clinical services each with their own critical design, function and process requirements. With continuous advancements in research, technology, expectations, needs and policy, healthcare planning demands expertise to optimise performance and efficiency, in a challenging competitive market.

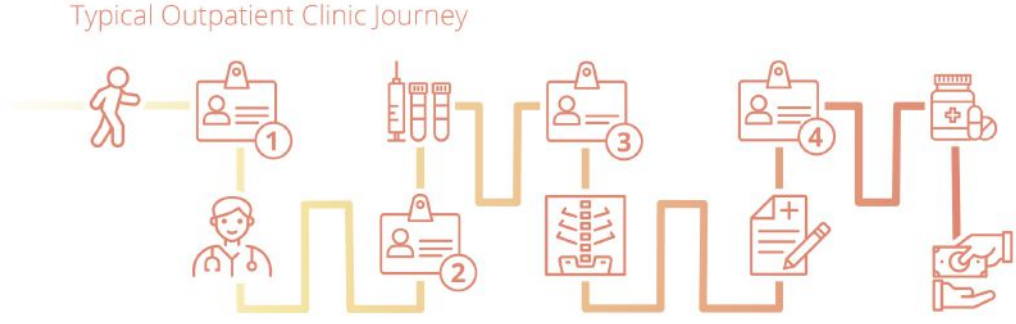
At the inception of each development project, the aspirations and vision are outlined. These initial objectives may be driven by service demand or infrastructure deficiency, but all healthcare projects have the one common goal of improving healthcare delivery.

The overall success of a project can be traced back to the time and effort invested at the early stages, when the strategic plan and brief is defined. Changes later on become progressively more expensive as the project develops and can lessen the integrated nature of the design. There is a tendency to rush this stage as it seems unproductive, but it is imperative that a strategic assessment of all influencing factors is carried out to ensure that the project vision is achieved in the most effective manner to optimise health and investment outcomes.

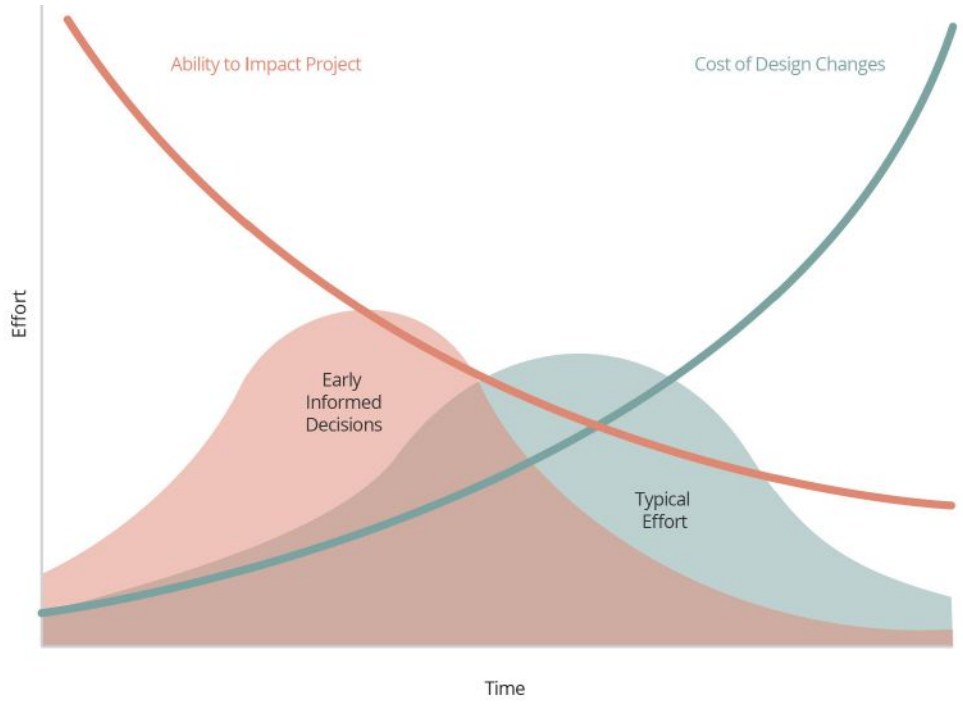
Emerging and strategic issues that influence a hospital's service and infrastructure requirements range from: demographics and epidemiology; healthcare statistics; site conditions; regulatory criteria; technological opportunity; and financial feasibility. The healthcare planner is adept at gathering, organising and assessing available data in order to predict the current and future service demand and prioritise needs. For long lasting success, healthcare facilities need to be able to adapt to accommodate future changes in demand, expectations, care and technology.

Each healthcare project deserves a unique solution, developed to address the particular needs of the client and region. It takes knowledge and understanding of best practice in healthcare design across the globe to effectively adapt to diversity in socio-economic profile, resource or time constraints. While health inequality exists, experience and insight offer strategic opportunities for sensitive yet successful results in any market.

Before putting pen to paper on designs, the briefing process offers the greatest opportunity for the client and users to influence the design. The brief typically describes the scope, function, quality, timescale and cost of the project, but on a healthcare project, the briefing process additionally involves the definition of clinical design standards such as: operational capacity targets; operational principles; patient flow charts; configuration



Healthcare projects involve a multitude of stakeholders, often with disparate and conflicting views.



The healthcare planner can assert the needs of the patient and clinicians, throughout design, coordination and construction process.

guidelines; and notable medical equipment. The brief is the highest level of control document throughout a construction project, therefore its completeness at the outset is fundamental to the efficient progress of the development.

Healthcare projects involve a multitude of stakeholders, often with disparate and conflicting views. Clinical professionals' input, together with strong client leadership, is highly valuable in defining the service needs and functional requirements of each department, such as the workload and operational procedures. The healthcare planner acts as the nucleus of this process of knowledge sharing amongst stakeholders to reach the best solution for patient care delivery. This involves discussion of new models of care; evidence-based design; new technology and regulatory constraints. These aspects can have a significant impact on the sizing of departments, with for example, a shift from healing to prevention leading to larger diagnostic and treatment facilities and a reduction in bed numbers.

It is important to consider that clinical professionals may not have experience of construction projects and this drawn out process has significant demands on time for regular meetings, to initially inform the brief and latterly the designs. There tends to be a common difficulty in identifying the exact requirements and recording them in writing.

To progress on the basis of incomplete instructions leads to provisional decisions being made, that may have major implications later. The healthcare planner holds the experience to ask the right questions; the objectivity to identify real needs; the skills to overcome challenges; and the tools to establish an effective communication system, to manage the complex and dynamic web of information and requirements. This systematic approach eases pressure on the clinical, client and design teams and ensures that informed decisions are made on-time.

Beyond the briefing stage, the healthcare planner remains a valuable member of the design team, acting as a single point of contact for clinical queries from the architects, engineers and project managers involved in developing the project. The healthcare planner can assert the needs of the patient and clinicians, throughout design, coordination and construction process.

Embarking on the design of a hospital project should not be underestimated, as indicated by the extensive and specialised preparation works involved. The need to provide ever increasing quality, value-based healthcare in a competitive market demands healthcare planning expertise. The healthcare planner's knowledge and understanding of service objectives; clinical processes and technical implications, drives the team towards opportunities to improve efficiency and advance the model of care. Through innovation, optimisation and flexibility in strategic planning, the healthcare planner can add value, reduce risk and maximise the lifespan of the development. Investing time in the pre-design stage pays dividends, not only in time and money, but furthermore in the fundamental objective of improving health outcomes.

Healthcare opportunities and challenges in Saudi Arabia

By Mansoor Ahmed, Director (MENA Region) Real Estate, Healthcare, Education, PPP, Colliers International

An increase in life expectancy is expected to extend from the current level of 73.1 years and 76.1 years for males and females to 78.4 and 81.3 by 2050.

The Kingdom of Saudi Arabia (KSA) with a current estimated population of approximately 32.6 million is the largest country in the GCC. Under Vision 2030, the country is going through fundamental structural changes in all the sectors including healthcare.

The healthcare sector in KSA is undergoing evolution on the back of rapid advancements in technology, research and development (R&D) in line with the global and regional trends. However, healthcare providers and professionals are grappling with several challenges concurrently, such as patients becoming customers and the patient care transitioning from "fee for quality" rather than "fee for service". This coupled with new compliance requirements that aim at wellness and prevention plus ensuring better coordination and efficiencies, add depth and complexity to an increasingly competitive marketplace.

Recent trends and industry dynamics require operators in the healthcare sector to make challenging decisions. Whilst the healthcare system has improved across the region including Saudi Arabia, the sector offers opportunities for investors/ operators. KSA's healthcare sector is structured to provide a basic platform of healthcare services to all, with specialised treatment facilities offered at some private and public hospitals.

Colliers International's *KSA Healthcare Overview 2018* (the 8th in *The Pulse* series) provides an in-depth analysis of key factors impacting the Saudi healthcare sector and its future outlook and identifies opportunities and challenges to operators and investors. Key factors that make KSA's healthcare market attractive are:

Population

KSA had an estimated population of 32.6 million in 2018, which is expected to double, reaching 77.2 million by 2050, growing at 2.65 per cent per annum. Assuming a more conservative 1.02 per cent average annual growth, as suggested by World Bank, KSA's population would still reach 45.1 million by 2050.

This increase in population is expected to fuel the demand for healthcare services in the Kingdom. Concurrently, the healthcare system needs to treat emerging lifestyle diseases and illnesses associated with modern and urban lifestyle, partially due to the growing middle-income population.

Changing population profile

The population pyramid in KSA has significantly changed between 1980 and 2015, and it will further change by 2050. This will have a significant impact on healthcare demand in terms of quality, quantity and type of healthcare facilities.

The changing population will have the following impact on demand for healthcare in KSA:

- During 2015-2050, approximately 19 million babies will be born in KSA, creating demand for facilities and services, relating to mother and childcare (obstetrics, gynaecology, paediatrics, etc.) along with the more common prevailing communicable and some non-communicable diseases.
- The age group between 20-39 years is very important for future healthcare planning, as it is common that there is the development of chronic diseases; cardiovascular, irritable bowel syndrome, chronic obstructive pulmonary disease and some types of cancer. With 12 million population in this age group there is considerable demand not only for curative but also preventative facilities.
- An increase in life expectancy in KSA is expected to extend from the current level of 73.1 years and 76.1 years for males and females respectively to 78.4 and 81.3 by 2050. This is expected to create demand on long- term care (LTC) facilities, focusing on geriatric related care, rehabilitation and home healthcare services. Based on current international benchmarks this is expected to reach 41,200 – 61,800 LTC beds by 2050.

Lifestyle diseases

Analysing the demographic trends, it is estimated that KSA's population will change from Baby Boomers to Generation X, Y & Z. This shift would impact disease patterns and in turn the type of healthcare services required. Lifestyle diseases (also sometimes called diseases of longevity or diseases of civilisation) are diseases that appear to increase in frequency as countries become more industrialised and life expectancy increases due to urbanisation and rising disposable income. A more sedentary, consumption of processed food often leads to increased chronic diseases (diabetes, coronary problems and obesity-related illnesses).

- **Diabetes:** The rate of diabetes related illnesses has witnessed an unprecedented increase across the MENA Region. Based on figures available for 2014, there were over 422 million people diagnosed with diabetes in the world and MENA's contribution was 38.7 million diabetic patients in 2017, which is expected to increase to over 70 million by 2024. In KSA during 2017, the diabetes prevalence rate was 17.75 per cent for age group 20-79 years, totalling to over 3.8 million cases.
- **Obesity:** In 2016, KSA's obesity prevalence rate among adults was 35.4 per cent, also one of the highest in the MENA region.
- **Hypertension:** The prevalence of hypertension among adults in 2015 in KSA stood at 23.3 per cent, also one of highest in the GCC region.

Demand gap beds

In 2016, KSA had 2.23 beds per 1,000 population, which was quite low compared to world average of 2.7 beds per 1,000 population. Number of doctors per 1,000 population ratios of 2.83 is quite impressive, however, the Kingdom has high dependence on foreign physicians.

Colliers has projected the demand for total number of beds based on the following scenarios:

Private sector participation & PPP

The government is encouraging private sector participation in the healthcare sector as the public sector's role is gradually transitioned to becoming more of a regulator rather than as a provider of healthcare facilities, as highlighted in the National Transformation Programme (NTP) and the privatisation plan. In 2017, Saudi Arabian General Investment Authority (SAGIA) announced that foreign investors can have 100 per cent ownership in health and education sectors. Once implemented this is expected to boost private sector investment in healthcare in KSA.

Government commitment to healthcare is evident as it continues its efforts in developing various medical cities, however, many of these facilities are expected to be operated in conjunction with private sector investment using various Public Private Partnership (PPP) models.

The PPP draft bill released in July 2018 for public debate and comments, is expected to boost private investment in the Kingdom with the concurrent impact on the Saudi economy. The PPP draft bill is the beginnings of the legal framework on which the Saudi government can begin to outsource healthcare provision. The outsourcing is expected to be done through typical PPP projects for a fixed duration and/or selected disposal of government assets. The Saudi government stated its aim is to raise US$200 billion by 2030 through privatisation.

Opportunities

Based on demand/supply analysis and characteristics of the healthcare sector in KSA, Colliers has identified the following opportunities for investors and operators:

- **Daycare surgical centres:** Due to advancements in healthcare technology (for example laparoscopy) a number of daycare surgeries (treatments/procedures) have significantly increased, resulting in higher demand for daycare surgery centres. The demand for daycare surgical centres has also

▼Scenario 1 (Beds) – applying KSA's ratio of beds of 2.23 per 1,000 population:

Projected Demand	Pessimistic Population Growth Rate of World Bank's 1.02 %		Optimistic Population Growth Rate based on Historical Growth of 2.65 %	
	2030	2050	2030	2050
Additional Number of Beds Required	10,850	29,300	51,000	102,000
Investment Required in Real Estate (Billion US$)	1.9–3.7	5.0–9.9	6.9 – 12.3	13.8 – 24.5
Investment Required in Medical Fit-outs (US$ Billion)	0.9–1.3	2.3–3.5	4.1 – 5.1	8.2 – 10.2
Total Investment Required (US$ Billion)	2.7–5.0	7.3–13.4	11.0 – 17.4	22.0 – 34.8

▼Scenario 2 (Beds) - applying world's ratio of 2.7 beds per 1,000 population.

Projected Demand	Pessimistic Population Growth Rate of World Bank's 1.02 %		Optimistic Population Growth Rate based on Historical Growth of 2.65 %	
	2030	2050	2030	2050
Additional Number of Beds Required	28,000	50,300	110,000	178,000
Investment Required in Real Estate (US$ Billion)	4.8–9.4	8.6–17.0	14.8 – 26.4	24.0 – 42.7
Investment Required in Medical Fit-outs (US$ Billion)	2.2–3.4	4.0–6.0	8.8 – 11.0	14.2 –17.8
Total Investment Required (US$ Billion)	7.0–12.8	12.6–23.0	23.6 – 37.3	38.2 –60.5

increased regionally and in KSA, due to increase in prevalence of number of lifestyle diseases such as diabetes, obesity, depression, strokes, cardiovascular diseases, blood pressure, etc., which does not require treatment in traditional hospital set-ups. Dedicated purpose built daycare surgery centres and Centres of Excellence can be part of a large office complex and retail centres; requiring space between 3,000 to 5,000 sqm.

- **Demand for maternity and paediatrics:** Number of private health facilities, especially in Riyadh and Jeddah are focusing on maternity and paediatrics owing to high demand for these specialties. Hospitals such as Dallah Hospital, Specialist Medical Centre and Dr. Sulaiman Al Habib have separate buildings dedicated for mother and child services. As per Colliers research, throughout KSA and especially Riyadh and Jeddah, there is a high demand for maternity and paediatric services supporting a business case for developing stand-alone hospitals or as part of a hospital complex.
- **Laboratory and diagnostic centre:** Standalone laboratory and diagnostic centres are required in KSA to support the increasing volume of outpatient facilities.
- **Long term care (LTC)/rehabilitation:** With the changing age profile, KSA requires a large number of LTC facilities. The government is seeking private sector facilities specialised in LTC to refer their patients requiring rehabilitation and/ or long-term care.
- **Increased demand for specialised services:** Centres of excellence focusing on certain specialties such as ophthalmology, cosmetic surgery, IVF and orthopaedics are expected to grow further, especially in Riyadh and Jeddah. Many General Hospitals have also established dedicated wings to provide highly specialised services in a single specialty and this has often been a key factor for their success.
- **Primary care:** Owing to the large population in KSA and high occupancy rates of hospitals, the country requires more primary care clinics and medical centres to meet the demand of the rising population.

Many General Hospitals have established dedicated wings to provide highly specialised services in a single specialty.

The Neom Project

NEOM City, which will cost US$500 billion and was announced in October 2017, will be located on the Red Sea Coast promising a new lifestyle that does not currently exist in Saudi Arabia. The new city is planned to span over a total area of 10,000 square miles (25,900 square kilometres) linking KSA to Egypt and Jordan, creating new markets for many sectors, including healthcare and biotech.

The biotech sector will focus on next-generation gene therapy, genomics, stem cell research, nanobiology, bioengineering plus attracting the talent to research, develop and apply the new knowledge; NEOM will be a new nexus for this vital activity.

Creating healthcare, wellness hub and second homes

In the last few decades alongside the demand for primary accommodation, a second-tier demand for second homes within the residential market has emerged, especially in the Eastern Province. With

the development of NEOM city, Colliers expects that the second homes market will flourish in the Red Sea area, not only as secondary homes but also as an investment product supported and driven by leisure, healthcare and wellness. Sustaining high occupancy levels all year round in second home destinations can be challenging. Colliers has witnessed and advised on these challenges in a number of countries.

Often, they can be addressed through introducing healthcare and wellness driven resorts, long-term care and rehabilitation facilities. These facilities can have a positive impact on occupancy levels by attracting not only vacationers but also retired households and those seeking longer holidays within proximity to healthcare facilities. While seasonality is part of the story, it can also be due to the lack of destination pull factors. Complex destination components, alongside leisure and environment include proximity of hospitals, clinics, long-term rehabilitation centres, wellness retreats, fitness/skill retreats and retirement homes.

There is an opportunity within the holiday home market for developers to create destinations by providing essential community infrastructure.

Challenges: The funding options

One of the key challenges faced while establishing quality hospitals in KSA is the high funding requirement. Despite the fact that banks and other financial institutions actively seek investments within KSA's healthcare sector, they often limit their exposure by only servicing known market participants with proven track records. International or regional operators contemplating entry into KSA's market often struggle to secure project finance unless there is a recourse to alternative cash flows.

Further, difficulties arise with the terms offered. Healthcare investments are typically long-term investments contradicting a bank's risk appetite, which typically extends to a tenure that ranges between five to seven years.

The various options available to operators based on availability of funds are:

- Outright purchase of the land;
- Long-term lease of the land;
- Land as equity investment by the landlord;
- Long-term lease of the land and shell-n-core structure from landlord/ investor;
- Creating a JV with the landlord/investor in equity partnership; or
- Signing a management agreement with the landlord/developer/investor.

However, each of these options have financial, operational and legal advantages and disadvantages and operators should seek professional advice before entering into any such arrangement.

Healthcare REIT

The Kingdom is moving towards encouraging more private sector participation in the healthcare sector, however; the extent of investment required is significant.

In Colliers opinion, one way of bridging the required investment is by way of creating more Real Estate Investment Trust (REIT) funds. Based on Colliers estimate, REIT funds in the Kingdom can unlock around US$7.5 billion to US$8.5 billion property value from the private sector, thereby playing a key role in augmenting growth in the healthcare sector.

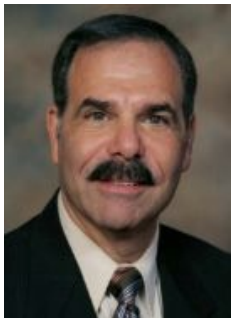
Colliers is currently working with several market participants through traditional and emerging funding options to assist them in their expansion plans.

Conclusions

In summary, the healthcare sector in KSA, especially the private healthcare sector, offers several lucrative opportunities for developers, investors and operators. However, it also possesses a number of challenges, such as high capital cost, difficulties in attracting quality doctors (and especially, nurses) and funding constraints for the new entrants. Colliers International works with a number of market players to assist them in their expansion plans either by expansion of existing brand or attracting international brands to the region. It also assists number of market participants through traditional funding options, such as debt and equity, or emerging funding options, such as OpCo/PropCo, or a Joint Venture (JV) with an investor and REITs.

At the crossroads of healthcare: Quality, safety, value and outcomes

By Dr. David Jaimovich, President, Quality Resources International and Former Chief Medical Officer and VP, JCI, Chicago, U.S.



Dr. David Jaimovich

Despite the advances and improvement in promoting patient safety and quality of care around the world, these issues remain an important public health challenge. Research and policy development have shown that tackling this is much more complex than previously thought. In addition, the pressure on healthcare organisations to have greater accountability and deliver better outcomes, for less cost has created a new paradigm in the process of transforming healthcare around the world. This is compounded by a global shift in health focus with ageing populations and the rise of chronic diseases, which are shifting the focus of the healthcare industry away from curing diseases in the short term and moving towards the long-term improvement of outcomes.

This type of evolution will require a shift in the way governments, providers, payers and others interact, therefore moving to integrated healthcare delivery systems to coordinate care and services for all patients, including the most vulnerable. There are four major elements that are fundamental for the transformation of healthcare – Quality, Safety, Value-Based Healthcare and Outcomes.

Quality

There has been a steady rise in the cost of care without a parallel, measurable increase in the quality of the healthcare delivered to patients. This has led to a situation of low-value care and for a demand to change into an evidence and value-based healthcare system.

The drive for providers delivering healthcare based on facts and disease-specific, sound research has grown dramatically and is expected to continue on a global basis. This is essentially founded on the demands of a much more educated patient, payors and government agencies asking healthcare organisations to be more accountable for their outcomes.

For healthcare organisations wanting to improve quality with value-based delivery of care, there needs to be an environment of collaboration and team mentality. This means that providers must work together as a team, involve patients in order to provide 'patient-centred" care, and create a situation that is appropriate to each individual's overall needs. This strategic change has been shown to provide higher quality in the delivery of care; founded on a care experience for patients that is more focused, coordinated and ultimately more efficient.

One of the foundational elements of success with this strategy is for healthcare providers to "think outside" of their disconnected, "siloed" approach and encourage them to work within a community of providers utilising "best practices" in order to offer the most appropriate and cost-efficient care for patients.

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Safety

Historically, change in healthcare has happened in a reactive, fragmented manner with each crisis that arises, as the primary driver for that change. A way of responding to the current changes occurring in healthcare is to consider every change an opportunity to influence the path an organisation desires to be on throughout their transformational journey.

Healthcare leaders are responsible to establish the path that their organisations will take, to that effect, one of the primary directives is to envision how patient safety will be in the future and how it will impact their respective organisation. In addition, they must foresee the changes needed between the present and the future in order for their vision to become reality.

With a macro-level view of where organisations need to strive to be, there are a number of initiatives that have to be undertaken in order for patient safety to not just be a priority, but to be a part of every moment that healthcare is delivered to a patient. These initiatives include:

A well-designed environment of healthcare delivery – needs to be safe, efficient, and designed to provide patients with healing aspects within the facility with advanced technologies that will support clinical care delivery. The environment will be safer by greater compliance with hand-hygiene guidelines, reduced patient falls and improved medication management. Construction materials need to be free of toxic materials and more effective in reducing contamination with

infectious organisms. It is paramount that the development of this environment be throughout the organisation including the ambulatory setting.

The best way to ensure that the investments necessary for the development of these healthcare environments are commonplace, is the implementation of evidence-based design and the right investments for the organisational transformation. Likewise, there needs to be a revision of the usual accounting practices of separating operating and capital expenses, which make it difficult to implement strategies that optimise the life-cycle cost of a building.

Health Information Technology – provides a platform for healthcare organisations to establish solutions that will influence the speed and character of the technologic implementations. A direct interface between health information technology (HIT) and patient safety has been long established. This has evolved in the form of electronic medical records (EMRs), computerised physician order entry (CPOE), an electronic medication administration system (e-MAR) and electronic prescribing (eRx).

Four decades ago, the promise that HIT would make the delivery of healthcare safer, faster, better and more clinician friendly was a viable vision, yet, since that time our enthusiasm has stalled. In spite of the opportunities that HIT holds, we also have to be realistic of the difficulties in its interoperability, data standards and storage safety and how to best apply it for improving patient safety. Because we want HIT to provide us the long awaited and promised patient safety solutions, we often overlook the difficulties that technology amplifies or complicates. The IT industry needs to develop a digital infrastructure that provides healthcare organisations with data liquidity. This would allow for a common format that would support medical research, boost efficiency and improve patient safety.

A new collaborative relationship needs to develop between the companies that develop HIT systems and the global clinical community. Therefore, this new technology environment would keep patients safer and would ultimately promote the purchase of safer HIT systems that would be truly valuable to the transformation of healthcare organisations.

Patient-centred care – although many organisations around the world believe that they embody the definition of "patient-centred care" by delivering what patients say they want; it doesn't completely represent safer care or the much broader concepts that "patient-centred care" embodies.

A model of co-creation and true partnership with patients is necessary to strengthen a culture of safety in a healthcare organisation. This relationship is based on mutual respect, trust, transparency, accountability and shared

A new collaborative relationship needs to develop between the companies that develop HIT systems and the global clinical community.

Healthcare administrators are universally facing the challenge to improve clinical outcomes in a cost-efficient manner.

decision-making. This re-design of healthcare delivery will not just involve the patient and the healthcare team, but also take into account the patient's perspective, thoughts, behaviour and of course participation. This new model can drive guidelines' development, funding, solutions, ethical initiatives, research and policy development. All of these qualities of the healthcare delivery model will assure that the healthcare system is safe, compassionate, just and efficient.

A more comprehensive "patient-centred" programme needs to have a complete understanding of the dynamics of the communication of risk and the impact on patient engagement. In addition, a robust patient reporting system for medical errors, reengineering of safety solutions and best practices, with an unwavering support from executive leaders, will significantly contribute to patient safety.

Complex systems for the delivery of care – healthcare organisations must recognise that the delivery of clinical care is comprised of complex systems and, in order for an organisation to be able to transform itself, there needs to be a deep understanding of complex systems.

To be able to do this, clinicians, administrators and legislators have to consider the delivery of healthcare as a conglomerate of complex systems. These leaders must learn to have a "systems thinking" approach. This management style and thought process is necessary when designing and implementing evidence-based changes that are targeted toward reducing harm and improving safety for patients. This requires more than just adding new processes to an unchanged existing system. Often, it requires a system redesign to incorporate new functions in order to be efficient, reliable, effective and have sustainable changes.

There must be a prospective evaluation methodology based on a continuous vigilance, measuring processes and outcomes to identify early indicators of change. Once systems thinking has been implemented, clinical practice can become dramatically safer.

Value-Based healthcare

In order to change national health policies, improve the operational performance of healthcare organisations and further improve outcomes, there needs to be advances and alignment in policy reform, improving the health system and applying health management education to organisational practice.

Globally, there is a recognised movement towards an incentive-based performance structure for healthcare providers. This is the shaping of the framework for a Value-Based Payment (VPB) system for healthcare organisations and a Reward for Performance programme for clinicians.

Although health systems around the world have different organisational, ownership and payment structures, they are all facing significant macro-level drivers of change, including rapid dissemination of HIT systems, ageing populations, cutting-edge medical treatments, escalating healthcare costs and an increasing demand for improving performance and better outcomes.

One of the first interventions that are necessary for the change to begin, is for administrative healthcare leaders to receive management training in order to be effective systems leaders; gaining specific skills and competencies to assure effective organisational and system level performance. These new, learned competencies will provide these management leaders with the ability to have a value-based approach to a budgeting and payment framework.

These competencies usually fall within two domains: the health environment and the business of healthcare. Within the health environment competency domain, there are certain health systems and organisational competencies that are most important:

- An administrator must balance the relationship between access to care, quality, safety, cost, resource allocation, accountability, facility, community needs and professional responsibilities.
- Assess the performance of the organisation as part of the health system/healthcare services.

In addition, multiple business competencies are required. Special attention must be given to the financial management competencies, especially as follows:

- Effectively use key accounting principles and financial management tools, such as financial plans and measures of performance (e.g., performance indicators).
- Use principles of project, operating, and capital budgeting.
- Plan, organise, execute, and monitor the resources of the organisation to ensure optimal health outcomes and effective quality and cost controls.

A very important lesson that administrators must learn is the need to adapt to the important changes in healthcare financing. There must be greater emphasis in learning about healthcare performance improvement and the measurement and metrics that will determine whether the

initiatives implemented have been successful.

In the U.S., the Centers for Medicare and Medicaid Services has introduced and implemented a new VBP programme. To be successful under this new programme, hospitals have to report and present on 12 separate metrics across four domains: Safety, Clinical Care, Person and Family Engagement and Efficiency and Cost Reduction. Although this VBP programme reflects the needs of the U.S. health system, the reasons driving these policies are globally applicable. There is worldwide concern about improving quality of care, patient safety, and cost reduction. Management leaders need to be prepared to understand the metrics implemented, the impact their goals will have on their health system and how consumerism will affect their long-term aspirations as a health system. These target metrics can be exploited to negotiate with payors, health insurance systems and Ministries of Health.

Outcomes

Excellent outcomes are essential to the survival and growth of all hospitals and healthcare systems around the world. To have excellent outcomes, organisations must continuously improve their delivery of care, which is increasingly more expensive, but failure to do so can be so much more expensive.

Healthcare administrators are universally facing the challenge to improve clinical outcomes in a cost-efficient manner. Improving outcomes means improving the health of the population, the patient experience of care, reducing the per capita cost of healthcare and improving the work life of healthcare providers.

This framework for improving healthcare delivery outcomes must consider all four of these dimensions, which, require a significant level of system change. To accomplish long-term, sustainable change and better outcomes, the appropriate balance amongst the four dimensions must be achieved.

Although, each improvement initiative may not embody all of these dimensions, creating a framework that shows meaningful context that each of these are essential for success. The improvement that is achieved needs to be visible and be relevant to the objectives and goals of the organisation. The information that is collected and the results that are attained must be disseminated throughout the organisation in order to align all associates and stakeholders with the institution's priorities.

It is important that an organisation develop the capability to relate every outcome to these dimensions, although not all may be included in the proposed processes for success. The organisational ability to have data-driven solutions for improving outcomes is a key indicator of readiness for sustainable outcomes improvement. To be able to have solutions based on data, an organisation must define and establish clear measures of improvement before any initiatives are implemented. The organisation should focus on the most common categories of measures – process, structure and outcomes. An acronym that is helpful in explaining the goals and objectives of how success will be measured is SMART – Specific, Measurable, Actionable, Relevant, and Time-based. The SMART acronym first appeared in the November 1981 issue of *Management Review* published by George Doran and collaborators.

All of the above-mentioned initiatives – new payments based on outcomes, better care and reliable data that can be used by clinicians and the community, are transforming healthcare throughout the world. The changes occurring in healthcare today requires administrative and clinical leaders to be ready to take well-thought out risks in order to provide the healthcare consumer with excellent, evidence-based, outcomes driven personalised care.

The changes occurring in healthcare today requires administrative and clinical leaders to be ready to take well-thought out risks.

Health professionals building computational models
How difficult can it be?

By Dr. Thamer L-Edresee. Ph.D, MBBS, Assistant Professor, Health Informatics Department, School of Public Health and Health Informatics, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Kingdom of Saudi Arabia

Introduction of computation in the healthcare field has opened the gate for continuous amazing discoveries in modern medicine and improved diagnostic and therapeutic approaches. Predictive computational modelling is used in different fields, such as marketing, weather forecasting, and resource management. While there is a great need for accurate and prompt intervention to treat many diseases, healthcare providers are reluctant in using computational models in their daily work to manage their patients. That is, however, understandable because they are worried about the accuracy of such models, especially if the prediction may suggest shifting the patient's therapeutic regime one way or another. In this article, I aim to explore the types of computational models, and how a clinician can build a successful model, which they may use as an irreplaceable tool in their daily patient care routine.

What are computational models?

A model is built to simulate how a system works, like building a model airplane or a car. So, using the computer to build a model that simulates the functions of a system (how it works) is generally what a computational model is. The model's concept is built on a scientific basis, which may include mathematical equations, statistical analysis, or biomedical rules obtained from scientific literature or a combination of different scientific disciplines. A model does not have to be an exact replica of the system it aims to simulate, it just needs to simulate simply how it works and produce the outcomes in a manner like the original system or close enough to provide a useful understanding for the user about the process in order to take a proactive approach in anticipation to the outcome of the simulation. A model aircraft or a model car does not have to have an AC or a top of the line sound system to simulate the damage of a car crash or how air turbulence affects the stability of an aircraft.

Why build models?

Computational models have many appealing benefits for healthcare providers and health researchers. Computational models can be used to perform In-silico experiments. When a model is valid and well-designed, it can perform thousands of simulations in a short time and at negligible cost. For example, a model simulating the response of cancer cells to treatment can run many simulations in minutes costing only the hardware, compared to performing actual wet-labs experiments that require funding and hundreds of hours to perform the same experiments. Computational simulations can help in testing medications in the safe – virtual – environment; it can also bring different understandings into the causative factors of different physiological processes or triggering factors in disease conditions.

As health professionals, how to build our model?

As healthcare professionals, we have a common preconception that this computational model is beyond our understanding or capability. That notion is inaccurate because many of the successful health-related computational models are built by teams that involve health professionals who do not have any programming skills or technical expertise.

What is the proper design method?

There are different methods to design computational models. Conventional methods are mathematical, statistical, or agent-based models. It is essential to choose the proper approach carefully to simulate the system or the condition of interest.

Mathematical models are designed based on complex mathematical equations. The equations are used to estimate and calculate the parameters of the factors involved in the simulation. Those models require a professional mathematician in the team to create the appropriate equations.

Statistical models use statistical methods such as regression analysis or ordinary differential equation to determine the most relevant factors involved in the system to include them in the model. Statistically based models require a large sample size during the factors' analysis and later during the training of the model. Statistical-based methods can be used to create models that analyse x-rays, or radiological images, to diagnose bone fractures or brain tumours.

Agent-based models (ABM) treat the active components in a system as agents. Each agent has a life-span, rules of interactions with other agents, and specific attributes. ABM's require to have the system or the process to be simulated well-understood in the literature. It is better to build the model using the most accurate parameter values from the literature and have a professional on the subject who works closely with the team – or a part of it – in order to have the proper model's design. ABM has been used to simulate many systems that range from cellular interactions and wound healing to the simulation of disease spread in a community.

When a model is valid and well-designed, it can perform thousands of simulations in a short time and at negligible cost.

In many cases, where the model is simulating a disease condition or a response to treatment, there must be a proper sample of actual cases available.

How to start?

Like any research project, a thorough literature review is required to understand the process or the system in interest. The process must be generally explained well enough to build a sound model. Not all the details are required nor are expected to be available in the literature. If we want to simulate the digestion of a material in the stomach, for example, we will find some missing values such as the amount of enzymes or acidic secretions required to digest a gram of the material. This is when we need to go and start building the equations to estimate that number. If the process is not well-explained in the literature, the design step is going to be difficult, and the model will be criticised for being a technical experiment rather than a health directed solution.

After having the process mapped with all the steps and values, select the proper design method according to the resources available. A healthcare professional who is an expert on the system or process being simulated is an important member of the team. Such an individual can advise the team and provide the much-required feedback to ensure the model's design credibility.

The model was built, now what?

The computational model, like any other software tool, requires much testing to ensure that the model is appropriately running. It may be a good idea to perform usability tests to make it more acceptable for healthcare providers.

The most important step comes next: validation. The team must carefully determine the proper approach to validating the model. In many cases, where the model is simulating a disease condition or a response to treatment, there must be a proper sample of actual cases available. For example, if we aim to simulate the effect of a drug on reducing the inflammation, we must have recorded cases of individuals who received that drug (control) and compare the outcome to the virtual case where the virtual patient is matching the criteria of the control. By comparing the outcome values of the simulation, e.g., inflammatory cells, body temperature to the reported values from the case, and statistically comparing the results using the proper tests, the team can decide whether the model is valid or not. The validation process must be performed and well documented. The model must also go through the other steps for any tool, meaning: reliability, sensitivity, and specificity.

Finally, like any software, the model must be updated and tested regularly. Adding or removing factors in simulations, testing new drugs, or other required changes due to new information available in the literature helps to keep the model trustworthy by the clinicians and users alike.

Computational models and simulations are being used in all industries but are not well utilised in healthcare. We should move in and take this solution and create our models instead of waiting for companies to sell us packaged solutions that will need many customisations. In this article, we simply reviewed the general concepts and requirements for health professionals to build their model. Health professionals – it is time about time to build our own computational models, and its that simple.

References available on request.

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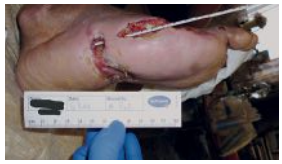
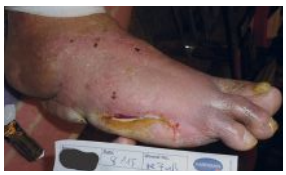
- **ulcus cruris**
- **slow-healing wounds**

Wound condition at therapy commencement



After 10 months TopiCare therapy



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Transitioning from volume-based to value-based healthcare

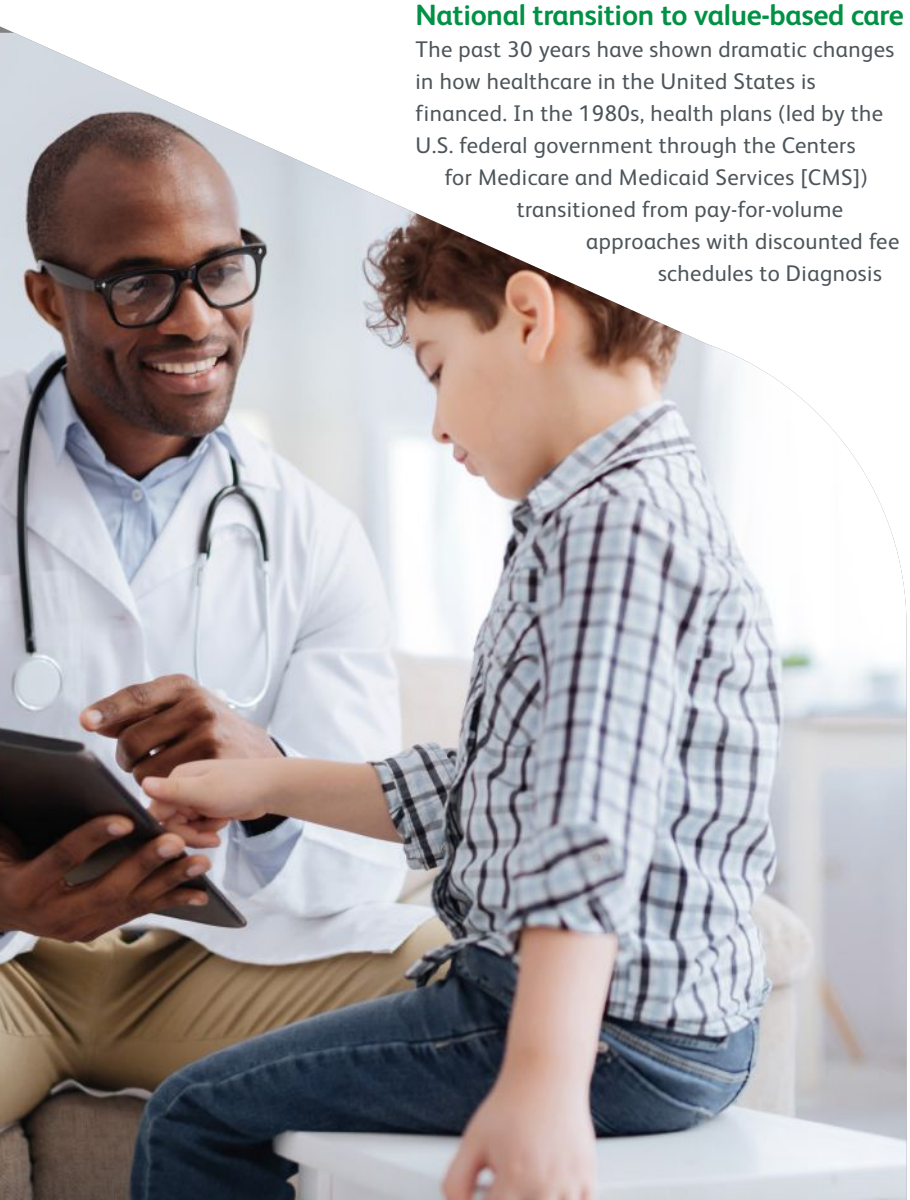
By Morris Blake, Project Director, International Initiatives, Henry Ford Health System

Integrated delivery systems must be able to manage pluralistic care and payment models.

In today's national landscape, healthcare organisations are being pressured by consumers and purchasers to compete on value. This means providing high quality health outcomes, excellent experiences and lower costs. To accomplish this, integrated delivery systems must be able to manage pluralistic care and payment models, simultaneously ensuring the highest value to customers in both risk-based and traditional fee-for-service contracts. This "both/and" environment requires new ways of managing healthcare at multiple levels – the organisation, its multiple populations and individual patients.

National transition to value-based care

The past 30 years have shown dramatic changes in how healthcare in the United States is financed. In the 1980s, health plans (led by the U.S. federal government through the Centers for Medicare and Medicaid Services [CMS]) transitioned from pay-for-volume approaches with discounted fee schedules to Diagnosis Related Group (DRG)-based payments for inpatient services regardless of lengths-of-stay. Almost two decades later, large commercial payers such as Blue Cross Blue Shield of Michigan created quality bonus programmes, tying earned incentives to relative performance on collaborative quality improvement programmes. In 2012, CMS introduced Value-Based Payment programmes, which use outcome-based quality, satisfaction and utilisation measures as the basis for earn-back incentives (for certain quality and service measures) or straight penalties (such as for readmissions and Hospital Acquired Condition penalties).



Value-based care was expanded to physician services when CMS launched an alternative care deliver/payment model for Medicare beneficiaries called an Accountable Care Organization (ACO) as part of the Affordable Care Act (ACA). An ACO is a network of doctors and hospitals that shares responsibility for providing care for "attributed" patients. Under an ACO risk-based arrangement, providers share in savings or losses with the payer, based on the negotiated risk contract. Healthcare costs, described as per-member, per-month or PMPM – along with pre-defined quality and service metrics – are tracked against baseline or target performance, and the difference between actual and targeted performance represents the potential shared savings pool.

CMS's value-based payment programmes continue to expand the earnings potential for high-performing organisations. The most sophisticated, with highest potential for both upside and downside risk, include the Next Generation Accountable Care Organization (NGACO) model, in which Henry Ford Health System (HFHS) has participated since 2016. Increasingly, non-government payers and even large employers are also entering into contracts with healthcare organisations using similar value-based parameters. These can be referred to as direct-to-employer contracts, such as HFHS's General Motors ConnectedCare contract, which began in 2019.

"Henry Ford recognised more than a decade ago that we could not continue to work in

the fee-for-service model and still provide our patients with the best and most appropriate care possible," said Bruce Muma, MD, Medical Director of Henry Ford's Population Health Management team. "Additionally, we recognised our Health System's ability to survive and thrive in a strictly fee-for-service world was coming to an end, as the healthcare industry made a definitive shift to value-based care. We embraced this new path and began putting people and programmes in place to become a leader in value-based care in the industry."

Creating a value-based care strategy

"Value-based care" and "population health" approaches are widely used to create favourable health outcomes for patients. HFHS has an extensive Population Health Management team, which is responsible for designing, delivering and coordinating high-quality healthcare services to manage health outcomes, experiences and costs for a population using the best available resources within the healthcare system. Examples include patient-centred team models, electronic patient registries, and virtual care alternatives for patients with multiple chronic conditions.

HFHS, including its provider-owned health plan Health Alliance Plan (HAP), has a long history of care delivery innovations, now referred to as population health management. Examples include chronic disease programmes developed collaboratively by HFHS providers, care coordination activities to assist patients with transitions between sites of care, and an electronic medical record (EMR) implemented system-wide in 2013. The EMR is also offered to private practice physicians who are part of the Henry Ford Physician Network (HFPN), Henry Ford's Clinically Integrated Network of employed and private practice physicians.

The System's Population Health Strategic Framework supports the system's vision to be the trusted partner in health, leading the nation in superior care and value.

Under this framework, HFHS identifies targeted populations, implements care delivery models or programmes that address value gaps in those populations, and responds to existing or new value-based contracts based on success with these population health management capabilities. This ongoing process is enabled by robust analytics to measure performance, engaged clinicians implementing best practices, EMR tools and alerts, and integrated process improvement and contracting expertise.

Critical success factors for delivering high-value care

Over the past three years, HFHS has introduced dozens of population health management programmes to leverage people, processes and technologies in new ways. Still, broad success in value-based care requires a holistic, organisation-wide transformation. As healthcare organisations aim to transition from volume-based care to value-based healthcare delivery and financing, the following infrastructural elements have emerged as critical for long-term success:

Culture and leadership: Leadership teams and incentive structures must reinforce shared accountability for simultaneous growth in population health management and strategic tertiary/quaternary care programmes.

Physician strategy: Ongoing development of a high-performing network of physicians providing primary care, specialty and geographic coverage for value-based populations.

Operations, technologies, and partnerships: Innovative care models and tools to enhance coordination across the care continuum, both inside and outside the health system. Examples include new access approaches, such as telehealth and walk-in clinics; community partnerships and information networks to capture data, such as social determinants of health and connect patients with needed resources; and, finally, analytics tools that give physicians and care teams the data they need to close gaps in care.

Risk-based contracting expertise: Speed and agility in launching new risk-based arrangements as part of a growing portfolio of successful value-based contracts.

In the long run, effective population health strategies that can make value-based care a success demands new partnerships among providers and payers, new care management models, integrated data support, redesigned IT structures and a potentially seismic shift in thinking by health system leaders on the definition of healthcare success.

"Henry Ford Health System has fully supported the shift to bring in more value-based contracts," said Susan Hawkins, Henry Ford's Senior Vice President of Population Health. "To achieve high performance on these contracts, we have needed resources, creativity and commitment, which we continue to receive from the system and from our team members. We are constantly exploring, creating and implementing new interventions to improve health outcomes, improve the care experience and reduce the cost of care – the cornerstones of value-based care."

Effective population health strategies that can make value-based care a success demands a potentially seismic shift in thinking by health system leaders on the definition of healthcare success.

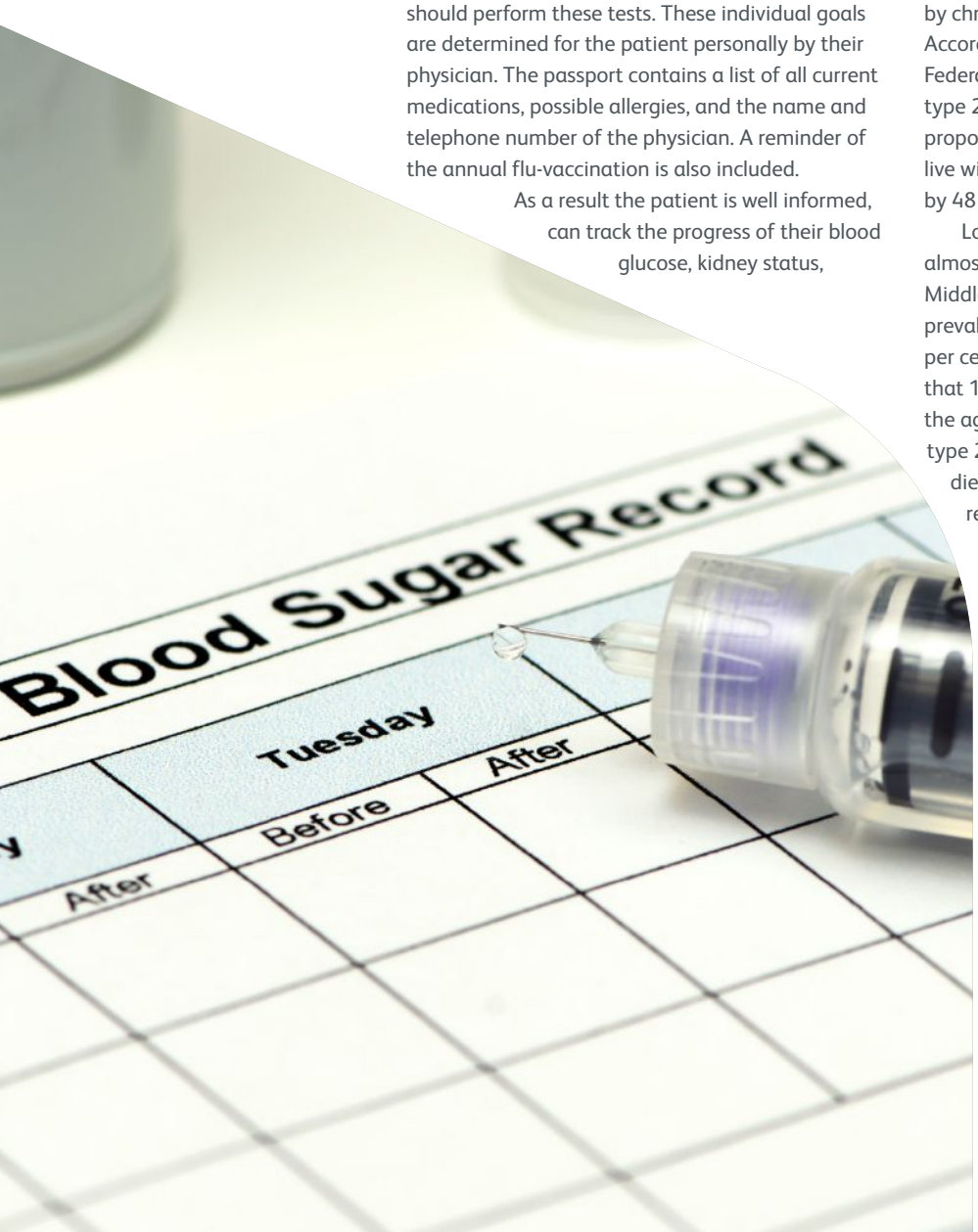
Diabetes passport to empower patients

By Dr. Amal Madanat MD, PhD, FACE, Consultant Endocrinologist, RAK Hospital

Recently, RAK Hospital's diabetes care team introduced a pocket-sized diabetes passport that illustrates important checkpoints for a patient, such as, blood pressure, body weight, feet examination, glycated haemoglobin, lipid profile, kidney, liver function, uric acid, as well as annual eye, peripheral nerves and cardiac examination.

The goals of these indicators are defined in the diabetes passport as well as how often the patient should perform these tests. These individual goals are determined for the patient personally by their physician. The passport contains a list of all current medications, possible allergies, and the name and telephone number of the physician. A reminder of the annual flu-vaccination is also included.

As a result the patient is well informed, can track the progress of their blood glucose, kidney status, cholesterol levels, performance of the annual peripheral nerve studies for both small fibres of the nerves utilising a non-invasive tool such as Sudoscan and large nerve fibres, cardiac and eye exam, and is therefore well informed about the standard of the diabetes care given and confident that they will be taken care of.



Chronic disease

Diabetes mellitus is a chronic disease characterised by chronic elevation of blood glucose level. According to the recent International Diabetes Federation, the prevalence of diabetes, especially type 2, is progressively reaching epidemic proportions. At present, nearly 425 million people live with diabetes; this number is projected to rise by 48 per cent to 629 million by the year 2045.

Low- and middle-income countries carry almost 80 per cent of the diabetes burden. In the Middle East and North Africa (MENA) region, the prevalence of diabetes is projected to rise by 110 per cent by the year 2045. Studies have revealed that 17.3 per cent of the UAE population between the ages of 20 and 79 have been diagnosed with type 2 diabetes. Rapid urbanisation, unhealthy diets and increasingly sedentary lifestyles have resulted in previously unheard higher rates of obesity and diabetes.

What makes the situation more frightening is the fact that undiagnosed and poorly managed diabetes is associated with long-term specific complications to the small blood vessels that lead to eye, kidney, and peripheral nerve diseases, which are the leading causes of blindness, end-stage renal failure and lower limbs amputations. In comparison with people without diabetes, patients with diabetes have a fourfold increase in the occurrence of cardiovascular disorders manifested as heart attacks, stroke, and peripheral gangrene. Being a chronic disease, diabetes causes devastating personal suffering, huge economic burden both to the families and healthcare systems.

Diabetes management

However, prospective studies have confirmed that comprehensive care for patients with diabetes where control of blood glucose is implemented together with screening for microvascular complications to the eyes, kidney, peripheral nerves for early detection of abnormalities, and early treatment, resulted in a considerable reduction in the rates of these diabetes-specific complications. Additionally, screening for cardiovascular risk factors in patients with diabetes such as hyperlipidaemia, hypertension, advocating a healthy lifestyle and smoking cessation resulted in prevention of major cardiovascular events.

As such, diabetes management requires continuous comprehensive medical care with multifactorial risk-reduction strategies beyond glycaemic control. Ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications.

Optimal diabetes management requires an organised, systematic approach and the involvement of a coordinated team of dedicated healthcare professionals such as an endocrinologist, diabetologist, nutritionist, diabetes educator, podiatrist, ophthalmologist, cardiologist, and neurologist, working together in an environment where patient-centred high-quality care is a priority.

And this is precisely our goal at the RAK Hospital Diabetes centre. We define patient-centred care as care that is respectful and responsive to individual patient preferences, needs, and values and that ensures that patient values guide all clinical decisions. Part of the Arabian Healthcare Group, RAK Hospital's diabetes care programme for patients with diabetes aims at excellence in holistic diabetes care guided by the most recent and continuously updated international guidelines for the care of diabetes. Through this programme, all attendees with diabetes mellitus are addressed and are reminded of their regular health check-ups and annual comprehensive physical and biochemical examinations.

"RAK Diabetes Centre has invested millions in this initiative with the sole purpose of creating a diabetes-controlled UAE, and in effect a healthier environment for both adults and children. We aim to help control a disease that is not only the root of several other ailments but eventually a severe burden on the health budget of any country," says Raza Siddiqui, CEO, Arabian Healthcare Group.

The rise of femtech and SHEconomy

Reenita Das, Tranformational Healthcare Senior Vice President and Partner at Frost & Sullivan, discusses how women in healthcare are revolutionising the industry and will generate an economic value close to US$24 billion in the coming years.

By Deepa Narwani, Editor

Women's health has been an issue for a long time, but the products and services have not evolved more than menstruation care, fertility, and mother and child wellness. However, women's health today has to revolve around factors such as mental health (women have five times more mental health issues than men), cardiac care (women have three times more heart attacks compared to men) or focus on care for autoimmune disease (women are seven times more vulnerable to it than men). This is where Femtech (Female Technology) comes in. It refers to diagnostics, therapeutics, drugs, apps, and wearables that empower women to control their own body.

Based in the U.S., Reenita Das, Partner and Senior Vice President, Transformational Health, Frost & Sullivan, was recently named in the Top 100 Women in Wearable and Consumer Tech by *Women of Wearables.* She has two big passions. One is to change the healthcare system so that it pays attention to wellness; the second is to focus on women in STEM (Science, Technology, Engineering and Math).

In an interview with *Arab Health Magazine*, Das shared that she has been in the healthcare business for the past 25 years and always wanted to work in areas that would have an impact and where she could make a difference. "I was always a curious person by nature and loved to ask questions, to study and find answers. As I started working in many industries, I felt that healthcare had the biggest reward because it dealt with human beings and talks about changing behaviour, wellness and is just an inspiring area to work in," she said.

Empowering women

Das started working in the area of Femtech because she felt that women had no voice in terms of healthcare products and services. "Most products, devices or drugs are not tested on women and always have large audiences of men, whereas 50 per cent of the economy is women," she said. "Secondly, we are reaching a world where we are going to be dominated by SHEconomy. It means that women will generate an economic value close to US$24 billion by the next two to three years, which is more than the GDP of China and the U.S.!"

Today, almost 30 per cent to 40 per cent of women own businesses, 20 per cent of the global wealth is in the hands of women, and yet, as a group, they are not advancing in terms of healthcare. Because of this, Das emphasised, she is doing a lot of work in building awareness around Femtech and is trying to help in efficiently navigating the system so women can have access to better products.

"The difference between women's health and Femtech is that it puts the power back to women. It is going to be a huge sector," Das said. "We have done a lot of research within it. It is going to be about US$50 billion according to our projections, and a large part of the sector is going to be apps and wearables. There are also a lot of women-driven companies. Whether it is an island in Europe, Australia, or the U.S., women are coming together much stronger and it is becoming a global movement. I am very excited about Femtech, as it is a big area driving much-needed change."

Future is female

Das is also the founder of GLOW (Growth, Innovation and Leadership of Women) at Frost & Sullivan. She started the initiative after becoming the first woman partner in the company. That was when she realised that her work had just begun and that it was the first step towards having a female voice at the table.

"Gender diversity is a big issue today. I realised that I had to do something for the billions of women who have not been heard yet," she said. "I felt that women need a different approach when it comes to mentoring and networking. Women don't network as much as men; we don't have a girl's club and usually end up competing with other women instead of supporting them. We don't know what girl power is! That's why I started GLOW. We are doing a lot of work in training and mentoring within Frost & Sullivan and have globalised it across the world. My goal is to eventually create a non-profit and take it outside the company."

Das also stressed that the number of girls opting for STEM fields is quite low in the U.S. She is a board member of an organisation called High-Tech, High Heels (HTHH) that helps to get young girls interested in STEM.

"We are working in middle schools in Silicon Valley and are running programmes to help young girls think positively and get them to build apps, go out and pitch, and work on projects that are close to their heart, but it is all computer-, engineering-, or math-based. We are trying to change the perception that STEM is nerdy, only for boys, or uncool," she concluded.

Reenita Das

Healthcare trends

Das highlights several developments that are set to transform the healthcare industry.

AI in medical imaging: The industry will see some applications that will go a long way in reducing radiologists' time.

Value-based care: This will involve looking at outcomes and value to the consumer and the environment, rather than volume. Instead of just selling a product and saying this is the price of the product, the sale of the product is going to be tied to the outcome. Almost 15 per cent of the healthcare expenditure globally is going towards value-based healthcare.

R&D: Asia is becoming a Research and Development (R&D) hub overall for manufacturing. Twenty per cent of R&D is going to come out of Asia rather than the Western countries.

Voice: It is becoming a big area in healthcare. With Alexa becoming Health Insurance Portability and Accountability Act (HIPAA)-compliant, it will be a great tool not only for physicians but also for patients.

Home care: Home is soon going to become the new clinic around the world, and this is an area that the UAE is starting to focus on.

Blockchain: The technology can be useful for clinical trials because it provides visible and transparent information about what trials are running, what results are being achieved, what types of patients are enrolling, and if there is any gender bias.

Eventually, in the coming years, blockchain is all set to move to a stage where everyone will own their medical records, instead of a doctor or insurance company owning the information.

Femtech is going to be about US$50 billion according to projections.

Dubai's global appeal to medical tourists continues to rise

DHA's DXH initiative has given a great boost to the city in international health tourism markets, with over 337,000 medical tourists visiting last year.

By Deepa Narwani, Editor

In Dubai, health tourism is under regulation and the focus is more on quality care rather than commercialising healthcare.

The journey of medical tourism in Dubai started back in 2012. The initiative was launched by His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Executive Council, who gave the Dubai Health Authority (DHA) the responsibility for building a strategy around medical tourism. It was approved by Sheikh Hamdan in 2014 and the Medical Tourism office was under the regulation department at the DHA. The department has had an organic growth and became the Medical Tourism Council in 2016. In 2018, with the change of the structure at DHA, it evolved into a department under the Health Regulation sector.

In an interview with *Arab Health Magazine,* Linda Abdullah Ali Ruhi, Consultant, Health Tourism Department, DHA, shares: "The interesting thing is that in Dubai, health tourism is under regulation and the focus is more on quality care rather than commercialising healthcare. That is going to be our outlook and that is how we are working towards strengthening the city's position as a destination that offers high quality of care."

Sheikh Hamdan launched DHA's DXH initiative in April 2016. It serves as a continuation of 'Dubai, a Global Destination for Medical Tourism' project and forms part of the government's efforts to make Dubai a global health tourism destination and a gateway to the finest medical experts and premier accredited healthcare facilities. The website *www.dxh.ae* has two tabs – Wellness Dubai and Medical Dubai. The medical one is focused on treatments while the wellness focuses on health check-ups, preventative care, as well as alternative medicine, which is regulated in the city.

Ruhi says: "DXH has received a great response. So far, we have had an increase in year-on-year of patients coming to Dubai. Last year we had 337,000 medical tourists coming into Dubai. Our aim in 2021 is to attract half a million health tourists and are quite close to achieving it." Excerpts from the interview.

What do you think is currently driving the healthcare industry forward in the Middle East? What role is medical tourism set to play?

Several factors are driving the Middle East's healthcare industry such as the growing population in the region with longer life expectancy. Another is the steady shift to value-based healthcare at reasonable costs. Innovation in technology and business models is also fuelling growth within the regional health industry as well as better organisational setting, which is increasing efficiency in the patient flow.

Furthermore, the ongoing digital transformation efforts in the region have had a dramatic impact on the health tourism sector as well as the many relevant initiatives that help bring the health community together. Patients today are more empowered as they prefer to take an active role in selecting the best and most appropriate treatments. This is what we try to provide to them through DXH, our digital gateway. The website provides an array of choices and information. We also try to keep visitors engaged through our social media channels so that they can make informed choices before they choose their next healthcare and wellness destination.

Is Dubai on its way to establishing itself as a medical tourism hub?

We are confident that Dubai is gaining great progress in its bid to become a medical tourism hub worldwide given its excellent healthcare facilities, world-class medical professionals, easy visa procedures, and extensive health packages. To date, we have over 600 packages from 72 healthcare facilities that include 18 hospitals and 54 specialties centres. In 2018, the local sector's revenue reached AED 1.163 billion. The number of health tourists during the same year stood at 337,011. We also recorded a 9 per cent growth in the number of healthcare facilities vetted and included in the health tourism DXH Group member programme. DXH continues to participate in several global events and roadshows to reinforce Dubai's position in the international health tourism market.

What would you say is the value of medical expenditures from visiting international health tourists? Could you share the countries from where medical tourists visited Dubai?

The sector's 2018 revenue hit the AED 1.163-billion mark in 2018, reflecting the influx of global health tourists to the emirate. In terms of international patients, around 33 per cent came from the Arab and GCC countries, including Kuwait, Saudi Arabia, and Oman. About 30 per cent were from Asia, including India, and Pakistan and 16 per cent from Italy, the UK, and France that led the ranks from Europe. Some countries from the African region are also steadily becoming a source market. Health tourists come to Dubai usually for wellness, dental, and orthopaedic treatments.

How does the future look like for Dubai's medical tourism industry?

The UAE will continue to play a major role as the region's medical hub and Dubai will sustain its global appeal to health tourists. This year, we will see growing adoption of the latest innovation in the field of stem cells, regenerative medicine and 3D printing, so we are spearheading such innovative techniques in the region. Moreover, the DHA's new and simplified healthcare licensing procedures will attract both investors and highly qualified medical professionals from around the globe. This will give us a strong foundation of trust that we are building with those that seek healthcare in Dubai.

Also, new investments will lead to the offering of technology-driven services delivered by the finest healthcare professionals. The services that will draw the most health tourists are dental, orthopaedic, dermatology, ophthalmology, health and wellness, aesthetics, and fertility. This will attract more and more health tourists to come to Dubai and is giving us confidence that we will continue our appeal. We are always strengthening our USPs and will continue to create this unique experience in collaboration with our stakeholders. In Dubai, both the public and private sectors are working hand-in-hand to create a successful journey for the patient. What Dubai has achieved in this short span of time is proof that the city is working towards being the number one in whatever project it takes on. This is thanks to the higher leadership that continues to give us directions as well as directives to grow.

From our end, we will continue to create a unique experience in the healthcare delivery standard; integrate and offer new medical and wellness service packages, and open new markets for Dubai. Our focus will remain on partnerships with key stakeholders and on our #DXHWellness campaign, which aims to promote a healthy and holistic lifestyle.

DXH has over 600 packages from 72 healthcare facilities that include 18 hospitals and 54 specialties centres.

DHA plans to develop "Certificate of Need" guidelines

The policies will help map out investment opportunities in the health sector.

By Kamakshi Gupta, Dubai Health Authority (DHA)

The Dubai Health Authority (DHA) held a workshop recently with the private sector to receive their input and feedback prior to developing a "Certificate of Need" (CON) policies and guidelines.

The workshop took place during the Dubai Healthcare Investors' Forum that was held recently at the Hyatt Regency, Creek Hotel and was supported by Advention Business Partners and Taylor Wessing.

The CON guidelines will help further bolster the health sector and promote need-based investments so that there is equilibrium in the sector and to avoid imbalances in supply and demand in health services. The move also aims to provide patients with access to a wide range of medical specialties.

Last year, DHA launched a comprehensive Health Investment Guide, which provides in-depth details of demand, supply, which includes future supply, and gaps in the health sector.

The investment guide helps promote investment in need-based areas and supports investors. Now, adding CON guidelines and policies will provide further clarity to investors and help them invest in areas of priority and need.

At the opening of the forum, HE Humaid Al Qutami, Director General of the DHA said, "There is no doubt that the healthcare sector in Dubai is now one of the fastest growing sectors. This is due to the promising and diverse opportunities available in Dubai and incentives provided by the Government of Dubai. The city's notable capabilities have transformed it into the preferred destination for healthcare investment by multinational health organisations. We are proud of our leadership and appreciate their role in the development of the health sector.

HE Humaid Al Qutami, Director General, DHA

"The CON Programme has policies and guidelines that ensure investments in healthcare are in line with the requirements of the sector and the needs of the population. CON is an important tool utilised by internationally advanced healthcare systems, to link the granting of licenses for medical facilities with a CON based on accurate and transparent studies. This helps lead to a dynamic health system that offers a wide spectrum of specialised health services."

Dr. Marwan Al Mulla, CEO of Health Regulation at the DHA highlighted the growth of the health sector over the last few years. He said that currently there are 37 hospitals in the Emirate and nine are under construction.

Fatima Abbas, CEO of Strategy and Corporate Development at the DHA said, "The CON programme will support and guide investments with the right calibre to deliver quality services. Through this programme we will make investors aware of where the opportunities are and will provide incentives in areas where investment needs exist and where CON requirements are met. This will limit oversupply of specialised services and protect investors who have invested significantly into specialised services."

Dr. Ibtesam Al Bastaki, Director, Investments & PPPs (public-private partnership) at the DHA added, "We believe that the CON programme will enable and ensure stability and sustainability of quality of care being provided for complex medical services. Investments generated through the CON programme will also lead to improvement in coverage for under-supplied services. We will work closely with the private sector to implement these guidelines and policies with an aim to further help develop the sector, keeping access to specialised services and patient experience as priority."

Arab Health
The Official Magazine
Together for a healthier world

Patient Safety Special

Highlighting a holistic approach

A holistic approach to patient safety

Patient Safety Middle East 2019 will welcome over 1,700 total attendees, more than 70 exhibitors, and 750 delegates.

By Deepa Narwani, Editor

Dr. David Nash

Millions of patients are harmed each year due to unsafe healthcare worldwide resulting in 2.6 million deaths annually in low-and middle-income countries alone, according to a recent report by the World Health Organization (WHO). It further said that four out of every 10 patients are harmed during primary and ambulatory healthcare. The report highlighted that the most detrimental errors are related to diagnosis, prescription and the use of medicines. Moreover, medication errors alone cost an estimated US$42 billion annually. Unsafe surgical care procedures cause complications in up to 25 per cent of patients resulting in 1 million deaths during or immediately after surgery annually. And the most alarming part of these figures is that most of the deaths are avoidable.

Patient harm in healthcare is unacceptable and patient safety and quality of care are essential for delivering effective health services and achieving universal health coverage.

To highlight the latest developments in patient safety, the 15th edition of Patient Safety Middle East is all set to take place between October 24 to 26 at the Le Méridien Hotel & Conference Centre, Dubai.

As an accredited conference, the show is a leading event that addresses issues that hospitals and other healthcare organisations need to be informed of in the critical area of patient safety, in the region. This edition will welcome over 1,700 attendees, more than 70 exhibitors, and 750 delegates.

The conference and exhibition will offer attendees one of the best platforms in the region to connect and network with their target audience and browse through the latest products and services. The event will welcome over 100 expert speakers and host more than 50 sessions, 8 supporting associations, 5-speed networking sessions, and allow participants to earn CME points.

In an interview with *Arab Health Magazine*, Dr. David Nash, Founding Dean, Jefferson College of Population Health (JCPH), Philadelphia, Pennsylvania, U.S. and the Plenary Keynote Speaker at the Patient Safety Congress, said: "I am very excited to visit the UAE for the first time and to attend Patient Safety Middle East. My aim at the event will be to share lessons on improving quality and safety and how it relates to care."

Repeatedly named in *Modern Healthcare's* list of "Most Powerful Persons in Healthcare", Dr. Nash will shed light on the 'Triple Aim' in healthcare, which includes improving the health of the population, reducing cost by reducing waste and improving patient experience through good communication.

"According to the triple aim, people need good treatment for the future. It works well for the population to improve health by reducing cost, which can be achieved by reducing waste. The number one way to do that is to reduce error," he emphasised. "Errors can be reduced by following evidence-based practices, system thinking, resource management and communication skills, and with avoiding things like nurses walking back and forth. When people think about reducing cost, they do that by firing nurses and closing certain programmes but that won't improve the outcome."

He shared that the secret to achieving success

is to improve quality and safety and reduce waste to improve healthcare. This is something he will be discussing at length during the event.

Dr. Nash highlighted that global education about quality and safety is important and something that the healthcare system has not paid attention to. As the Dean of JCPH, the doctor shared that the college has the second oldest Master's degree in Population Health. "There are 13 such programmes in the U.S. now. However, I would like to see these programmes all over the world and work together and improve education in population health," he concluded.

Improving patient outcomes

The theme of this year's event is 'a holistic approach to do no harm' and the accredited conferences will engage stakeholders including policymakers, clinical governance, academia, professional societies, patients, organisations and individuals engaged in patient safety. Paving the way for these health professionals to utilise evidence-based practice and maintain their knowledge and skills to maximise patient safety and patient outcomes, the event will feature three days of exclusive content. The conferences are accredited by Cleveland Clinic and cross-accredited by the UAE Ministry of Health and Prevention. Below is an in-depth look at the agenda:

Middle East Patient Safety Conference

The 15th Patient Safety conference aims to help patient safety professionals benchmark their programmes against current best practice and to develop a customised patient safety strategy based on an organisation's individual needs and implement quality programmes that produce successful, sustainable results for patients and staff.

Workshop

In collaboration with the University of Wollongong in Dubai, the Patient Safety Congress will feature a workshop on "Implementing Quality Tools in Patient Safety".

The workshop is a part of the Patient Safety Conference and will review usage of the seven quality tools to improve service processes in healthcare. Here attendees will be able to learn to understand potential problem causes, collect and analyse data, and solve problems using the fishbone diagram, 5 whys, Pareto chart, scatter diagram, check sheet, flowchart, and run chart.

The workshop is designed to explore existing quality tools to find innovative ways for participants to identify causes, understand processes, collect and analyse data, generate ideas, keep projects on track, and make informed decisions.

Infection Control Conference

The arbitrary use of antimicrobials, poor implementation of process coupled with the staggering number of patient deaths and nosocomial infections create an urgent imperative to make critical decisions about minimising the impact of infections in clinical and community settings.

The 14th edition of the Infection Control Conference will host expert speakers, medical safety advocates and policymakers who will discuss the latest best practice and standards in 'Moving Towards an Infection Free Healthcare Environment – a Global Perspective', the theme for this year.

Central Sterile Services Department (CSSD) Conference

The theme of the upcoming edition of the CSSD conference is 'Getting it Right – every instrument, every time!'. It aims to explore how to adopt the best operating procedures and provide tools to enable central service-sterile processing professionals to be efficient and effective in the areas of controlling and monitoring medical device and environmental decontamination and administering infection control.

Nursing Conference

From using information technology to improving patient safety standards to community-based care and enhancing surgical safety, nurses take the lead in minimising the incidence of patient harm in the healthcare setting.

In recognition of this, the event will host the first conference dedicated to nurses who 'Lead from the frontline through innovation' in promoting a culture of patient safety. The conference will look at the latest best practice through the lens of case studies and success stories, and joint interactive sessions to learn from the practical experience of world-renowned speakers.

The secret to achieving success is to improve quality and safety and reduce waste to improve healthcare.

Awards

At the opening ceremony, the show will celebrate and showcase the best safety people, initiatives and solutions of 2019. The award categories include 'Most Innovative Patient Safety Product of the Year', 'Patient Safety Project of the Year', and 'Leadership Excellence in Quality and Patient Safety'. The opening ceremony, awards and plenary keynote session are open only to exhibitors and delegates of the conferences.

Building compassion into safety culture

By Dr. Rakesh Suri, CEO, Cleveland Clinic Abu Dhabi

Dr. Rakesh Suri

Safety must always be the highest priority for hospitals and healthcare providers. Reinforcing safety requires leadership support and ongoing process improvement, as well as a commitment to a culture of safety that promotes high reliability across all systems.

Most importantly, it requires engagement across the organisation – from the leaders at the top through to the caregivers on the frontline. Everybody needs to be empowered to understand what could go wrong, prepared to speak up, and ready to improve it. An effective safety culture ensures that everybody can listen, learn, and then lead to create effective, enduring solutions.

Cleveland Clinic Abu Dhabi caregivers are encouraged to report events even if they did not cause harm to the patient. Reporting of 'near misses' provides an opportunity for our Quality & Patient Safety Institute to identify flaws in the system and to implement changes before they impact the patient.

In our effort to be the safest place in healthcare, Cleveland Clinic Abu Dhabi has introduced a range of measures to capture this feedback and assess the health of our safety culture. The hospital deploys a validated survey instrument that provides benchmarks and department-level results. It enables the team to assess specific safety measures around key areas, such as error prevention and reporting; organisational learning; communication openness; handoffs and transitions; and management support for safety.

This ongoing analysis generates a body of data that helps track and measure our development as a hospital. The survey findings have fed into specific strategies for preventing complications, hospital-acquired conditions and infections, and falls.

However, one of the key learnings we have realised is the importance of the intangible elements, most particularly the role of compassion in building a safety culture.

Compassion is best understood as the capacity to recognise other people's suffering, combined with the motivation to try to help them. It can be summarised through three key elements – "I hear you", "I feel your pain", and "How can I help?"

First, when we make a connection with another person – recognising they are in trouble, we hear their voice and make an important step beyond our own personal needs. Focusing on other people is a crucial shift in the mindset from "I" to "We," enabling us to grow as human beings, professionals, and leaders.

Then, when we respond to a situation that another person is facing with empathy, feeling another person's pain, we are establishing a connection with the wider community. We are creating space for people to ask for support and letting them know that we are there for them, without judgment.

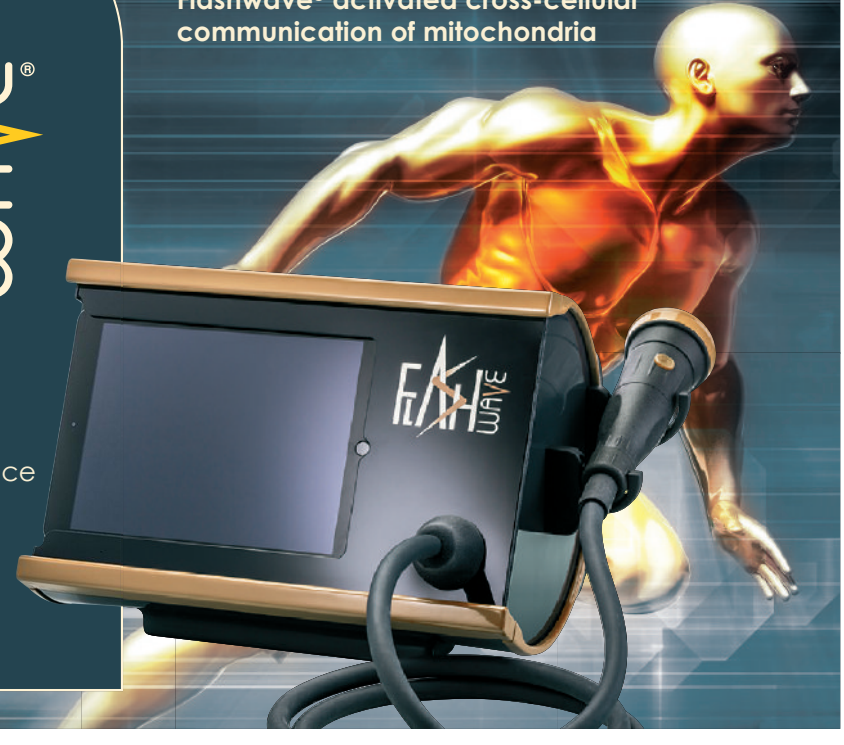
Finally, when we ask, "How can I help?", we are demonstrating our shared commitment to change our environment for the better.

By building compassion into our efforts to enhance safety culture, we are encouraging everybody to actively listen. This ensures that near misses or adverse events are reported, shared and the learnings from each are built into effective solutions.

In 2019, one of our major focuses has been on 'closing the loop' regarding safety issues. We have trained managers to standardise the review process and provide feedback on every event reported. In parallel, we have created teams of subject matter experts to help quickly resolve and close safety events, which has led to a significant reduction in events staying open too long.

Throughout this process, we have kept the three key elements – "I hear you", "I feel your pain", and "How can I help?" – at the fore, ensuring that our patients and colleagues understand we are working to resolve these issues, and that our caregivers are motivated to keep striving. Building compassion into our safety culture has delivered a significant impact at Cleveland Clinic Abu Dhabi. It could make a measurable improvement across the wider healthcare sector.

Dr. Suri will be one of the panellists at the "CEO and leadership panel: Establishing a culture of patient safety" on October 24, day one of the Patient Safety conference, at Patient Safety Middle East.



Learn to challenge your medical device vendor

By James Waterson. RN, M.Med.Ed. Medicines Safety Manager, Medical Affairs and Larry Neal, Regional Marketing Manager, Medication Management Solutions, Becton Dickinson, Eastern Europe, Middle East and Africa

Medical device companies make profits from healthcare. By virtue of this, the relationship between healthcare providers and these companies has often been an uneasy one. This said, it is important to remember that device manufacturers have a vested interest in the wellness of patients. Medical devices that fail to deliver results and improve the lives of patients (and clinicians) are short-lived in the market and damage their maker's reputation.

Bringing a medical device to market requires extensive consultation with customers to acquire 'Voice of Customer' (VOC) insights. Without consulting the expertise and acumen of clinicians and biomedical staff there is a very real risk of creating a device that has multiple features but no real application to the customers' challenges.

A simple example of an apparently 'impressive' but pointless feature would be a manufacturer producing an IV pump that claims to deliver 0.01 ml/hr for continuous infusions. A simple VOC exercise would soon make it clear to the manufacturer that such a device, running at 0.01 ml/hr, would take over 30 hours just to clear the dead space in even a small gauge cannula before true drug delivery takes place!

VOC therefore helps medical device companies to create devices and processes that deliver efficient, effective and above all, safe care to patients. Answers from VOC surveys help manufacturers decide how pre-existing environmental, technological, and organisational cultural barriers to safe, effective, and economical care can be overcome through innovative device design.

One of the goals of the Becton Dickinson (BD) Middle East and Africa office in the near term is to ensure that a more significant component of global VOC consultation takes place in our territory. This reflects the trend towards ever higher standards of leadership on patient safety, automation, technology utilisation, and innovation that we see in the region.

The large-scale use of VOC also ensures that medical device companies have extensive global experience of how facilities have solved patient care problems using their products, and of how customers have undertaken integrations of these products into their risk management and patient treatment strategies. These can of course be shared, and essentially a medical device company can be the coordinator of a global community of its users to promote and to disseminate best practice in the use of its products.

Examples of this are sharing best practice nursing audit processes for infusion pump pressure alarm setting to reduce extravasation injury risk in neonates and the hosting of region-wide and global teleconference seminars, face-to-face meetings, and expert panels for pharmacists and risk-managers to discuss and create strategies for hazard reduction in high-risk medication prescription, compounding, dispensing, and administration.

A more formal example of the kind of coordination that medical device manufacturers undertake is creating advisory boards of advanced users of their products and directing the activity of Key Opinion Leaders (KOLs) towards solving issues for the larger healthcare community. A key component of this process is 'spreading the word'

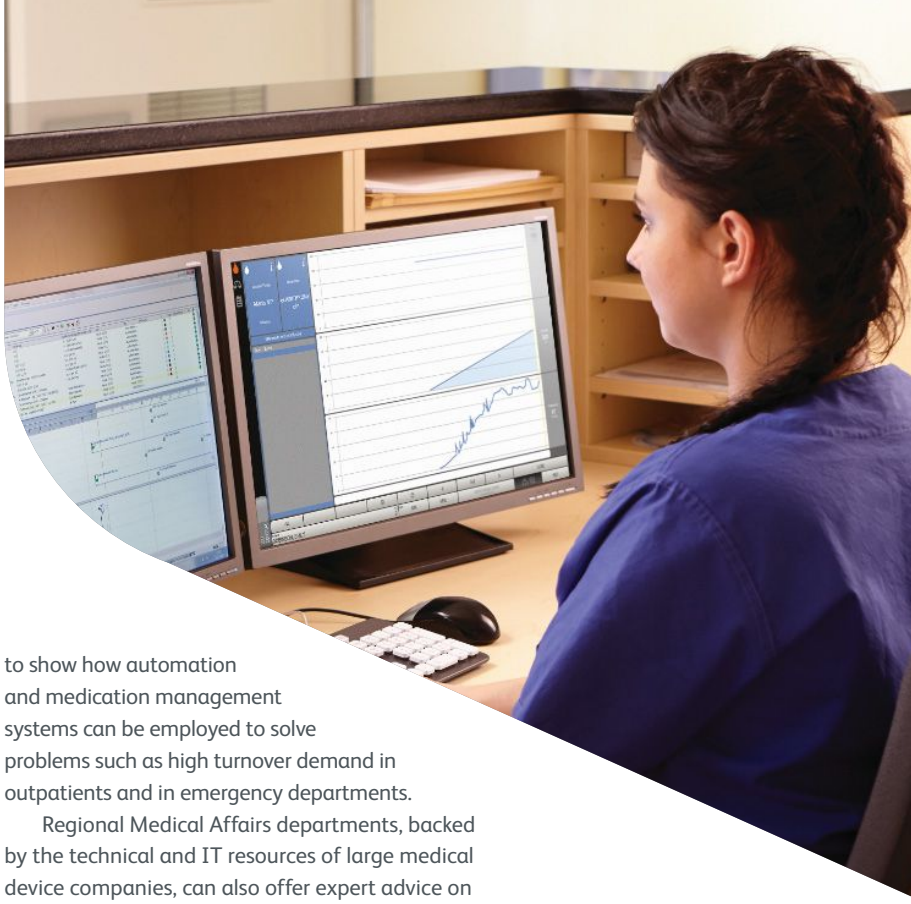
from KOLs and advisory panels about new, or previously under-recognised, healthcare and risk management challenges and solutions to a global audience. Medical device companies may be uniquely positioned to undertake such dissemination as they are often large corporations that are globalised, interactive, and connected to locations throughout the world.

Medical device companies should have extensive Medical Affairs and Health Economics Outcomes Departments. These departments are dedicated to ensuring that products that come to market meet the needs of organisations, patients and end-users, and are used optimally by clinicians to deliver real value. These departments are therefore a perfect partner for any facility or healthcare professional looking to create research or undertake quality projects within their facility, as they have access to large volumes of data taken from devices, specialist services for interpretation of data and results, and, often, experience of similar projects undertaken by other customers even though these customers may be in other parts of the world. Examples of this from our own region include an extensive engagement by BD with the NICU of University Hospital Antwerp in Belgium to identify and to improve issues of alarm fatigue and clinician response to critical infusion alarms and a large scale assessment of data from infusion pumps from every part of Europe, Middle East and Africa, with 1,600,832 separate infusions and over 2.2 million alarms analysed.

Such work is time consuming and exhausting for individual clinicians to undertake but is important. The Antwerp NICU study included changes to the way infusion pumps were used and how their alarms were monitored. These changes led to a 56 per cent reduction in key alarms overall and to a 31 per cent improvement in clinician reaction time to critical infusion alarms.

The large-scale cross-regional study mentioned above has identified how 'Right Maintenance' of critical short half-life infusions is both a previously under-reported potential area of risk for patient safety, and has identified areas in which technology may help mitigate the risk of prolonged interruption of delivery for critical drugs such as Epinephrine in increasingly understaffed and over-extended critical care areas.

Creating regional case studies to show how products that are used globally can be 'localised' is an important part of the work of any regional Medical Affairs department and requires partnering with key centres of excellence at a national level. We are fortunate in the Middle East in having so many top-level institutions to undertake this work with, and to show how automation and medication management systems can be employed to solve problems such as high turnover demand in outpatients and in emergency departments.



Regional Medical Affairs departments, backed by the technical and IT resources of large medical device companies, can also offer expert advice on existing technologies in facilities, and in particular, on complex issues such as infusion interoperability with Hospital Information Systems (HIS). An example of this is the 'clinical walkthrough' to assess the readiness of a facility to undertake bar-code IV medication administration with medication orders being sent directly to smart IV pumps from the HIS. The walkthrough includes assessment of existing hardware, pharmacy and nursing resources, and clinical workflows, and is followed by a technical assessment of the networks and server infrastructure required for such integrations.

Medical Affairs departments can also assist with solution planning to meet accreditation requirements, and can help customers by focussing on specific areas such as Medication Management and Usage (MMU) and Quality Improvement and Patient Safety (QPS) where data aggregation and analysis, and evidence of Failure Mode Effect Analysis (FMEA) processes are required by agencies such as Joint Commission International.

Medical device vendors need a strong engagement with customers, in order to learn from them, and to continue to learn more about our own devices and their full 'real world' potential. Equally customers should engage with manufacturers to gain valuable support if they are to realise the full value of their investment in these technologies for patients and clinicians.

So, learn to love your medical device vendor, but, of course, put them to work and ensure that they deserve your love.

Waterson will be speaking on "ET Tubes and VAP" on October 26, day three of the Nursing Conference, at Patient Safety Middle East.

Early Warning Scores (EWS)

A patient safety quality improvement project at a tertiary hospital in UAE

By Dr. Wissam Abdul Hadi, Chief Quality Officer, NMC Royal Hospital Cluster, Khalifa City, Abu Dhabi, UAE

Early Warning Scores (EWS) are commonly used in acute care hospitals to detect early signs of patients that are medically deteriorating to have timely intervention by multidisciplinary medical teams to reduce morbidities and mortalities; reduce admissions to Intensive Care Units (ICUs); improve patient safety, clinical outcomes; and patient and family experience. Several studies demonstrated that patients before dying or going into a cardiac arrest are commonly preceded by several hours of deranged physiology.

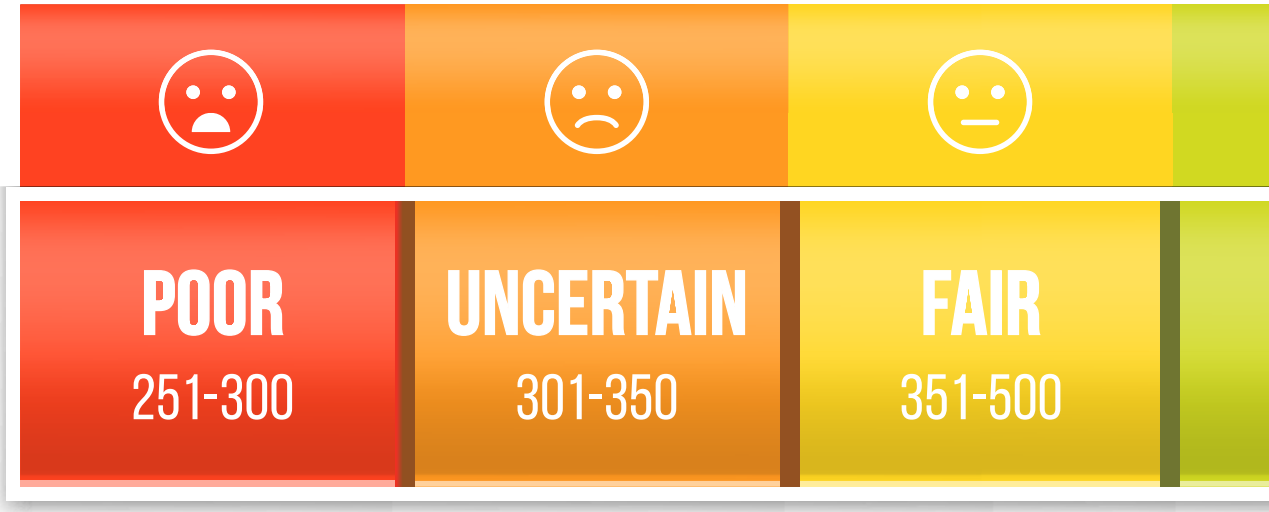
The EWS scoring system is based on physiological measurements: respiratory rate, oxygen saturation, temperature, systolic blood pressure, heart rate and level of consciousness. Each measure is scored from 0 to 3 and added together to give an overall score with an additional two points for supplemental oxygen. Based on the score, medical intervention will be formulated to care for the patient; examples include putting the patient under frequent observation to admitting the patient to ICU.

Implementation

For implementing the EWS, a multidisciplinary team of physicians and nurses was formulated and started researching the internationally published references and forms on EWS. It was decided to adapt one of them to avoid reinventing the wheel. The adapted EWS Policy and related forms were modified resulting in having a draft that meets the hospital criteria, needs and population it serves; ranging from neonates to adults taking into consideration special services at the tertiary hospital like Obstetrics and Gynaecology and Long-Term Care, which requires a modified EWS.

Having this as a Quality Improvement (QI) project in the patient safety domain pilot testing was conducted for three months using the Plan-Do-Study-Act (PDSA) cycle across all inpatient units excluding the ICUs. Data was gathered and the draft of the EWS Policy and related forms were revised based on the feedback gathered. That was the first PDSA cycle. Then the second PDSA cycle was initiated to pilot test the changes done on the first version of the draft of the EWS Policy and related forms for another three months. Again, data was gathered and the EWS Policy and related forms were revised for the second time based on the feedback gathered. A third PDSA cycle was initiated to pilot test the changes done on the second version for another three months. Once more, data was gathered and the draft of the EWS Policy and related forms were revised for the third time based on the feedback gathered. Finally, a fourth PDSA cycle was initiated to pilot test the changes done on the third version for another three months, which ended up in endorsing the third

Based on the score, medical intervention will be formulated to care for the patient.



version. This process took about nine months to ensure that the EWS system is sound, in line with international standards, and helpful to staff. Staff engagement in this project helped a lot in the buy-in, which is very crucial to implement any new system or programme.

The hospital staff was involved in choosing the name of the multidisciplinary team that will respond to the EWS activation. They had to choose between 'Rapid Response Team (RRT)' or 'Medical Emergency Team (MET) call' and they decided to have it as MET call, which comprised of an in-charge nurse, General Practitioner and an Intensivist.

Afterwards, an education and training campaign was initiated to all concerned staff at the inpatient units to help in the EWS implementation. Constant feedback and support were given to staff to ensure correct implementation and maintaining the practice. The clinical leadership always encouraged the clinical staff to activate the MET call whether by the nurses or physicians when necessary, and even when they have doubts or feel uncertain.

The initial results of three months implementation showed a 45 per cent reduction in the number of code blue activations and transfers to ICU.

Challenges

Having noted all of the above, this doesn't necessarily mean that all sick patients will be captured by the EWS as the physiologic measurements may not fall within the pre-determined high-risk values of the EWS. Staff initially were hesitant to call the physicians to avoid any inconvenience or potential 'trouble'. Other challenges included things like, nurses didn't record the right physiological measurements or totally forgot to document it and didn't activate the EWS and call the MET call team.

Success factors

The key success factors in the implemented EWS system were having debriefs following the MET call team response to any call. Also, all feedback gathered from all MET calls' activations were discussed in the Code Blue Committee, which regularly shared the feedback on any changes required and good practices to improve and maintain the implementation of the EWS system. Additionally, the MET call team served as a resource and support to the medical team. Finally, support and respect from management and medical team regardless of whether the MET call was real/valid or unreal/invalid. One must have the attitude that this is a learning experience to sharpen the clinical skills of staff to better serve the patients and keep them safe.

Areas for improvement

Some of the things that can be done to improve the EWS implementation is to have an automated one. All the physiological measurements that are needed for the EWS can be accurately captured by an electronic system that can be configured to do the calculations and give the staff an idea about what actions to take. Reducing the human intervention can help in reducing errors due to manual data entry errors and miscalculations. On the other hand, the team will need to keep in mind that having an automated system could have some errors due to the automaton that needs to be managed before implementing it.

Conclusion

Implementing an EWS is a very important hospital initiative. It's a learning journey with some challenges, but with the right tools, support, and team members, it can make a significant difference for both clinical teams, patients, and their families. It reduces mortalities, morbidities, admissions to ICU and code blue activations. And very importantly it will make the staff feel supported, and it will keep the patients and their families safe.

References available on request.

The initial results of three months implementation showed a 45 per cent reduction in the number of code blue activations and transfers to ICU.

Dr. Hadi will be speaking on "Implementing an Early Warning Score System: A quality improvement project" on October 25, day two of the Patient Safety conference, at Patient Safety Middle East.

Mental health – A hidden secret?

By Craig Halpin, Registered Mental Health Nurse, Nurse/Operational Manager, the Mental Health Centre of Excellence, Al Jalila Children's Speciality Hospital

Do you have physical health? Or, have you ever had a physical health problem? It can be assumed that most people feel no shame discussing their physical health. But what if you were asked if you have mental health? Or, if you have a mental health problem? Would you answer truthfully and honestly? Would you feel shame discussing how you feel mentally? If the answer is yes, you are not alone. Stigma and prejudice with regards to mental health is a worldwide issue. We all have mental health, yet many of us don't always talk about it. It is often our own personal secret.

In its simplest form, mental health is 'a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community'. It is an integral part of our health; there is literally no health without mental health. Mental health problems do not discriminate; they can affect people of all ages, genders, ethnicities and socio-economic backgrounds. We all have mental health, and respectfully, no matter who you are – you have mental health and you are at risk of developing a mental health problem. However, some are more at risk than others, whereas some are more protected than others.

The World Health Organization (WHO) estimates that 1 in 4 adults, and 1 in 8 children are at risk of developing a mental health problem or disorder. What is more concerning is that every 40 seconds worldwide, someone will commit suicide; this includes young people under 18 years. The very sensitive nature of mental health, along with cultural stigma and prejudice often means that we don't always discuss it; yet paradoxically, it's the 'secrecy' about our mental health that can be a contributing factor to developing mental health problems, and/or why some people commit suicide.

The WHO estimates that 1 in 4 adults, and 1 in 8 children are at risk of developing a mental health problem or disorder.

Mental health, problems with mental health and suicide are understandably harsh topics to openly discuss, which means that many people are unnecessarily suffering in silence. Many people are afraid to speak up or to get help. Yet, specialist help is available by qualified and experienced clinicians. Importantly, evidence shows that early detection and early intervention can result in better outcomes; the sooner help and support is sought, the better. Nevertheless, many are still silently suffering. Although mental health problems and suicide can affect both genders, males are significantly more at risk of 'silent suffering'. This is mainly owing to the stereotypical views that men should be 'strong', and that feeling sad or upset is a sign of weakness or is effeminate. Males from a very young age are often told statements such as "man up", or that "crying is for girls", which further emphasises the belief that males should be strong, and not feel normal emotions. This has catastrophic consequences; the fact that suicide is the second leading cause of death globally in males aged 15 – 29 years of age is a prime example. What if these males openly discussed how they were mentally feeling? What if they did not feel judged or stigmatised because of their mental health? What if they could openly feel sad or upset without feeling that they are weak? Would the rate of suicide still be the second leading cause of death? Maybe not. Regardless of gender (as both genders do suffer), it's crucial that we all feel comfortable talking about mental health. We all need to be the 'Change Makers' in shifting attitudes towards our own, and others mental health needs. Your attitude to mental health could literally change someone's life.

Talking openly about mental health, especially with children is very important. As children, we need to learn how to recognise and manage different feelings and emotions, and to understand our own well-being. Our well-being evolves from a combination of factors, in which physical and mental health are fundamental contributors. Openness and transparency about mental health, particularly from a young age can create a sense of 'mental health normality'. We can literally empower children to recognise that there is no health without mental health; that there is no shame in having emotions and feelings; and, that it's okay to feel sad or angry. The first steps in empowering and educating is to openly talk about our health – from both a physical and mental perspective. Both are interlinked and do affect each other. More so, recognising that our mental health is on a continuum, and that movement happens between different

Figure 1: Risk and protective factors for mental health

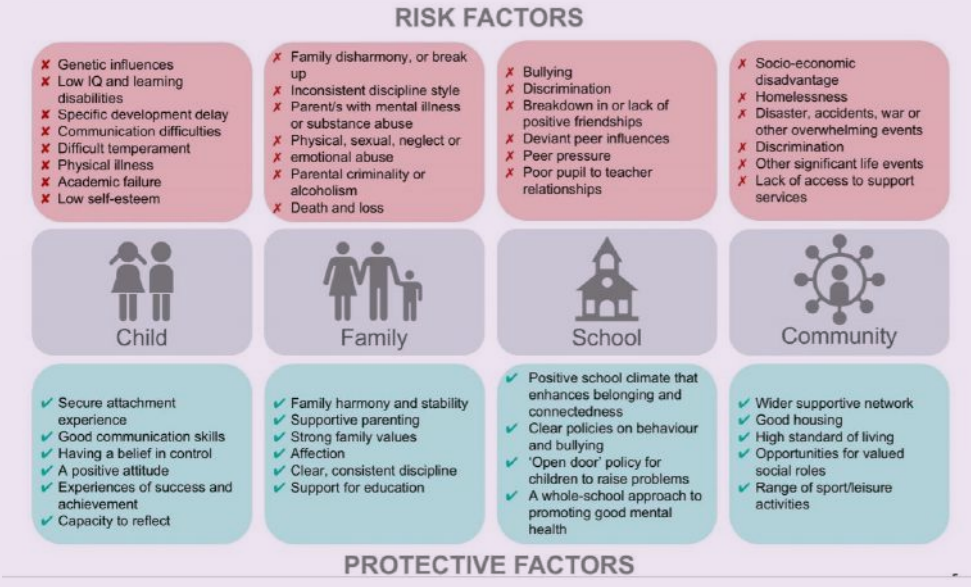


Figure 2: The mental health continuum

SELF-CARE AND SOCIAL SUPPORT		PROFESSIONAL CARE	
HEALTH (Normal Functioning)	**REACTING** (Common and reversible distress)	**INJURED** (Significant functional impairment)	**ILL** (Clinical disorder, severed and persistent functional impairment)
• Normal mood fluctuations. • Takes things in stride • Consistent performance. • Normal sleep patterns • Physically and socially active. • Usual self-confidence comfortable with others.	• Irritable/impatient. • Nervousness sadness increased worrying. • Procrastination, forgetfulness. • Trouble sleeping • Lowered energy. • Difficulty in relaxing. Intrusive thoughts. • Decreased social activity	• Anger; anxiety. • Lingering sadness, tearfulness. • Having a feeling of hopelessness, worthlessness. • Preoccupation. • Decreased performance in academics or at work. • Significantly disturbed sleep (falling asleep and staying asleep). • Avoidance of social situations; withdrawal	• Significant difficulty with emotions. • Thinking high level anxiety. • Panic attacks. • Depressed mood. • Feeling overwhelmed. • Constant fatigue. • Disturbed contact with reality. • Unable to fall or stay asleep. • Significant disturbances in thinking. • Suicidal thoughts/ intent/behaviour.

stages is also important. This movement is dependent upon influences such as risk factors and protective factors, including stress and vulnerability.

For example, you might be extremely stressed because you have lots of exams or other urgent deadlines, which consequently moves your well-being into the 'reacting' stage. Yet once the exams are over or the deadlines are met, you move back to the 'Health' stage. This process is entirely normal and is a reaction. It is when we move into the 'Injured' and 'Ill' stages that professional help and support is often needed; these stages can significantly impair the day-to-day functioning of people. Early detection and early intervention is key.

If you are worried about your mental health, or the mental health of someone else, seek some help. Specialist help is available, which includes receiving assistance, support, assessment and treatment from trained mental health professionals who have the experience, knowledge and skills to work with children, adults and families. Sadly, stereotypical views of mental health services still do exist – for example, people imagine padded cells or patients strapped to beds in cold and dark rooms (just like in the movies!) – be assured that this is not the case. Together, we can improve mental health of the children, young people and adults within the UAE. Let's start talking about mental health, let's speak up. It doesn't need to be a secret.

References available on request.

Halpin will be speaking on "Patient safety in a mental health inpatient department" on October 25, day two of the Nursing conference, at Patient Safety Middle East.

Our well-being evolves from a combination of factors, in which physical and mental health are fundamental contributors.

Enhancing patient safety through AI

By Mohammed Alhajjy, Medical Informatics Specialist, Quality Informatics – Healthcare Information Technology Affairs – KFSH&RC, Riyadh, KSA

AI could help avoid duplications and overlapping roles among healthcare providers by ensuring well-established communication channels.

Year after year, the world is witnessing discoveries and trends in diseases, treatments, drugs, and technologies related to healthcare. This is evident through the significant advancement in hospital systems, models, and services. Therefore, many governments in the past few years have focused on reforming their systems to adapt to these new trends and to shift from a volume-based system towards a value-based system. However, decision-makers are concerned with the growing demand on healthcare services that are contributed by several factors such as ageing factors, an increase in population, and chronic diseases. The World Health Organization (WHO) has estimated that 50 per cent of the global burden of disease is chronic illness. These factors are overwhelming healthcare resources within the available capacity and may lead to poor quality of services and result in safety incidents. This would be resolved if we consider Health Information Technology (HIT) as a remedy that would ensure adherence to quality of standards within safety measures and maintain the minimum requirement.

Technology can help us in shaping our future healthcare system effectively and efficiently by providing the required access to care based on the availability of services promptly. It could retrieve, store, detect, and recommend on behalf of humans as a decision support system. This would ensure patient safety by building up a vigilant system that detects and predicts near misses. For example, administering a Naloxone injection (which is used to treat a narcotic overdose in an emergency) should be reported in a safety reporting system to alert the organisation about such a human or system failure and to establish a system to prevent it in the future. Yet, this incident might be not reported due to several reasons such as safety culture issues due to lack of organisation support in reporting near misses or potential harm occurrences. Alternatively, it could be that the involved provider was too busy to meet other patients' needs and forgot to report it, or that the reporting mechanism itself might be not accessible or available. In this case, building up rules and queries in the system database and integrating them between the Electronic Medical Record (EMR) and reporting tools would overcome this issue and report it automatically based on the given formula.

This will also support the organisation by providing them more opportunities to learn not to blame reporters upon reporting such potential or actual occurrences to avoid them in the future. Moreover, it should be noted as per researchers that only 10 to 20 per cent of errors are reported. Hence, using technology to automate reporting of triggers could shift to a higher level by inducing quality standards along with safety measures into automated workflows and lead to predict and prescribe through Artificial Intelligence (AI). This shift in healthcare from manual to electronic has reached beyond clinical documentation or merely prescribing orders towards predicting and providing recommendations to what healthcare providers should perform. This is essential to guide the care delivery based on recent validated evidence embedded into the clinical workflows and empowered by technology features in retrieving, storing, and alerting clinicians about their interventions and plans. Yet, the human factor is crucial and won't be eliminated but it will be utilised to add more values to their performance. However, as per James Reason, humans tend to make errors intentionally such as mistakes and violations or make non-intentional errors such as slips, and memory lapses. Thus, human errors would be minimised by using technology that will play a significant role in building up a reliable system and eventually will mitigate the risks of both human factors and system failures.

Healthcare is a complex system and its workflows cannot be replicated with every single patient due to their special needs and requirements, but AI could help avoid duplications and overlapping roles among healthcare providers by ensuring well-established communication channels and coordination platforms. This will require healthcare systems designers to consider a LEAN concept while designing workflows and re-engineering processes to ensure the best fit for their organisations and patients. Ultimately, integrating quality and patient safety standards in every single activity performed in designing health IT systems is vital to ensure the benefits of implementing technologies and solutions successfully.

Alhajjy will be giving a special address on "AI and nursing" on October 26, day three of the Nursing Conference, at Patient Safety Middle East

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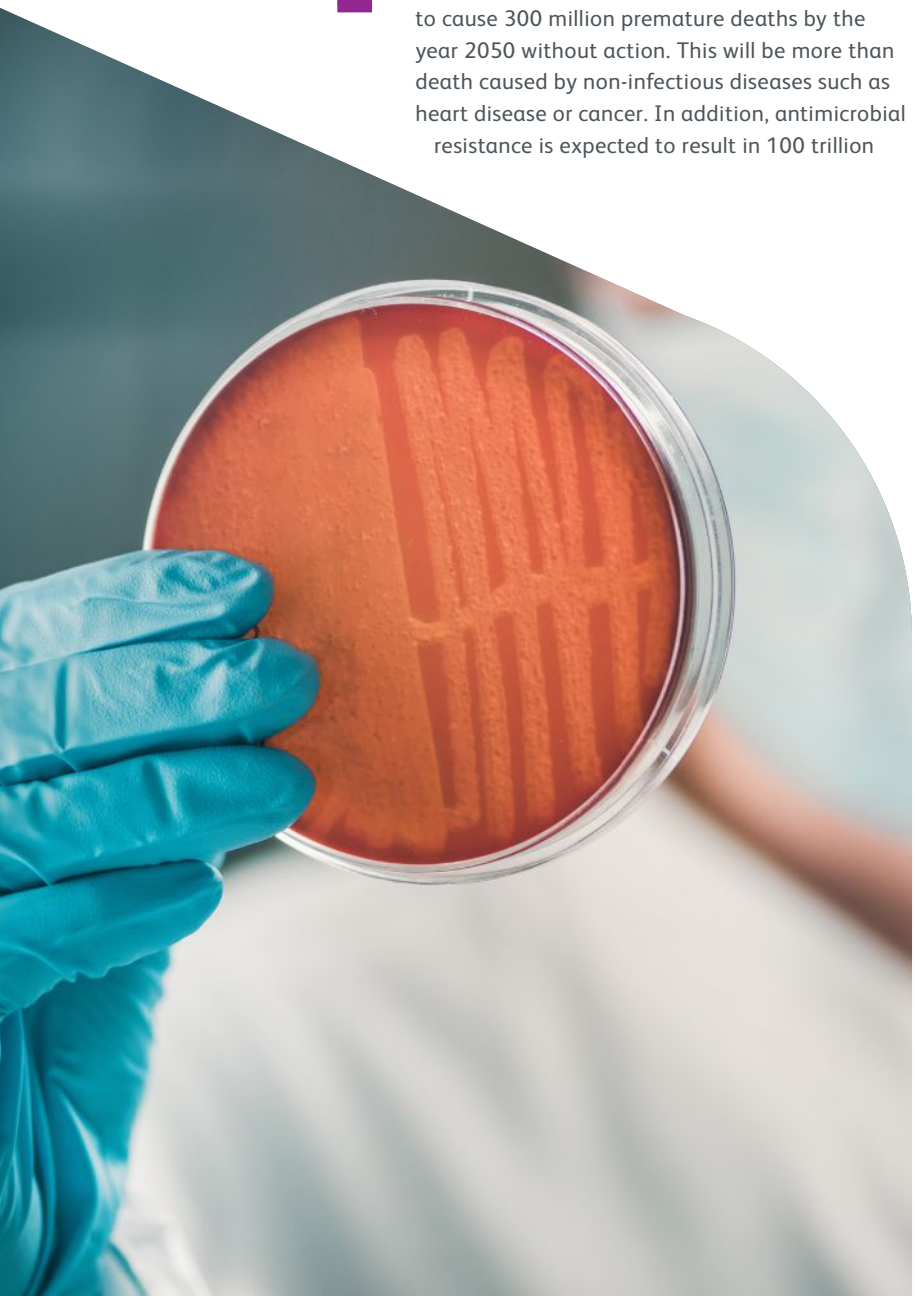
Partnership is key to fighting antimicrobial resistance

By Dr. Nehad Al Sharawi, Intensive Care Unit Consultant, Al Zahra Hospital Dubai and Dr. Mohaymen Abd El Ghany, Al Zahra Hospital Dubai, CEO

Antimicrobial resistance is expected to result in 100 trillion dollars loss in global economy by 2050.

Since the discovery of penicillin by the Scottish scientist Alexander Fleming in 1928, antibiotics have been increasingly used to treat infections. Alongside with discovery of new antibiotics, microbial resistance appeared. The first strain of penicillin resistant staphylococcus was discovered in 1940. Currently, antimicrobial resistance has become a global health threat. According to United Kingdom statistics, antimicrobial resistance is expected to cause 300 million premature deaths by the year 2050 without action. This will be more than death caused by non-infectious diseases such as heart disease or cancer. In addition, antimicrobial resistance is expected to result in 100 trillion dollars loss in global economy by 2050.



New antimicrobial resistance mechanisms are emerging and spreading globally. This will lead to inability to treat common infections, which results in prolonged illness, increased cost and death. Without effective antimicrobial therapy, procedures such as major surgeries, organ transplantation or cancer chemotherapy become very high risk or even fatal.

Antimicrobial resistance occurs when microbes are exposed to antimicrobial drug. It happens through genetic alteration that renders the microbe resistant to the action of antimicrobial. This is a natural process, which is accelerated by the overuse and misuse of antibiotics. Up to 85 per cent of antibiotics have non-human use and up to 75 per cent have non-therapeutic use such as growth promoter. It is estimated that more than 50 per cent of antimicrobial prescription in hospitals is inappropriate.

Heker MT et al (2003) analysed the patterns of inappropriate antimicrobial prescription in 129 patients. He found that 33 per cent of unnecessary prescription was due to longer duration than required, 32 per cent due to treatment of non-infectious syndromes, and 16 per cent due to treatment of colonisation.

According to the Centre for Disease Dynamics, Economics and Policy (CDDEP) report in 2017, the prevalence of Extended Spectrum Beta-lactamase (ESBL) Escherichia coli (E coli) in the UAE is 48 per cent, which is close to that in the Kingdom of Saudi Arabia (KSA) which is 49 per cent. Carbapenem-resistant E coli prevalence in UAE is 2 per cent and KSA is 3 per cent, according to the same report. Antimicrobial Susceptibility and Multidrug Resistance in the Middle East (SMART) study showed that the prevalence of ESBL Klebsiella pneumoniae (K pneumoniae) is 25 per cent in KSA, 28 per cent in Lebanon, 52 per cent in UAE and 54 per cent in Jordan. At Al Zahra Hospital, Dubai (2018), the prevalence of ESBL E coli is 20 per cent, K pneumoniae ESBL is 17 per cent, and carbapenem-resistant

K pneumoniae is 2 per cent.

In view of these alarming numbers of antimicrobial resistance and the few new effective antibiotics in the pipeline, the World Health Organization (WHO) has identified antimicrobial resistance as a major health threat and called for global action. To overcome the problem of antimicrobial resistance, we need to optimise the use of existing antimicrobials and to prevent the transmission of multi-drug resistant organisms. The first can be achieved through effective antimicrobial stewardship programme and the latter through effective infection control practices.

The Centre of Disease Control (CDC) has recommended four necessary actions to prevent antimicrobial resistance. These are:

- Prevent infections and transmission of infection
- Tracking
- Developing new drugs and diagnostic tests
- Antimicrobial Stewardship Program (ASP)

Antimicrobial Stewardship Programme involves careful and responsible management of antimicrobials. This includes both pre-operative antibiotic prophylaxis and treatment of various infections. It also involves timely and optimal selection of antimicrobial that covers the most likely organisms involved, using the appropriate dose and duration and avoid treating non-infectious or non-bacterial syndromes with antibiotics.

The advantages of Antimicrobial Stewardship Programme include:

- Improve patient-related outcomes such as infection cure rates, reduction in surgical site infection and reduction in mortality.
- Improve patient's safety through reduction of antimicrobial-related side effects such as clostridium difficile colitis.
- Reduce the rate of antimicrobial resistance.
- Reduce healthcare related costs.

Any Antimicrobial Stewardship Programme has core elements. CDC has identified seven core elements for effective ASP which include: leadership commitment, accountability by appointing a single leader for the programme, presence of clinical pharmacist, implementing at least one recommended action or protocol, tracking antibiotic prescribing patterns and antibiograms, reporting information about antibiotic use and resistance to other healthcare workers and educating the prescriber, patient and family.

Antibiotic Stewardship Programme at Al Zahra Hospital Dubai started in the year 2017. It consists of a team leader who is a physician with an interest and expertise in infection diseases, clinical pharmacist, clinical microbiologist and infection control nurse. Daily prospective audits are performed on all cases that are prescribed antimicrobials. Data is collected and presented to the antimicrobial stewardship committee on regular basis. Several protocols are available to guide physicians on the optimal use of antimicrobials such as preoperative prophylactic antibiotics protocol, treatment of upper respiratory tract infection protocol, and treatment of infectious diarrhoea protocol. Continuous feedback is given to prescribers about their antimicrobial prescription patterns.

In conclusion, an optimal Antimicrobial Stewardship Programme requires multidisciplinary efforts to retain impact and sustainability. Leadership commitment, prescriber's involvement and patients/family education will help to overcome the challenges associated with Antimicrobial Stewardship Programme.

The WHO has identified antimicrobial resistance as a major health threat and called for global action.

Dr. Abdelghany will be one of the panellists at the "CEO and leadership panel: Establishing a culture of patient safety" on October 24, day one of the Patient Safety conference, at Patient Safety Middle East.

Organisation self-assessment: The first accreditation challenge

By Dr. Abdalla Ibrahim, M.B.B.CH, MSc, MBA, Managing Director of Smart Management Consultancy, Bahrain and Adjunct Business Faculty, Geneva Business School

The purpose of self-assessment is to identify the organisation's quality gaps.

According to the International Society for Quality in Health Care (ISQua), accreditation is a self-assessment and external peer review process used by health and social care organisations to accurately assess their level of performance in relation to established standards and to implement ways to continuously improve the health or social care system.

Healthcare accreditation is currently a national mandatory requirement in some countries and optional choice reflecting performance excellence in other countries. The Quality Accreditation Life Cycle includes multiple steps and among them, there is an essential one that we call self-assessment.

Self-assessment is a process where an organisation compares its activities and performance against pre-set standards of excellence developed by an accrediting organisation or national authority. The purpose of self-assessment is to identify the organisation's quality gaps, and consequently, find opportunities for future enhancement in terms of quality performance, safety practices and positive patient experience.

Because self-assessment step starts early in the accreditation life cycle, it is usually conducted by team members who demonstrate, at this phase, little understanding of benefits of accreditation and are confused with the accreditation terms. At this moment of the accreditation life cycle, the staff reflect an actual chaotic phase and continuously debate on questions like, "Why do we put extra load on the busy managers and staff?" "What's in it for us?" And finally, "Why do we do such work?" This stage of rejecting versus accepting accreditation proves a true challenge to the organisation.

It is important to admire that self-assessment is not an easy task, as it seems on paper. It takes multiple sessions and some of them might not be related to the process itself but related to conflict consequences. As self-assessment is a teamwork task, therefore, all obstacles and challenges of teamwork will sound as struggle and competition; engagement and detachment; idea generation; acceptance and rejection, humble leadership support and reluctance of team involvement.

In the beginning, team participation, feedback, and input are expressed in terms of frustration, aggressive response, and dissatisfaction. Chaos and hard talk are a common impression after the early session. To overcome those challenges, it requires an effective leader who can manage the session to be organised, direct the hard talk to be productive, complete efficiently the self-assessment on due time and effectively, as it ought to be written. That leader will coach the team and work hard to facilitate the team transition from the low productive Forming Stage, and peacefully passing the staff to Storming Stage, then to the Norming Stage and finally

reaching the highly productive Performing Stage of team development.

Nevertheless, it is essentially to know which team members should present the team. Self-assessment should be done with the involvement of staff who work within the discussed service chapter/element of accreditation standard manual. The self-assessment team should ideally consist of a group of motivated and committed staff of diverse backgrounds. Principally, the team should include a member who is quality/accreditation oriented with good teaching skills to clarify the standards. It is equally important to have a member with extensive experience and knowledge of the organisation structure, committees, people in authority and people with talents. Likewise, a positive add is to include a knowledgeable member who can relate standard criterion to available organisational legislation, policy, manuals, practices, audits, circulars and other indicators. Additionally, there is a need for a mid-senior and new generation staff for their drive, ambition and enthusiastic power to meet accreditation challenges and confront other staff frustration and resistance for change.

Different models have been deployed to do self-assessment and currently they are electronically available on the portal of the accrediting organisation. The self-assessment portal has the following domains: Standard Met; Partial Met, Not Met, Not Applicable and finally a place for the evidence.

The problem is that, in some instances, the staff are requested to fill the self-assessment electronically and then to upload the response to the system without receiving training or clarification of the standards. This process may lead to improper input that results in doubtful assessment of the organisation.

Preferred method

There are many models to overcome such problems and the one I prefer the most and find easy to apply on the ground is when the team comes together in one single room and starts the process all together in the following sequences.

First, the leader of the self-assessment team reads and clarifies the requirement of a standard. To clarify a standard, identify how many verbs are in the standard phrase. The standard will be met whenever the organisation responds to the available verbs. For example: If the standard states "The organisation should develop and implement a process to improve …" this means there should be two activities: initially, develop the process. Next, implement the developed process.

Once the leader explains the standard, then, the team separately responds in a 'Check List Style' with an answer. The answer could be Met, Partially Met, Not Met or Not Applicable. If the answer is met or even Partially Met, the staff ought to mention evidences that might be a policy, manual, circular, meeting minutes, observation, outcome of process, interview findings, etc. Finally, the team members discuss their feedback and come in common agreement that the standard is met or partially met or not met and available evidences are true ones that actually meet the standard requirements.

To wrap it up, self-assessment is the first and true challenge for an organisation going through the accreditation cycle. It requires an effective and efficient leader to coach and navigate the ship through the early stage of chaos and team brainstorming and to achieve harmony between the accreditation team members to complete the self-assessment process and identify the organisation's quality gaps.

Dr. Ibrahim will be speaking on "Communication safety in healthcare services" on October 25, day two of the Patient Safety conference, at Patient Safety Middle East.

Self-assessment is the first and true challenge for an organisation going through the accreditation cycle.

Rapid molecular diagnostics and antibiotic stewardship

Key for positioning UAE as a global leader in healthcare

By Dr. Hafiz Ahmad (Ph.D– AIIMS, New Delhi, PDF- NIH, USA), Assistant Professor and Clinical Microbiologist, Department of Medical Microbiology and Immunology, RAK College of Medical Sciences, RAK Medical & Health Sciences University and Adjunct Clinical Microbiologist, RAK Hospital, Ras Al Khaimah, UAE

Dr. Hafiz Ahmad

Antimicrobial agents have long been used for treating patients with infectious diseases, reducing morbidity and mortality. Antibiotics can be lifesaving when treating bacterial infections. But because of inappropriate use, over or under dosing and excess use in animal feed and plant manures, has generated resistant forms known as Multi Drug Resistant Organisms (MDRO). Studies indicate that up to 50 per cent of antibiotic use is either unnecessary or inappropriate across all type of healthcare settings.

Antibiotic Stewardship is needed to ensure prompt appropriate clinical decision. This will translate rapid diagnostic test results in the laboratory into improved patient and clinical outcomes. It is important to select the right test for the right patient at the right time to optimally influence patient management and conserve healthcare resources and reduce turnaround time (TAT).

The rationale for utilisation of rapid diagnostic molecular technology coupled with antimicrobial stewardship is necessary for the accurate and rapid identification as well as characterisation of resistant super bugs like Methicillin-resistant Staphylococcus aureus (MRSA), ESBL- producing Enterobacteriaceae, Carbapenem-resistant Enterobacteriaceae (CRE) ensuring appropriate improved patient management, resulting in decreased hospital stay and decreased costs. Hence, reduction in morbidity and mortality. A recent study implementing advanced Antibiotic Stewardship Programme (ASP) at Cleveland Clinic, Abu Dhabi has reported US$ 1,339,499 total direct cost savings, despite significant increase in patient discharges. Thereby, decreasing antimicrobial utilisation, antimicrobial expenditure and reduction in hospital acquired *C. difficile* and MDR rates.

Rapid molecular diagnostic tests are "game changer" for patient care especially in cases with diagnostic uncertainty. With the introduction of Polymerase Chain Reaction (PCR), multiplex PCR panels, Matrix Assisted Laser Desorption/Ionization Time of Flight mass Spectrometry (MALDI-TOF MS) and Next-generation sequencing (NGS) to identify organisms directly from specimens, has significantly reduced the window of testing for diagnosing bloodstream, respiratory tract, urinary tract, gastrointestinal and central nervous system infections. Once the appropriate rapid tests have been selected, it is important to use the test for the right patients to affect optimal clinical care – Diagnostic Stewardship. Nevertheless, clinicians, Infectious Disease specialists and antibiotic stewards will always guide to decide between definitive negative results, colonisation versus true infection, based on clinical acumen taking into account clinical history and physical examination as nucleic acid-based testing does not always equate to viable organism detection. Therefore, synergy of ASP team and diagnostic laboratory is key for proper implementation and optimal clinical outcomes.

The UAE ASP team along with national Antimicrobial Resistance (AMR) provides national clinical guidelines based on data of local resistance patterns of antibiotics for the management of common infectious diseases and reducing emergence of MDROs in the region. Furthermore, having an ASP is now a requirement for hospitals to be accredited through The Joint Commission and Joint Commission International (JCI).

Thus, amalgamation of ASP and Rapid Molecular methods along with high quality nursing and pharmacy care have profound impact on healthcare in the UAE and the Middle East and drives the way forward for positioning the country as a global leader in healthcare.

References available on request.

Studies indicate that up to 50 per cent of antibiotic use is either unnecessary or inappropriate across all type of healthcare settings.

Dr. Ahmad is a member of national ASP for UAE and will be speaking on "Rapid molecular diagnostics & antibiotic stewardship" on October 25, day two of the Infection Control Conference, at Patient Safety Middle East.

Building the future of healthcare

GSD Healthcare brings together pioneering scientific research and first-class care for patients to the UAE

Gruppo San Donato (GSD) is by far **Italy's leading private hospital group** and among the largest in Europe, with 19 hospitals, 5300 beds, over 4000 specialist physicians and more than 4.7 million individual patients treated per year.
GSD Healthcare is a branch of GSD, dedicated to providing both **educational and consulting services** worldwide. Given our broad experience in the medical and healthcare field, we put our best efforts into delivering outstanding results for clients ranging from young private clinics striving to achieve excellence up to national healthcare system regulators looking for efficiency improvements.

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

The GSD Healthcare organizes high quality, **CME-accredited courses** in a number of locations across Dubai, UAE and whole Middle-Eastern Region. We provide short, specialized courses, with hands-on training, conducted by highly qualified professors that excel in the healthcare field.
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GSD Healthcare, through its network of Universities and partners, **designs consultancy and advisory solutions in the healthcare field**, with a systematic, practice-oriented and holistic approach. We link strategic goals with analysis and implementation of solutions.
The high level of customization is one of our main features: **we create value through tailoring programs to different needs of healthcare systems**, taking into consideration markets and various organizational contexts.

www.gsdinternational.com

Single Port Laparoscopy: Ease like never before

Article provided by RAK Hospital

As laparoscopic procedures increasingly find their way into the operation rooms across the world, patients have gained more confidence while undergoing invasive surgeries. The highly specialised technique allows faster recovery, reduced blood loss and infection rate, results in less complications and is comparatively painless compared to traditional procedures. These factors serve as a huge incentive for patients to go under the knife without apprehensions and misgivings. With single-port laparoscopy surgery (SPLS) that requires just a single incision – typically through the navel – minimally invasive surgeries have reached a new level of safety while ensuring minimum internal and external scarring.

Procedures that can be done with the help of single-port approach include appendectomy, cholecystectomy, bariatric surgery, hysterectomy, ovarian cystectomy, hernias repair, adrenalectomy, hemicolectomy, sigmoidectomy and total colectomy. The spectrum of SPLS applications has extended from benign diseases to malignant colorectal diseases. It offers the chance to further minimise the access trauma.

In the past few years, the demand for laparoscopy has risen noticeably, and is expected to reach US$14,046 million in 2022, registering a CAGR of 5.8 per cent from 2016 to 2022, as per Allied Market Research. Another Reuters report places the growth at a CAGR of 7.3 per cent. The statistics simply reflect the growing preference and patients' trust in advanced technology and methods that ensure more precision. The trend is further propped by the alarming rise in chronic ailments, particularly obesity, which affect approximately 650 million people across the world, according to WHO statistics. In the UAE, obesity levels are as high as 37 per cent of the population, pushing people to find painless invasive alternatives to losing weight.

However, while laparoscopy – both multiple- and single-port – has provided significant ease in operation, the real test of the procedure remains in the hands of a skilled surgeon. Not every surgeon can perform laparoscopic surgery since it needs minute precision and command over the use of the tools and techniques.

In this regard, RAK Hospital in Ras Al Khaimah has gained a firm foothold in the realm of minimally-invasive procedures, particularly single-port laparoscopy. The hospital has become an important referral point for surgical cases, both local and foreign, for laparoscopic procedures. With focus on minimising surgical trauma and maximising ease and comfort, the hospital boasts of a skilled team of doctors adept at handling single-port minimally invasive surgery procedures related to removal of gallbladder, appendix, hernia repair, surgery on the small and large intestine, stomach and liver, including cancer surgery, surgery on the kidney, uterus and ovaries-related procedures, thoracoscopic, paediatric and bariatric surgeries.

"With a growing portfolio of successful laparoscopic surgeries, we take pride in the fact that RAK Hospital has put together an impressive team of doctors as well introduced cutting-edge technology. Together, we form a formidable force that can take on – and have taken on – surgeries in emergency situations that have called out for extremely skilled professional expertise," said Dr. Raza Siddiqui, CEO Arabian Healthcare Group and Executive Director, RAK Hospital. "We have performed minimally invasive surgeries on patients flown in from other parts of the world who have returned to their native countries completely satisfied with the treatment and within just a few days. This speaks volumes of our incredible service and globally, RAK Hospital is being increasingly referred for surgical procedures – both laparoscopic and traditional."

A multiple award-winning healthcare institution, RAK Hospital has been constantly bringing new surgical procedures and technologies to the UAE, as well as several world-renowned doctors under one roof.

Using artificial intelligence to deliver personalized radiation therapy

Article provided by Cleveland Clinic

Cleveland Clinic researchers have trained an advanced "deep-learning" computer network to detect subtle radiation sensitivity features in the computed tomography (CT) scans of lung cancer patients that can predict the likelihood of successful radiotherapy outcomes.

Using this unique "image fingerprint" and a patient's electronic medical record, the artificial intelligence (AI) agent, called Deep Profiler, generates a personalized radiation dose plan that can reduce the probability of treatment failure to less than 5 %.

This marks the first time that machine-driven quantitative image analysis has been used to personalize radiation dose delivery. It represents a major improvement over conventional radiotherapy, which is delivered uniformly.

"While highly effective in many clinical settings, radiotherapy can greatly benefit from dose optimization," says lead author Mohamed Abazeed, MD, PhD, a Cleveland Clinic Cancer Center radiation oncologist. "This framework will help physicians develop data-driven, personalized dosage schedules that can maximize the likelihood of treatment success and mitigate radiation side effects for patients."

Applying machine learning to tumor characterization

In addition to information about tumor location, size and geometry, CT scans record considerable additional amounts of data in the form of voxel intensity, which is related to tissue density. The human eye can only see a fraction of those density variations, which limits the images' utility for individualized radiotherapy.

Dr. Abazeed and colleagues addressed it with a machine learning approach called deep learning, where an artificial neural network is fed raw data and uses data-characterization algorithms to discover progressively higher-level classification features.

In this case, the Deep Profiler neural network identified and extracted radiation sensitivity parameters predictive of treatment failure from individual pre-therapy lung CT images. The large size of the clinically annotated image data set the researchers used to train and validate Deep Profiler — representing 849 Cleveland Clinic patients with lung cancer or metasteses — bolstered the neural network's classification accuracy and limited false findings.

After analyzing a patient's CT scan, Deep Profiler produced an image signature of radiation sensitivity whose characteristics predicted the likely outcome of standard high-dose stereotactic body radiotherapy.

Combining that signature with information from the patient's medical record, including biologically effective dose (BED) and the tumor's main histological subtype (adenocarcinoma or squamous cell carcinoma), yielded an optimized, patient-specific radiation dose called iGray whose estimated probability of local failure was less than 5 % at 24 months post-treatment.

An improvement over classical radiomics

To test the accuracy of Deep Profiler's predictions, Dr. Abazeed and his colleagues compared them with patients' clinical outcomes. They found that patients whom Deep Profiler scored as high-risk for treatment failure actually failed at a significantly higher rate (20.3 % at 3 years) than that of failures among patients with low-risk Deep Profiler scores (5.7 % at 3 years). On multivariate analysis, a high-risk Deep Profiler score, a low radiation dose and the histological subtype of the patient's tumor were all significantly associated with local failure.

The results confirmed the AI approach's validity and its superiority to classical radiomics or clinical variables alone.

The wide iGray dose ranges that Deep Profiler determined were capable of achieving a less than 5 % failure probability in individual patients' treatment indicated that dose reductions were feasible in 23.3 % of cases in the study cohort. The results also showed that the recommended iGray dose could be safely delivered in most cases.

"The development and validation of this framework is exciting because not only is it the first to use medical images to inform radiation dose prescriptions, but it also has the potential to be used to deliver radiation therapy tailored to individual patients," says Dr. Abazeed.

In the know

Flashwave opens new treatment options

Article provided by Flashwave

Flashwave® is a new kind of non-invasive therapy based on cellular communication. The combination of technology, diagnostics and application allows fully trained Flashwave users to active endogenous muscular satellite cells, which opens up completely new treatment options in:

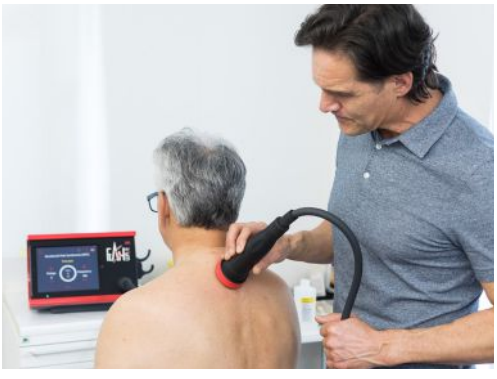
- Musculoskeletal indications
- Aesthetics
- Wound care
- Diabetes and
- Urology

Flashwave is fully CE & MDSAP certified, already clinically proven and used with great success in various countries.

The Flashwave MMC indication group – Musculoskeletal Management & Correction – has quickly attracted high profile clinical users and clients, as therapy results are immediate and the learning curve for users is swift.

Here are some of the athletes who have been in contact with Flashwave:

- Richie Patterson (weightlifter, three-time Olympian, 3 x gold-medalist at the Commonwealth-Games, holder of multiple national records in New Zealand)
- Manuel Feller (alpine skiing, Olympic silver-medalist and world championship silver medalist)
- Lydia Ko (former #1 LPGA Tour, 2 x major winner)
- Tennis players of the Spanish Davis Cup Team
- Junior Noboa (former Major League Baseball {MLB} player, hitting coach of Dominican Republic National team, current VP Latin America for the Arizona Diamondbacks)



The answer to the need for pharmacy automation

CONSIS H solution for hospital outpatient pharmacies

Article provided by Willach Pharmacy Solutions

With a population of more than 411 million people, the Middle East is one of the world's largest healthcare markets. The Middle East Pharmacy Automation Market is projected to grow at a CAGR of 7.20 % during the forecast period to reach a total market size of US$ 0.165 billion in 2022 from US$ 0.109 billion in 2016.

Increasing healthcare expenditure is driving the demand for pharmacy automation in the region in order to provide improved service to a large patient base. Hospital outpatient pharmacies busy with dispensing prescriptions find it challenging to focus on additional revenue streams and so Pharmacy Automation is space and accuracy of dispensing.

Medication dispensing and patient consultation take time and where efficiency is critical to maximize the potential of this revenue generating department, rush mode can mean finding yourself with costly, even dangerous, errors on your hands.

Pharmacy Automation allows the pharmacy to improve customer service, reduce dispensing errors and free up staff time, so team members can spend more time carrying out the customer facing services.

The key benefits of Pharmacy Automation are:

- Speeding up the dispensing process
- Cutting down on dispensing errors
- Saving space on product storage, creating more room for retail space or consultation facilities.

Willach Pharmacy Solutions can offer Pharmacy Automation advice and support within your own business.

All key benefits are covered by the CONSIS H robot, the fast and reliable principle capable of providing this over a long period of time with its parallel ejection from several storage channels.

Reference projects are in the region of Middle East. This includes solutions provided in Saudi Arabia at John Hopkins ARAMCO Hospitals (Al Khobar and Al Hasa) and in Kuwait in MoH Hospital Jaber Al Ahmad with automatic dispensing CONSIS robots and FAMA storage and dispensing systems.

The solutions with CONSIS robots and FAMA storage and dispensing systems cover reliably a dispensing volume of at least 10,000 packages / day for many years.

Willach Pharmacy Solutions provide with its network of reliable partners in the Middle East all solutions for the dispensing and storage area in the Hospital and Community Pharmacies.

For more info visit
www.willach-pharmacy-solutions.com/ME/

Figure 1: Automatic dispensing with CONSIS robots at John Hopkins ARAMCO in Saudi Arabia.

Figure 2: Automatic dispensing with CONSIS robots at Jaber Al Ahmad Hospital in Kuwait.

Figure 3: Automatic dispensing with a CONSIS H robot with automated product loading from Willach Pharmacy Solutions.

In the know

Masimo Announces Halo ION™

Article provided by Masimo

Masimo recently announced that after a decade of developing and testing its comprehensive, scalable, and customizable continuous early warning score, with the aid of leading expert clinicians around the world, it is releasing Halo ION™. Halo ION allows clinicians to aggregate trend data from as few as three physiological parameters (oxygen saturation, pulse rate, and perfusion index), and as many as are available, including data from EMRs, into a single continuous early warning score. Each patient's Halo ION score is displayed on the Masimo Patient SafetyNet™ Supplemental Remote Monitoring and Clinician Notification System as a number ranging from zero to 100, helping to streamline clinicians' patient assessment workflow.

What is difficult for people is easy for Halo ION: in calculating scores, Halo ION not only takes advantage of immediately available patient data, but more importantly, keeps track of historical physiological data and data from other records. Halo ION thus helps to automate the process by which clinicians assess patient status over time, providing a cumulative, trended score for each patient, easily visible on the Patient SafetyNet View Stations or Replica™ mobile application, configured according to their clinical protocols, that can help facilitate their determination of a patient's overall status. Trends in Halo ION scores, which are calculated according to how the hospital has chosen to configure Halo ION, help clinicians evaluate whether patients are improving or deteriorating according to their own criteria. Clinicians may then use this information to, for example, intervene with certain patients, to transfer or discharge certain patients, and to schedule nursing assignment loads accordingly.

Halo ION works by continuously extracting key characteristics from clinician-selected parameters that are continuously monitored on the Root® Patient Monitoring and Connectivity Hub and anything connected to Root – such as oxygen saturation (SpO_2 using Masimo SET® pulse oximetry), noninvasive hemoglobin (SpHb®), blood pressure, temperature, and pulse rate – to create an overall score. Hospitals and clinicians determine which parameters to include in the overall score, how each is configured, how each is weighted, and how combinations of changes across multiple parameters affect scoring – providing the flexibility and customizability to ensure that Halo ION reflects each institution's assessment policy.

Unlike other Early Warning Score assessment tools, which take spot-check snapshots of patient vital signs, Halo ION provides cumulative, continuous visibility into patient status over time, taking into account not only historical trend data for each parameter but also more complex characteristics, such as a parameter's degree of stability and variability. Halo ION creates individualized, patient-specific baseline scores for each parameter – not global, one-size-fits-all thresholds – and tracks how each patient deviates from their baselines, adjusting the overall Halo ION score differently for different patients. For example, the Halo ION score might be different for two patients whose oxygen saturation drops to 89 % if one patient normally has 100 % SpO_2 and the other 94 % ; those different deltas would be reflected in different amounts of change in their Halo ION scores.

Joe Kiani, Founder and CEO of Masimo, commented, "Precision medicine is no longer only about the right drug for the right patient based on their genetics, but also about individualized assessment of their state of health. Halo ION represents many years of research into how best to take the complex, almost overwhelming stream of high-quality physiological data available to clinicians and present it in a way that is intuitive, efficient, and provides individualized insight into a patient's overall status. With its unique ability to create patient-specific baselines and to take into account many subtle changes over time, Halo ION helps automate and simplify the process of patient assessment, helping clinicians stay focused on providing the best care for their patients."

About Masimo

Masimo (NASDAQ: MASI) is a global medical technology company that develops and produces a wide array of industry-leading monitoring technologies, including innovative measurements, sensors, patient monitors, and automation and connectivity solutions. Our mission is to improve patient outcomes and reduce the cost of care. Masimo SET® Measure-through Motion and Low Perfusion™ pulse oximetry, introduced in 1995, has been shown in over 100 independent and objective studies to outperform other pulse oximetry technologies.[1] Masimo SET® has also been shown to help clinicians reduce severe retinopathy of prematurity in neonates,[2] improve CCHD screening in newborns,[3] and, when used for continuous monitoring with Masimo Patient SafetyNet™ in post-surgical wards, reduce rapid response activations and costs.[4-6] Masimo SET® is estimated to be used on more than 100 million patients in leading hospitals and other healthcare settings around the world,[7] 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.[8] Masimo continues to refine

Masimo Patient SafetyNet™ with Halo ION™

SET® and in 2018, announced that SpO_2 accuracy on RD SET™ sensors during conditions of motion has been significantly improved, providing clinicians with even greater confidence that the SpO_2 values they rely on accurately reflect a patients' physiological status. In 2005, Masimo introduced rainbow® Pulse CO-Oximetry technology, allowing noninvasive 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®), RPVi™ (rainbow® PVi) and Oxygen Reserve Index (ORi™). In 2013, Masimo introduced the Root® Patient Monitoring and Connectivity Platform, built from the ground up to be as flexible and expandable as possible to facilitate the addition of other Masimo and third-party monitoring technologies; key Masimo additions include Next Generation SedLine® Brain Function Monitoring, O3® Regional Oximetry, and ISA™ Capnography with NomoLine® sampling lines. Masimo's family of continuous and spot-check monitoring Pulse CO-Oximeters® includes devices designed for use in a variety of clinical and non-clinical scenarios, including tetherless, wearable technology, such as Radius-7®, portable devices like Rad-67™, fingertip pulse oximeters like MightySat® Rx, and devices available for use both in the hospital and at home, such as Rad-97™. Masimo hospital automation and connectivity solutions are centered around the Iris® platform, and include Iris Gateway™, Patient SafetyNet, Replica™, Halo ION™, UniView™, and Doctella™. 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 and RPVi have not received FDA 510(k) clearance and are not available for sale in the United States. The use of the trademark Patient SafetyNet is under license from University HealthSystem Consortium.

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In the know

A prescription for reducing medication errors and alert fatigue to maximise value of clinical decision support

By Alaa Darwish, MEA Country Manager, Wolters Kluwer

Alaa Darwish

Medication errors remain a challenge for healthcare providers across the Middle East. While work to address the problem has yielded many improvements, there are still old and new challenges to overcome.

Rapid evolution of health information technology over the past decade has introduced unprecedented opportunities and challenges to the healthcare industry. EHRs, for example, helped pave the way for increased awareness of the scope and effect of medication errors. Electronic drug interaction screening has helped healthcare professionals catch potential errors for over 20 years.

Today, the industry is using its continually expanding knowledge and more sophisticated medication-related alerting systems to focus on improvement efforts, such as drug dosing in pediatric patients, for which body mass index can cause dosing to vary greatly.

Healthcare leaders increasingly recognise the promise of Clinical Decision Support (CDS), especially as rapid medical advancement continually introduces new medications to the market. Clinicians working within today's fast-paced healthcare environment are simply unable to keep up with all the nuances of medication efficacy.

When CDS is optimally designed and integrated into workflows, a growing body of evidence connects better outcomes with use of CDS and embedded drug data solutions.

The value of CDS tools extends to all stakeholders — providers, payers, and patients alike — as the industry benefits from more efficient and effective healthcare services. However, many CDS initiatives fall short due to 'alert fatigue', a condition where over-exposure to unnecessary information causes clinicians to override alerts without serious consideration.

Alert Fatigue: Improving the outlook

Alert fatigue has become commonplace due to information systems generating alerts that are not relevant to a professional's treatment, prescribing, or dispensing concerns. Industry research points to a direct link between overrides and medication errors, proving this phenomenon is problematic for effective patient care.

Industry data estimates that between 40 and 90 percent of alerts are overridden by clinicians.[1] Since it is estimated that 50 percent of alerts are valuable and relevant to patient care, these statistics strongly suggest that we are not maximising the potential of CDS.

Healthcare IT vendors have struggled to find the right balance of alerts — one that appropriately weighs clinical significance against a clinician's ability to consume helpful information. The challenge lies in the complex nature of human interaction with healthcare technology.

A new approach

Going forward, clinical and information technology teams must come together to identify ways to customise, filter, and suppress alerts based on clinical evidence and patient risk. This strategy begins with a basic understanding of how many alerts are firing, factors that contribute to high volumes of alerts, and why alerts are overridden.

There is no "one size fits all" approach to addressing alert fatigue. Some considerations are:

- EHR technology that allows for user controls, whether that be at an organisational, departmental, or end-user level
- System design strategies that consider human factors to guide the presentation of alerts
- Alert customisation driven by ongoing analyses of patient populations and clinical workflows
- Identification and deployment of contextual or tiered alerts using patient data e.g. age, weight and gender
- Ongoing maintenance and updating of clinical content to deliver current and relevant information at the point of care

When optimally deployed, CDS has potential to significantly help enhance patient care and reduce medication errors. By implementing systems that address alert fatigue, healthcare leaders can realise the value of their CDS and EHR investments and notably help raise the bar on patient care and safety.

Wolters Kluwer provides trusted clinical technology and evidence- based solutions that engage clinicians, patients, researchers, students, and the next generation of healthcare providers. With a focus on clinical effectiveness, lifelong learning, and clinical intelligence, our proven solutions drive effective decision-making and consistent outcomes across the continuum of care.

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References

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