SHOW ISSUE 2018

arab health

THE **OFFICIAL MAGAZINE** OF THE ARAB HEALTH EXHIBITION

CLEVELAND CLINIC'S INTERNATIONAL COMMITMENT EXPANDS TO LONDON

'DHA ENVISIONS A HEALTHIER, HAPPIER COMMUNITY'
Q&A WITH THE DHA'S HUMAID AL QUTAMI **p34**

TOTAL RADIOLOGY MAGAZINE INSIDE **p132**

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Official magazine of Arab Health Exhibition:
ARAB HEALTH
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life sciences exhibitions

letter from the editor

Promising innovations in smart wearables marks debut at Arab Health 2018

In keeping with its agenda of staying abreast of the industry's latest trends and advancements, Arab Health introduces the Personal Healthcare Technology Zone this year. With the young, health-conscious and tech savvy generation seeking more personalised healthcare options, the wearable sensors market in the UAE alone is expected to increase to $3.97 million by 2018. Exhibitors will display the latest in "smart" healthcare technology that connects patients to physicians and healthcare service providers across the spectrum. This Zone also includes Connected Health as an overall theme with Big Data, Telehealth, Healthcare Software, 3D Medical Printing, Patient Monitoring, Homecare Devices and many others.

Following on its immense success last year, Arab Health continues with its popular Hands-on-Training modules that enable participants to train on advanced techniques with the latest state-of-the-art equipment across different modalities. The business, leadership and Continuing Medical Education (CME) conferences part of Arab Health provide the very latest updates and insights on healthcare innovations & medical technology.

Contributors from across a range of disciplines have enhanced the editorial content in this issue with their incredible insights into the overall healthcare industry landscape including critical aspects of healthcare leadership, integrated approaches to healthcare delivery and cutting-edge technologies and innovations that address the future of healthcare.

Trends and developments shaping the diagnostic medical imaging industry – authored by our conference speakers – are the highlight in our special focus section on Total Radiology.

As the Arab Health Exhibition and Congress steps into its 43rd year, we hope you engage and network with industry leaders, healthcare experts and potential buyers and customers in a productive manner. We will be back with more peer commentary and in-depth analysis in our next issue.

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contents

Giving new hope to children with metabolic disease

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

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

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

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

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

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

Find out more about our excellent outcomes and extraordinary care.

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

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

Children's Hospital of Pittsburgh of UPMC

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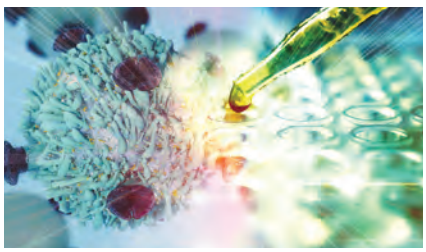
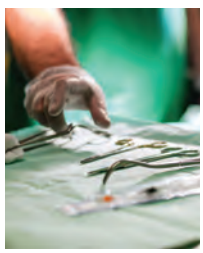
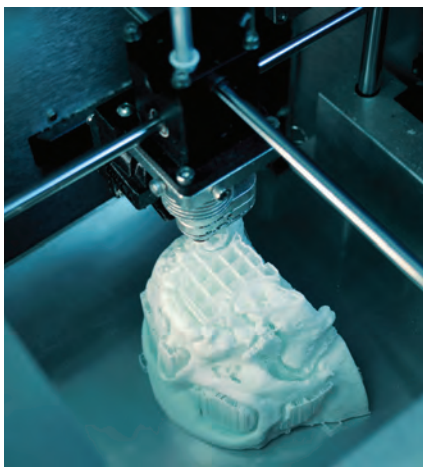






HEALTHCARE MANAGEMENT

ONCOLOGY

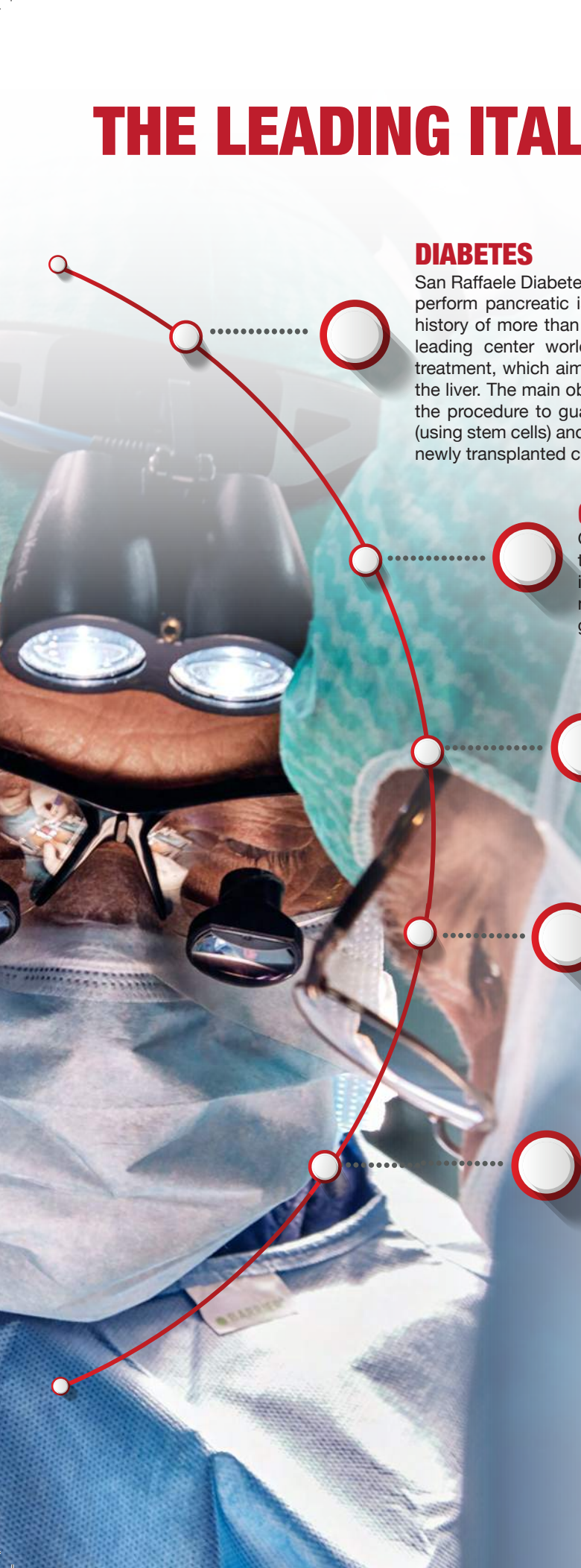
BARIATRICS

3D PRINTING

SURGERY

RESPIRATORY MEDICINE

THE LEADING ITALIAN HOSPITAL GROUP



DIABETES

San Raffaele Diabetes Research Institute (DRI) has been the first center in the world (in 1990) to perform pancreatic islet transplantation to treat patients with type 1 diabetes. Today, with a history of more than 200 patients and 400 cell infusions, the Diabetes Research Institute is a leading center worldwide for the implementation and enhancement of this experimental treatment, which aims at recreating the function of insulin-producing cells in a host organ like the liver. The main objectives of DRI researchers working on islet transplantation are improving the procedure to guarantee cells engraftment, finding new and affordable beta cells sources (using stem cells) and controlling immune response after transplant to avoid degeneration of the newly transplanted cells.

GENE THERAPY - STRIMVELIS

Ospedale San Raffaele is the only hospital in the world which currently can treat with gene therapy adenosine deaminase-deficient severe combined immune deficiency (ADA SCID), better known as 'bubble babies' syndrome. Strimvelis is the first life-saving treatment in the world using ex vivo gene therapy for ADA SCID.

CARDIOVASCULAR

Our cardiology and cardiac surgery department is the most important in Italy and one of the most highly experienced centre in Europe specialized in congenital heart disease. We take care of patients affected by complex heart defects from birth to adulthood, providing them the most innovative techniques of cardiac surgery and interventional cardiology. GSD has the only center in the world for the treatment of Brugada syndrome.

ONCOLOGY

The Group staff works very closely to create a well-integrated multidisciplinary team (Surgery, Oncology, Diagnostic Radiology, Radiotherapy, Nuclear Medicine, Pathology, Oncological Psychology, Plastic/Reconstructive Surgery). At San Raffaele, which is our biggest facility, there are approximately 9000 hospitalizations for tumors each year (approx. 17.2%), with 6000 tumor surgeries (approx. 30%). Every week, a multi-specialty team meets to set up a diagnostic and therapeutic pathway for every patient.

ORTHOPAEDICS

Our centre has the largest number of orthopaedic admissions in Lombardy.With its 13,209 hip and knee prosthesis operations per year and 3,693 spine operations per year, it is a reference centre for locomotor system diseases.

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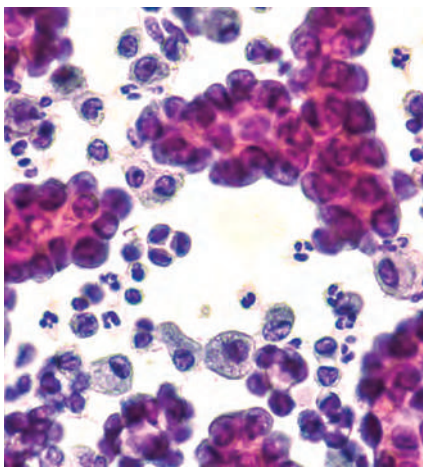

Boldly moving forward

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

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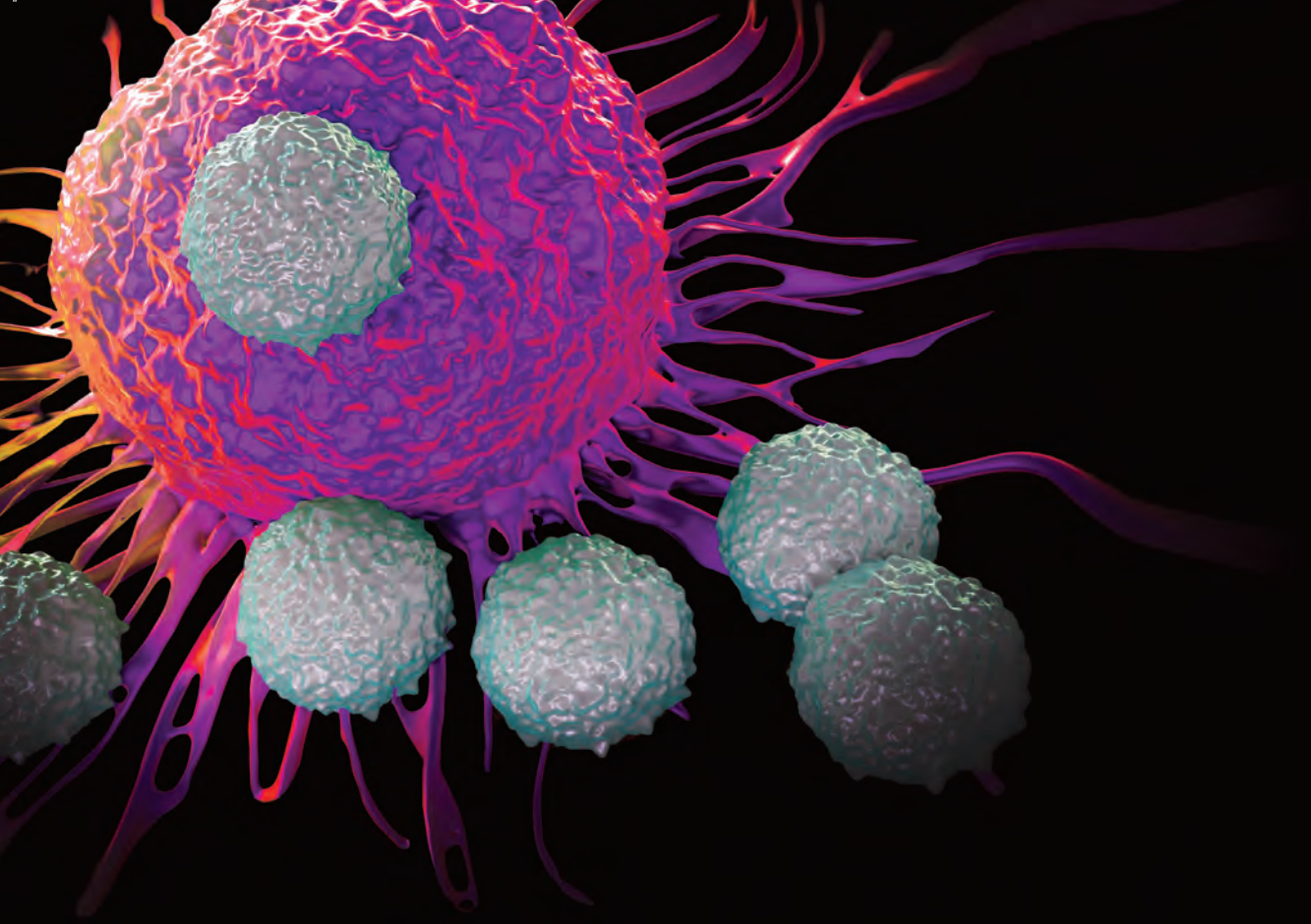

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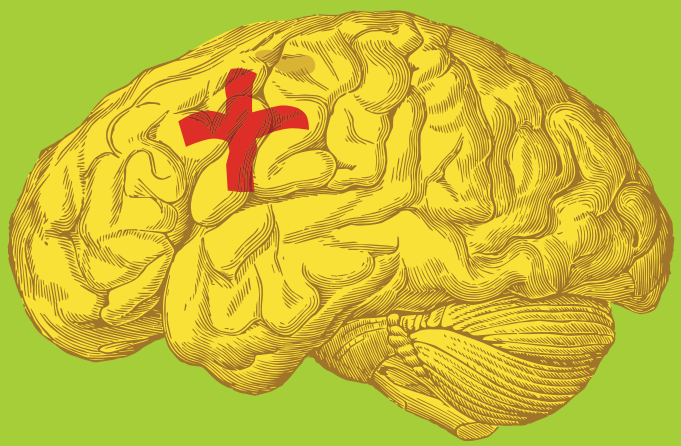

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TECHNOLOGY, INNOVATION AND EDUCATION

TAKE CENTRESTAGE AT ARAB HEALTH 2018

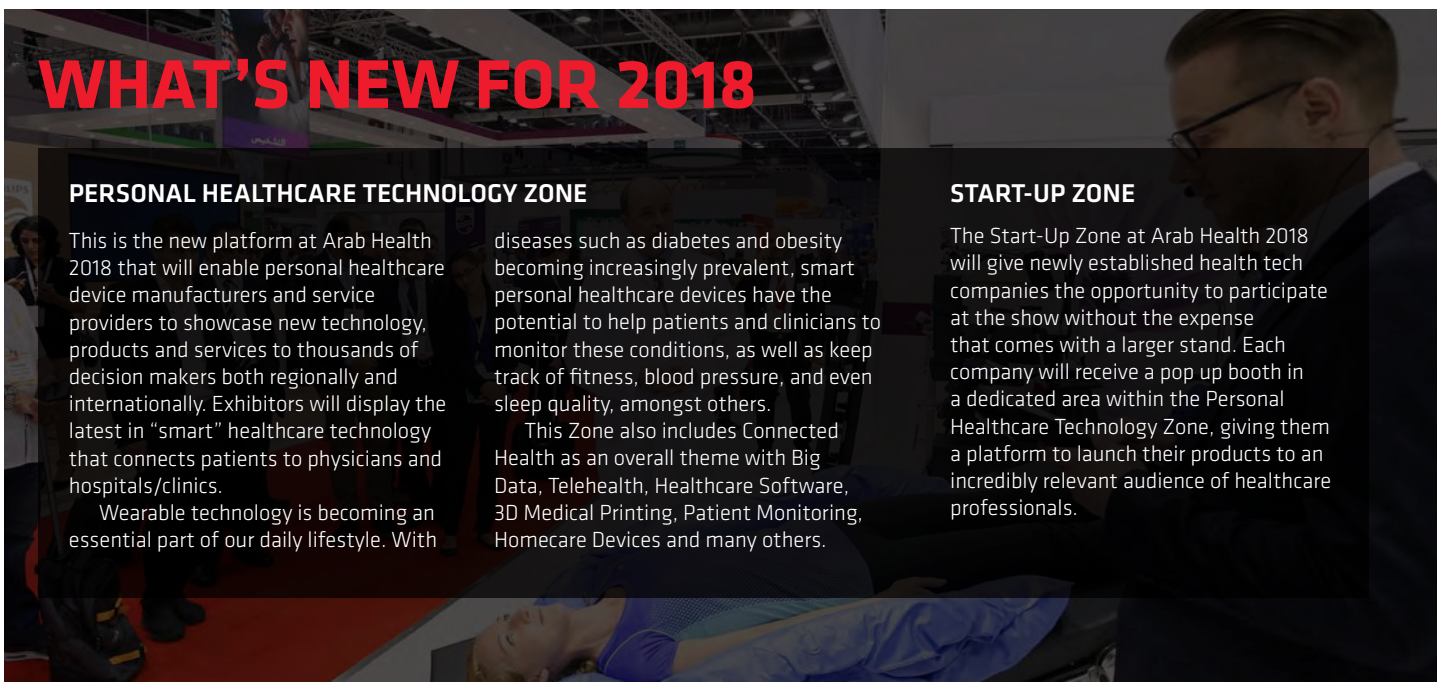
By Arab Health Magazine Staff

From 29th January to 1st February 2018, the emirate of Dubai will welcome more than 4,200 exhibiting companies and around 103,000 attendees from over 150 countries at the 2018 Arab Health Exhibition and Congress in what is clearly the largest gathering of healthcare and trade professionals in the MENA region. With 90% of exhibitors at last year's event rebooking their space for the 2018 edition of the show, the success and strength of the event as the region's leading exhibition and conference in the healthcare industry has been validated beyond doubt.

In addition to hosting more than 40 dedicated national pavilions, the 43rd edition of the event showcasing the global healthcare industry in the Middle East, gives a truly international representation of hospital equipment, medical devices and medical technology on display at the exhibition. Occupying the entire exhibition space of the Dubai International Convention and Exhibition Centre, Arab Health 2018 will enable companies to showcase progress and achievements in the sector, and help facilitate the exploration of new business opportunities in the global healthcare field. The exhibition also provides an important platform for the MENA healthcare industry to build relationships with international stakeholders.

From its inception 42 years ago in Dubai, UAE, as a small trade show under a tented canvas to its emergence and transformation as the MENA region's foremost global healthcare industry platform and education hub, the Arab Health Exhibition and Congress enjoys the continuous patronage of healthcare professionals in the region and beyond.

Accompanying the exhibition will be 19 business, leadership and Continuing Medical Education (CME) conferences providing the very latest updates and insights into cutting-edge procedures, techniques and skills. Arab Health Congress 2018 is one of the largest multi-track medical conferences accredited to CME worldwide and will see the participation of more than 8,000 delegates and 500 speakers from the region and around the world as it aims to bridge the gap in medical knowledge.



WHAT'S NEW FOR 2018

PERSONAL HEALTHCARE TECHNOLOGY ZONE

This is the new platform at Arab Health 2018 that will enable personal healthcare device manufacturers and service providers to showcase new technology, products and services to thousands of decision makers both regionally and internationally. Exhibitors will display the latest in "smart" healthcare technology that connects patients to physicians and hospitals/clinics.

Wearable technology is becoming an essential part of our daily lifestyle. With diseases such as diabetes and obesity becoming increasingly prevalent, smart personal healthcare devices have the potential to help patients and clinicians to monitor these conditions, as well as keep track of fitness, blood pressure, and even sleep quality, amongst others.

This Zone also includes Connected Health as an overall theme with Big Data, Telehealth, Healthcare Software, 3D Medical Printing, Patient Monitoring, Homecare Devices and many others.

START-UP ZONE

The Start-Up Zone at Arab Health 2018 will give newly established health tech companies the opportunity to participate at the show without the expense that comes with a larger stand. Each company will receive a pop up booth in a dedicated area within the Personal Healthcare Technology Zone, giving them a platform to launch their products to an incredibly relevant audience of healthcare professionals.

YOUR GUIDE TO ARAB HEALTH 2018

Here is a quick overview of things to look out for at Arab Health 2018.

THE WORLD'S MEDICAL PRODUCTS

With even more companies participating this year, explore thousands of products on display from more than 4,200 companies coming in from over 70 countries. The exhibition gives a truly international representation of hospital equipment, medical devices and medical technology.

3D MEDICAL PRINTING ZONE

Get updates on the latest 3D technology healthcare applications at this immersive feature area. Alongside the Zone, a 3D Medical Printing conference will also expand on the latest educational components around 3D printing.

CHANCES TO WIN

All visitors stand the chance to win fantastic prizes from the onsite competitions that take place during the show.

EDUCATION

With 19 conferences, Arab Health Congress is one of the largest CME accredited multi-track medical conference in the world. More than 8,000 delegates and 500 international and regional speakers will be welcomed over the four days of the Congress.

HANDS-ON-TRAINING (HoT)

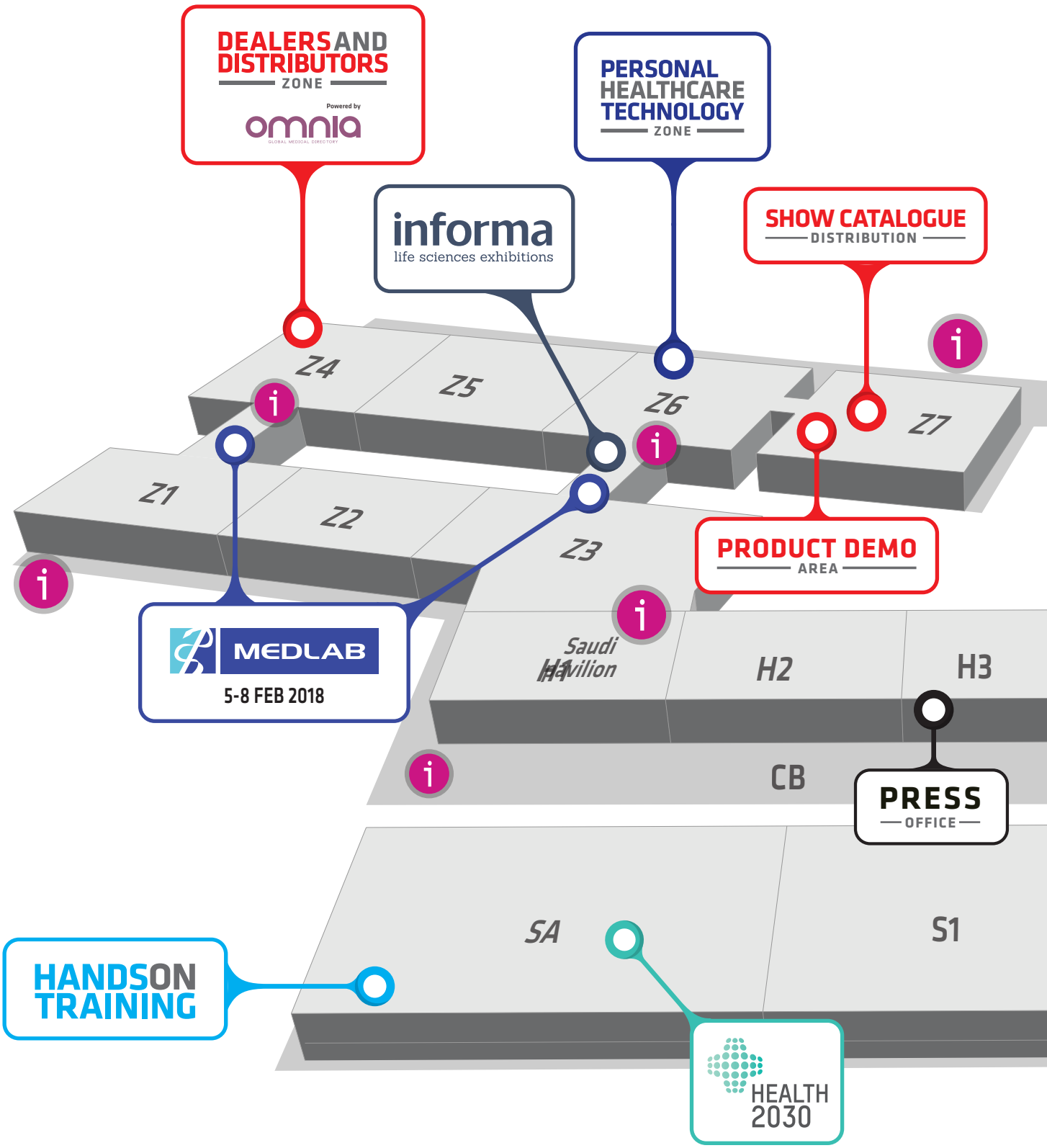
An innovative concept introduced in 2017, these Hands-on-Training modules are delivered on the exhibition floor with a number of unique programmes. The trainings allow high-level participants to train on advanced techniques with the latest state-of-the-art equipment across different modalities.

PLAN YOUR VISIT WITH OMNIA

Omnia The Global Medical Directory is a supplier, manufacturer and product database providing you with information of all Informa Life Sciences exhibitions, 365 days of the year. This digital platform allows you to connect with the people and products in one simple click.

PROMOTE YOURSELF

The Dealer and Distributor Wall takes information you provide and displays it at the exhibition. This will allow exhibitors to identify which distributors/dealers are looking for their products and set up a meeting directly onsite, fast-tracking business opportunities between you and Arab Health attendees.



STAND KEY PREFIX

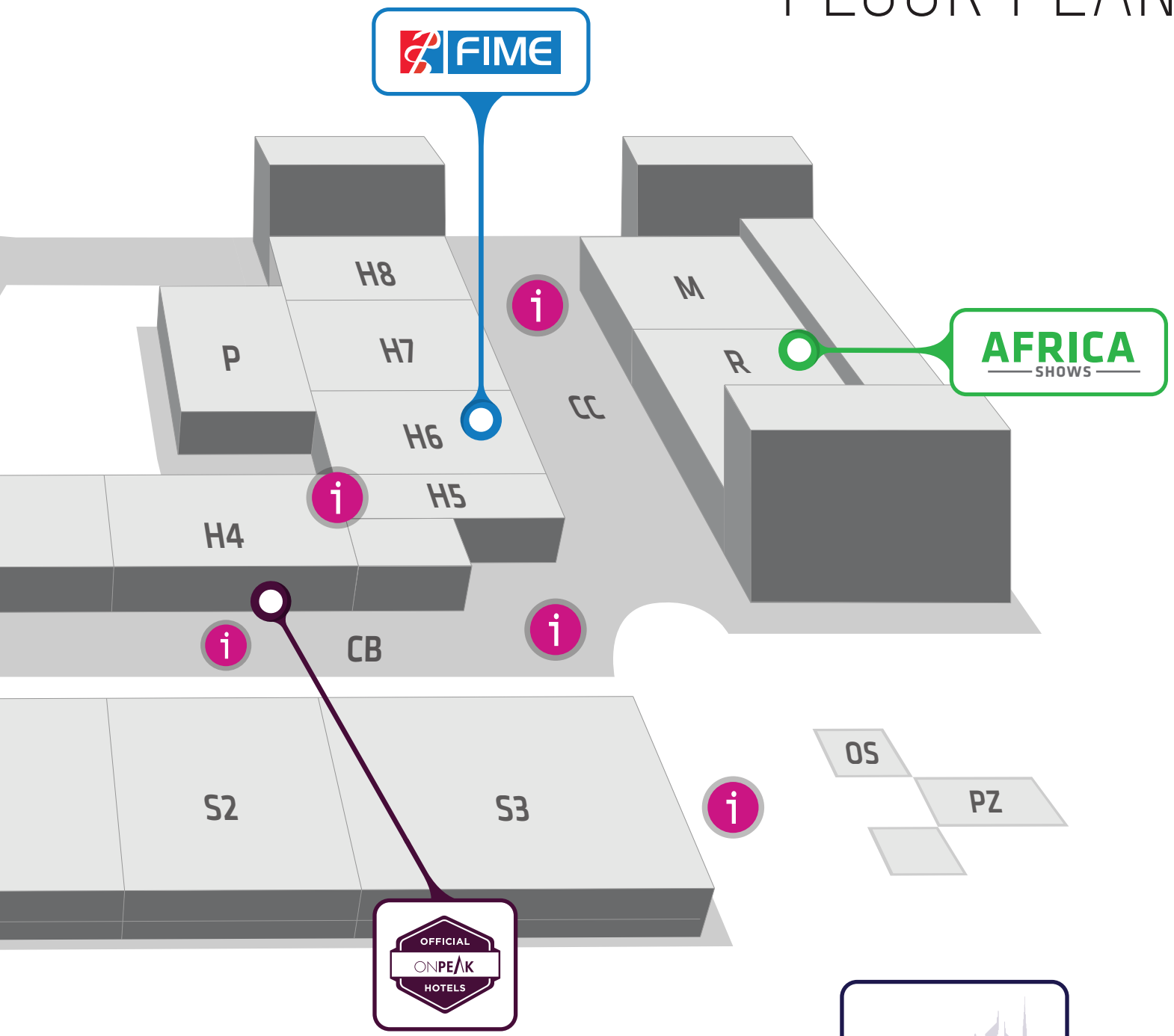
INFORMATION

PRESS OFFICE
Al Ain C, Level 1 above Hall 3

H1 - Hall 1
H2 - Hall 2
H3 - Hall 3
H4 - Hall 4
H5 - Hall 5
H6 - Hall 6
H7 - Hall 7
H8 - Hall 8
SA - Trade Centre Arena
S1 - Sheikh Saeed Hall 1
S2 - Sheikh Saeed Hall 2
S3 - Sheikh Saeed Hall 3
M - Sheikh Maktoum Hall
R - Sheikh Rashid Hall

ARAB HEALTH

FLOOR PLAN



مترو دبي
Dubaimetro

Z1 - Za'abeel Hall 1
Z2 - Za'abeel Hall 2
Z3 - Za'abeel Hall 3
Z4 - Za'abeel Hall 4
Z5 - Za'abeel Hall 5
Z6 - Za'abeel Hall 6
Z7 - Za'abeel Hall 7
P - Pavilion
PZ - Plaza
CB - Concourse 1
CC - Concourse 2
OS - Outside

CONGRESS OVERVIEW

IMAGING & DIAGNOSTICS (29 Jan – 1 Feb)

Theme: Advances in the Art of Radiology

With 17+ new speakers and 50+ new scientific papers, delegates can learn how to deliver accurate diagnosis whilst maintaining the highest standards in quality imaging and safety. Globally renowned experts will give their insights on how to translate academic research into evidence-based diagnostic radiology to improve the standard of care provided to patients. With dedicated sessions by sub-speciality on imaging and diagnostics for oncology, breast, abdominal, emergency and respiratory, gastrointestinal, urogenital, cardio-thoracic, emergency, neurology, interventional, radiography and urogenital imaging, this is a one-stop-shop for all imaging professionals.

SURGERY (29 Jan – 1 Feb)

Theme: Decision-making in complex cases

This scientific programme is for general surgeons who want to refine their procedural skills and are interested in performing advanced procedures. It is suitable for experienced surgical specialists and consultants involved in MIS, GI, bariatric, onco-surgery, thoracic, plastics, head and neck and emergency surgery. The programme will cover both the theoretical aspects around the relevant procedures in addition to case-based experiences on these procedures.

ORTHOPAEDICS (29 Jan – 1 Feb)

Theme: Stepping into the future of Orthopaedics - from innovation to practice

After the success of last year's programme, this year, participants will be updated on the diagnosis and treatment of a wide variety of common and serious orthopaedic conditions. This multi-focus format will provide a comprehensive review of orthopaedics that is clinically relevant and applicable to daily practice. Renowned orthopaedic experts will provide delegates with the opportunity to learn new techniques, methods and surgical procedures.

PAEDIATRICS (29 Jan – 1 Feb)

Theme: Towards a 21st century roadmap for quality care

The 11th edition of the Paediatrics Conference will see notable experts from around the globe presenting the most up-to-date information on diagnosis and treatment of paediatric conditions. As this field is quite diverse, and features every aspect of medicine for children and babies, the speakers will highlight the latest advances and hottest topics. This conference will also increase the participant's ability to diagnose and manage patients in his/her practice by analysing and discussing cases with the faculty and his/her peers.

PUBLIC HEALTH FORUM (29 Jan – 1 Feb)

Theme: Bridging the gap between policy and public health

Public health achievements in the 20th century have increased life expectancy and paved the way for more advanced treatments and preventive measures today. Although astounding advancements in medicine and public health have been made, considerable public health challenges persevere in the Arab world. Some of these neglected issues will be the focus at this Forum which will also offer a means for exchanging information and a platform for debate among researchers, policy makers, and practitioners in the field of public health and health services research.

BIOMEDICAL ENGINEERING (29 January)

NEW

Theme: Enhancing clinical outcomes through biomedical engineering and technology

This one-day scientific meeting will present the latest advancements in medical devices, imaging, management of biomedical systems and healthcare informatics. The conference will allow delegates the opportunity to hear from renowned experts who will address the challenges and opportunities concerning the complex role of leadership within biomedical e ngineering. In addition, updates aligned to the regulation and assessment of medical devices will be discussed.

CONNECTED CARE (29 – 31 Jan)

NEW

Theme: Connected clinicians, connected providers, connected patients

This brand new addition to the Arab Health Congress will cover a different theme on each of the three days: digital health, patient telehealth and home & long-term care. Organised by the industry for the industry, the esteemed speaker line-up will highlight case studies and discussion points around the healthcare industry's most pressing issues including integration of digital healthcare, EHR, cyber security, remote patient monitoring and patient satisfaction in home healthcare.

FAMILY MEDICINE (29 – 31 Jan)

NEW

Theme: Patient-centred collaborative care in family medicine

Debuting in 2018, this conference will welcome family medicine and primary care practitioners interested in learning about the challenges and evidence-based medical interventions available to them. The key topics addressed include diabetes, liver diseases, dermatologic conditions, infectious diseases, immunisation, cancer and thyroid diseases. Notable local and international experts will offer attendees a unique opportunity to engage in stimulating discussions and an opportunity to exchange experiences and expertise.

3D MEDICAL PRINTING (29 – 30 Jan)

Theme: The Future of Emerging Technologies in Healthcare

Although the global use of 3D printing in the medical field is rapidly expanding, there are still significant clinical and regulatory challenges to overcome, along with the ongoing knowledge gap and scepticism surrounding its clinical use, particularly in the Middle East. This conference, now CME-accredited, will provide a global perspective on the key challenges involved in the implementation of medical 3D printing practices in a variety of settings. The reality of the technology will be discussed, and regional and international case studies from a range of clinical specialities will be presented.

EMERGENCY MEDICINE (29 – 30 Jan)

Theme: Practical guidelines for the senior emergency physician

The 2nd Emergency Medicine conference will be an important meeting point for professionals involved in emergency care in pre-hospital and hospital settings who are committed to high quality healthcare delivery with compliance to the latest standards and best practice. The programme will feature important new research, findings and best practices to improve patient outcomes using case examples and personal accounts of how expert speakers managed unique cases.

HYPERTENSION (29 – 30 Jan)

NEW

Theme: Managing Hypertension today: Insights from clinical trials new guidelines

Hypertension and its associated risk factors are placing a heavy burden on public health and the healthcare system in the UAE and across the Gulf states. This new addition to the Arab Health Congress 2018 will bring together experts in hypertension and highlight its relationship to cardiac and kidney diseases, stroke, obesity, and diabetes. The programme will also include several interactive sessions specifically designed to highlight innovative research and provide practical how-to sessions on the management of hypertension.

ANAESTHESIA (29 – 30 Jan)

NEW

Theme: Enhancing Perioperative Safety

With 2 action-packed days of learning, networking and discovering the latest updates and developments in the field of anaesthesia and perioperative care, the focus of this conference is on recent advances designed to minimise patient risk, reduce errors and optimise outcomes in a variety of challenging conditions. Regional and international speakers will provide an up-to-date global perspective on the key challenges in the field of anaesthesia today.

OBESITY (31 Jan – 1 Feb)

NEW

Theme: Tackling Obesity: Real answers to real questions

A new entrant at the Arab Health Congress, this conference is a timely and relevant forum for clinicians in the region where prevalence of the disease has reached epidemic proportions. Globally, it is the fifth leading risk for premature death. The conference will put the spotlight on the management and treatment of the associated health risks as well as preventive measures that can minimise the epidemic. The conference will also bring together research findings that support treatment and management of obesity through non-surgical methods.

QUALITY MANAGEMENT (31 Jan – 1 Feb)

Theme: Building High Reliability Organisations (HROs) in Healthcare

As healthcare in the Middle East undergoes rapid transformation, this conference will address the issues of how to maintain or improve existing healthcare systems while facing continuing pressure on resources and increasing demand for services. The agenda will also focus on the science of improvement and the importance of leadership in providing the right direction for delivering these improvements.

TRAUMA & ACUTE CARE SURGERY (31 Jan – 1 Feb)

NEW

Theme: Beating the odds with evidence-based practice

This scientific programme is being held with the objective of improving standards of care for trauma cases. The conference will focus on updates in humanitarian military interventions and also offer comprehensive continuing education in the treatment of critically ill and injured patients, stressing current basic and cutting-edge guidelines and technology for evaluation, diagnosis and management.

GASTROENTEROLOGY (31 Jan – 1 Feb)

Theme: Current concepts: what to explore further vs implement?

To stay up-to-date on the latest evidence-based medicine, this conference will deliver a comprehensive overview of the latest information, insights and practices in gastroenterology, hepatology, endoscopy and more. The agenda aims to provide a forum for all gastroenterologists within the region to exchange ideas, discuss innovative methods and review new developments within the field of gastroenterology. It also addresses the latest in essential knowledge to reduce procedural complications and hasten patient recovery.

RESPIRATORY MEDICINE (31 Jan – 1 Feb)

NEW

Theme: Bring bench research to the bedside

The most important trend and future direction in chest medicine and pulmonology has been the move to evidence-based practice. This new conference will enable specialists to stay up-to-date on management of all aspects of respiratory diseases and therapeutic interventions. This comprehensive programme will feature clinically-relevant respiratory medicine research, updates on conventional procedures and advanced pulmonary procedures.

PHARMACOTHERAPY (31 Jan – 1 Feb)

NEW

Theme: Safety First

This conference will explore 'Safety first' in consumer healthcare, OTC medication and pharmacovigilance in new medication. It aims to promote effective communication, cooperation and interaction on medication safety amongst pharmacologists in the UAE to safeguard public welfare and to benefit from trials and best practices applicable in the field of work.

DENTAL (1 February)

NEW

Theme: General Dentistry

Brand new to Arab Health for 2018, this conference seeks to offer solutions to the multitude of challenges dentists are currently facing in the UAE and wider MENA region. The programme is centred around 3 main sessions: restorative, periodontal diseases and implant dentistry. The sessions will cover the latest scientific research developments, best practices and novel technologies. AH

Global innovations and trends in the spotlight at

MEDLAB 2018

Come February 5, 2018, and the 18th edition of the MEDLAB Exhibition and Congress will move into its 2nd year as a stand-alone show, looking to welcome more than 25,000 attendees from over 140 countries at what is clearly the largest attended laboratory expo worldwide. Occupying 7 exhibition halls of the Dubai World Trade Centre, the 2018 edition of this annual laboratory meeting celebrates its vigorous growth by presenting a platform to over 600 exhibitors from more than 40 countries, including 13 national pavilions and one unique regional pavilion featuring the city of Berlin.

In addition, the MEDLAB Congress 2018 will also introduce new clinical tracks designed to enhance collaboration between laboratory professionals and clinicians as they come together to discover innovations in medical laboratory testing.

MEDLAB is the flagship exhibition and congress of the MEDLAB Series portfolio, a collection of leading laboratory management and diagnostics exhibitions and conferences worldwide, spanning across the Middle East, Asia, East/West Africa, Europe and the USA.

Showcasing the latest laboratory advancements from all corners of the globe, the year-on-year growth and success of MEDLAB stems from more than 15 years of growth alongside the MENA region's largest healthcare gathering, Arab Health.

The core specialities of the MEDLAB 2018 exhibitors include: Allergy, Anatomic Pathology, Cardiovascular Disease, Coagulation, Dermatology, Endocrinology, Gastroenterology, Genetics,

Haematology, Infectious Diseases, Medical Drug Monitoring, Microbiology, Obstetrics/Gynaecology, and Oncology.

Highlights of MEDLAB 2018

Dealers and Distributors Zone: This dedicated meeting area onsite allows medical dealers and distributors to promote the products they are looking to source from exhibitors, as well as provide their contact information. This encourages business relationships between the participating companies and their core audience.

Workshops: Hosted by leading laboratory management and diagnostics companies, the workshops occur onsite on the exhibition floor and offer a more hands-on approach to learning and are tailored to each specific company's latest findings, technology and best practice.

Scientific Posters: Displaying the latest research from laboratorians worldwide, the scientific poster zone promotes knowledge sharing and networking amongst MEDLAB's delegates, to congregate and discuss the latest research and developments within the industry to encourage future partnerships.

Country Pavilions: The 2018 edition of MEDLAB will host 13 country pavilions further enhancing the range of hospital equipment, medical equipment, medical devices and medical technology on display at the exhibition. New country pavilions this year include those of Finland and Japan. The other dedicated pavilions are from China, USA, Germany, Austria, Brazil, Poland, United Kingdom, Taiwan, Spain, France and Egypt. MEDLAB 2018 also introduces the concept of a unique regional pavilion with Berlin marking its debut in this category. In addition, the 2018 event will witness increased country attendance from Korea, India and Turkey.

Introducing the Obs-Gyne Zone

MEDLAB, the all-encompassing event for every speciality within the laboratory management and diagnostics spectrum, features the Obs-Gyne Zone this year—the region's leading expo and congress for obstetricians and gynaecologists. Apart from meeting with more than 80+ international exhibitors at the Obs-Gyne Zone, visitors can also gain knowledge of recent developments in women's health in the Middle East and build important relationships with key industry stakeholders.

Obs-Gyne also features new and leading obstetrics and gynaecology devices, equipment and solutions. Exhibitors include imaging companies looking to showcase the latest technologies in ultrasound and mammography. Other product areas range from endoscopic, laparoscopic and hysteroscopy equipment to more conventional surgical equipment, cervical cancer screening products to gynae chairs and stretchers. Another area of focus at the exhibition is hospitals, clinics and IVF centres including the numerous cord blood bank and stem cell technology based organisations.

More than 50 speakers from the Middle East, UK and US will also bring international perspectives on medical and health issues prevalent worldwide at the 10th Obs-Gyne Congress. This premier annual scientific women's health meeting for the Middle East audience, scheduled from 5th to 8th February, features four dedicated educational tracks and is held under the theme, 'Optimising best practice & research in obstetrics & gynaecology'.

MEDLAB 2018 Congress Overview

In conjunction with the MEDLAB expo is a multi-disciplinary Congress set to attract over 6,500+ local and international delegates. Accredited by Cleveland Clinic Ohio, USA, this year's congress introduces 17 conference tracks, with the overall theme of unifying clinicians with laboratorians to better improve patient care in the region. Through these multi-disciplinary CME-accredited conferences, the Congress provides education, best practice and the chance to learn, meet and network with leading laboratorians from across the globe, as delivered by over 128 thought-leaders.

MEDLAB Congress 2018 will be introducing 7 new clinical tracks and serves as the ideal platform to come together and discover innovations in medical laboratory testing.

This will aid in accurate interpretation, quick reporting and diagnosis, therefore strengthening each laboratory's ability to provide clinical decisions and improve the overall quality of service and care.

Laboratory Tracks

Laboratory Management 5 February 2018

This conference is designed to provide its audience with a unique opportunity to understand the collaboration of administrative and medical leadership and exchange knowledge about the dynamics of quality management and safety improvement in a medical laboratory of any size, scope, or speciality. ▶

Molecular Diagnostics 5 February 2018
This conference will bring together a balance of industry and academics, so that delegates have the unique opportunity to network with colleagues from different sectors and gain fresh perspectives on the various researches and studies on molecular and non-molecular rapid diagnostic techniques and Next Generation Sequencing.

Haematology 6 February 2018
Focusing on the lab testing and interpretation of treatment of blood-related diseases, this conference provides an opportunity to the delegates to discuss the emerging therapeutic options and recognise the factors that affect the diagnosis, staging, and prognosis of patients' treatments.

Laboratory Informatics 6 February 2018
As clinicians are likely to become increasingly dependent on direct access to pathology data, the challenge for laboratory scientists is to ensure the timely and effective introduction of IT systems that can meet the needs of modern laboratory medicine. This conference will discuss better solutions on optimal use of pathology services to encourage appropriate test requesting.

POCT - Point-of-Care Testing 6 February 2018
As the only point-of-care event in the Middle East, international and regional speakers will provide a global consensus on the key challenges and best practices for all POCT users while also discussing regulatory aspects, validation and clinical applications to develop skills needed for successful application of POC in a variety of settings.

Clinical Microbiology 7 February 2018
This conference provides a unique platform for the clinical scientists, young researchers, and consultants and will focus on the latest developments in microbiology and immunology and the role of medical laboratory in both the management of infectious diseases and epidemiology of infections.

Clinical Chemistry 8 February 2018
To further develop a thorough understanding of laboratory operations, instrumentation and test availability, this conference will provide laboratory professionals latest solutions for better quality and turnaround time and technology usage.

"MEDLAB is a unique opportunity for us at Siemens Healthineers to share with our customers, to display our latest innovations, and let them see how we can help them take healthcare to the next level."

Romain Fournials,
Vice President,
Laboratory Diagnostics,
Siemens Healthineers, UAE

Blood Transfusion Medicine 8 February 2018
From the management and organisation to the clinical and lab aspects of transfusion, this conference will discuss the global challenges in transfusion transmitted infections and effective tools for improving these practices in the hospital setting.

Histopathology 8 February 2018
This conference seeks to provide participants a comprehensive review of the latest histopathological, cytological and related technical advances, and features a discussion to exchange views regarding the latest research on cell biology using molecular tools and genomic data.

CLINICAL TRACKS

Oncology 5 February 2018
Focusing on topics including non-medical oncology methods, radiation oncology, tumor testing, screening and surgical oncology, this programme serves as being essential to all specialties involved in the care, treatment and management of patients with cancer.

Obs-Gyne 5-8 February 2018
Obs-Gyne this year features a conference programme with four dedicated educational tracks on general women's health, gynae-oncology, foetal medicine and infertility.

Diabetes Testing and Management 5 February 2018
To establish a successful functioning of the patient- physician-laboratory triangle in interpreting lab tests, this conference will focus on clinical- laboratory correlations and communication of diagnostic processes.

Endocrinology 6-7 February 2018
A must-attend for everyone involved in the diagnoses and development of endocrine disorders, this conference aims to promote greater collaboration and a stronger working link between the clinician, laboratory, and imaging department to improve the quality of diagnoses and efficiency of working practices.

Cardiology 7 February 2018
As global and regional field leaders present a comprehensive review of new guidelines and share contemporary and novel clinical techniques and strategies, cardiovascular specialists can accrue information enabling the enhancement of their expertise.

Tumour Markers 7 February 2018
This conference deals with advances in biomarkers used in oncology to help detect the presence of cancer and is designed to gather oncologists and lab professionals to better understand application of research findings related to cancer.

Cardiac Markers 8 February 2018
This is the only focused cardiac marker interpretation conference in the region led by clinicians and laboratory professionals which will discuss developments in current and new markers for acute coronary syndrome, atherosclerosis, chronic heart failure and non-cardiac conditions.

Antibiotic Use and Misuse 8 February 2018
Apart from addressing the challenges concerning antibiotic use within the region, and globally, this conference will also discuss the latest developments, innovations, and the corrections necessary to meet the critical need of tackling antibiotic misuse. AH

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'DHA envisions a healthier, happier community'

Interview with His Excellency Humaid Al Qutami, Chairman of Board and Director-General of Dubai Health Authority (DHA)

By Arab Health Magazine Staff

With recent research studies pointing to an upsurge in the UAE's healthcare sector by 2021 owing to a shift in demand for preventive care, a rise in specialist medical services, and more efficiently integrated healthcare solutions, amongst others, *Arab Health Magazine* speaks to His Excellency Humaid Al Qutami, Chairman of Board and Director-General of Dubai Health Authority (DHA) to learn about the long-term outlook for the healthcare sector in Dubai, and the organisation's strategies in improving healthcare services in the emirate.

1. What are the major challenges that the growing demand for care brings about in Dubai, and how is the DHA working to address these challenges?

The healthcare sector in Dubai remains robust driven chiefly by continued growth in population and supported by economic growth and Dubai's position as a financial, trading and aviation hub for the Middle East region. Rise in prevalence of chronic diseases such as diabetes, cardiovascular diseases, cancer etc. also contribute to a rise in health spending as it necessitates investment in specialised services and chronic disease management.

Higher life expectancy and consequent rise in ageing population in the next decade will lead to a rise in demand particularly for long-term care, rehabilitation and home-based health services.

Innovations in clinical services, the adoption of new technology in care pathways, and mobile health solutions are changing the way health services are delivered across the world, and we can expect to see new and innovative models of care and the use of technology in early diagnosis (e.g. genome sequencing), and treatment of diseases (through precision medicine, use of 3D printing, advanced robotic surgeries, use of VR and AI in disease management and treatment pathways).

Increased access to health services owing to mandatory health insurance in the emirate will also push up demand for services.

The key challenges confronting DHA are to control the rise in health spending, curb unnecessary utilisation of health services and improve the availability of high calibre clinical talent to support the needs of the health sector. Hence, we focus on preventive care to reduce the burden of non-communicable diseases (NCDs). DHA also works on regulations, projects and initiatives with the Dubai and federal government stakeholders as well as the private sector to address these challenges, and improve the health eco-system.

2. What are the current trends in Dubai's healthcare industry? What is your outlook for the health sector in the medium to long term?

Dubai provides encouragement and support for private sector investment and participation in the health sector, and this has resulted in significant growth in utilisation of health services in the private sector. The private sector accounted for over 75% of outpatient services and 70% of inpatient services in 2016. We expect to see continued rise in investments in innovative primary care models (especially ambulatory care and urgent care clinics) to address the demands of the under-served segments and for new residential communities in South Dubai.

Large investments are expected in specialised centres and centres of excellence for specialised services to provide access to high quality health services to UAE nationals, residents and visitors. Dubai is currently developing a Clinical Services Capacity Plan that looks into the demand, supply and gaps for health services and manpower over the next 30 years, which will be completed in early 2018. This will provide us with quantifiable information on investment priorities, and accordingly, efforts will be made to drive, support and encourage investments from the private sector, as well as foster partnerships to deliver health services that address the needs and gaps in the health sector. ▶

3. As the Dubai Health Strategy 2021 completes almost two years of implementation, how would you evaluate its success in improving healthcare services in the emirate? What has been its impact on patients, healthcare professionals, facilities and the overall health sector in Dubai?

DHA's Dubai Health Strategy 2016-2021 has three key goals: drive innovation and ensure governance, protect and improve population health and ensure patient happiness by providing world-class health services. These goals aim to fulfill DHA's vision of progressing towards a healthier and happier community. Our focus is on working across a continuum of care, starting from early prevention and detection of diseases all the way to rehabilitation.

In the last two years, we have accomplished several key tasks aligned to the top three goals of the Dubai Health Strategy, which we had divided into immediate, medium and long-term goals. Several of the immediate initiatives were accomplished and these include:

Achievements in innovation and ensuring governance

- Implementing easier medical regulation processes in line with international best practices. Total number of health professional license increased by 15 per cent and number of licensed facilities increased by about 27 per cent.
- DHA is working on revamping its health governance structure, which will result in increased accountability of hospitals and further improve patient safety and experience.
- Adoption of new health technologies such as telemedicine, RoboDoc and 3D printing with the aim of fostering innovation across the continuum of care in addition to smart applications.
- Completion of electronic medical records implementation across all DHA facilities. Recently, Rashid and Dubai Hospitals and 12 DHA PHC's were felicitated with an award for achieving EMRAM stage 6 of patient data maturity.

Achievements in protecting and improving population health

- Currently, 92 per cent of hospitals in Dubai have completed their international accreditation, which is a significant jump from 86 per cent in 2015.
- Number of physicians per 10,000 of the population has reached 33 exceeding the national level (27) and approaching the level achieved by Sweden (39).

Achievements in realising patient happiness and providing world-class healthcare services

- The mandatory insurance coverage has been a direct source of patient happiness and today, 98 per cent of Dubai residents are covered under the scheme.
- Life expectancy of Dubai residents has reached almost 80 years exceeding that of the USA and approaching that of UK and Japan.

4. How has the mandatory health insurance scheme benefitted the sector in Dubai and how will it drive the sector's maturity in the years to come?

In line with our vision that healthcare is a universal right and not a luxury, Dubai's mandatory health insurance scheme has provided a basic blanket cover for its residents in a financially sustainable manner, irrespective of their income or strata.

Apart from access to care, it offers access to better quality of care and Dubai has standardised care by implementing clinical guidelines so that health facilities that provide better quality of care will be rewarded through the payment model. In addition, screening – especially for NCDs – is becoming a bigger part of the mandatory cover and is an important step towards our mission to provide preventive care and early detection of diseases.

In terms of driving the sector's maturity, healthcare has evolved into a data-rich sector as we continue to capture vast amounts of healthcare information. Such gold-standard evidence-based healthcare data will help us devise policies based on measured outcomes. In 2016, the number of healthcare transactions through health insurance was 63 million, which is valued at AED 9.6 billion, and which accounts for more than 70 per cent of the total health spending in the emirate.

Going further, innovation is now becoming key with programmes such as hospital at home for the elderly, which helps with early discharge of patients. Once home, patients are monitored through telemedicine and provided with customised homecare services. This service is provided for elderly UAE nationals under the Saada Health Insurance programme.

5. What steps are being taken by Dubai to transition from being a hub for the best available medical care to being a source of innovation in medical science?

DHA is currently establishing its innovation centre and partnering with world leaders in healthcare and pharmaceutical industries to work on addressing the region's healthcare challenges and utilising the best research minds while leveraging the best practices worldwide.

DHA's close association with the Dubai Future Foundation Accelerator programme has led to collaborations with several upcoming firms for implementing innovations in healthcare delivery.

In its day-to-day healthcare delivery, DHA currently utilises a number of advanced technologies such as 3D printing for prosthetics, dentures, and cosmetology. In addition, Telemedicine is widely used, and DHA has piloted and is now implementing RoboDoc, which enables specialists to provide expert opinion to cases in remote areas, or for patients who are less mobile.

6. What are the long-term care services being planned to meet the specialised needs of the growing elderly population?

DHA has a robust homecare programme for elderly patients and we intend to expand this. Currently, we have a full-fledged nursing home and will soon be setting up another facility.

Rashid Hospital is equipped with an acute care unit for addressing the needs of elderly in-patients while DHA's 15 PHCs provide frontline care with screening services for early detection of diseases so that patients can be referred to the geriatric clinics early on.

The DHA's geriatric section is also working with the private sector to roll out joint initiatives and services. AH

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FUTURE TRENDS IN OCCUPATIONAL HEALTH

Primary prevention and encouraging countries to establish new policies and programmes are key

By Inga Louisa Stevens, Contributing Writer

Occupational health relates to the impact health has on work and work has on health. Its objective is to prevent or reduce occupational health diseases developing such as asthma, hand-arm vibration and noise induced hearing loss. Sometimes the employee brings these conditions into work and sometimes they can be made worse or contributed to by the working environment. In all cases, the employer has a responsibility to manage occupational health issues and often will use the services of an occupational health provider to assist them. Clearly as staff are a key business asset and essential to good productivity and profitability, they need protecting.

Staff can be put at risk from workplace exposures in a number of ways: through excessive noise that might affect their hearing or extreme stress that might affect their ability to carry out their responsibilities. Excessive chemicals in the environment is another potential hazard if absorbed through the skin or breathed in. These dangers can lead to conditions such as respiratory disease, eye and skin irritation, muscle and nerve damage and even cancer.

Team work pays

The role of an occupational health team is to keep staff in the best of health – physically and mentally. In addition, it will do the appropriate risk assessments to lessen the chances of ill health in the workplace. If any risks remain, control measures will need to be put in place, part of which may be an occupational health surveillance programme.

An occupational health provider should be selected by the employer on the basis of being able to work with their risk assessment, work with the staff identified as being at risk and being able to set a programme and make appointments with those at risk before getting back to the employer with a comprehensive health action plan.

More access to care needed

About 45% of the world's population and 58% of the population over 10 years old belong to the global work force. A recent WHO study revealed that unhealthy working conditions contribute to at least 1.6% of the 'burden of disease' in the WHO European region. The major occupational risks associated with this burden are injuries (40%), noise (22%), carcinogens (18%), airborne particulate matter (17%) and ergonomic hazards (3%).

The WHO created a global strategy for occupational health in 1994 which called for all countries to show a "progressive development of occupational health services with the ultimate objective of covering all workers with such services irrespective of the sector of economy, size of company, occupation, mode of employment, or nature of self-employment."

It added that many individuals spend one-third of their adult life in hazardous working environments and that approximately 120 million occupational accidents with 200,000 fatalities are estimated to occur annually. Furthermore, the costs involved in theses health hazards amount to several per cent of some countries' GDP. However, just 5-10% of workers in developing countries and 20-50% of workers in industrialised countries have access to occupational health services. The need is particularly critical in developing and newly industrialised countries where around eight out of ten of the world's workers live. ▶

Where we are now globally

There are numerous challenges facing occupational health provision around the world today. These appear to be linked with new information technology and automation, new chemical substances, health hazards associated with new biotechnologies, an ageing working population plus the special problems of groups such as the chronically ill, the handicapped, migrants and the unemployed.

To frack or not to frack

In the United States (US) for example, issues affecting workers cut across several industry sectors. In an article in the US journal *Occupational Medicine,* John Howard of the National Institute for Occupational Safety and Health pointed out some of the issues that needed addressing. Firstly the development of 'fracking', the process to increase the energy output in the US, has brought with it new risks to the workforce involved in drilling and other activities in extracting oil and gas up to the point of shipment.

The rise of the robots

Meanwhile, job automation and robotics, where jobs formerly done by human workers are now done by machines, continues to disrupt the labour market in a number of key sectors. Robotic workers are also working alongside human workers and there have already been headlines about workers injured or killed by robots such as the employee at a Volkswagen assembly line whose chest was crushed after a robot gripped and pressed him up against a metal plate in June 2015 in Germany. Occupational safety and health professionals will need to take a proactive approach, said Howard, to the risk profile of occupational robotics.

Brexit warning

In a recent article in *Personnel Today,* it was argued that Brexit could impact on occupational health and safety in the UK in two distinct areas. There is the potential knock-on effect for health and wellbeing spending should there be a downturn in the economy. Secondly, there is the possibility of health and safety legislation being amended or watered down. Lucy Kenyon, communications director for the Association of Occupational Health Nurse Practitioners, said there is a counter-argument to this in that in a recession or downturn, you need your skilled, experienced employees to be at work, fully fit and healthy even more.

On your bike!

In the UAE it has been suggested that sedentary desk jobs can contribute to physical inactivity and that stress in the workplace can result in lack of sleep and a poor diet and more needs to be done to tackle this. Dr Michael Bitzer, the chief executive officer at national health insurance company Daman said in an article in The National newspaper recently that encouraging a healthier lifestyle is key. He insisted that when organisations adopt a health-oriented strategy that prioritises the wellbeing of staff, it immediately impacts the employee-management relationship in a good way and can lead to increased loyalty. He suggested initiatives such as having weekly runs at a park or encouraging colleagues to get together for brisk walk or bike ride.

Future challenges

In their paper 'Creating a Future for Occupational Health', academics from the University of Washington suggested that changes in the workplace and the resulting job insecurity change the nature of risk to a large fraction of the workforce. The paper states: "Workforce demographics are changing, and economic disparities among working groups are growing. Globalization exacerbates the 'race to the bottom' for cheap labour, poor regulatory oversight, and limited labour rights. Largely, as a result of these phenomena, the historical distinction between work and non-work exposures has become largely artificial and less useful in understanding risks and developing effective public health intervention models."

It added that additional changes related to climate change, governmental and regulatory limitations and inadequate surveillance systems can challenge and frustrate occupational health progress while new biomedical and information technologies expand the opportunities for understanding and intervening to improve worker health.

Better training and research

The University of Washington paper concluded that occupational health training, professional practice, and research should evolve towards "a more holistic, public health-oriented model of worker health. This will require engagement with a wide network of stakeholders. Research and training portfolios need to be broadened to better align with the current realities of work and health and to prepare practitioners for the changing array of occupational health challenges."

The WHO said that with the rapid changes in modern working life such as the demands of learning new skills, adapting to new types of work, the pressures of higher productivity, work quality and time pressure, there are growing psychological and stress issues among the workforce. More attention and resources should be given to these matters within occupational health, which can ultimately play an important role in ensuring that productivity, quality, motivation and work satisfaction are maintained at a high level.

Governments' key role

In response to this, the WHO has set out ten priority objectives for the development of occupational health at national and international levels. These include strengthening international and national policies for health at work and developing the necessary tools; developing healthy work practices and promoting health at work; establishing registration and data systems; using effective transmission of data and raising public awareness through public information.

The organisation says that the objectives reflect the importance of primary prevention and encourage countries with guidance and support from the WHO to establish their own national policies and programmes with the necessary infrastructure and resources for occupational health. The role of government in this will be crucial in order to set the standards for controlling risks at work and ensuring that compliance with such standards are adhered to. The principal players at the workplace level though are the employers and workers who should work closely together to ensure health and safety at work. AH

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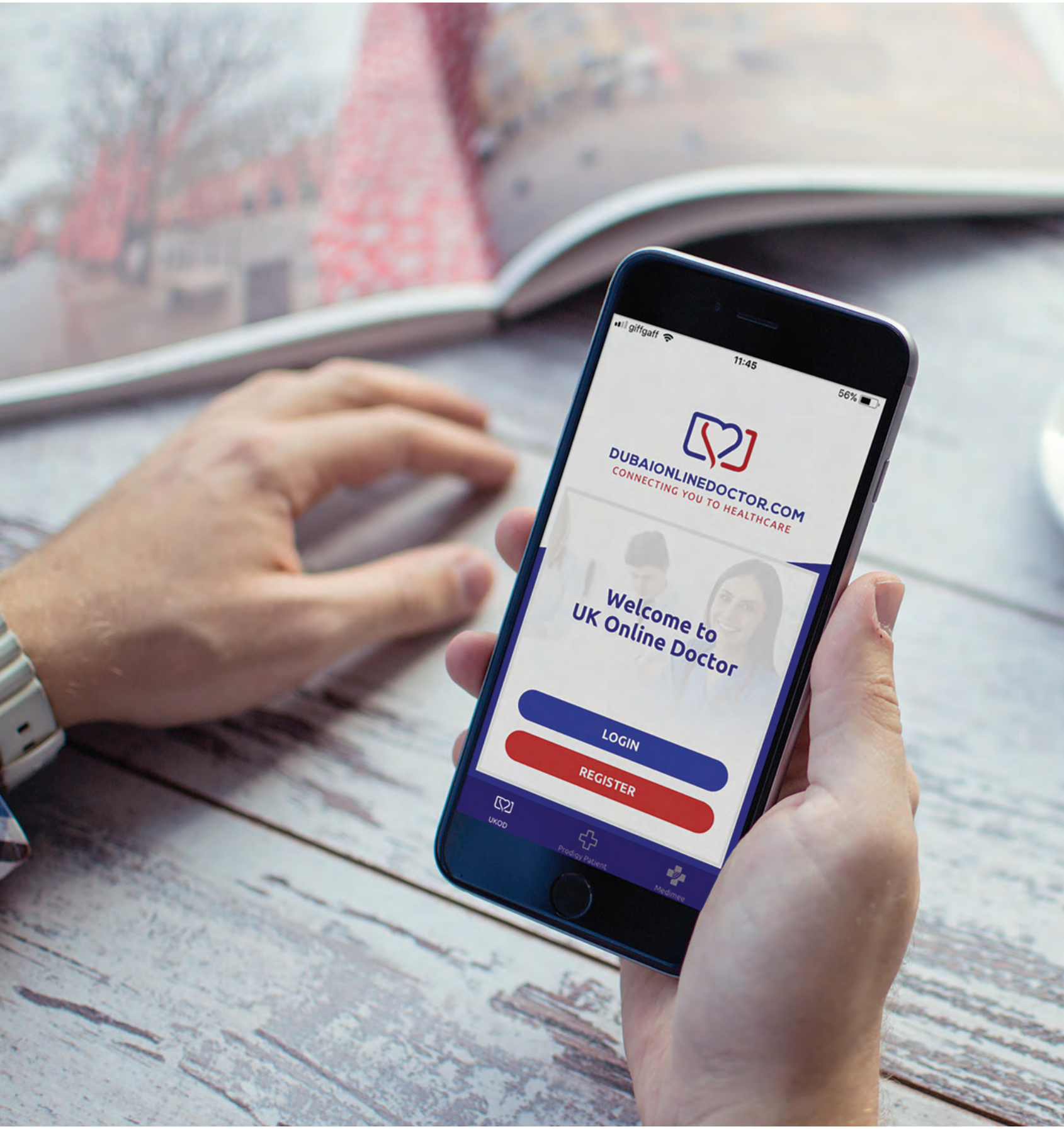
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HEALTHCARE TECH
TAILORED SOLUTIONS FOR THE UAE

By Inga Louisa Stevens, Contributing Writer

With hospitals and healthcare providers across the Middle East under huge pressure to cut costs, they need to be ready to adapt to the inevitable changes that this may bring. Advances in medical technology are increasingly being utilised to modernise healthcare systems with the potential to transform the way healthcare is delivered across the Middle East.

Telemedicine, cloud-based solutions and smart wearable technology are an effective way to create more affordable healthcare with increased speed of access. Artificial Intelligence (AI) and robotics also offer the potential for a new, more efficient paradigm of healthcare delivery.

According to JLL MENA, to simply maintain the current provision rate (1.9 hospital beds per 1,000 persons) would require 10,500 additional hospital beds in the five major cities (Abu Dhabi, Dubai, Cairo, Jeddah and Riyadh) across the region over the next five years (assuming a typical ratio of 150 beds leads to a requirement for around 70 additional hospitals). To increase the provision of hospital beds in line with the current OECD average of 4.8 beds per 1,000 persons, JLL found that it would require a total of 470,000 additional beds (equating to 3,130 new hospitals) across these same five major cities by 2022.

With this demand driver, we will see more and more medical technologies becoming home based, with remote monitoring, to free up beds for more advanced cases. Overall, new healthcare technologies will have to be faster, more efficient and more affordable in order to keep up with the increasing demands on the existing healthcare systems in the region.

Dubai Future Accelerators (DFA), which is an intensive nine-week Dubai government-backed programme pairing international technology companies with government organisations to create transformational solutions, successfully completed its third cohort in December 2017.

As a government partner of DFA, the Dubai Health Authority (DHA) had invited around 40 companies from all around the world to submit their applications to help meet some of the challenges in the Dubai Health Strategy 2016-2022. The challenge set for the DFA entrepreneurs was to "reduce costs and increase the efficiency and potency of diagnosis, disease prevention and patient monitoring by factor of 10". Arab Health Magazine spoke to three of the innovative healthcare technology companies who were chosen by the DHA to participate in helping to achieve their vision.

Hexoskin

Canadian-based Hexoskin is the leader and pioneer in smart clothing and body sensing technologies, while being the only clinically validated system that offers a non-invasive solution to monitor the cardio-respiratory and activity functions of the users. The smart garment is lightweight and machine washable and can be worn by the user in their daily living activities and during their sleep. The system is designed to minimise user setup time and collect remotely real-world evidence over long periods. Hexoskin is compatible with iOS, Android, Watch OS and Android Wear.

The Hexoskin biometric shirts were developed between 2006 and 2011 and started being used for health research and sports performance in 2012. Since then, in addition to offering its technology to consumers from ▶

its website, the company became official supplier for top research organisations like NASA, the US Navy Medicine, Harvard School of Medicine, Houston Methodist Hospital, MIT, and more than 100 other top health and research centres.

"Our technology is much cheaper than other clinically validated devices and medical devices on the market for continuous monitoring of patients," says Hexoskin director of partnerships and business development, Marc Paquin. "With the cardiac, respiratory and activity sensors that collect this rich and precise data continuously, it's like having three of the best monitoring devices in one lightweight garment."

As part of the DFA's third cohort, Hexoskin worked with DHA to design the most advanced healthcare programmes and to make Dubai a global hub that connects patients to the best healthcare services in the world.

As Paquin explains, "Dubai is the perfect example of a city that can achieve these goals. The city is implementing an Electronic Medical Record system (EMR) and most public hospitals in Dubai are connected (or are preparing to connect) to the EPIC electronic health record system. All the elements are aligning to create the best environment to offer connected health services and unleash the potential to generate data to create machine learning analysis of big datasets and create AI systems to improve the services provided to the Dubai's population. It also creates the conditions to move toward a value-based system where the quality of care services provided to the patients matter."

Hexoskin is developing use cases for DHA stakeholders that will demonstrate the economic advantage for insurance companies to refund the Hexoskin products - or at least the connected health services - that will allow patients to receive state-of-the-art care in the comfort of their home.

"From what we've learned so far, it is difficult for some patients in Dubai to even be compensated for hospital visits," Paquin says. "If we can at least demonstrate that patients can still receive care while not missing work, and also doing their normal activities, we think that it will already change the way we think of how care should be delivered. We are looking forward to announce the first projects that will demonstrate that this is a possibility today."

Global Health LLC

Telehealth platform Global Health LLC was founded in March 2015 with its head offices in Dubai, UAE. The platform allows a patient to manage their health from wherever they are in the world. Global Health is working with corporations and government entities to help Dubai become the world's first region to offer telemedicine services on a truly national scale.

As part of the DFA initiative, Global Health has a unique opportunity to listen to their specific challenges in health and wellbeing and navigate the regulatory and technical landscapes to offer tailored solutions.

"We believe the smartest thing you can do in health is prevent illness itself," explains Raj Kohli, who is the medical director for Global Health. "We work with big data analytics to identify and target disease before symptoms set in. If symptoms are present, we have developed an internationally accredited tool to help patients understand their illness better and self-manage mild to moderate illness. Should they still need to see a doctor, they can schedule a live video consultation with a doctor trained specifically to deliver safe treatment, and confidently through a smart phone or laptop."

Global Health doctors are trained to offer appropriate reassurance where possible, but can also arrange a sick note, electronic prescription, referral letter or further investigations, if needed. The platform also offers secure plug-ins, allowing trained professionals such as occupational health doctors, nutritionists and physiotherapists to consult with patients in the easiest possible

way. To help their doctors see exactly what's going on in a patient's body, they have also partnered with fellow DFA cohort Hexoskin to utilise their smart shirt which can stream live biometric data to your doctor.

According to Kohli, the current model of healthcare is far too reactive, waiting for people to develop symptoms before it steps in. Equally, he says, healthcare sectors globally face the same challenges; equity, access, quality and sustainability.

Going to see a doctor is inconvenient and expensive; a study of 17,000 telemedicine consultations delivered using trained doctors revealed that 83% of non-emergencies can be safely managed with just one online consultation.

"Crucially, through our partnerships with hospitals and pharmacy groups all over the world, we can also safely manage the remaining 17%," he explains. "We don't see ourselves as a threat to the traditional healthcare model as our solutions are specifically designed to support existing healthcare assets and services in country to deliver telemedicine to their patients."

There is an assumption that telemedicine can be delivered by simply putting a doctor in front of a Skype screen, but, as Kohli clarifies, this is far from the truth. "In fact, without focused and accredited training, it can become a dangerous weapon which is why we have painstakingly developed telemedicine training programmes for clinicians, healthcare organisations and even patients themselves."

Last year Global Health's training partner NB Medical, trained 20,000 doctors to deliver evidence-based healthcare to their patients. All of the training is accredited by the Royal College of General Practitioners (RCGP) and Global Health's data partner, Clarity Informatics is the official content provider to the National Institute of Clinical Excellence (NICE).

When it comes to privacy and patient confidentiality, Global Health is the world's only online doctor platform complaint with HIPAA, the US Health Data standard and the EU General Data Protection Regulation (GDPR) - by far the most stringent and evolved international data protection law in existence, due to be enforced in May 2018.

MediMee

MediMee is an online Emergency Medical platform designed to help save lives. It contains a user's medical, emergency contact, health and travel insurance information all in one place for quick and easy reference, whenever needed. MediMee also interacts with wearable technology in order to make this information available in a matter of seconds anywhere in the world, regardless of language barriers.

"At MediMee, we have one primary goal, which is to help save lives," says Bernard Nolan, who is the Co-Founder and CEO of MediMee. "We know from our own experiences that when it comes to saving lives, every second counts. Our team, which consists of highly experienced medical and technology professionals, have worked tirelessly to bring innovative health record/ Personal Emergency Information solutions to life and make them available to individuals, enterprise, private and government sectors."

So, what if you or a family member or a friend is severely injured in an accident, stricken by an allergic reaction, suffered a stroke, heart attack or seizure? How quickly could you relay vital medical information to first responders and the emergency services? And how accurate do you think that information would be? Now, let's add in pain, stress, time and even language barriers into the situation. "This is an issue facing millions of people around the word each day and MediMee allows for vital information to be communicated in the event of an emergency by simply tapping a NFC-enabled smartphone against any of your wearables. Alternatively, you can just enter the printed ID code to retrieve vital information," Nolan says.

Nolan explains that MediMee differs from their competitors by working directly with emergency services and integrating with call dispatch centres meaning that when the SOS function is activated, a user's vital information is sent directly to those coming to help the patient. "Paramedics will already have a GPS location of an individual along with any relevant medical details, even before they arrive on scene. MediMee also has further capabilities, which can dispatch drones to a user in need. The drone can be used to deliver vital medical equipment such as an AED (automatic external defibrillator) or an EpiPen and give emergency services real time video of the situation."

"We are truly pushing the boundaries of what's possible," he adds.

MediMee went live in February 2017 at the launch of the Dublin tech summit in Ireland and, since then, the company has grown rapidly having operations in three countries - Ireland, UK and UAE. As part of the DFA programme, MediMee is working closely with the DHA and has partnered with other organisations such as Global Health to help save lives in the UAE. AH

Dr Raza Siddiqui, CEO of the Arabian Healthcare Group and executive director, RAK Hospital, UAE

WORD-CLASS QUALITY CARE

Transforms the healthcare landscape of the UAE

By Sangeetha Swaroop, Contributing Editor

The UAE's commitment to be a leader in offering advanced, high quality and integrated healthcare services gained international recognition once again in 2017 when it ranked first globally—for the fourth year in a row—for the number of healthcare establishments accredited by Joint Commission International (JCI), the world's largest healthcare accrediting agency. While this achievement attests to the high capabilities of the UAE's healthcare system, it also demonstrates how the UAE has redrawn the global competitiveness landscape by adopting internationally-accredited protocols and standards as it seeks to fulfil its Vision 2021 objectives of becoming among the world's best countries in terms of quality of healthcare, sustainability of healthcare services and achievement of health safety.

"This is no mean achievement, considering that just two decades ago, subsidised or free medical care was the norm in public hospitals; and residents and citizens alike opted to travel abroad for even minor treatments," says Dr Raza Siddiqui, CEO of the Arabian Healthcare Group and executive director, RAK Hospital, UAE, who has been witness to the dramatic evolution of healthcare in the UAE since his arrival here in 1998. "Today, the roll out of mandatory health insurance schemes, the adoption of a ratings system for public hospitals, and public-private partnerships in the healthcare arena have led to an acceleration of growth in this sector."

This transformational journey, he adds, was mostly driven by the changing and rising needs and demands of a growing population. "Twenty years ago, the population of the UAE was a mere 2.5 million while today, it is touching 10 million. Obviously, there had to be a change in the status quo as the complete onus of delivering care could not remain the responsibility of the government alone. Increasing private sector participation supported by government investment has therefore been the cornerstone of UAE's development strategy in its efforts to build a robust healthcare system that is able to deliver top-notch services across all aspects of the medical industry."

With the evolution of the healthcare system, it is important for the key stakeholders to ensure that the strategy plan of the private sector is aligned with the vision of the country, and what is in the best interests of the people it serves, believes Dr Raza. "We live in challenging times; the downward plunge of oil prices has had an impact on all sectors of the economy including healthcare, necessitating the need for stronger involvement of private entrepreneurs. As the government is allocating more resources towards public health, the next step forward relies on two critical factors: optimisation and maximisation. This, I believe, is the name of the game that will take the healthcare industry in the UAE to the next level of success."

The key word here is "efficiencies", he explains. "If we have duplication of services, efficiency will suffer. Everyone stands to lose if there are 20 players providing cardiac services, and if none of them seem to have optimum numbers. Duplication can be avoided only when the government and private sector share a unified vision. Then, it becomes possible for both entities to work on their core strength areas such that the resources available are put to optimum use and the resulting efficiency and price benefits are passed on to payers, patients, and others."

An integrated strategic plan, he adds, will not only make the country self-sufficient but also transform it into an ideal, meaningful medical tourism destination. "It has been observed that the UAE population seeks ▶

treatment overseas chiefly for cardiac, cancer and advanced orthopaedic care. If we could create centres of excellence in these areas, it will not only address the needs of the local population but will also attract international medical visitors to the region. Currently, the UAE domestic market is touching 10 million, the GCC has a population size of around 100 million while the MENA market is much larger in both size and scope. We are therefore talking of huge opportunities and I believe that as healthcare providers in the region, the private sector—with their experience and expertise—has to rise to the occasion and take a more responsible approach in scaling up the supply side of the increased demand for general and specialised healthcare services in the UAE."

The current practice of some health insurance players to sell their policies at lower rates will have to be stemmed if timely, quality healthcare has to become the standard, asserts Dr Raza. "The UAE has achieved top global rankings for accreditation of its healthcare establishments both in the private and public sector. This attests to the prevalence of best practices and high standards of care. But when insurance providers go low on prices, it speaks of a mismatch in the healthcare ecosystem, and adversely impacts the advances made in the sector as it forces the local population to seek relevant services outside the country."

What needs to be done, therefore, is to smartly structure the system so that it is possible to maximise on the immense opportunities available and optimise on usage and bring in maximum efficiencies so that it safeguards the interests of the patients, payers, providers, policy makers and other stakeholders, opines Dr Raza. "With the pool of numbers in the region and by integrating our resources, we can bring in economies of scale to make this a reality."

The shifting demographic profile of the UAE also needs to be taken into account when making strategic plans in the healthcare sector in the region. As Dr Raza says, "In '98, the population in the UAE above the age of 50 was less than 5 per cent while in 2030, that number is expected to be around or more than 20 per cent. At the same time, the region is also facing the challenges of non-communicable diseases and has adopted a preventive and early diagnosis approach by creating an awareness about lifestyle diseases and encouraging the promotion of healthy lifestyle practices. The recently concluded Dubai Fitness Challenge: 30x30 is a case in point and the initiative taken to promote an active lifestyle and make fitness a healthy habit for life is laudable. The preventive approach has also thrown up immense opportunities for growth in the wellness sector."

On the other hand, the rapid rise in population in the 65 plus age group is leading to an increase in demand for acute care services. The demand for rehabilitation and long-term care have grown and are projected to increase in the coming years. Assisted living clusters could also soon be a possibility in the region, he adds.

Another core area that healthcare providers are focusing on in a big way is advanced digital health solutions. "This is what integrated healthcare is all about; so, many of the conditions may be monitored by the patient at home and remotely by the health professional which is critical to managing cost and maximising efficiencies," says Dr Raza. "Indeed, patient engagement is a key emerging trend in healthcare and it is not just the younger generation who are tapping into technology to monitor or engage in their healthcare needs. As health information technology becomes more user-friendly and accessible, there is an encouraging trend in technology adoption growth across all age groups."

The Middle East's digitally savvy population is one reason why the region could embrace AI and robotics in healthcare more easily, he adds. "Robotics has the potential to transform healthcare delivery as it brings about speed and accuracy in both diagnosis and treatment. Although the human touch has remained a key element of the healthcare experience, we will also soon be looking at a scenario where this influence is minimised and big data will emerge as the chief player. Accordingly, when a patient undergoes a scan, the scanner will not only scan but also diagnose with the help of big data available."

Despite a challenging global economy and low oil prices, the healthcare sector in the UAE has witnessed major expansion programmes with mergers and acquisitions becoming commonplace, adoption of a patient-centric model, and tremendous improvement in the overall delivery system. The ongoing consolidation trend has not only boosted the quality of healthcare provision but also helped in driving up efficiencies.

In addition, says Dr Raza, regional and cultural factors have contributed to the tremendous growth of the health tourism market, especially in Dubai. "Dubai's tourism infrastructure is one of the best in the world; its outstanding hospitality credentials have also enabled it to attract skilled medical professionals to the region. To retain such talent and become the top medical tourism destination, what we need here are first-rate surgical and medical services in critical disciplines. The plans to open organ transplantation units in the UAE—following the organ transplant law that came into effect in March 2017—is therefore a step in the right direction. Patients will no longer need to travel abroad for such treatment and apart from providing outstanding physician expertise, it also attests to the highly sophisticated facilities available in the country. Such demanding treatment specialities have the potential to transform healthcare delivery and I look forward to seeing the UAE becoming a top centre of healthcare expertise and innovation." AH

The UAE has achieved top global rankings for accreditation of its healthcare establishments both in the private and public sector. This attests to the prevalence of best practices and high standards of care.

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JOHNS HOPKINS MEDICINE

A 'COMPLETE OVERHAUL' of the health insurance model

Meeting the need for change head on and adapting accordingly

By Inga Louisa Stevens, Contributing Writer

The Emirate of Dubai in the United Arab Emirates was one of the first in the Gulf Cooperation Council (GCC) to have a legislative mandate in place that requires employers to insure their employees by law. The Dubai Health Insurance Law No 11 of 2013 came into effect in January 2014 stipulating that all nationals and residents with a Dubai visa should have compulsory health insurance cover. However, according to the Dubai Health Authority (DHA), less than 2% of residents of Dubai are yet to be covered.

Following suit, Mandatory Health Insurance is expected to be fully implemented across the GCC by 2020. In Saudi Arabia, for example, it is now illegal for any employer to exclude their employees from health insurance. On 10 April 2017, The Council of Cooperative Health Insurance (CCHI) announced the start of the final phase of implementing unified health insurance in the Kingdom. This final phase is part of a CCHI plan, which started in July 2016, to implement a unified health insurance that includes all employees and their dependents.

The first stage included companies with more than 100 employees while the second stage targeted companies that have between 99-50 employees. The third stage, which started in January 2017, included companies with 49-25 employees. Now, with the implementation of the final stage of the CCHI plan, all private sector companies in the Kingdom are mandated to provide unified health insurance cover.

Meanwhile, in Kuwait, basic Mandatory Health Insurance is currently required for all expatriates in Kuwait in order to obtain a residency visa. However, healthcare providers, insurers and employers await news on how the Kuwaiti government's recent decision to ban foreigners from access to public healthcare services - expected to be implemented in two years' time – will impact the system.

It is also anticipated that Qatar, Oman and Bahrain will make regulatory changes in the near future to usher in compulsory health insurance.

Mounting economic burden

According to a recent report by property consultancy JLL MENA, the introduction of Mandatory Health Insurance has attracted more international operators to the region, and increased the private sector's share of healthcare infrastructure. With the increase in the number of operators - to date there are 48 health insurance providers in the UAE, 27 in KSA and 28 in Egypt (Source: JLL MENA) - it is estimated that the total medical insurance premium in the GCC is expected to continue to grow over the next five years. For example, according to global health insurance broker Pacific Prime, medical inflation in the UAE was 9.5% in 2015.

The evident escalation of medical insurance costs is supported by analysis of health insurance provider Aetna International's 700,000 globally mobile customers which revealed the top nine conditions among their over 50 members: hypertension, low back pain, high cholesterol, ischemic heart disease, type 2 diabetes, chronic obstructive pulmonary disease, osteoarthritis, asthma and glaucoma. The prevalence of these chronic conditions markedly rises between the 60-69 age group and the over 70s.

According to Dr Mitesh Patel, Medical Director at Aetna International, this data correlates with the exponential rise in medical costs as people age, with medical spend on the over 70s standing at three times that of members aged 50-59. With the number of people aged 65 or older expected to reach 1.5 billion by 2050, governments, medical providers and insurers face a mounting economic burden with the rapid rise of these largely non-communicable, lifestyle-related diseases.

"Simply, they impact people's quality of life – healthspan - and life expectancy and require lengthy and costly treatment," he says. "As the data shows, chronic conditions start to become prevalent among individuals in their 40s. This highlights the need for targeted education and wellness support for people in their 30s to prevent or slow down the onset of these diseases." ▶

A complete overhaul

Aetna International is calling for a complete overhaul of the traditional health insurance model – shifting focus from episodic, reactive claims-based care to a continuous proactive health and wellness model. "Most healthcare systems around the world are actually sick care systems; designed to deal with people when they become unwell, when they require medical intervention, but we as a society, and as an industry, do not spend enough time or effort or resource on keeping people healthy," Dr Patel explains.

He says that a paradigm shift is beginning to occur where individuals are taking more control of their wellbeing, which comes through diet and exercise, stopping smoking and making sure that they're looking after themselves generally. "That is a fundamental shift, and Aetna International is making the transformation from being a health insurer to becoming a health and wellness partner – where a proactive education combined with individual mobilisation will be key to preventing the onset of chronic conditions."

According to Dr Patel, Aetna International's goal is to make the home and the community the default setting for care, and to ensure that they are investing in the creation of a proper primary care infrastructure to motivate and help people to stay healthy, and to deal with them appropriately if they become unwell.

Aligned on all fronts

"We are calling on the healthcare industry to rally around the single goal of improving health and service while reducing costs," says Dr Patel, who believes healthcare providers have a significant role to play. For example, he explains, using predictive analysis to find, engage and help those with conditions and provide ongoing support; provide face-to-face and virtual access to primary healthcare (family doctor) services; using data mining techniques and reporting metrics to prevent the onset of conditions and diseases, and better serve at-risk individuals. He also says health insurers can invest in IT infrastructures to surround clinicians with data, protocols and tools in support of a culture shift.

"At Aetna International, we are harnessing the power of technology to meet consumer demands, to increase efficiencies and to build a healthier world through innovations like our virtual care - or vHealth service," Dr Patel says. "Additionally, through value-based care, insurance and government payers need alignment and collaboration with healthcare providers, so payment is based on overall health, not just treatment."

Aligned incentives will lead to:

- Increased efficiencies
- Better health and healthier lifestyles
- Better consumer experience
- Less unnecessary intervention
- Sustained affordability
- Sustained trend reductions

At what cost?

For Aetna International, it's about wellness and efficiency. "First, we focus on keeping people well, and stopping them from becoming chronically ill in the first place. And secondly, we believe in increasing efficiencies, simplifying the patient journey and improving access to primary care (family doctors) to reduce acute care costs," explains Dr Patel.

Harnessing technology to deliver primary healthcare can reduce the strain on acute care, focus people on wellness and deliver without huge infrastructure costs. ICT will be crucial in supporting the transformation of healthcare systems in the region and especially so in achieving objectives such as fighting lifestyle-related diseases, improving access to healthcare services and building workforce capacity.

He adds, "Investments are important to upgrade existing and to build new hospitals and clinics, roll out mandatory health insurance schemes, and encourage private sector investments in healthcare, for example."

Ready, Set, Go

According to Dr Patel, every market is ready for this transition as the increasing demand for healthcare services, including health insurance, is unsustainable. Medical inflation is going up at a huge rate depending upon which country you are in but largely across the world and it's driven by a number of factors, including:

- Populations are increasing and incomes are rising in developing countries leading to greater utilisation of services, increased demands on healthcare systems
- We are getting older as a society and as we age we have more medical conditions, which require intervention
- More of us are living with chronic conditions like diabetes and high blood pressure
- Technology improvements and innovation
- The entrance into markets of higher-priced providers
- The underlying cost to provide services AH

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Interdisciplinary approach as an improvement tool for healthcare

By Dr Parvez Masood, Specialist - Diagnostic Radiology, Cleveland Clinic, Cleveland, Ohio, USA

No one person can know it all. We, as humans, are inherently forgetful and limited in knowledge. But if we put the right minds together; we have Almighty's gifted ability to achieve miracles, be it in realms of science, technology, medicine or any other field.

To the common man, there is an assumption that healthcare institutions function as seamless well-oiled machines at optimum levels. As healthcare professionals, we recognise the various challenges and there is no denying that we encounter potentially rectifiable hitches at bureaucratic, technical as well as interpersonal levels. As an accompanying relative to a patient, my biggest concern was the time it took to reach a correct diagnosis and the run around and number of specialists it needed for us to visit. Had it been a critical illness, my relative could have succumbed to his disease. We wondered, at the time, if there could have been an alternative approach, wherein we would have been seen by a limited number

of professionals who could then discuss with a full team or array of experts and share the information to arrive at a reasonable diagnosis and treatment plan which would then save time and finances not just to us, an individual patient, but an entire healthcare system and the nation.

Taking a clue from numerous well-established and successful institutions in different turfs, what we ideally need is an unbiased collaboration across disciplines - which now is increasingly vital to medicine - in order to generate high-quality patient care. The growing prevalence of complex and varied forms of diseases, along with increasing complexity of skills, fragmentation and sub-specialisation of knowledge base among healthcare professionals necessitates the need for shared information, partnership and an interdisciplinary approach to medicine so that we can provide excellent care to patients. This will also allow us in ushering new ideas, pursuing documentable continued improvement in quality and brain-storming on new, as of yet, unfamiliar pathologies.

The purpose of interdisciplinary team is to foster collaboration in a structured and documentable way among healthcare professionals, so as to achieve treatment goals and desired enhanced patient outcomes. This tool may also be effectively used to monitor, revisit and revise treatment options. Yet at the same time we should be well aware that we are here to do service to the population by assembling a purposeful, knowledgeable and cost-effective team and not for bragging our personal assets. Also, we must take into account that a set-up that is very effective for one institution may not be easily mirrored to another. Each institution comes with its own capabilities, patient population, demography and epidemiology. Each institution accordingly should fine-tune this model to suit itself for optimum results of their respective patient population.

An ideal approach would be to develop a panel in the light of the following principles. We would need a team with a positive team leader who would propel a structured, cohesive, well-informed panel of professionals with appropriate available resources, to implement the decisions taken. A group which incorporates team culture, is well-educated and trained in the topic of concern and is encouraged to have a patient-oriented approach with a verifiable outcome.

> "There are no incurable diseases - only the lack of will. There are no worthless herbs – only the lack of knowledge."
>
> Abu Ali Al-Husayn Ibn Abd Allah Ibn Sina

This team should function with discipline, be respectful and understanding of each of the team member's individual roles.

It would also be a good idea to have a constant non-disciplinary feedback to the team so as that it becomes a good learning opportunity and an encouraging reinforcement for future scenarios and leads to continued improvement in its function. If necessary, there can potentially be an oversight-committee that closely monitors without direct interference and provides constructive criticism without castigating members, to constantly improve the function of this interdisciplinary panel. Initially, there may be a perception that this may be a cumbersome and difficult to formulate approach but, once put in place, it will prove itself to be a cost-effective and correct decision that will inculcate a team-work culture and will lead to significant improvement in healthcare.

With these ideals in mind, an infrastructure should be set in place that will implement the recommendations of this team to relay and translate into improved patient management for desired outcomes. For acceptable outcomes, we also need to develop a shared language and learn to coordinate our actions. Eventually, using these interdisciplinary models and resources, it will help build a faculty with the desired set of skills to construct an interdisciplinary curriculum.

Inspite of this being a tested tool, application of this technique continues to face obstacles. This collective approach, though quite prevalent at some institutions, is only tangentially implemented in most parts of the world, especially in healthcare institutions. Even if encouraged, interdisciplinary approach at many institutions is frequently not well embraced or adopted and faces challenges that go against the very principle and goals of this methodology. Occasionally, we may encounter poor leadership or a forceful push by certain set of participants overpowering lesser established yet innovative ideas leading to an inadequate or detrimental outcome due to irreconcilable differences among the team. Professionals have to overcome these challenges and need to learn to communicate well, respect others and not compete, for the shared common good of the patient.

In conclusion, we have to rectify the anticipated problems, rid our long embedded convictions and attain a philosophy that we can do more together than independently. Physicians regrettably have traditionally tended to be more isolationists, in fact, frequently stubborn and retentive in their practices. We are resistive when it comes to a collaborative approach with multidisciplinary models and reluctant in sharing resources. We have to understand that a collective collaboration is a strong foundation for improved patient care.

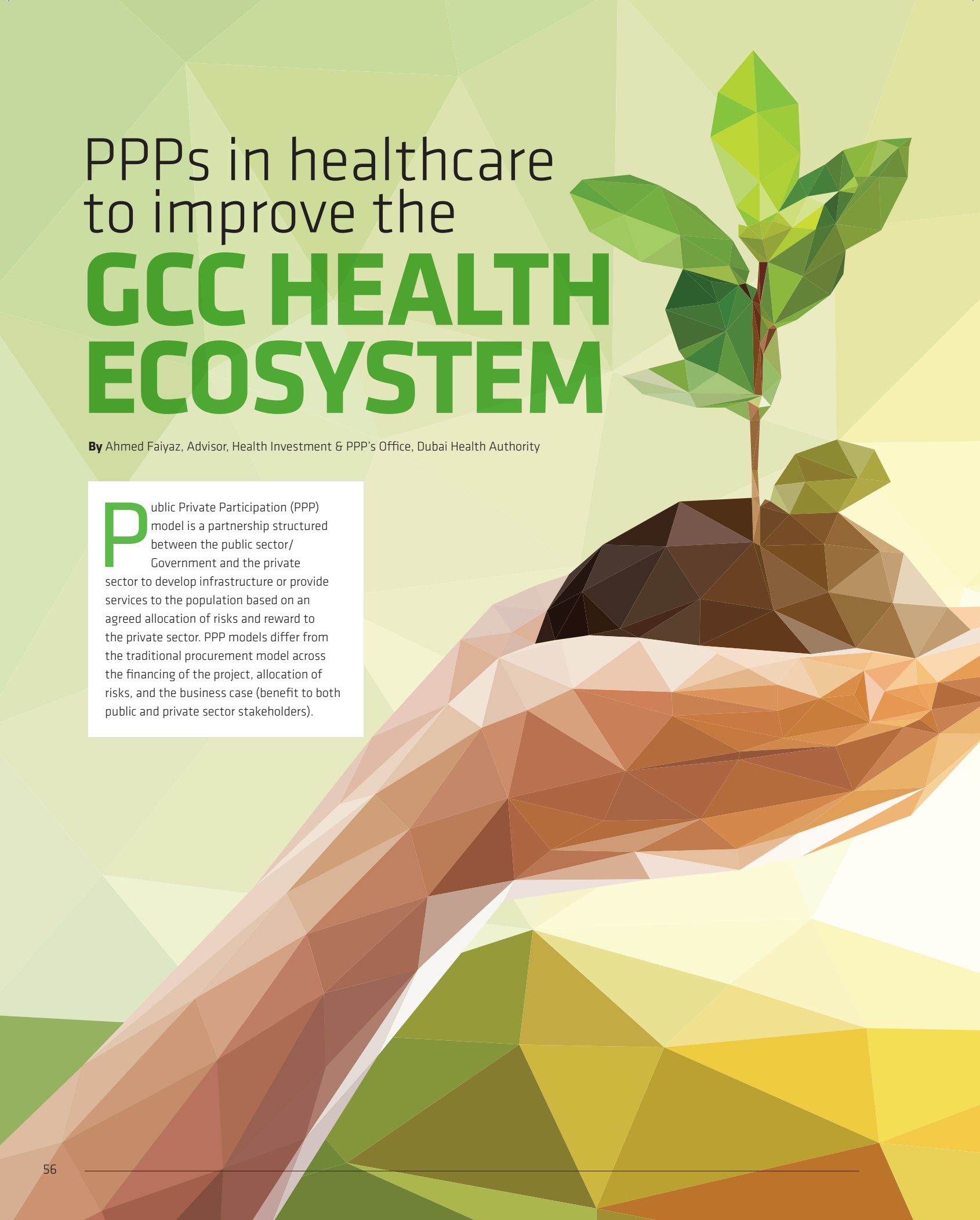
As individual healthcare professionals - though we share a common focus on patient care - frequently and potentially unknowingly, we are overwhelmed by our innate attitude and may not accept alternative suggestions. Our capabilities are rooted in varied training backgrounds, hold distinct professional perspectives and talents and we individually have different strengths and weaknesses. Bringing the abilities together only is going to harness our strengths and subdue our weaknesses. This will lead to overall excellence and further development in patient care. The set-up of our healthcare institutions offers us an ideal pitch in which we can now infuse this time-tested and harmonised collective approach. We have to strive hard in achieving this vision of interdisciplinary involvement, including its conceptualisation, expansion and capacity-building for our own enhanced future in an inevitable atmosphere of change, so as to upgrade the quality of healthcare. AH

Dr Parvez Masood is a Speaker at the 18th Imaging and Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

PPPs in healthcare to improve the GCC HEALTH ECOSYSTEM

By Ahmed Faiyaz, Advisor, Health Investment & PPP's Office, Dubai Health Authority

Public Private Participation (PPP) model is a partnership structured between the public sector/ Government and the private sector to develop infrastructure or provide services to the population based on an agreed allocation of risks and reward to the private sector. PPP models differ from the traditional procurement model across the financing of the project, allocation of risks, and the business case (benefit to both public and private sector stakeholders).



Increased life expectancy, together with a growing prevalence of chronic diseases, adds significant pressure on the public sector to seek efficiency gains in everyday operations. While the GCC countries continue to see rising demand for health services, given the demographic needs and rising prevalence of chronic diseases, many of the health systems face capacity challenges in the public health sector, and have gaps across the health ecosystem, more specifically in primary, tertiary and extended care services. There is growing interest and efforts by GCC governments to study and develop PPP legislation to enable PPPs in healthcare as well as other sectors such as transportation, energy, aviation and education, given the success of PPP models in other developed countries and emerging markets.

PPPs in healthcare provide flexibility to optimise and better manage the utilisation of health infrastructure and services. GCC countries could adapt PPP models that have proven to be effective in other countries to –

Enhance and improve health infrastructure with reduced capital investment while ensuring speed and efficiency in project completion and delivery of improved health services: The public sector can benefit from the private sector partners by bringing a consortium who are highly specialised and have deep expertise in hospital design, construction, project management and facility management, which could significantly reduce the capital investment and operating costs over the asset's lifecycle and bring efficiency and sustainability in the design, functional use and operations of the facility.

Canada has extensive experience in having completed over 83 healthcare projects with capital investment of over 22 billion Canadian dollars, and have dedicated PPP units such as Infrastructure Ontario to manage the PPP procurement. One such example is the $622 mn for Bridgepoint Health Re-development in Riverdale, Toronto, Ontario. This was a Design Build Finance Maintain contract (DBFM) for construction of a new 10-storey, 464 beds and 680,000 square ft hospital, to replace the older facility. The new hospital has enabled the Government to develop state-of-the-art infrastructure, integrating patient care, research and teaching in complex chronic disease and disability. The repurposed hospital has succeeded in bringing together world-class clinical, education, and research talent, and has increased ambulatory space for outpatient/community programming, along with larger inpatient rooms with modern technologies for more bedside procedures.

Based on the official analysis, the project was completed as scheduled, and generated $ 95 mn cost savings from the design, construction and maintenance of the PPP project. The new hospital was recognised for Leadership in Energy and Environmental Design (LEED) with 20% less energy and water use compared to old hospital and for the efforts made to divert at least 75 per cent of construction waste away from landfill by recycling. Similar results have been observed from PPPs completed in Europe and Australia.

Improve Quality and Efficiency in delivery of health services: One of the biggest successes in healthcare PPPs is the concession model adopted by the Government of Valencia in Spain for the Hospital de la Ribera in Alzira requiring investment of 61 million Euros which was given on a 10-year concession (extendable by a further 15 years) to Ribera Salud Group back in 1997. The model requires an integrated model of care to the patient providing primary, secondary, tertiary care along with extended care, while also adopting innovations in remote patient monitoring and use of electronic health records.

The Ribera Salud Group is paid a capitation fee per patient annually and it has to cover its costs within the capitation fees, and the capitation fee paid per patient was estimated to be 25-27% lower than the average cost per patient to the health system. Ribera Salud Group pays 100% of the expenses if the patient leaves its network for treatment and receives 80% of the fees for patients outside the catchment population for the hospital. Adopting this model has delivered exceptional results in improving the quality of care and the efficiency of the health system. Importantly, it has centred the focus on preventative care, lowering variation in care and helped evolve a holistic and multi-disciplinary approach to chronic disease management. All of this has positive outcomes for the health system - readmission rates are 40% lower while patient satisfaction is over 90% (compared to 70% for other providers).

There has also been an increase in outpatient procedures and 75-100% reduction in waiting times for most surgeries, MRI and other diagnostic tests compared to other public hospitals. Several hospitals have been contracted on the concession model in Spain, and other countries have studied the Alzira PPP Model to improve and enhance the delivery of health services to deliver better outcomes. Through this model, the public sector has ensured that the cost of healthcare needs to follow the patient and has brought focus on prevention, integration and continuity of care.

Improve Access to high-quality services: Kenya set up a PPP unit and embarked upon rolling out PPP models as a part of its Vision 2030 strategy. In early 2015 they signed a Managed Equipment Services (MES) Partnership for $ 420 mn with GE as one of the main partners for a period of 7 years. The partnership has enabled them to bring nearly 600 diagnostic imaging equipment including X-ray and ultrasound systems covered by a long-term service and maintenance contract, at 98 Ministry of Health hospitals in 47 counties across the country.

The project's aim is to ensure early diagnosis of diseases and early intervention to a population that has traditionally had poor access to specialised healthcare services. The impact so far has seen the number of diagnostic tests rising significantly, with more than 30% of the specialised hospitals offering in-hospital mammography exams, and thus improving the screening of breast cancer which is one of the leading causes of deaths in Kenya. The partnership also focuses on training and upskilling of talent within Kenya, thus improving the healthcare capabilities and quality of allied health talent, while providing advanced diagnostic infrastructure.

Given the varied PPP models adopted by the countries in each of the above cases, it is useful to note that each country can take and adopt PPP models most suited to their needs, to enable them to enhance and improve the much-needed healthcare infrastructure, improve patient outcomes, and deliver value by adopting best in class and more efficient processes and practices in design, development and planning of health infrastructure and the delivery of services. AH

Sources: 1) World Bank Studies 2) IFC Reports 3) Ribera Salud Group 4) Infrastructure Ontario

PURSUING BREAKTHROUGH IN CANCER DRUG DEVELOPMENT

How to get the right medicines to the right patients faster

By Björn Albrecht, a partner in McKinsey's London office and head of the McKinsey Cancer Center

The pharmaceutical industry continues to pursue the discovery of medicines for cancer patients with unprecedented rigour. Over the last several years three major trends have reflected this pursuit. They include the growth of the industry pipeline of cancer drug candidates, the evolution of the clinical trial landscape, and the explosion of available clinical and real-world data.

The cancer drug pipeline and associated investment has been growing nearly exponentially. We estimate that currently more than USD 50 billion are invested into oncology R&D annually. With this investment, the number of active compounds in oncology R&D has quadrupled since 1996 and nearly doubled since 2008 alone. Today oncology makes up nearly 30% of the global clinical pipeline. Not surprisingly, immuno-oncology (IO) has been a main driver of the growth of the industry pipeline. According to our own research over 40% of the annual R&D investment in oncology is directed to the exploration of immune checkpoint inhibitors, both in monotherapy and combination programmes. Between 2015 and 2016 alone, we witnessed a growth of 70% in the number of unique hypotheses or experiments tested in combination with PD-(L)1 or CTLA-4 across 85 mechanisms of actions, further underscoring the dynamic nature of this field. At the moment, there are over 1,500 Immuno-Oncology clinical trials in the industry pipeline in monotherapy and combination testing across 183 unique therapeutic mechanisms.

The clinical trial landscape has also evolved significantly. While the number of trials is three- to five-fold higher than the number of active compounds, the relative rate of increase in the number of trials relative to the increase in number of compounds has been decreasing from 5:1 to 3:1 over recent years. While there are many factors playing into this trend, a noticeable shift towards accelerated approvals and breakthrough designations, as well as changes in the clinical development paradigm towards adaptive trial designs and combined phases has played a role. This is highlighted by the fact that over 40% of FDA pivotal trials for novel anticancer agents between 2013 and 2015 were Phase 1 or 2.

These statistics highlight the evolution of regulatory data packages, with increased scrutiny of post-marketing data generation commitments. Importantly, breakthrough-designated trials have also recruited 1.5 to 2 times faster, thus further adding to the speed with which many novel cancer therapeutics are being developed today. Pioneering examples of these innovative development paradigms include, but are not limited to pembrolizumab (KEYNOTE-1 supported the initial registration in both NSCLC and melanoma as a Phase 1 trial), osimertinib (followed the accelerated approval path as a breakthrough therapy with a single-arm design) and LOXO-101 (announced plans to submit data from the ongoing NAVIGATE Phase 2 trial for accelerated approval, enrolling patients with NTRK-fusion proteins across 14 metastatic solid tumours). While there are successes and failures, the pursuit of approaches independent of tumour site is certainly becoming more prominent (e.g., denosumab approval across primary tumours based on bone metastases selection in 2010, the first FDA tissue/site-agnostic approval for pembrolizumab in MSI-H or dMMR cancers in 2017 and the NCI-MATCH study, a 30-arm trial treating cancers according to molecular abnormality).

This increase in clinical activity is interesting in the broader context of the explosion of data generation. Nearly 90% of the data ever created originated in the past two years. In healthcare alone, data is rapidly proliferating from different sources – from patients (e.g., vital signs, behavioral data, patient-reported outcomes), providers (e.g., electronic medical records, clinical notes, medical imaging), pharma companies (e.g., drug discovery, clinical trials, genomics) or payers (e.g., health claims, billing, population health data). This presents significant challenges in how to structure, integrate, and interpret this data for relevant insights to inform care decisions as well as R&D and complement or, in part even replace, wet-lab innovation in the long term. Within the context of rapidly increasing healthcare data generation, oncology is once more at the forefront. Over 13 million electronic medical records exist for cancer patients in the US alone. The next-generation sequencing market is projected to grow at a 20%+ annual rate from 2017 to 2022. Lastly, payer spend on data and analytics capabilities is growing at a 20% clip year on year.

To maximise the opportunity from these rapid changes and thus bring the right therapies to the right patients faster, the whole cancer community must embrace five major imperatives:

- Improve patient access and recruitment to clinical research
- Ensure real-world impact of new medicines and faster approvals
- Optimise data capture, standards, and integration
- Further push the clinical development model
- Evolve the pharma clinical development operating model

Improve patient access to clinical research

The first step to more comprehensive clinical data generation and acceleration of clinical research must address today's recruitment challenge. For example, in the US only about 3 to 5% of patients participate in clinical trials. The resulting poor accrual is the underlying cause of 33% of the terminations ▶

observed in oncology clinical trials, the largest segment by far. In breast cancer, for example, 80% of the incident patients would have been required to complete recruitment for open clinical studies in 2016, not considering any exclusion/inclusion criteria.

The reasons for this are manifold. Physicians, especially in the community setting, are not always aware of open trials and often do not have adequate incentives to refer patients to clinical studies. Patients often misperceive the nature of clinical studies in cancer. For example, they often do not want to join a clinical study for fear of being randomised to the control arm and expecting to receive placebo. In addition, approximately 80% of cancer patients are diagnosed in the community setting and require logistical support to reach the nearest trial centres. And lastly, clinical trials are becoming more complex with the number of total procedures having doubled since 2000. Increasingly demanding inclusion and exclusion criteria have led to an uptick in screen failure rates, an experience after which patients often do not embark on participating in clinical studies again.

Finding a solution to these issues is by no means trivial. It needs to start with increased physician awareness, alignment of incentives and patient education. In addition, a system would ideally be established by which trials are conducted in a more decentralised fashion in the community while not losing quality. This would include leveraging digital approaches for remote consent and other steps in the trial and community nurses for select procedures. Lastly, advanced analytics approaches combining multiple data sources can help improve patient recruitment through more effective identification of patients, especially in rare tumour types.

Ensure real-world impact of new medicines

With the advent of targeted therapies in the late 1990s and early 2000s and the recent wave of immuno-oncology-based therapies, we have seen dramatic improvement of clinical outcome measured either through progression-free or overall survival or surrogate end points. Some solid tumour examples include prostate, breast, and melanoma. Additionally, in select haematological indications, therapies like imatinib and ibrutinib have turned cancer almost into a chronic disease.

On the other hand, over the last two years two studies were published that have questioned the long-term impact of modern medicines in cancer on real-world survival and quality of life outcome. These studies, which examined drugs approved by the FDA and EMA, found that there was limited follow-up after approval with a subset of agents and that other agents did not show survival or quality of life improvement in the real-world setting. The authors highlight that there are clear limitations to these studies, including data comparability, differences in trial design and comparator and selection of studies for analytical interpretation. However, they do illustrate the complexity in comparing data from randomised controlled clinical trials and real-world settings and underline the need for continued monitoring of approved medicines.

To address this, the industry is continuing to invest into different avenues of data generation after approval. Given the increase in accelerated approvals over the last several years and the differences in progression-free survival (PFS) and overall survival (OS) observed in multiple studies with PD-(L)1 check point inhibitors, it will be critical to continue to closely monitor not only the correlation between surrogate and survival end points in controlled settings, but also data generated in the clinic and in the real-world setting.

Optimise data capture, standards, and integration

A cancer patient generates over 100 million data points daily. Numerous efforts, both in the private and public setting, are attempting to integrate disparate data sets, including electronic medical records, pathology and genomic data, and clinical trial data to generate insights that could lead to better clinical care and more effective R&D.

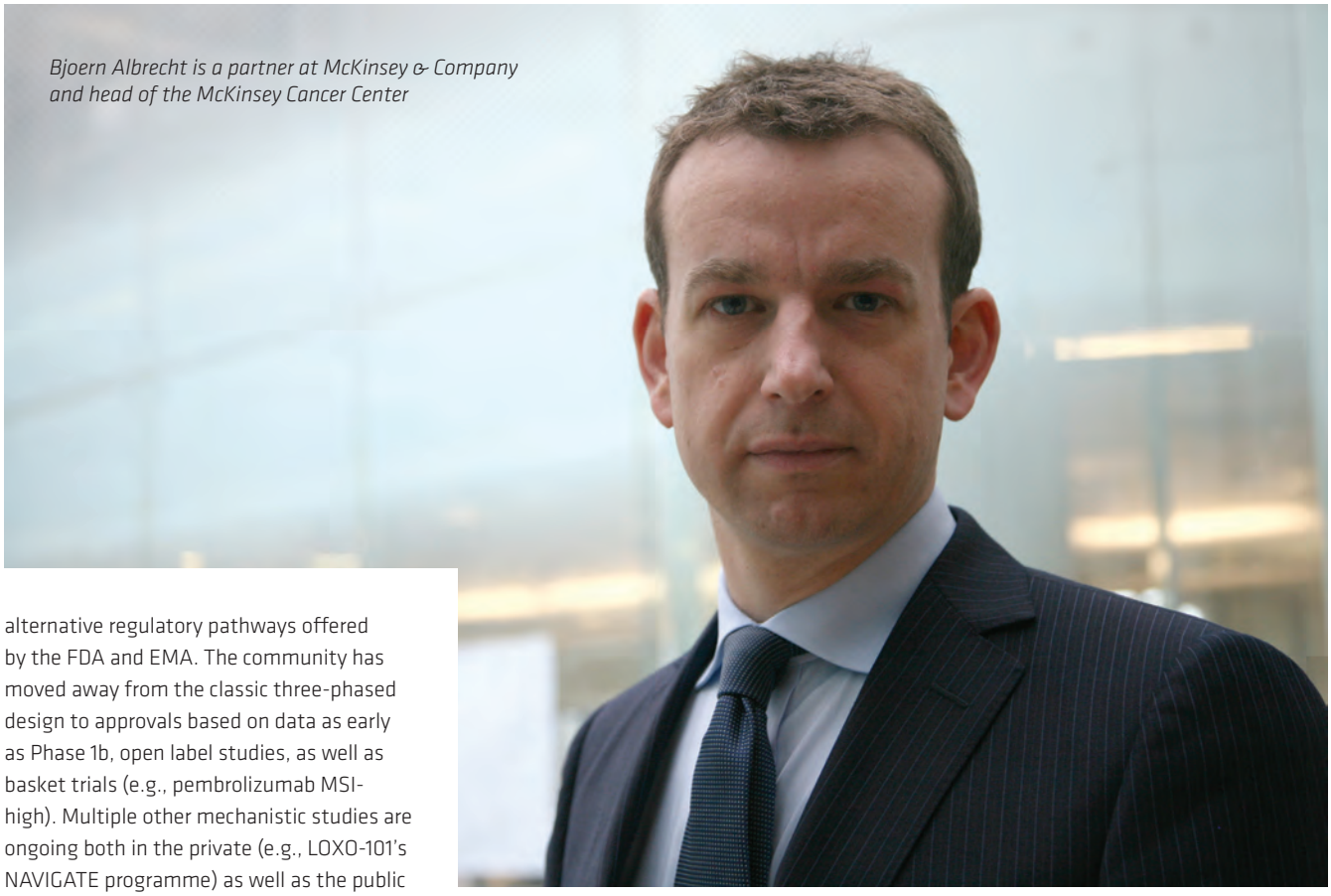
Two key areas that need to be addressed are standardisation and sharing of data. Multiple data standards have been developed over the years, including HL7, ICD-10, and others. However, each standard has faced its unique challenges to broad adoption including lack of specificity in some instances (e.g., ICD-10), limited standardisation within the specific envelope itself (e.g., HL-7) and focus on specific subsets of data (e.g., TransCelerate for clinical data). The Oncology Research Information Exchange Network (ORIEN) and Project GENIE (Genomics Evidence Neoplasia Information Exchange) of the American Association for Cancer Research (AACR) are starting to combine and standardise across larger sets of data, including cancer genomic and clinical outcome data as well as EHR, pathology and clinical data, respectively, but represent more closely data from academic medical centres with more health systems needing to join.

Data sharing is hampered by a multitude of factors, including adequate financial and nonfinancial incentives, the type of data being shared (e.g., limited sharing of negative data from nonclinical research), governance of sharing and patient control (opt-in, directive, or other measures), metrics for sharing (data points posted vs. reused), a sufficient infrastructure to create insights and many more.

Solving the data issue will require technical as well as governance aspects. Learning health systems (LHS), systems in which health information generated from patients within that system is continuously analysed to improve knowledge that will be transferred to patient care, could be one potential solution to address data standardisation without creating yet another standard. Project TRANSFoRm is such an example and has shown proof of concept in a set of three use cases showing that, using the same platform, linked cross-country clinical and genomic data could be used across several countries, diagnostic decision support can be established and trials can be designed prospectively across international sites with different data systems. Data sharing, in addition to an adequate infrastructure and financial incentives to capture and share data, will rely even more so on policy and governance solutions. These need to incentivise scientists to capture and share data during nonclinical research and not just after, establish adequate metrics to ensure quality of shared data (e.g., measured by reuse) and develop approaches for patients to opt into or direct data sharing to different degrees, to name a few.

Further push the clinical development model

Over the last several years the clinical development paradigm in oncology has significantly evolved, in part due to



Bjoern Albrecht is a partner at McKinsey & Company and head of the McKinsey Cancer Center

alternative regulatory pathways offered by the FDA and EMA. The community has moved away from the classic three-phased design to approvals based on data as early as Phase 1b, open label studies, as well as basket trials (e.g., pembrolizumab MSI-high). Multiple other mechanistic studies are ongoing both in the private (e.g., LOXO-101's NAVIGATE programme) as well as the public sector (e.g., NCI-MATCH).

While this lends significant additional agility to the clinical development paradigm, select questions remain. Survival times as well as therapeutic choices after clinical trials are increasing. This will make it increasingly difficult to improve OS (vs. PFS) in select indications, or even to conduct clinical studies due to time and cost considerations. While more diverse surrogate end points would address this problem in part, their correlation with OS remains a point of debate as outlined above. Furthermore, and especially evident in the recent wave of PD-(L)1 clinical programmes, there is a certain level of redundancy with control arms for studies of similar drugs in the same tumour type and line.

While it is essential to retain the scientific rigour behind clinical research, potential considerations to address these topics could include increased use of adaptive designs and master protocols as well as a broader assessment of additional surrogate end points for earlier-stage disease and indications with longer survival times. Additional clinical testing to validate these end points or additional control arms more reflective of a real-world-like setting have been debated. However, safety and ethical aspects must be considered here first and foremost. Lastly, synthetic control arms might offer potential for more efficient clinical programmes, but will require significant further exploration before having impact.

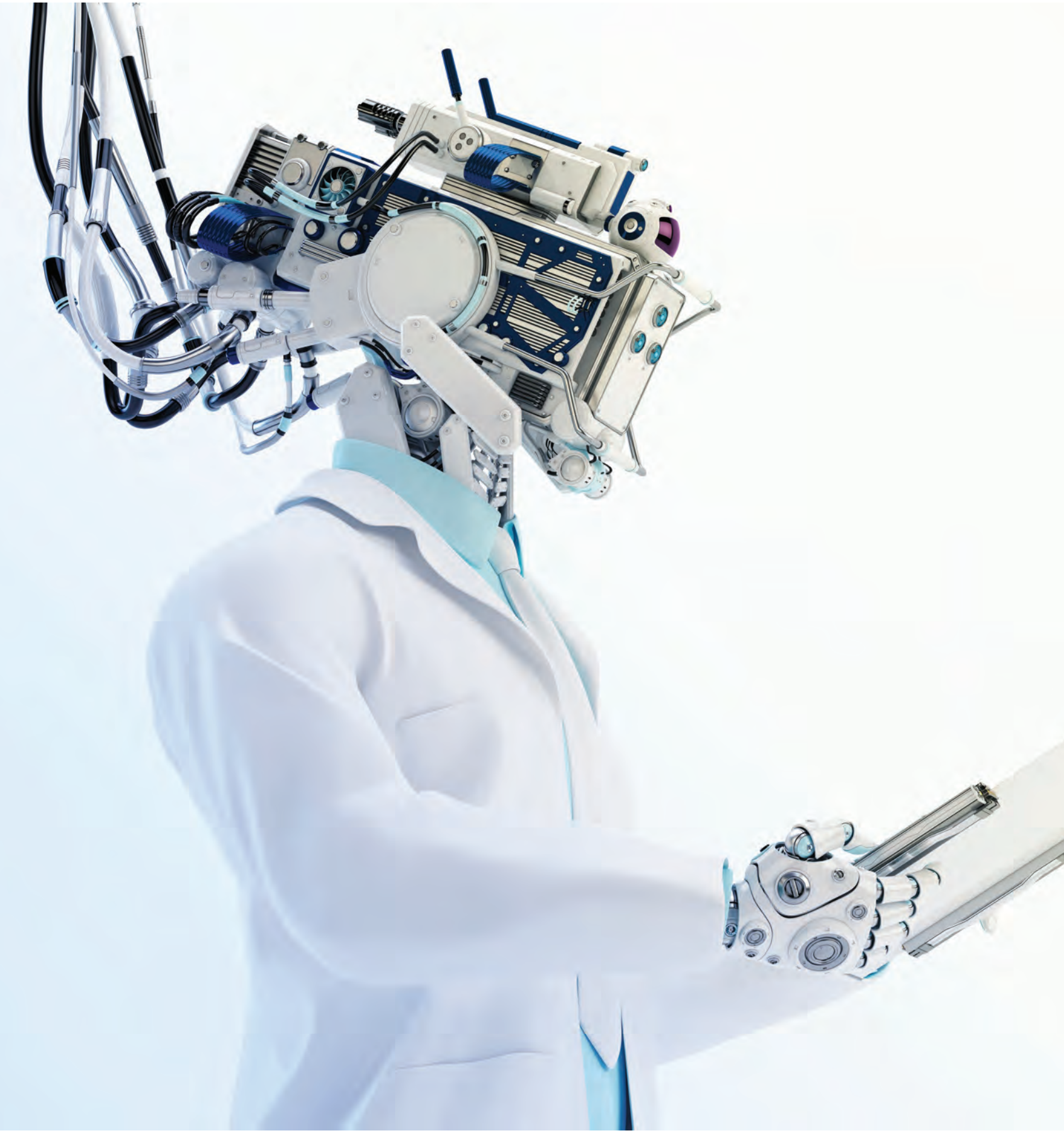
Evolve the pharma clinical development operating model

For a long time, drug development required a somewhat stable operating model for manufacturers. The broader move towards translational medicine started to change this, especially in oncology, given the low predictability of preclinical and even early-stage clinical data for later-stage significance in efficacy and safety. The change in the development paradigm, increased exploration of combination therapies and the power of advanced analytics in drug development is taking this change to another S-curve.

Clinical trial design must take into account potential opportunities for accelerated approval paths, trading additional post-approval commitments and potentially smaller patient populations with faster market entry. A deep understanding and translation of the disease biology as illustrated in the AURA3 programme for osimertinib illustrate this.

Clinical operations teams must become more agile, changing compounds more frequently with faster development paths. In addition, they will increasingly need to work across company boundaries in the pursuit of combination therapies and development partnerships. And lastly, they must harness the power of advanced analytics approaches to drive effective and efficient clinical development through patient finding, improved site selection, in-trial monitoring, and other approaches. In our experience, these approaches can liberate up to 15 to 20% clinical capacity that can be redirected to additional development programmes to develop more medicines for cancer patients globally.

Embracing these five imperatives and addressing the disruption and opportunities they bring to drug development will permit the community to develop more medicines faster and in a more directed fashion to improve the lives of cancer patients globally. AH



SURGERY AND THE RISE OF THE ROBOTS

How operations have evolved from pain and blood loss to advanced robotic procedures

By Inga Louisa Stevens, Contributing Writer

A brief history

The treatment of injuries or disorders of the body by incision or manipulation, especially with instruments has enjoyed a dramatic and groundbreaking history. Surgical procedures began to gather pace around the nineteenth century but the priority for scientists at that time was focused on tackling the three main problems associated with it: pain, infection and blood loss.

The first of these challenges to be solved was pain when anaesthetics were discovered. Nitrous oxide, commonly known as laughing gas, was discovered by British chemist and inventor Humphry Davy in 1799 which was able to numb patients' pain but was unable to knock them out.

Surgeons spent years searching for a better alternative and in 1842 the US surgeon and pharmacist Crawford Long experimented with ether. However there were some pretty unpleasant side effects to this such as vomiting and the production of flammable gas. Five years later, what appeared like the perfect anaesthetic, chloroform, was popularised by the Scottish obstetrician James Young Simpson.

While pain was seemingly conquered, infections soared as surgeons performed more daring operations. Hungarian physician Ignaz Semmelweis, one of the early pioneers of antiseptic procedures, found that he could reduce rates of puerperal fever if surgeons washed their hands, but it wasn't until Louis Pasteur published his Germ Theory in 1861 that anyone would listen to the advice of Semmelweiss. After reading Pasteur's paper, Joseph Lister found that germs caused infection and in 1867 began to use carbolic acid to sterilise operations. Carbolic acid was not completely effective and also an irritant so another method was developed – aseptic surgery which involved sterilising equipment and surgeons, prior to operations.

The problems of blood loss only began to be solved in 1900 when Karl Landsteiner discovered the different blood groups. The demand for a cure was heightened during the First World War when British doctors discovered sodium citrate which stopped the blood from clotting. Other areas of medicine such as plastic surgery were developed during this period which later on led to the pioneering work of cosmetic surgeon Archibald McIndoe in the Second World War. X-rays were increasingly used in the war as well to locate broken bones and pieces of shrapnel lodged in bodies.

First discovered by Marie and Pierre Curie, radioactivity has had a huge impact on medicine. Its major use has been in the treatment of cancer despite the damage it can do to body cells. Transplant surgery has also had an enormous influence which continues to this day. The first operation to transplant a kidney happened in 1954 and since then hearts, lungs, livers, bone marrow and brain tissue have been successfully transferred between bodies all over the world. The first keyhole surgery was performed by Hans Christian Jacobaeus in 1910.

New frontiers in surgery - the key developments

These days surgeons have a range of extraordinary, state-of-the-art equipment at their fingertips such as fibre optic cables attached to an endoscope to operate inside the body without creating large wounds, and in the future may have access to small nanotech robots to use within the body too.

Minimally invasive surgery

Performed through minute incisions rather than one large opening, minimal invasive surgery is becoming increasingly common in hospitals mainly due to the fact that patients have a faster recovery with wound healing times shorter. There is normally less trauma, scarring and a lower risk of infection than with conventional surgery but the benefits can be the same.

Endoscopic surgery

Endoscopic procedures involve incisions that are just a few millimetres followed by the insertion of a long flexible tube with a tiny video camera or endoscope attached to it. This can also be inserted through a natural orifice such as the nostrils or mouth. Images from this examination can then be enlarged and projected on to a screen in the operating room to enable surgeons to get a clearer understanding and view of the surgical area. Endoscopic surgery is also known as non-robotic invasive surgery. Other instruments allow surgery to take place by exploring, removing or repairing problem areas.

Some of the conditions treated using endoscopic surgery include pancreatic cancer, hernias, liver and lung tumours, skull-based brain tumours and heart conditions such as atrial septal defects and aortic insufficiency.

Robotic surgery

Doctors are afforded greater control and vision thanks to advanced robotic systems that enable them to perform safer, more precise and less invasive surgery. Procedures involve operating from a console equipped with two master controllers that operate four robotic arms. This takes the place of hand movements ▶

and can be a lot steadier and more precise. It then allows surgeons to see the procedure better than ever before by viewing a high-definition 3D image. Conditions treated by robotic-assisted surgery include pancreatic, gallbladder, head and neck cancer.

There have been many examples of successful operations using this revolutionary new technology. In 2007 a 59-year-old German woman who had spent 55 years with part of a pencil inside her head finally had it removed via endoscopic sinus surgery. The surgery team at Berlin-Weissensee Clinic carried out the operation using a 3D construction of Margret Wegner's skull and an endoscopic procedure that allowed them to open the frontal sinus which had suffered serious inflammation.

Surgeons from Southampton University in the UK helped to pioneer endonasal endoscopic skull-base surgery where previously surgeons had to perform the operation by splitting the facial skeleton or peeling back scalp and removing the skull on the forehead. It allows surgeons to reach a tumour with minor disturbance to the surrounding parts of the brain. Patients make a quick recovery and are usually discharged within 48 hours.

The first robotic surgery in the world for a heart located on the right side of the body was performed last year at Al Qasimi Hopsital in Sharjah, UAE, and broadcast live on the internet to thousands of surgeons around the world. Consultant cardiologist Dr Arif Al Nooryani said the operation was a breakthrough for the region and showed that the Middle East "is not inferior to others" and can perform the same operations as in Europe and maybe do them even better.

Man vs. Machine

Simon Leonard, a Johns Hopkins University computer scientist last year published research showing that a robot surgeon can better adjust to the subtle movement and deformation of soft tissue to execute precise and consistent suturing. Leonard, an assistant research professor in the Whiting School of Engineering, who worked with five co-authors said there is a wide range of skills out there among surgeons. Leonard worked for four years to programme a robotic arm to precisely stitch together pieces of soft tissue. Soft tissue can move and change shape in complex ways as stitching goes on, requiring a surgeon's skill to respond to these changes to keep suturing as tightly and evenly as possible. According to the researchers, more than 44.5 million soft-tissue surgeries are performed in the United States each year.

In a recent survey in the United Arab Emirates, half of respondents said they were happy for a robot rather than a doctor to perform a minor surgical procedure. The survey also found two thirds of the Middle East respondents were willing to replace human doctors with AI and robots, with 62% agreeing in the UAE. Just 26% of those surveyed in the UAE were against technology replacing human doctors.

Even for getting an initial consultation, patients could be shaking hands with a robot rather than a real doctor. Already Robo Doc, an interactive hospital robot that lets specialists examine and diagnose patients, is being used extensively at Hatta Hospital in Dubai, UAE. It is also helping to reduce costs. A human doctor examining a patient costs around $90 whereas Robo Doc can do it for $40.

More local training is vital

Many see robotic surgery as the future for patients. Robotic surgery could soon be the new norm. For more than a decade, robotic machines have largely been used in private hospitals and doctors have had to travel overseas for training. However that is changing in many parts of the world where more localised training is being introduced and the technology more widely available. In Australia for instance, more surgeons will now be trained following the opening of a dedicated training centre at Sydney's Royal Price Alfred Hospital.

The World Laparoscopy Hospital has recently opened a branch in Dubai to provide aspiring trainees, doctors and surgeons with training in robotic and laparoscopic surgery. Professor Prokar Dasgupta, Professor of robotic surgery and urological innovation at King's College London said previously that surgeons wishing to be trained in robot assisted surgery have had to travel abroad which needed effort and investment but now surgeons who are home-grown can increasingly be trained locally.

"Through the training centres, the number of surgeons that can operate using the robots will increase, so more people will have access to the best quality care."

In a BBC interview, Louise de Winter, CEO of the Urology Foundation added: "Robotic surgery will have enormous benefits for future generations. Patients are able to get out of hospital sooner, recover quicker and get back to normal life faster. That is hugely important for the morale of people and frankly for society and the economy at large." AH

To know more, please attend the Surgery Conference scheduled to be held from 29th January to 1st February at the Arab Health Congress

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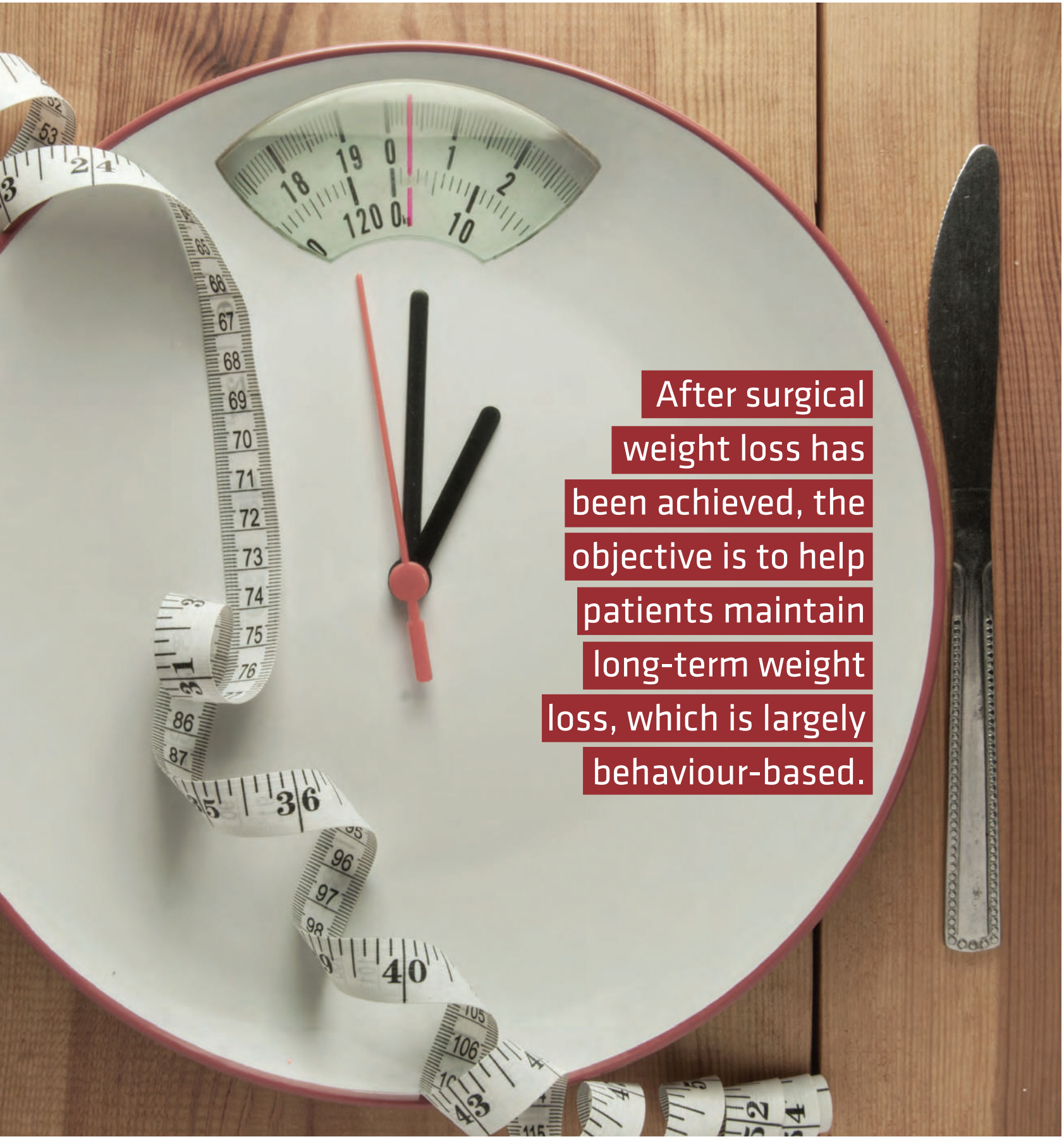

After surgical weight loss has been achieved, the objective is to help patients maintain long-term weight loss, which is largely behaviour-based.

Weight Regain after Bariatric-Metabolic Interventions:

Challenges and necessity of choosing the optimal procedure

By Raul J. Rosenthal, MD FACS, FASMBS, Professor of Surgery and Chairman, Department of General Surgery and Director, The Bariatric and Metabolic Institute Cleveland Clinic, Weston, Florida

The World Health Organization (WHO) statistics indicate that in 2016 at least 650 million adults worldwide were obese. Today, bariatric surgery has become one of the most important tools for treating obesity. Positive effects in patients' comorbidities and mortality reduction are undeniable. Weight loss surgery (WLS) has resulted in remission or cure of medical problems such as diabetes, in obese populations.

Although bariatric surgery is an important tool for treating obesity, it is not the only one surgeons need to use. It may be considered an initial approach to succeed in the management of morbid obesity; however, a multidisciplinary evaluation is the only approach that would encompass all factors in totality. This approach will maximise the chances of achieving the desired results.

After surgical weight loss has been achieved, the objective is to help patients maintain long-term weight loss, which is largely behaviour-based. This goal can be achieved with continuous followup and by helping patients create lifelong habits that promote weight loss, such as healthy eating and regular physical activity.

Unfortunately, some weight loss surgery patients do regain their weight after losing it, often due to persistent eating disorders, lack of lifestyle modifications, psychiatric problems, medical conditions, or failure of the weight loss surgery itself. Procedure-related failures can result from dilation of the sleeve gastrectomy (SG), or the gastric pouch in the case of Roux-en-Y gastric bypass (RYGB), gastrogastric fistulas, or slippage of the gastric band. Most of these patients stop losing weight after 24 months, and up to 18.8% will present with weight regain after 4 years, often requiring another surgery.

Managing weight regain is a major challenge. There are several possible scenarios for weight regain, including patients who have serious medical complications from previous surgeries, patients who failed to lose the weight necessary to achieve resolution of their comorbid disease, or patients who have regained their weight after an acceptable initial weight loss. Further research is needed to identify optimal management and treatment strategies for preoperative and postoperative bariatric surgery patients in order to maximise weight loss and minimize weight regain.

Of the several bariatric surgeries described, all might have different weight loss mechanisms, comorbidity resolution incidences, and failures rates, but all share one complication: weight regain. This is the reason for up to 50% of reoperations.

The growth of bariatric surgery and obesity rates has created the negative trend of new centres all over the world performing weight loss procedures without proper training and, as a result, increasing failure rates. How to individualise treatment is a topic surgeons will need to research further.

Different strategies have been described to treat this condition, from medical treatment and nutritional assessment to surgical revision or conversion to a different type of bariatric surgery. However, there are no current guidelines or an accepted algorithm in the literature. The following is my approach to this condition.

Hazards of weight regain

1) Diabetes

Bariatric surgery is extremely effective in the treatment of diabetes. The mechanism of action is related to weight loss and metabolic changes in intestinal hormonal regulation. While surgery brought a paradigm shift in the hormonal pathophysiology of diabetes in the obese, weight loss or regain still has an important role. Weight regain can result in a quick relapse of poor glycemic control and diabetes. Insulin resistance is very sensitive to weight; diabetes can disappear with weight loss but can also return very quickly with weight regain. Insulin resistance and secretion will vary according to weight.

2) High blood pressure

High blood pressure, as well as diabetes, can quickly return with weight regain because it is a symptom of an overwhelmed system; at least 1 in 3 obese patients have hypertension.

3) Heart disease

Weight gain, and even rapid weight loss followed by weight regain, can put a person at risk for heart disease because it compromises the strength of blood vessels and muscles, and adds to the stress that surgical anesthesia has already placed on the heart and surrounding tissues.

4) Other comorbidities

It is important to keep in mind that obesity is a disease that goes from the top of the head to the tip of the toes. This disease can affect any organ, and it is just a question of time for new related diseases to appear with weight gain. ▶

Anatomical factors for weight regain

1) Stretching the stomach

In any procedure in which the stomach has been surgically reduced overeating can stretch the stomach out. The fact that the stomach regains size over time with continued overeating will virtually reverse one of the most important aspects of all bariatric procedures which is the lack of restriction to food intake. The progressive weight regain will be directly proportional to the volume that the pouch or stomach can contain, but there is no literature that sustains that RYGB or SG stomachs can go back to pre-surgical size.

2) Choosing the right procedure

Most procedures for the treatment of morbid obesity carry a percentage of patients that either fail to lose adequate weight or regain weight in the long-term. Matching the right procedure to the right patient and using evidence-based medicine to optimise the chosen surgical technique is key to maximising the success rates. Factors to be considered for the choice of right procedure are: patient's BMI; comorbid conditions; surgical history; age; insurance coverage; and patient's preference.

The surgeon's goal is to achieve the best weight loss outcome with resolution of comorbid illnesses, minimal morbidity and reduce the need for potential reoperation. Unfortunately, there is no perfect surgery and a significant number of patients require some sort of reoperation or revision of an anatomical abnormality or complication.

3) Technical pitfalls

Despite choosing the best procedure for each patient, in certain circumstances, the procedure itself can fail or be a major contributing factor in the failure to lose weight.

There are several problems that should be carefully avoided depending on the primary procedure of choice, including:

1. For Gastric Bypass

a) The large pouch: RYGB has two proposed mechanisms—the restrictive component and the malabsorptive component. The restrictive component of a small pouch is the key element on reducing the amount of food intake and has a major role in RYGB. A large pouch will cause less restriction and make the patient prone to eat more. Also, a large pouch will distend more easily than a small one. The volume that a pouch should be able to hold is approximately 10-30cc.

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b) Large anastomosis: The gastric pouch is not the only restrictive component that makes the RYGB work. The size of the anastomosis is what will finally increase the pouch´s emptying time and prolong the time of satiety. There are different techniques to perform the anastomosis; the two most often used are linear stapling and circular anastomosis stapling. Surgeons should review and consider whether they are using the right size with the circular stapler. In the case of a linear stapler, surgeons need to review their technique to verify the size of the anastomosis.

c) Short limb: The malabsorptive component of RYGB or DS is based on the length of the roux limb or alimentary limb. This is a very important component of the derivative surgeries. It is a common strategy to increase the length of the limb according to BMI; the length of the limb must balance weight loss against the possibility of malnutrition. This might encourage some surgeons to shorten the limb and consequently achieve less weight loss. However, some studies have found no difference between short and long limb RYGB.

2. For gastric sleeve

a) Large sleeve: One of the technical issues of concern here is the size of the bougie used. Sometimes even when small-sized bougies are used, patients do not achieve an acceptable weight loss or may regain weight more frequently. This is possibly because: a) the size of the bougie was too large or b) the bougie may have not been used properly and the sleeve was too loose. In the second situation, the over suture can help to reduce the size of the sleeve. The size of bougie should be between 34 and 40 F.

3) For gastric banding

Poor patient selection is probably one of the two main reasons why patients require a reoperation due to failure of weight loss or weight regain. The second important reason is poor adjustment schedule due to surgeon's inexperience and/or patient's poor compliance.

4) Anatomical problems resulting in reoperations:

Gastrogastric fistula (GGF): This is a complication seen in RYGBP patients only. The exact incidence of GGF is unknown as groups of patients can be asymptomatic. This complication is now rare, and in experienced groups it can be present in approximately 1% of patients. Patients with GGF may complain of reflux, abdominal pain, nausea, failure to lose weight, or weight regain. This unusual communication between the gastric pouch and the remnant stomach can have an acute or chronic presentation. In an acute presentation, the patient shows symptoms related to epigastric pain, and can appear ill. In the chronic setting, weight regain and loss of restriction are frequently seen. Epigastric pain is explained by the association of GGF with marginal ulcers or leaks.

b) Pouch dilatation: This is the result of a poor surgical technique or a long-term result of an eating disorder whose incidence increases with time. It is usually related to continuous overeating, which will over-distend the gastric remnant and progressively increase the size. It is questionable if a narrow anastomosis plays a role in the development of a dilated pouch. The mechanism would be immediate pouch distention with a minimum amount of food. This complication is associated with marginal ulcers also, due to increased acid secretion.

Sleeve dilatation: This is the most common long-term anatomical abnormality that results in weight regain after sleeve gastrectomy. The main reason for a sleeve to become dilated is due to a failure in the primary procedure. In super obese patients, or if a non-diagnosed hiatal hernia is present, the fundus may be difficult to visualise if insufficient dissection is done and, this can contribute to a major gastric capacity.

Management approach

1) Observation and medical assessment

Two years after the initial procedure, nearly 8% of patients not only stop losing weight but also tend to regain it. Followup and observation are the most important approaches to assessing where the problem lies and for explaining the reason for weight regain. The observation period for a reoperation ideally should be 6 months to assure compliance with diet and stabilisation of medical conditions.

2) Nutrition and psychiatry

A good response in the treatment of binge eating is to give the patients the option of a better result. It has been emphasised that this problem should be managed preoperatively. Ashton et al suggest that patients with binge eating disorder, even with treatment, may have poorer results than patients who do not have this condition. If the eating disorder was missed prior to the first procedure, afterward is the time to have a meticulous evaluation and management.

Depression is a psychiatric disease with high prevalence in the obese population and it needs to be treated and reassessed during follow up. It is important to determine any emotional factor (relative bereavement, divorce, family problems) that may explain a change in eating behaviour or physical activity. Medication regarding this condition must be adjusted if required.

Behavioural therapy is necessary to support and motivate obese patients to adhere to their new eating habits and lifestyle. The fundamental behavioural components to maintain surgical weight loss include dietary control, commitment to regular physical activity, and behaviour modification. Many formerly obese individuals ultimately experience weight regain due to noncompliance.

3) (Testing) Ruling out an anatomical abnormality

Upper GI (UGI): This is a test that I recommend as a postoperative evaluation following every bariatric procedure. Its role is important in diagnosing both acute and chronic complications. I consider this exam as part of the postoperative routine. During followup, it is a great tool for diagnosing complications related to weight regain, such as dilated gastrojejunal anastomosis or pouch in RYGB, gastrogastric fistula, and dilated sleeve gastrectomy or slip band. Before attempting any treatment option, this exam should be performed. In patients that underwent an LAGB, the adjustment under fluoroscopic guidance can help the surgeon achieve the adequate restriction.

EGD: This is the most important tool in the diagnosis and management of bariatric complications. It should be used after performing an upper GI (UGI) gastrograffin test. The gastrogastric fistula can be diagnosed with an UGI but is not always seen in the EGD. It may be visualised when it is larger than 0.5 cm. In certain situations, the scope can be passed into the remnant stomach. In this scenario, an endoscopic closure attempt should be the next step in managing the complication.

Endoscopic Treatment Options

Although not yet scientifically validated in prospective randomised studies, when the anastomosis is dilated in the gastric bypass, one option in management is to endoscopically narrow the anastomosis. This technique is still under study and should be performed by skilled endoscopists in experienced centres. The ROSE procedure (Restorative Obesity Surgery, Endolumenal) uses an endoscope to place tissue anchors in order to reduce gastrojejunal anastomosis (GJA) or the gastric pouch. One of these therapies is an endoscopic plication of the stoma used to reduce its diameter and length.

Surgical Options

Reoperations in bariatric surgery can be classified in reversals, revision and conversions. In patients with failure of weight loss or weight regain, revisions and conversions are the only ones to be considered.

Before performing any kind of surgical reoperation, it is imperative to review the nutritionist and psychologist evaluation, the UGI and EGD results and of course, request the operative notes of the primary procedure. There is much relevant information that can be gathered here which can prepare surgeons for unexpected situations and help prevent further complications or unnecessary treatment.

Surgeons should be prepared for prolonged surgeries due to possible extensive lysis of adhesions or an unclear anatomy. I recommend having an endoscope available in the operating room, which would be of great use to identify important landmarks.

I believe that the strategy to manage weight regain must be based on thorough studies and on the patient´s preparation. The most important factor is to choose the right procedure at this moment. AH

Dr Raul J. Rosenthal is a Speaker at the Surgery Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

OBESITY:
Nature, Causes and Management

By Prof Safwan A. Taha, MD, FACS, CABS, FRCSGlasg., Medical Director, Consultant Laparoscopic and Bariatric Surgeon, Director of the Bariatric and Metabolic Surgery Center, Mediclinic Airport Road Hospital, Abu Dhabi, UAE.

During my long service as a bariatric (weight loss) surgeon, I literally struggled, and still do, with the enormous "misunderstanding" of the concept of obesity as a disease and the "confusion" surrounding its effective treatment. So many misconceptions of obesity and deep-rooted illusions regarding its management need to be challenged in order to help the community defeat one of the most serious threats to its wellbeing.

This article was written within this perspective and aims at giving the general public as well as the non-bariatric physician a clear definition of obesity, its etiology, prevalence and management.

Obesity is a disease

The first thing we need to know is that obesity is no longer a condition that is stigmatised by the perception of it being caused mostly by the modifiable behavioural factors of diet and physical inactivity; the penalty that we pay for our "bad eating and exercising habits". It is now recognised

worldwide as an actual disease which, like all other diseases, requires active management for cure and not only behavioural changes. There is currently a rich body of literature to demonstrate that obesity is a complex disease condition mediated through the interplay of multiple genetic, biologic, metabolic, behavioural, social, economic and cultural factors.

Back in 2013, and for the first time, the American Medical Association (AMA), one of the most credible medical bodies in the world, officially declared obesity as a disease. Thus began the transformation of the idea that obesity is caused by weak will power, insufficient discipline and wrong eating choices; a change that stressed the importance of addressing obesity and dealing with the stigma that is often associated with the condition.

The Canadian Medical Association (CMA) followed suit and declared obesity as a chronic medical disease requiring enhanced research, treatment and prevention efforts. "It is important for healthcare providers to recognise obesity as a disease so preventive measures can be put in place and patients can receive the appropriate treatment," CMA President Cindy Forbes had pointed out then.

According to Webster's Dictionary, a disease is "a condition that impairs normal functioning and is typically manifested by distinguishing signs and symptoms."

One of the most comprehensive definitions of obesity that fulfils those criteria is provided by the Obesity Medicine Association in "the Obesity Algorithm" where obesity is defined as a "chronic, relapsing, multi-factorial neurobehavioural disease wherein an increase in body fat promotes adipose tissue dysfunction and abnormal fat mass physical forces, resulting in adverse metabolic, biomechanical and psychosocial health consequences."

Obesity results in increased accumulation of fat that is not always directly attributable to consuming too much calories or abstaining form physical activity. Victims of obesity develop impaired metabolic pathways with disturbed signaling for hunger and satiety (feeling of fullness). For most obese people, efforts to lose weight are generally met with strong resistance or, even worse, disappointing weight regain.

Having said that, please don't get the other dangerous misconception that behavioural (eating habits/exercise) and environmental factors have nothing to do with obesity since all determinants - behavioural, environmental and genetic - need to be addressed to solve the problem of obesity.

Size of the problem

Almost 35% of all adults and 17% of children (ages 2-19 years) in the USA are obese by definition which makes obesity one of the greatest public health challenges of our time especially considering that it has been shown to causally relate with or raise the risk for multiple medical conditions including type 2 diabetes mellitus, hypertension, dyslipidemia, coronary heart disease, cerebrovascular disease, sleep apnea and other respiratory problems, gastrointestinal conditions such as reflux, non-alcoholic fatty liver, gallbladder disease, osteoarthritis, reproductive disorders and some cancers. Obesity also leads to premature death in individuals who are severely overweight with death rates increasing at least by 200% for both men and women who are significantly overweight (more than 23 kg excess of body weight).

It is predicted that obesity will become the global number one health problem over the course of the next few years (Figure 1).

One problem with treating obesity is that many obese people don't flag themselves as obese and another one is that many of those who do just don't spend enough effort facing it.

So who is considered obese, by definition?

We currently use a formula that relates a person's weight (kg) to their height (metres) to give us their Body Mass Index (BMI) according to the formula: ▶

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Treatment of Obesity

Treatment of obesity can be medical or surgical and with a few exceptions that are beyond the scope of this article, we must first exhaust the medical resources before contemplating the surgical options.

Medical treatment of obesity is delivered by specialised physicians and healthcare experts (bariatric physicians, endocrinologists and dieticians, amongst others). The pillars of medical treatment are:

- Diet: low in calories, fat and carbohydrates
- Exercise: ideally 40 minutes 5 times per week
- Behaviour Modifications:
- Three sensible meals/day
- Avoid snacking
- Drugs/Prescription medications
- Appetite suppressants
- Antidepressants
- Fat absorption inhibitors

Although medical treatment of obesity has succeeded in achieving a lot of success in individual cases within certain scenarios, the overall outcome as a stand-alone approach to obesity management has not been so encouraging, to say the least, mostly because:

- The majority of patients (95-97%) regain most or all of the weight that was lost within 2-5 years following diet or drug treatment.
- The average amount of weight loss is relatively small.
- Drug therapy may be associated with severe complications (especially heart disease).
- Most insurance companies do not cover costs associated with these programmes.
- There is difficulty for most people to maintain these programmes in the long term.
- The "yo-yo" effect of many different programmes leads to significant weight fluctuations.

Surgical Treatment of obesity

Surgeons who specialise in treating obesity are known as Bariatric surgeons. Bariatric surgery encompasses all of the various operations which have been designed to cause a significant and long-lasting weight-loss in severely obese patients. The term "bariatric" comes for the Greek words "baros" meaning weight" and "iatreia" meaning medical treatment. All bariatric procedures are currently performed laparoscopically (i.e. through small incisions of the abdominal wall).

Bariatric surgery clearly has the best weight loss outcome compared to medical treatments as 50 - 70 percent of people were able to lose at least 50 percent of the excess weight and keep it off for five years while, after five years, only 2 - 5 percent of people who dieted and exercised had maintained a weight loss of at least 10 percent. It also results in the resolution or dramatic improvement of the obesity-related comorbidities highlighted above.

Surgery for the treatment of obesity is only appropriate for those individuals with high levels of BMI who fulfil certain other medical and/or metabolic criteria. Furthermore, candidates for bariatric surgery should:

- Have no known endocrine (glandular) or metabolic causes for their severe obesity.
- Be of sound mind to understand the risks of the operation and are willing to commit to the lifestyle changes that will be necessary following surgery.
- Be able to commit to regular follow-up visits with their doctor as well as a sound diet and, possibly, exercise programme after surgery.

On the other hand, there are very few contraindications for bariatric surgery but patients with the following criteria are considered ineligible for it:

- History of substance abuse, eating disorder or major psychiatric problem which is still not treated and/or not resolved.
- Patients who are too ill or too high a risk for surgery.
- Women who are trying to or expecting to get pregnant soon.

Types of bariatric surgery:

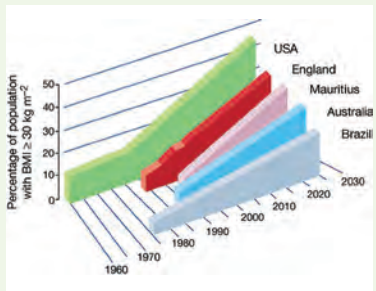
This article will highlight only the common available options that are unanimously accepted worldwide and leave the details, including potential complications, to be communicated to the patients by their treating physicians and obesity consultants.

Purely Restrictive

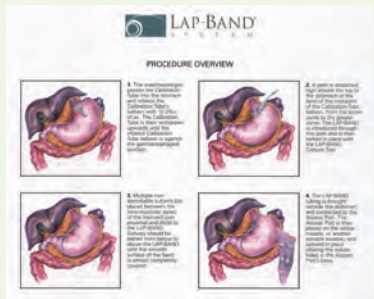
Restricts the amount of food that one can consume and therefore decreases the amount of calories taken. This type of procedure does not alter the digestive or absorptive function of the intestine.

The most famous procedure of this sort is the Laparoscopic Adjustable Gastric Band (LAGB) which was approved by the FDA for use in the US

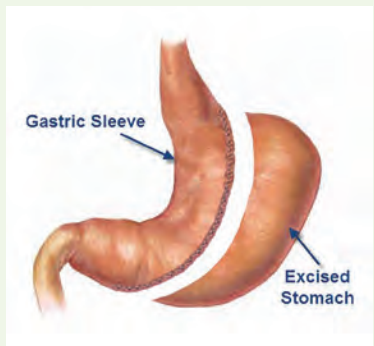
▼FIGURE 1:



▼FIGURE 2:



▼FIGURE 3:



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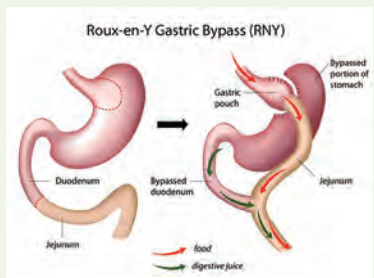

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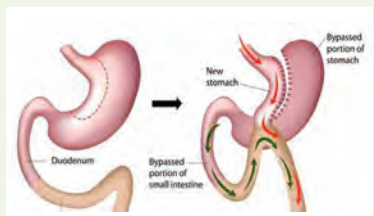
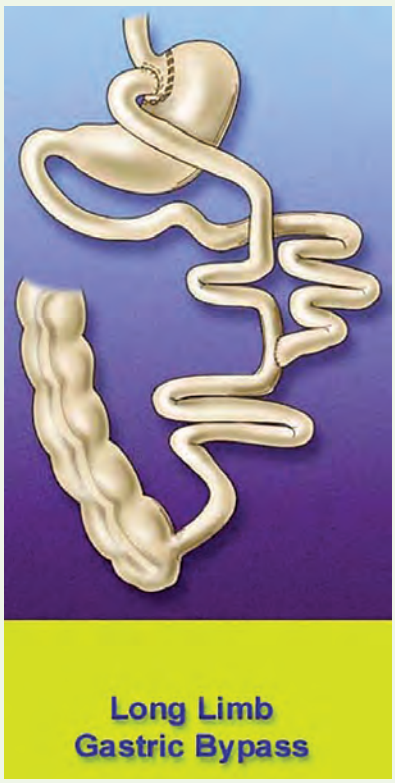


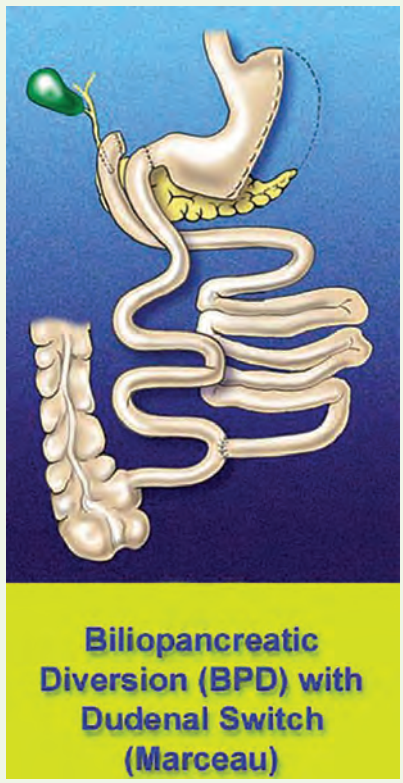
▼TABLE 1:

Body Mass Index (BMI) = Weight (kg) / Height (m)2		
Obesity status is scaled according to the BMI values obtained through this calculation (Table 1).		
Overweight	=	BMI > 25 Kg/m^2
Obesity	=	BMI 30 – 34.9 kg/m^2
Morbid Obesity	=	BMI 35 – 39.9 kg/m2
Super Obesity	=	BMI > 39.9 kg/m2

Table 1: Obesity scale by BMI

▼FIGURE 6 & 7:





in June 2001. The band is placed around the top of the stomach and induces weight loss in three ways: creating a small "stomach pouch" that fills with just a little amount of food, around 15 cc, causing a sensation of "fullness", squeezing the stomach like an hour glass keeping food in the stomach pouch (prolonging the sensation of "fullness") and indirectly suppressing the appetite, albeit mildly.

LAGB suits patients with moderately high BMI and didn't prove popular eventually because of its failure to attain high percentage weight loss on the long term as well as its long list of complications.

Mostly Restrictive

The majority of the weight loss is caused by the restriction of food and calorie intake. However, part of the procedure is directed at limiting calorie absorption from the intestine.

Notable examples of this type of surgery are:

Laparoscopic Sleeve Gastrectomy (LSG), Figure 3. Most of the stomach is excised leaving a 90-120 ml tube. It exerts its effect both through restricting intake and alterations of the hormonal profile of the patient. LSG is currently the commonest bariatric procedure performed all over the world.

Roux-en-Y gastric bypass (RYGB, also known simply as Gastric Bypass), Figure 4. It primarily causes weight loss by restricting the food intake. A small amount of malabsorption, however, does occur with this operation consequent upon the exclusion of a short segment of the small bowel from the original food path. However, it is very effective in obtaining and maintaining long-term weight loss in the long term and seems to be more effective in patients whose BMI is 50 or more especially with serious comorbidities. Late weight regain may be a problem in heavier patients, though.

One Anastomosis Gastric Bypass (OAGB), also known as Mini Gastric Bypass and Omega Loop Gastric Bypass, Figure 5. Besides restriction, a larger amount of malabsorption is created here than with RYGB because of the exclusion of a longer segment of the small bowel from the food path to the point that there are some who advocate to classify it under the "mostly malabsorptive" procedures; an issue that is still controversial. The procedure is gaining growing popularity over the past few years because of its excellent results and relatively lower complication rate than RYGB especially regarding internal herniation.

Mostly Malabsorptive

A large percentage of the small intestine is "bypassed" leading to poor absorption of the food which is eaten, especially fats. Food passes through the body without being digested.

Those procedures are of very limited application and are associated with a higher incidence of serious metabolic disorders which is why they require very diligent post-operative follow up and more aggressive supplemental medication. The two notable examples are long limb Roux-en-Y gastric bypass, Figure 6, and Biliopancreatic Diversion with Duodenal Switch, Figure 7.

Lastly, and of particular importance, it is imperative that patients do not take the matter into their hands but, rather, reach for the expert physicians, surgeons and ancillary obesity consultants to guide them through their treatment journey and help them choose the most appropriate modality for their particular case. AH

References available on request.

Prof Safwan A. Taha is a Speaker at the Surgery Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

Diabesity: The Pandemic Disease of Modern Life

WHEN WILL WE START FIGHTING IT?

By Mohammed Al Hadad, MD, FACS, Consultant Bariatric Surgeon, Healthpoint Hospital, Abu Dhabi, UAE

Obesity and type 2 diabetes mellitus (T2DM) (diabesity) are among the most serious non-communicable health problems facing mankind in the 21st century. The term "diabesity" was first used to describe diabetes + obesity in the early 1970s. It is defined as a cluster of signs of abdominal obesity, dyslipidemia, high blood pressure, high blood sugar (fasting above 100 mg/dL, Hb1Ac above 5.5), systemic inflammation and a tendency to form blood clots. The symptoms of diabesity include (but are not limited to) sugar cravings, especially after meals; no relief in cravings for sugar even after eating sweets; fatigue after meals; frequent urination; increased thirst and appetite; difficulty losing weight; slowed stomach emptying; sexual dysfunction; visual problems; and numbness and tingling in the extremities.

It is difficult to find a person in 2017 who is not affected by diabesity, directly or indirectly. However only a few people understand the relationship of all these problems with each other; they have the same underlying causes; they require the same treatment and they are almost 100% preventable and, in some cases, reversible. The term 'diabesity' can sometimes be misleading as people believe a person has to be obese to have these signs and symptoms. Yet there are many thin people who suffer from a full-blown picture of the metabolically obese.

The relationship between morbid obesity and T2DM has been well established. Research has shown that a body mass index (BMI)of 35 increases the risk of developing T2DM by 35 times in women. However, some studies suggest that the same risk is found amongst Asian (Chinese and Indian) and African populations at a much lower BMI of 24 and 25. BMI is calculated by dividing the weight in kilogrammes by the height in metres squared. The normal range in the western world is between 20 - 24.9.

Globally there is more acceptance for the definition of obesity as a disease since the very late recognition by the American Medical Association in 2013. The World Obesity Federation released a position statement in 2017 recognising obesity as a 'chronic progressive relapsing life threatening disease'. There is no single cause nor single treatment of diabesity. We need to separate between the mechanism and the effect as all theories of diabesity fail to explain the whole spectrum of the disease.

The simplest epidemiological model of obesity disease identifies the agent as food (tasty, low-cost, convenient foods are abundant in the western diet), body as the host and fat cells (obesity) as the disease.

Statistics from the International Diabetes Federation show that in 2015, DM treatment cost was 673 billion dollars (12% of global health expenditure) and there was one death from DM every six seconds. Other studies have shown that morbid obesity kills eight people every fifteen minutes. Therefore, diabesity kills an average of 158 people every 15 minutes.

In the Middle East and North Africa, there are 35.5 million people diagnosed with DM (one in two is undiagnosed) and this number is expected to double by 2040. Obesity is an even bigger problem with highest recorded prevalence of obesity in Gulf countries approaching 35% while Egypt lead in terms of highest reported age standardised adult obesity prevalence at 35.5%.

The problem is even bigger when it comes to children. Obesity was the number one health concern in the United States in 2013. In 2017, 12.7% of the children in the US are obese (highest age standardised in the world). An overweight or obese child between the age of 10 to 15 years has 75 - 85% chance of becoming a morbidly obese adult.

Diabesity is the pandemic of the 21st century and is on the rise, as 70 countries around the world doubled their obesity prevalence over the last 30 years.

The basic model shows that the modern lifestyle tasty foods, which are primarily refined wheat, fructose and industrial seed oils, activate the so-called pleasure centres of the brain, providing pleasurable rewards from eating. These are the same centres that are activated by substances of abuse. At the same time, those tasty foods have become less expensive and more abundant. Environmental toxins (chemicals like pesticides, flame retardants, and heavy metals), micronutrient deficiencies (especially magnesium and vitamin D); chronic stress (emotional, psychological, physiological); altered gut microbiota (caused by antibiotic use, poor diet, formula-feeding during infancy) and sedentary lifestyle, with or without genetic predisposition, lead to obesity which, in turn, leads to chronic inflammatory process which increases leptin resistance. Leptin is the hormone secreted by fat cells. Its main function is to provide feedback to the brain on the levels of fat in the body, suppress appetite and increase metabolism. Note that most obese people have very high leptin levels. However, there

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seems to be a defect in leptin signaling, impaired glucose and fat metabolism, B cell destruction and development of T2DM.

Diabesity is an autoimmune, chronic inflammatory disorder triggered by modern lifestyle, influenced by genetics, characterised by impaired glucose and fat metabolism and fat hormone resistance. The relationship between chronic inflammation and diabesity is more than 100 years old and has been shown in more than 1800 articles. Earlier, T2DM was treated by a high dose of salycilates which makes all symptoms disappear but that treatment fell out of favor because of the serious side effect of high doses of salycilates.

Diabetes used to be a disease of the middle aged and the elderly. Not anymore. A recent study indicated that nearly one in four kids between the ages of 4 and 18 have pre-diabetes (glucose intolerance). Some regional studies reveal that type 2 diabetes in kids has jumped from less than 5% before 1994 to 50% in 2004.

In spite of all the above frightening figures, no real action has been taken; and diabesity continues to be treated with conventional approach, which proves its dismal probability of success. As Einstein once said, "insanity is doing the same thing over and over, and expecting a different result."

If we want to deal with the diabesity pandemic, we must first bust all the myths about it. The truth is:

- Obesity is not as simple as eating too much and not exercising
- Diabetes is not always progressive, and can be reversed in many people
- Diabetes is not caused by consuming too much carbohydrates alone
- A fasting blood sugar of 95 mg/dL and Hb1Ac of 5.5% is not "normal"

Thin people can get type 2 diabetes

Using medications or doing bariatric surgery to treat symptoms like T2DM, dyslipidemia, hypertension, and the other complications is similar to mopping up the floor while the sink overflows. We have a choice, we can continue to mop up this overflow, or we can deal with the source of the problem and turn off the faucet and treat the root problems that are causing the illness.

Most people think they are gaining weight because they don't exercise. However, maintaining weight requires a lifelong lifestyle modification. This consists of a combination of adopting healthy balanced dietary habits, healthy lifestyle (eliminate stressors and getting enough sleep), as well as regular moderate intensity exercise (minimum of brisk walking or light jogging) for minimum of 150 minutes per week.

The key element in fighting the diabesity global pandemic is through raising awareness through national, regional, and global prevention programmes. This can take place through educating the public about the risks of modern lifestyle, poor dietary habits, chronic psychological stress, sleep deprivation, toxins and micronutrient deficiencies and sedentary lifestyle. The overflow of this pandemic can start being controlled through educating the new generation. This starts with introducing educational programmes in primary and secondary schools to create awareness on the dangers of regular consumption of high calorie fast food, educating our children about healthy dietary habits and increasing school exercising programmes. AH

Dr Mohammed Al Hadad is a Speaker at the Obesity Conference scheduled to be held from 31st January to 1st February 2018 at the Arab Health Congress.

From Supply Chain Strategy to Execution

PATIENT SAFETY & QUALITY OF CARE

By Arab Health Magazine Staff

"We have to cancel this emergency surgery because we don't have the right equipment," says the Surgeon

"We don't have enough vaccine stocks for your newborn baby," says the Midwife

"Sorry, we don't have your cancer medication at the moment and we don't know when we are going to get it,"

says the Doctor

These are some of the real and alarming situations that healthcare professionals have found themselves dealing with, where patient safety and quality of care can be potentially compromised. This begs the question: Why is this happening and why is it not being fixed?

The issues in supply chain are well recognised. In the Middle East, supply chain has struggled to keep up with the rapidly expanding healthcare sector. Developing a Procurement and Supply Chain strategy, as discussed in the previous article titled *'Supply Chain Management: Top 5 Improvement Themes'* published in Issue 4 2017 of the *Arab Health Magazine,* is an important first step in addressing these issues by underpinning supply chain management with clinical service provision, and empowering hospitals in the Middle East to save money and improve quality outcomes.

However, strategies that do not translate into implementation with tangible results will not address the underlying patient safety and quality of care issues, as a trauma surgeon, who works at a high-level trauma centre in the GCC, states:

"I understand that there is a national strategy for supply chain but as a trauma surgeon in this hospital, I see a number of patients scheduled for surgery negatively impacted by supply chain difficulties," he says. "I had a patient come into the hospital with a pelvic fracture that required fixation under general anaesthesia. The instruments and implant range required for the surgery were incomplete, and there were no appropriate surgical gloves that I could use. The surgery had to be cancelled and this will obviously affect the patient's clinical outcome."

The Issues

The implementation risks to patient safety and quality of care can be summarised into the following three key areas:

1. Significant disconnect between national strategy design and local implementation

While good forward-facing steps have been taken in recognising difficulties within the procurement and supply chain as well as designing a strategy to address that, challenges remain in translating strategy into an effective local implementation plan, thereby increasing the risk of adverse impact on patient safety and quality of care. The challenges faced in appropriate implementation can lead to patient-associated risks, e.g. patient-required items not being available, or that these items are substituted, by suppliers, with other items that may have expired or are simply obsolete or expired.

"We have visited several public hospitals within the Middle East and noted shortages of basic medical supplies in certain patient-treating hospital domains essential for ensuring patient safety and maintaining quality of care. These include items such as medications, gloves and sutures," says Hamish Clark, PwC Partner in the Middle East Health Industries Practice. "The treating teams have regularly expressed their frustrations about patients being put at risk and their quality of care being potentially compromised because of these difficulties."

2. Governance structure and understanding of value add

Healthcare organisations treat supply chain as a support function to their operations with little value add attributed to it. While this has started to change in the Middle East at a national level, this has not, as yet, filtered down to the local implementation stage.

According to Clark, procurement and supply chain activities within local organisations are invariably undertaken by healthcare professionals (HCPs), who are not appropriately trained in this domain. "Additionally, the time spent by HCPs dealing with procurement & supply chain can be better spent treating patients, providing a high level of quality and safe patient care," he adds.

A transition to an integrated procurement & supply strategic function, with appropriately appointed and trained dedicated staff, processes, and digital enablers in place, would significantly improve patient safety and quality of care.

3. Lack of transparency and visibility

With the significant manual processing present in healthcare procurement & supply in the Middle East, adverse patient events are always a risk. Additionally, the lack of transparency and accountability across the chain can allow for patient safety factors to be compromised and quality of care to be impacted (missing items, expired items, obsolete items, poor forecasting, inappropriate forecasting, etc.)

"Healthcare globally is driven nowadays by science and technological innovation," says Clark. "It is clear that advanced integrated inventory systems, to include automated technology that deliver supply chain data and analytics, are the next logical evolutionary step for healthcare supply chains. These will allow for transparency, accountability and support patient safety and quality of care while reducing costs and improving workflow." ▶

Hamish Clark is a Partner in the PwC Health Industries Practice based in the Middle East. His core expertise is cost reduction, efficiency and productivity with hospitals and also has extensive whole system transformation and merger and acquisition experience in health.

The International Benchmark

The United Kingdom's National Health Service (NHS) is in the top five of the world's largest workforces and, as funding comes principally from taxation, the service is under intense pressure to reduce its levels of expenditure.

Historically, the NHS ran an inefficient and broken down supply chain with supply chain operations that were inadequate, inefficient, and costly, with many hospitals at different levels of supply chain maturity. This centralised service with minimal local 'bottom-up' input was putting patient safety at risk. This eventually transitioned to a fully de-centralised model which was also inefficient and highly cost-ineffective.

Procurement was predominantly carried out at the local level through trusts - the public-sector organisations that serve a geographic area or provide a particular healthcare service – and there was no single, national product database with consistently described data. Purchasers, therefore, were blind to the prices that other trusts were achieving. This silo-based approach created a number of inefficiencies, such as a lack of inventory visibility, poor-quality data, product wastage, inconsistent stock levels, lack of storage, and security problems.

Now, with the application of new technologies such as inventory management solutions developed specifically for the NHS, and the trend towards managed services evolving rapidly, the final "hybrid" state is gradually making way for improved practices. This ensures patient safety and quality of care maintained through transparent processes, and visibility across all chain while maintaining efficiencies and cost-optimum state.

Further assurances of patient safety and quality of care come from organisations, such as the Medicines and Healthcare products Regulatory Agency (MHRA) that regulates medicines, medical devices and blood components for transfusion in the UK. As an executive agency of the Department of Health, the agency is responsible for ensuring that the supply chain for medicines, medical devices and blood components is safe and secure.

The agency's priorities include early access to medicines schemes, introducing a combined reporting system for adverse incidents, medicines, medical devices, blood and counterfeit products to ensure patient safety, and working with their partners across the UK, Europe and globally to prevent counterfeit and substandard products entering the supply chain.

The Solution

In order to make headway in procurement & supply chain management in the Middle East, a national strategy should have a significant bottom-up component to allow better local implementation. All key stakeholders – from local, regional and regulatory levels - should be involved and appropriate transparency and accountability must be in place across a visible digital supply chain.

An integrated procurement & supply chain function in healthcare can be established that is engaged and viewed as a strategic partner at national, regional and local levels, with appropriate processes, procedures, policies, digital enablers and service delivery models. HCPs should work closely with the integrated supply chain, particularly in helping with standardisation and working in a multi-disciplinary governance environment that drives down cost and improves outcomes.

The combination of the above points can lead to the development of Procurement & Supply Chain Excellence, defining strategy, policies, standards and implementation roadmaps with strategic business partners working across national, regional, and local areas.

PwC has been engaging with multiple healthcare clients to deliver improvements and efficiencies in their procurement & supply chain function by helping shape the national to local strategy and aligning it to the respective implementation roadmaps, recommending the appropriate procurement and supply chain operating and service delivery models, as well as directly influencing sustainable efficiencies and capacity improvements through coaching, training, and the establishment of policies, procedures and standards.

"How many organisations have a process that simultaneously harms their customers and loses the company money? If you ran an airline that did that, you wouldn't stay in post for very long. But in healthcare that's precisely what is happening with supply chain," says Clark.

"Enabling an integrated Supply Chain, with the right strategy and implementation, that is aligned with all key stakeholders and executed well, would ensure the highest safety and quality of care standards, while delivering on significant cost savings for organisations," he concludes. AH

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THREE-DIMENSIONAL PRINTING

Three-dimensional Printing Supports Individualised Therapy in Cardiovascular Medicine and Surgery

By Thomas Bartel, Department of Cardiovascular Medicine, Heart & Vascular Institute; and Andrew Rivard, Imaging Institute, Cleveland Clinic Abu Dhabi, UAE

Thomas Bartel, MD, PhD, FESC, Section Head, Invasive Cardiology, Professor of Medicine, Heart & Vascular Institute, Cleveland Clinic Abu Dhabi

Three-dimensional (3D) printing has significant advantages over other imaging techniques because it can represent anatomical structures inside the body. As the complexity of procedures in medicine has increased and become minimally invasive, the need for realistic representations of human anatomy is becoming increasingly important. The heart is a complex organ which has valves, chambers, and vessels of which, especially in congenital heart disease, can be difficult to represent using conventional imaging techniques. 3D printing can be used for surgical planning, patient education, and student teaching.

Creating a 3D printed model first starts with 3D data sets usually obtained by computed tomography (CT), magnetic resonance imaging (MRI) and 3D echocardiography. This initial step called "segmentation" allows specific heart and vascular imaging information to be extracted from the original raw data, which comes in Digital Imaging and Communication in Medicine (DICOM) format. Unfortunately, DICOM files cannot be utilised by 3D printers. Therefore, they have to be converted into Standard Tessellation Language (STL) format and will need further post-processing to optimise the form for printing (Figure 1).

A variety of 3D printing techniques and materials are available, some of which are well suited to the needs of cardiovascular medicine and surgery. The most useful are sterolithography, selective laser sintering, binder jet, poly jet technology, and fused deposition.

Stereolithography represents an early technique based on a layer by layer photopolymerisation. This technique reveals transparent or non-transparent but rigid printouts and is therefore not ideal for purposes in cardiovascular medicine.

Selective Laser Sintering (SLS) considered an outclassing technology uses laser as a power source to sinter powdered material. This technique enables 3D printing of delicate cardiac structures, e.g. native valves. Its dissemination is still limited owing to high production costs.

Binder Jetting is a technique that creates artifacts through inkjet printing of binder into a powder bed of raw material, provides with rigid and non-transparent printouts. It is capable of printing substructures, e.g. ventricles, atria and large vessels in different colours.

PolyJet Technology provides with dual-material printouts combining smooth, soft and transparent material with hard and non-transparent components. The advantage of this technique is its capability of printing pathology or implants being visible through surrounding native tissue.

Fused Deposition Modeling also known as Fused Filament Fabrication or Plastic Jet Printing utilises melted thermoplastic material being supplied layer by layer as the material hardens immediately after extrusion from a nozzle which can turn the flow on and off.

Similar to printing on paper, 3D printing deposits a small amount of material onto itself, making many passes to grow the form. The time to complete a 3D printing varies from three fours for distinct cardiac or vascular structures to a full day for complete hearts. Because 3D printing is relatively new the costs are still considerable and usually start around $1000 but depend much on the quality of equipment and the institutional volume.

3D printing can be used for preprocedural preparation of complex interventional procedures. Tangible benefits resulting

from 3D printing have been shown for transcatheter aortic valve replacement (TAVR), percutaneous mitral valve repair and device closure of interatrial communications. Device selection, sizing of defects and solid structures as well as general 3D conceptualization are clearly shown in the 3D models. Accurate imaging of pathology including its anatomic features and spatial relation to the surrounding structures is critical for selecting optimal approach and evaluation of procedural results. For example, a high-frequency ablation procedure for treatment of atrial fibrillation using 3D printing allows patient specific optimisation (Figure 2) importantly including optimal catheter selection which can be tested in the 3D model prior to the procedure. Similarly, physicians-in-training can also practice and develop adequate skills on dedicated 3D models before translating them into optimal procedural accomplishments.

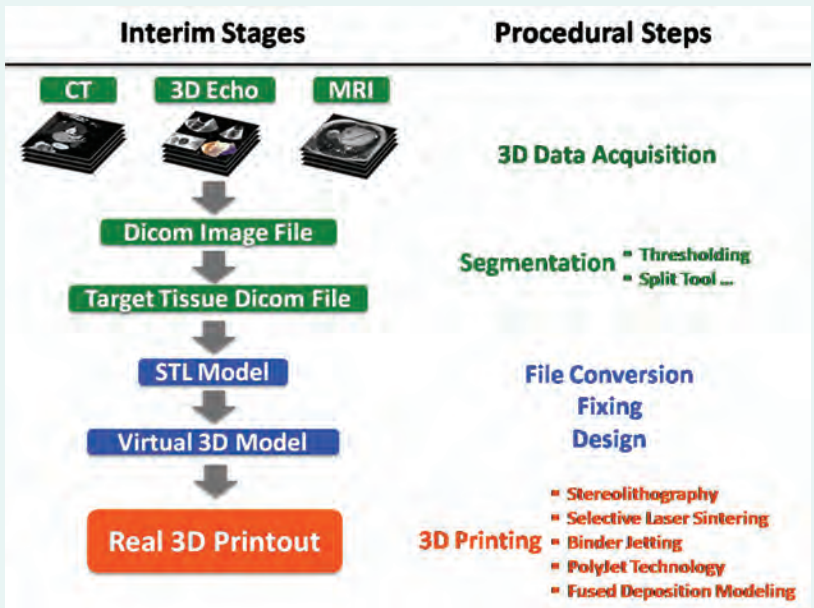
Through preoperative tactile and visual experience, the opportunities of simulating surgery with 3D models show promise and a vast yet unrealised future of this technology in medicine. More research is needed to demonstrate improved safety and better long-term results, and cost reduction. Nevertheless, even reduction in medical costs from reduction of complications from a surgeon knowing the anatomy precisely before making an incision will likely outweigh the time and expense to prepare the 3D model. Future perspectives of this method derive from standardisation of segmentation of the 3D imaging and optimal printing substrates (i.e. hard vs. soft) 3D printing appears to be most beneficial in highly specific procedures with complex anatomy. Prospective, multicenter clinical trials as well as standardisation of 3D modeling are needed to verify accuracy of this approach and clinical benefits in order to justify insurance reimbursement.

In conclusion, 3D models derived from conventional CT, MRI, and echocardiographic imaging is helpful for individualised treatment of complex cardiovascular anatomy. 3D printing provides users with the ability to manipulate the model and to simulate and test how the procedure will be performed and how a catheter or device responds to the unique cardiovascular anatomy. Although more research is needed, 3D printing has all the necessary elements to provide high quality patient specific treatments, utilising both a visual and tactile experience. As 3D printers become more commonplace, it is anticipated that it will integrate into quality management and payment systems necessary for its continued growth in medicine. AH

References available on request.

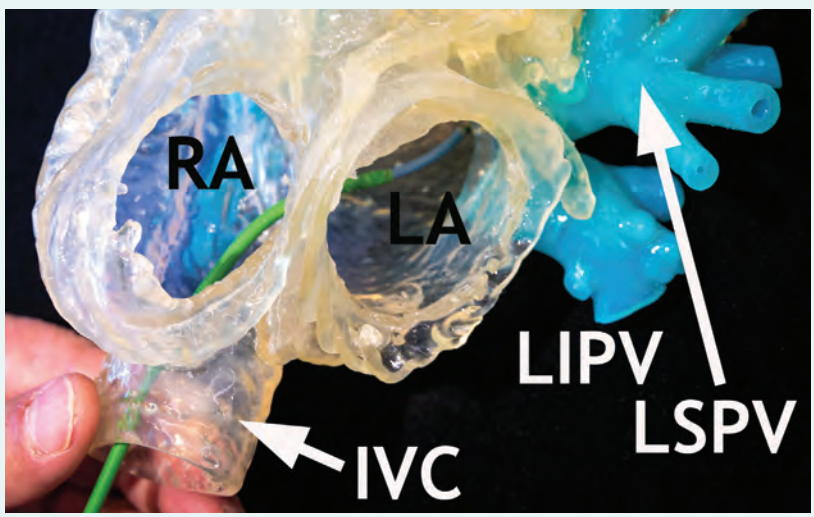
Dr Thomas Bartel speaks on '3D printing in cardiology and cardiac surgery: New opportunities' at the 3D Medical Printing Conference scheduled to be held from 29-30 January 2018 at the Arab Health Congress.

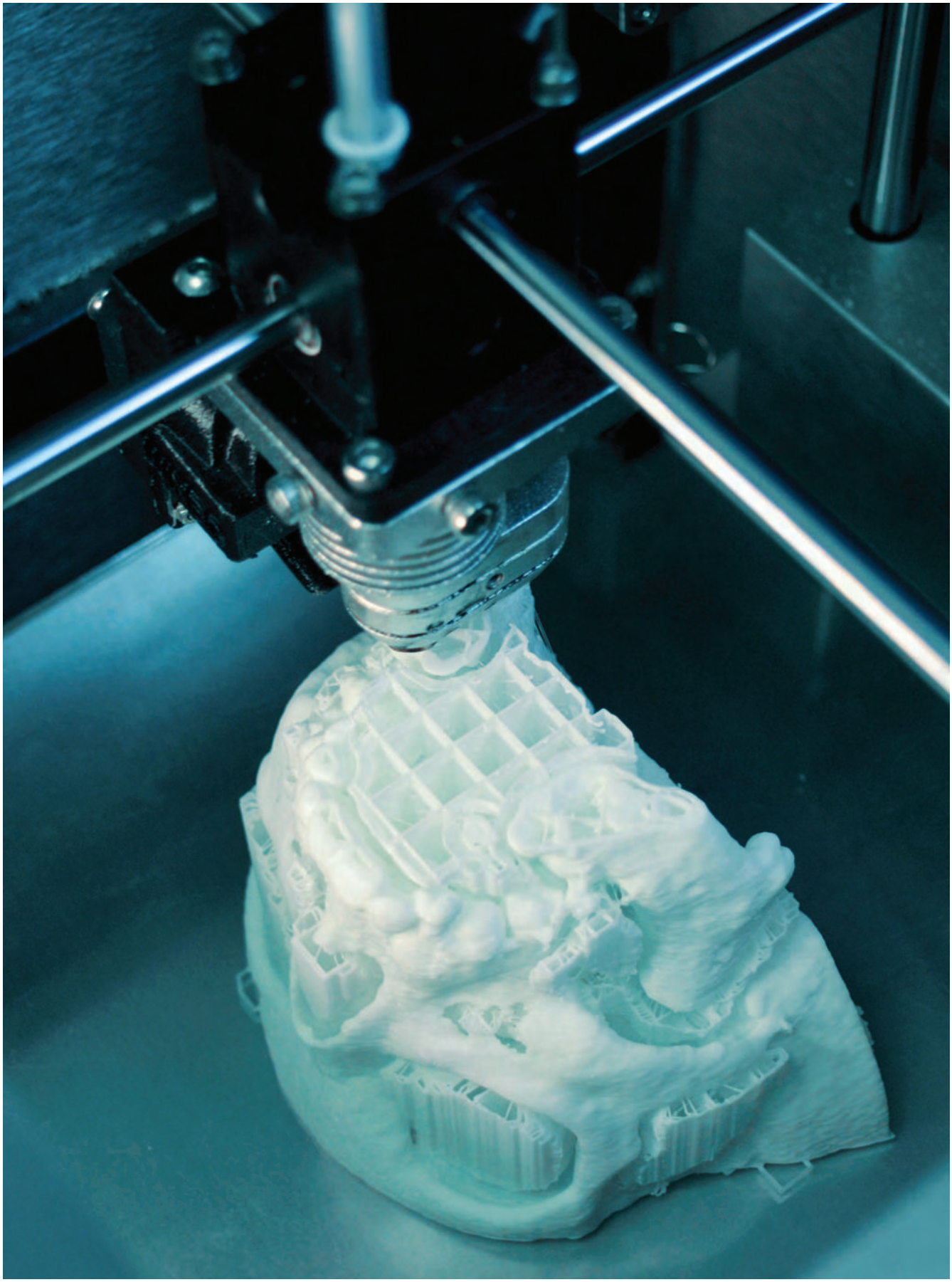
▼ **FIGURE 1**: Workflow in three-dimensional printing from imaging to modeling. CT, computed tomography; DICOM, Digital Imaging and Communication in Medicine; STL, Standard Tessellation Language; MRI, magnetic resonance imaging.



Bartel T, Rivard A, Jimenz A, Mestres CA, Müller S. Medical three-dimensional printing opens up new opportunities in cardiology and cardiac surgery. European Heart Journal 2017, doi:10.1093/eurheart/ehx016

▼ **FIGURE 2:** Simulation of high-frequency ablation for treatment of atrial fibrillation on a 3D heart model of the patient prior to the procedure. Effective banding is tested in order to advance the catheter to the entrance of the left upper pulmonary vein into the left atrium. Pulmonary veins are highlighted in blue for better distinguishability. IVC, inferior vena cava; LA, left atrium; LIPV, left inferior (lower) pulmonary vein; LSPV, left superior (upper) pulmonary vein; RA, right atrium.





Utilisation of 3D-printing and 3D-modelling techniques in PAEDIATRIC CARDIAC SURGERY

By Dr Laszlo Kiraly, MD PhD FETCS, Division Chief, Medical Affairs, Sheikh Khalifa Medical City, Abu Dhabi, UAE

Modern 3D-imaging methods greatly support the development of individualised medicine and surgery. In the cardiovascular domain, these imaging technologies that include 3D-echocardiography/ultrasound, 3D-rotational angiography (3DRA), computer-tomography (CT) and magnetic resonance (MR) imaging provide accurate direct information of the anatomy and indirectly of the hemodynamic consequences. 3D-multimodality image integration grossly improves reliability, accuracy and resolution of these modalities, however, as images are not acquired in real-time, three limitations persist: (1) any change in the position of patient or equipment can cause misalignment of the registration; (2) static models do not account for cardiac and respiratory motion; and (3) 3D-models are in projected in two-dimensional plane of the visual screen. 3D-printed anatomical models remain static, but they are different and offer interactivity and hands-on approach. Personalised imaging and modelling of anatomy presents surgeons with a range of advantages, e.g. better understanding of complex anatomy, preoperative planning and virtual surgery, manufacturing of intraoperative aids and prostheses, ability to assess expected result, improved communication within the multidisciplinary team and with patients.

3D-printing processes, manufacturing of patient-specific prototypes

3D-printing consists of consecutive steps of pre-processing (digital data acquisition, segmentation), production (actual stereolithographic printing, a.k.a. additive manufacturing) and post-production (processes similar to chiselling and refinement in sculpture). First, digital data from imaging sources (CT-angio, MRI and echocardiography) are obtained. Most commonly ECG-gated breath-held contrast-enhanced CT-angiography is used that can reach a spatial resolution of 0.3–0.7 mm. Dataset is processed by a special 3D-software [Mimics, Materialise, Leuven, Belgium] and a rotatable digital (virtual) 3D-model is segmented. Accuracy of segmentation depends on the completeness and clarity of raw data and appropriate selection of segmentation values. Areas and structures of interest are exposed while others (temporarily) removed. All this requires intimate knowledge of anatomy. Thus, involvement of the surgeon/morphologist is advised; segmentation is also time-consuming, laborious and – at present – it is not feasible for automation.

The virtual model (stereolithography or '.stl' file) already offers indispensable insight in most instances. The actual printing process involves rapid prototyping and additive manufacturing, building parts layer by layer. In our clinical practice two prototypes are 3D-printed: a real life-sized (blood-volume) solid model provides exact dimensions of the structures; another 1.5-2.5x-magnified (or scaled) hollow model is printed in transparent, flexible material. This allows simulation of the surgical approach and steps of the operation with high-fidelity (virtual surgery). Intraoperative assessment can confirm anatomic accuracy of 3D-models. Prototyping contributes to improved patient safety and shortened operating time, leading to successful outcome.

Among the multiple benefits of 3D-printed models are the improved communication within the multidisciplinary clinical team and patient/family education. Feasibility of new procedures could be experimented with patient-specific morphological characteristics. Besides listed and documented advantages, 3D-printing presents with possible downsides: labour- and technology intensive manufacturing presents with additional costs, need for extra personnel and infrastructure (e.g. 3D-printing facility). It is expected that 3D-printing will have a major role in providing patient-specific (individually customised) implants and prostheses, especially with evolving techniques of bioprinting. Bioscaffolds seeded with progenitor cells of the recipient may develop into complex structures, tissues and ultimately organs. In cardiac surgery, all this could help in fulfilling the ultimate goal to create an ideal cardiac valve implant.

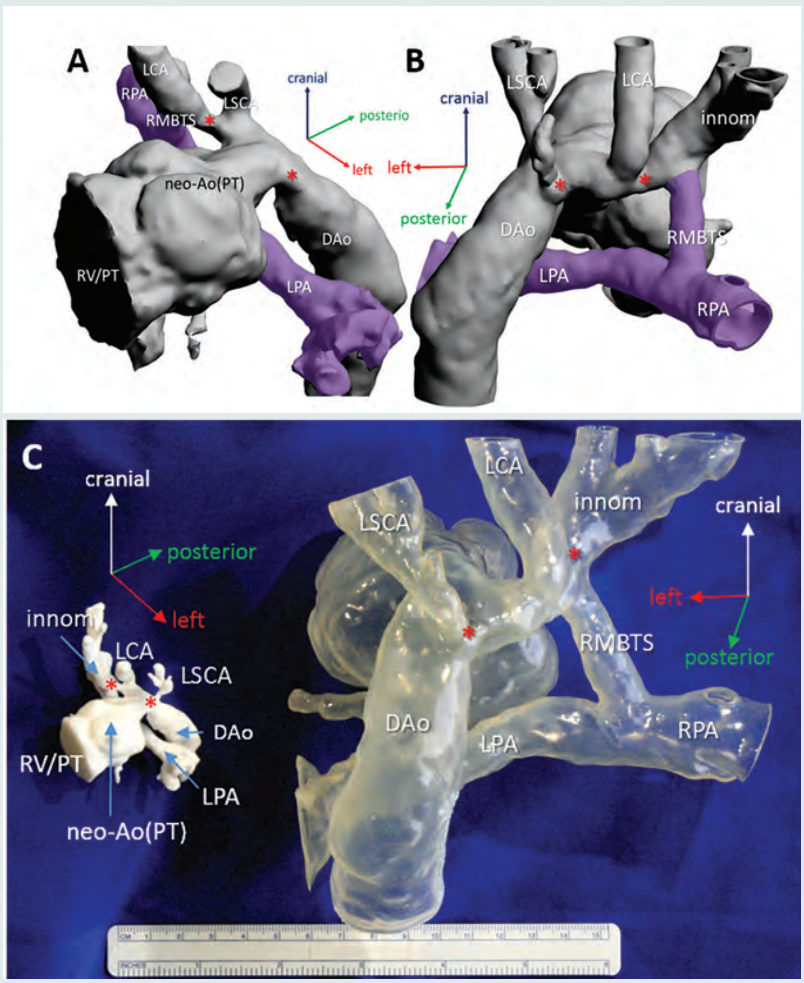
Applications of 3D-modelling and printing in paediatric cardiac surgery

Paediatric cardiac surgery deals with a wide range of patients in view of age (from neonatal to adult-congenital), acuity (from emergencies to elective and/or staged reoperations), and complexities. Most operations are performed with a special attention to the expected growth of structures and assumed transformation of pathophysiology. These aspects mark out our discipline as pioneering in embracing of new modalities, e.g. advances in 3D printing, bioprinting, utilisation of novel methods and materials.

Paediatric cardiac surgery is also a discipline where individual decision-making is key in planning of complex operative plans. Preoperative preparation starts with detailed knowledge of the general patho-morphology before contemplating on an individual surgical procedure. Historically, generations of physicians and surgeons were educated with the help of cardiac specimens that come from individuals with congenital heart disease but they also represent general features of morphology.

Dr Maude Abbott (1869-1940), founder of patho-morphology for congenital heart disease, began 'museum demonstrations' in 1904 that had become part of the medical school curriculum. In recent years, however, availability of these specimens has become ▶

▼**FIG 1:** 3D-virtual (A,B) and 3D-printed (C,D) models of the aortic arch following modified Norwood-1 arch repair
A: Digital 3D model of the aortic arch, its branches and the pulmonary arteries; left anterior oblique lateral view. B: posterior view. C: 3D-printed prototype of the aortic arch, its branches and the pulmonary arteries, life-size solid model; left anterior oblique lateral view. D: 3D-printed prototype of the aortic arch, its branches and the pulmonary arteries, 3x-magnified size, hollow model; posterior view. Sites of obstruction are denoted by *.
(Abbreviations: DAo: descending aorta; innom: innominate artery; LCA: left common carotid artery; LPA: left pulmonary artery; LSCA: left subclavian artery; neo-Ao(PT): neo-aorta; RCA: right common carotid artery; RMBTS: right modified Blalock-Taussig shunt; RPA: right pulmonary artery; RV/PT: right ventricle to pulmonary trunk junction).



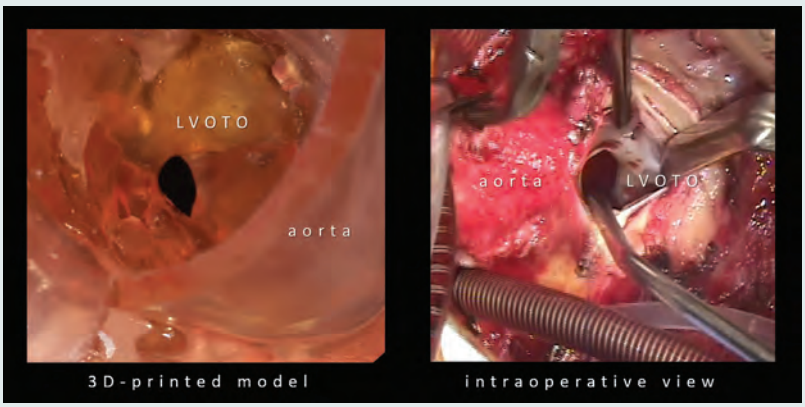
limited due to stiffened data protection regulations, reduced number of autopsies, natural attrition of specimens and most importantly that patients with congenital heart disease survive. Source of specimens has dramatically dropped.

Transfer of specimens in the morphological archives and from clinical data onto digital platform and creation of a virtual museum could solve the problem. First, specimens are scanned with high-resolution micro-computed tomography (it can achieve a resolution of 10 micrometres). Next, digital information is segmented to create 3D-virtual models and could be 3D-printed in various materials. A virtual museum offers innumerable opportunities for training and education, pre-surgical planning and virtual surgery, patient-family education, etc.

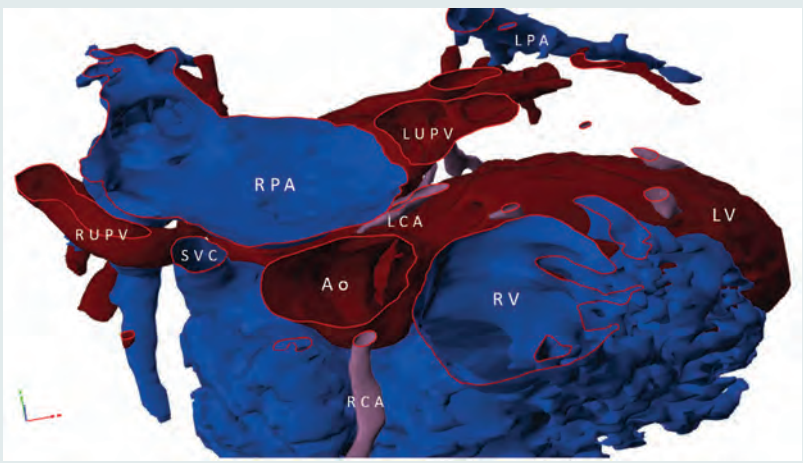
Introduction of 2D-echocardiography enhanced the importance of anatomical knowledge in our discipline that is further emphasised by newer imaging modalities. Interactivity and hands-on approach is key in modern-day medical and postgraduate education, especially in training of the new generations of surgeons. In the meantime, the learning-curve for surgical trainees has become rather steep; no collateral morbidity/mortality is now tolerated. Access to morphological archives – as mentioned – became restricted. Simulation-based methods with 3D (virtual) models and printed prototypes (clinical case scenarios and specimens) could overcome these difficulties and meet the demands of morphological demonstration. Medical education ranges from medical students, trainees, the multidisciplinary clinical team and towards patients/families and the community.

3D-printed prototypes are regularly utilised to improve understanding of the morphology in complex re/operations. 3D-visualisation of the atrial anatomy and connections of the pulmonary and systemic veins in complex atrial baffling procedures offer unique possibility of tailoring geometrically challenging separation patches. Similarly, intraventricular tunnelling and muscle resection can be designed with the help of models. Scaled, transparent hollow-models printed in flexible materials are very suitable in planning intracardiac procedures as segments can be registered with different colours helping identification of the structures. Blood volume models are especially handy for taking measurements and planning procedures on the great vessels and their branches. Actual 3D-printed models are jointly utilized with the 3D-virtual models as these can later be opened, digitally modified, etc. Accuracy of the models is excellent, even after moderate postproduction smoothing. Familiarisation with the expected operative anatomy and planning out alternative surgical scenarios (surgical emulation, virtual surgery) results in improved safety margin. As a critical mass of experience has not yet been accumulated due to the highly individual and variable case-scenarios, no conclusion can be drawn whether 3D-prototypes are effective in saving of time, or other expenses. Personal experience identifies patient-safety and reduced occurrence of complications and ultimately improved quality of care as major advantages.

▼**FIG 2:** View of the left ventricular outflow tract obstruction (LVOTO) in a 3D-printed model and intraoperatively.
Prominent musculature significantly restricts outflow from the ventricle (black opening). Morphology on the model looks identical to the one confirmed by intraoperative exploration.



▼**FIG 3:** 3D-virtual model of tetralogy of Fallot and absent pulmonary valve
The model is opened in a horizontal plane at the level of the aortic root and viewed from above. Orifice of the left coronary artery (LCA) is flattened and obstructed by the grossly dilated right pulmonary artery (RPA). LCA is much smaller than the right coronary artery (RCA). Right-sided structures (superior vena cava: SVC and right ventricle: RV) are blue; left-sided structures (left ventricle: LV; right upper pulmonary vein: RUPV; left upper pulmonary vein: LUPV) are marked in burgundy. The opened and rotated model provides unparalleled insight into the intimate spatial relationship of the structures.



A National Centre of Excellence (COE) in 3D-printing for healthcare

The vibrant and ever-evolving sociocultural and scientific context of the United Arab Emirates demands the establishment of a Centre of Excellence (COE) in the field of 3D-printed techniques for healthcare. There are five key pillars for the success of such a venture. Most importantly, governmental leadership should embrace and support this rapidly growing and pioneering area by providing transparent legal framework and a spectrum of subsidised programmes. Programmes span from specific clinical applications in orthopaedics, maxillofacial surgery, plastic and reconstructive surgery to cardiovascular surgery to prosthetics and development of bioscaffolds, bioengineered materials, 3D-printed tissues and organs, etc.

Participation of local academic research organisations in biomedical and bioengineering sciences is also key in providing scientific leadership and proper prioritization of viable projects.

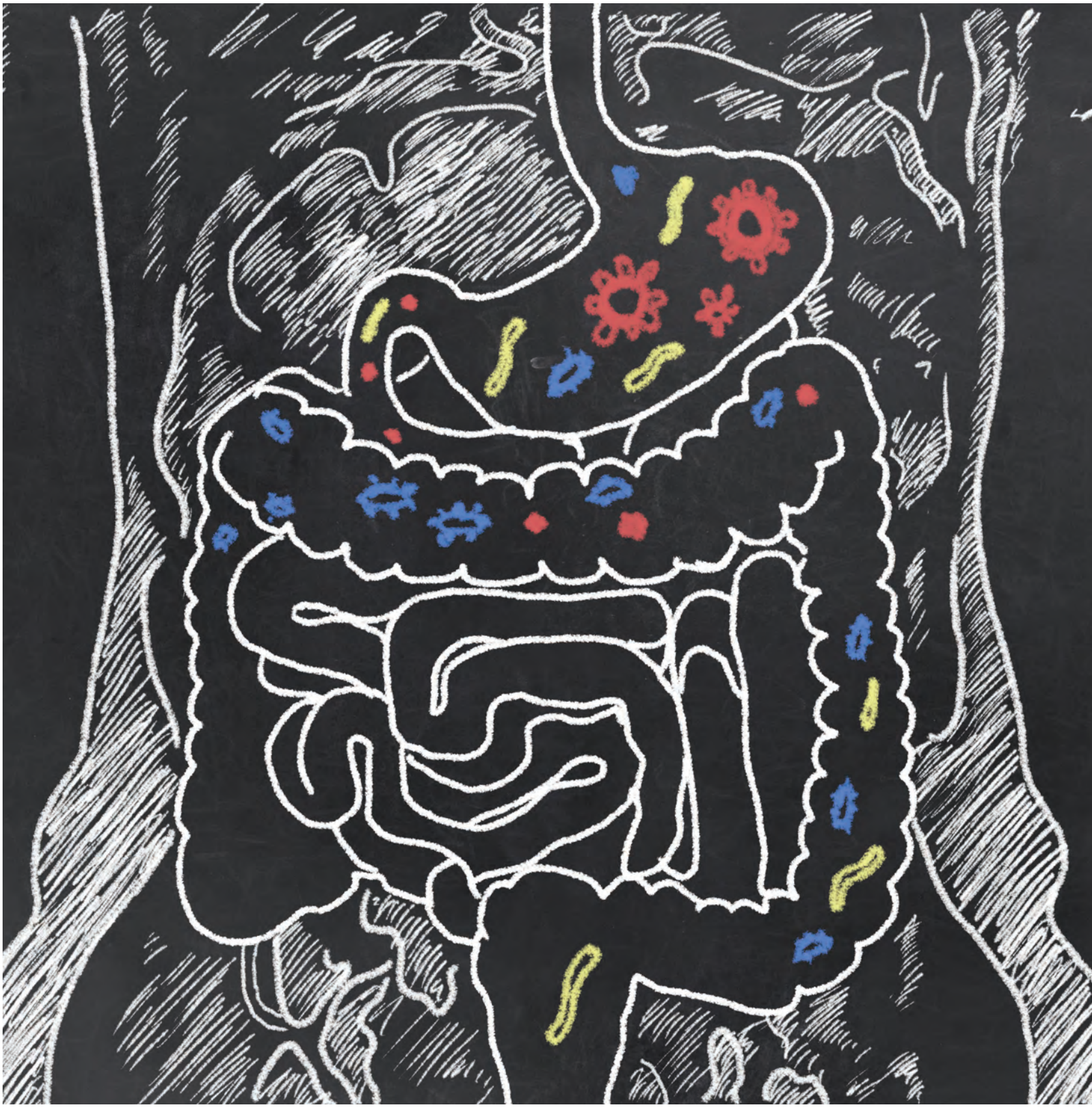
The third pillar is the involvement of clinical healthcare (professional and providing institutions) where individual projects can find their realisation, outcome and provide continuous feedback for research. Fourth, healthcare financers should be motivated and involved. Financial cover for 3D-printed models and aids remains unresolved worldwide. At present, there are no internationally established Current Procedural Terminology (CPT) codes available for insurance companies and/or healthcare financial bodies to cover expenses related to 3D-printing.

Finally, the fifth key element is the integration of local 3D-printing companies, who act as an interface with the world of rapidly-evolving technology. They are seminal in adapting new methods from 3D-printing outside of healthcare. Governance of the COE should be based on cooperation and communication among all key participants along a governmental legal framework, established scientific guidelines in research, clinical benefit to the patients, and financial sustainability.

Future prospects

Another direction of 3D-modelling technology is image-guided surgery/augmented reality. With this modality, patient-specific 3D-models or holograms are projected to a fixed point in virtual space or are directly superimposed on structures of the operative area. Thus, key landmarks of the 3D-holographic model are identified and paired with counterparts of the patient's anatomy. In combination with robotics, optical display could revolutionise surgery: it could allow procedures in the heart with preserved perfusion/organ function while being operated. The operator performs procedures on the holographic model in the 3D-virtual reality and robotic micromanipulators would identically follow the same movements in the patients' real surgical field. Of course, there are myriads of problems to be solved, e.g. interactivity between the holographic model and real organ – as the latter moves and changes shape and size in time with the cardiac cycle that the virtual model should exactly follow – just to mention one. Nevertheless, such prospects in 3D-technology revive an intellectual excitement comparable to the one that established anatomy as a medical science and paved the way for modern surgical methods five hundred years ago. AH

Dr Laszlo Kiraly is the Chair of the 3D Medical Printing Conference scheduled to be held from 29-30 January 2018 at the Arab Health Congress.



ENHANCING HUMAN HEALTH

What are Probiotics and Can They Help?

By Dr Nigel Umar Beejay MB BChir, MA (Cantab), FACP, CPE, Dip (Med Hyp), Consultant Physician, Gastroenterologist and Hepatologist, Certified Physician Executive, Advanced Center for Daycare Surgery, Abu Dhabi, UAE; Harley Street, London UK

A new wave of supplements has risen to the fore in recent years. These supplements are most commonly known as probiotics or good bacteria. Probiotic supplements are easily available, can be bought without a medical prescription, are reasonably cheap, do not hurt patients and most importantly, might help combat patient diseases and enhance human health. So popular have probiotics become as a booster to human health that a recent market analysis of probiotics by Global Market Insights estimated the market will exceed $65 billion USD within the next 7 years. There has been an explosion in research into probiotics with a 168% increase in the number of research publications about probiotics over the last 10 years.

What are Probiotics?

Probiotics are living microorganisms, including bacteria that affect human health in a beneficial way. The World Health Organization defines probiotics as "live microorganisms which when administered in adequate amounts, confer a health benefit on the host." They are found in the human body, most often in the gut, where trillions of them exist in unique populations. Probiotics vary in terms of the different types, amounts and exact location within the human body. The probiotic bacteria act in several ways to enhance health. These include, but are not limited to, effects on food absorption, immunity and levels of inflammation. Probiotics can also be found naturally in certain foods such as yoghurt but are also sold in more concentrated formulation as dietary supplements to be eaten or applied on the skin or mucosa of the body.

What are the differences between Prebiotics and Probiotics and Synbiotics?

A Prebiotic is basically a non-digestible plant fibre which acts a carbohydrate food source for probiotics. Prebiotics are the food source for probiotics. The most common type of prebiotic is inulin, a product found in naturally occurring foods like oats, soybeans, banana, leeks and asparagus as well as onions, garlic and chicory. On the other hand, a probiotic is a live microorganism that can improve human health. The final term, synbiotic is used to describe a product that is a combination of a prebiotic and a probiotic. Theoretically it has been suggested that synbiotics may offer more benefit than just taking a prebiotics or probiotic but the evidence is quite scanty.

Can a Normal Diet Supply Probiotics?

Today, just as in the past, people can nurture and partially modify their gut bacteria by using certain foods. Even though yogurt is the most common probiotic-carrying food, other food sources can have probiotics. These include natural sources, often derived from fermentation practices, such as yogurt, kefir, kombucha, kimchi and raw unfiltered apple cider vinegar, cheeses, miso, and buttermilk. Interestingly, the benefits of fermented food have been known about for over 5000 years in human society. In addition to natural sources, many foods such as cereal, juices, smoothies, nutrition bars are supplemented with probiotics because of their potential benefits.

What Bacteria live within our Gut?

Before explaining how probiotics work it is important to understand the complexity of the bacterial population in the gut. The bacteria (microbiota) that live within the gut are known as the "intestinal microbiome" and we have been living (usually in peaceful coexistence) with these bacteria for thousands of years. We already know that the human microbiome is an incredibly complex ecosystem with significant diversity. In fact, it is fair to say that there are over 500 different bacterial species that make up 100 trillion microorganisms weighing up to 2kg in each human being. So specific is this mixture in each human being that it is akin to a unique genetic fingerprint. And not unsurprisingly, the person to whom you owe most in giving you a unique set of gut bacteria is your mother as the bacteria are transferred from mother to baby during normal vaginal delivery.

How do Probiotics work?

Probiotics works by replacing, restoring and ▶

Dr Nigel Umar Beejay is the Chair of the Gastroenterology Conference track at the 2018 Arab Health Congress.

or altering the complex populations of living organisms that already live within the gut.

We also know that certain diseases have, as one of their causes, dysregulation or imbalance in the billions of multiple bacterial organisms that live within the human gut. This dysregulation/imbalance may contribute to diseases in multiple ways, either directly by actions on the lining of the gut, or indirectly by the signals and interactions they have with the body via the gut wall.

Probiotics can help by modifying the bacterial population so that they more resemble the pattern seen in the gut of a healthy person. Transplanting different bacterial populations into the body alters the balance of the existing bacteria and this change can lead to an improvement or resolution of disease.

What are the Different Strains of Probiotics?

The many different strains of probiotics are usually identified by their Latin names. The most common probiotic you may have heard of is called Lactobacillus. Other common names include strains like Bifidobacterium, Enterococcus but many others exist as well. Interestingly, each of these strains may have one or more different subtypes. For example, in the Lactobacillus family, Lactobacillus exists in over 150 different species including Lactobacillus acidophilus, Lactobacillus bulgaricus, Lactobacillus casei ss. casei, Lactobacillus fermentum, Lactobacillus helveticus and Lactobacillus plantarum. Studies have demonstrated that different probiotic strain subtypes have different effects in combating disease and promoting human health.

What Diseases can be affected by Probiotics?

Many diseases can be affected by probiotics ranging from antibiotic related diarrhoea, vaginal yeast infections and urinary tract infections to Irritable bowel syndrome and the prevention or reduction in the severity of colds and flu. But there are many more conditions where probiotics may be useful including the management of eczema, obesity and even Alzheimer's disease!

Can Probiotics help in Managing Obesity?

In 2014, Chinese researchers discovered that in a preliminary trial involving different diets in 93 obese volunteers, those volunteers fed supplements that included prebiotics (a precursor to probiotics) lost around 5 kg on average over a 9-week period. In another study, 125 obese subjects were split into 2 groups. Half of the subjects were given the probiotic Lactobacillus rhamnosus as part of the weight loss diet over 12 weeks and half were not given the probiotic. This 12-week period was followed by another 12-week period aimed at maintaining body weights. The study results found there was a greater average weight loss in women who received the probiotic compared to the women who did not receive the probiotic. Moreover, the change in body weight persisted in the second 12 weeks when the diet was no longer followed!

Other kinds of information lend their support to a relationship between gut bacteria and obesity. For example we know that in people who are overweight or obese there is less bacterial diversity seen in the gut than in the normal weight subject, and we also know that antibiotic usage and dietary modification can alter the characteristics of the gut bacteria. Put together, the current research helps support a relationship between the intestinal microbiome and obesity.

How Can I choose the Best Probiotic?

Choosing the best probiotic is often challenging because of the wealth of incomplete information and because of the preponderance of unsubstantiated claims made by some manufacturers. Not everything that is published on the web is true! Nevertheless a few general principles should guide choice. The first port of call should be checking high quality patient information portals like NHS Choices from the UK and NIH MedlinePlus in the USA and more scientific websites such as NICE (National Institute for Clinical Health) or the Cochrane Database. These websites can help sort the wheat from the chaff when deciding if a probiotic works or not in a medical condition.

Once you have decided to use a probiotic, other criteria can help inform yo ur choice. These include product quality, a term that encompasses the source of the probiotic as well as manufacturing and storage issues. Generally speaking it is best to pick a probiotic with a high count of colony forming units (CFU Count) such as 15 to 100 billion as well as a probiotic that contains a cocktail of strains (between 10 and 30). Another thing to consider with probiotics is their survivability with some higher quality probiotics requiring cooler storage temperatures to optimise their survival. Last, but not least, the amount of validated research and evidence should be considered when picking a probiotic.

The Bottom Line

It is eminently clear that probiotics have a part to play in the promotion of human health given their long use over human history. In addition, the scientific advances made in human DNA sequencing and understanding human genome as well as the advances in understanding the intense "crosstalk" between the human body and the gut bacteria has led to a much better understanding of how to modify human health and disease by targeting the gut bacteria. Although we know that gut bacteria are important and that probiotics can alter their composition and function, there is still a lot of detail that needs to be discovered to allow us to use probiotics in a targeted precise way that will optimise their potential. The race is on to find the best combinations of probiotics for specific diseases in the realm of personalised targeted medicine – a race that is worth billions of dollars. AH

Dr Nigel Umar Beejay is the Chair of the Gastroenterology Conference track scheduled to be held from 31st January to 1st February at the 2018 Arab Health Congress.

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ENDOSCOPIC COLORECTAL STENTING:

Pushing the limit of endoluminal surgical therapy

By MAHER AREF ABBAS, MD; Professor of Surgery; Fellow, American College of Surgeons; Fellow, American Society of Colon and Rectal Surgeons; Consultant, Colorectal and Digestive Surgery, Al-Zahra Hospital, Dubai, UAE

The last two decades have witnessed a rapid growth in interventional endoscopic techniques. A variety of conditions previously tackled with conventional operations can now be successfully treated with therapeutic endoscopy. Interest in endoscopic stenting grew initially to palliate non-operable malignant esophageal and biliary obstructions. Once technical feasibility and clinical success were demonstrated for these two conditions, the indications for stenting expanded to include malignant disease of the colon and rectum.

The role of endoscopic colorectal stenting continues to evolve with the introduction of a newer generation of stents and delivery devices. Colorectal stents are now being deployed for benign conditions and for malignant disease, both as a bridge for future surgical intervention or as a definitive treatment. In the past, the majority of stent procedures were performed by gastroenterologists and interventional radiologists but more recently there have been an increasing number of surgeons interested in therapeutic endoscopy and stenting. The following is an overview of the current status of stenting for colorectal diseases.

STENTING FOR BENIGN CONDITIONS

Stenting was initially introduced for malignant obstruction of the colon and rectum but its indications have expanded to include benign conditions. Several non-malignant types of strictures have been successfully treated with metal and non-metal stents. These include strictures secondary to radiation, chronic diverticulitis, inflammatory bowel disease, ischemia, and postoperative anastomotic complications. In a series of 23 patients with benign strictures treated at the Mayo Clinic, technical success was achieved in 22 patients (95%). The stent was used as a bridge to surgical intervention in the majority of patients. However, major complications occurred in 38% of the patients and included re-obstruction in 4 patients, stent migration in 2 patients, and perforation in 2 patients. The majority of complications occurred within a week of stent placement. The data derived from this study suggested that stenting can be an effective method to treat acute colorectal obstruction secondary to a benign stricture but that it should not be routinely used as a definitive treatment. Furthermore, surgical intervention should follow once the colon is decompressed and prepped. Migration is a significant issue in the setting of a benign stricture. Geiger and colleagues reported a 43% migration rate in their review of 63 reported cases in the literature.

From personal experience, I concur with the findings of both studies. Preliminary review of a study I am currently conducting at Kaiser Permanente, Los Angeles, California, revealed a total of 137 patients who underwent stenting of the colon and rectum. Of these patients, only 11 patients underwent a stenting procedure for benign disease. Over half of these patients underwent subsequent operative intervention.

The deployment of a covered stent has also been reported for the treatment of colovaginal and colovesical fistulas. However, the data on the technical success and durability of a covered stent for these conditions is limited and therefore it should only be used in the setting of a patient with multiple prior failed operative interventions [when the only option left is fecal diversion] or in a patient with significant medical co-morbidities that preclude a major abdominopelvic operation.

The use of a temporary covered stent to treat acute anastomotic leak or obstruction is intriguing. It was recently introduced to treat upper gastrointestinal anastomotic complications following bariatric surgery and esophagectomy. Its role in the management of colorectal anastomotic complications is yet to be determined but recently reported data suggests that it is technically feasible and can avoid re-operative intervention in a select group of patients. Whether it will be become a viable alternative to operative intervention in a select group of patients in the future is unclear. Additional investigation is needed to determine its technical feasibility and clinical outcome in a larger number of patients. Furthermore, industry needs to provide covered stents designed specifically for such purpose. ▶

STENTING FOR MALIGNANT OBSTRUCTION

Definitive palliation of malignant disease

Stents are commonly used to palliate obstruction in patients with unresectable metastatic primary or recurrent malignancy. While stents are often used for intraluminal colorectal malignancies, they can be successfully used to palliate extracolonic metastatic tumours originating from the endometrium, ovaries, pancreas, stomach, esophagus, prostate, and breast. In a review of 10 published reports in the literature comparing operative intervention to endoscopic stenting for malignant large bowel obstruction, Tilney and colleagues reported a technical success rate of 92.6%. In addition, the group that underwent endoscopic stenting had shorter hospital length of stay, fewer medical complications, less stoma formation rate, and a lower mortality compared to the group treated surgically. Additional advantages of endoscopic stenting include faster resumption of palliative chemotherapy and less healthcare cost attributed to the malignant obstruction. From a psychosocial aspect, stenting is a more preferable option for the patient. This is particularly important for patients with metastatic disease and a limited life expectancy.

Bridge to future surgical intervention

An increasing number of colorectal stent procedures are being performed as a bridge to future surgical intervention. The concept of such approach is to avoid an emergent abdominopelvic operation and to perform definitive resection on a more elective basis. The advantages of converting the patient from the emergency to the elective setting include the potential for bowel decompression and preparation, optimisation of the patient's medical and nutritional status, and for patients with locally advanced rectal cancer the administration of neoadjuvant chemoradiation. Several studies have reported the use of stents as a bridge to surgical intervention in patients with acute malignant large bowel obstruction. Except for one clinical trial which was stopped due to a lower technical success rate and an unacceptable perforation rate, all other studies have demonstrated several advantages to the use of stents as a bridge to operative intervention.

In a review of two multinational registries, Jimenez-Perez and colleagues reported 98% technical success rate, 94% clinical success rate, and an acceptable complication rate of 7.8% which included perforation in 3%, stent migration 1.2%, and bleeding in 0.6% (25). In several studies, the use of stents as a bridge of surgery was associated with a shorter hospital length of stay, fewer complications, lower stoma formation rate, and lower mortality.

TECHNICAL ASPECT OF STENTING: HOW I DO IT

Stenting can be performed in the endoscopy suite, interventional radiology suite, or the operating room. I prefer to perform the procedure in the operating room for two reasons: the availability of a general anaesthetic if needed and the flexibility of converting to an operative procedure in case of technical failure or complications. All patients are consented for endoscopic stenting with possible laparotomy or laparoscopy with resection and/or fecal diversion. Patients without complete or near complete obstruction undergo bowel preparation with Golytely [polyethylene glycol electrolytes solution]. A gastrografin enema is obtained in all patients to assess the degree of obstruction, location and length of the stricture, and sigmoid colon configuration [especially important when stenting a lesion proximal to the rectosigmoid area].

Findings of the gastrografin enema can often guide which stent to deploy and what type of delivery device to use. In general, there are 2 types of stent delivery devices: those that are introduced through the working channel of the endoscope and those that are guided over a wire external to the endoscope. Rectal strictures can be tackled with both delivery devices in the majority of patients. However, lesions proximal to the sigmoid colon, especially in patients with redundant sigmoid colon, are best approached with stent delivery devices that are introduced through the working channel of the endoscope.

The patient is positioned in the left lateral decubitus position and intravenous sedation is given. Patient with complete colonic obstruction and small bowel dilation should have a nasogastric tube to decompress the stomach. I typically use an adult flexible sigmoidoscope to reach any left sided stricture or alternatively an adult gastroscope in the setting of a torturous and redundant sigmoid colon especially if the stricture is at a sharp angle. Once the stricture is reached, an attempt is made to cross it with a soft, extra-long wire [450 to 500 cm long, especially when using a delivery device that advances through the working channel].

Several wires are available on the market. It is best to avoid a stiff wire to minimise the risk of perforation. Once the wire crosses the stricture, I use fluoroscopy to ensure that the wire is still inside the lumen of the colon. If any doubt, a catheter is guided over the wire and contrast is injected on the proximal side of the stricture to confirm the intraluminal location of the wire. In patients with complete obstruction, advancing the wire across the stricture will yield the passage of a small amount of liquid stool which can be helpful in confirming that the wire is still intraluminal.

A variety of stents are available on the market. For most adult patients, I favour a stent diameter between 25 and 30 millimetres. The length of the stent depends on the size of the lesion but for most adult patients, a 6 to 9 centimetres stent is usually sufficient. Ideally, I like to see 2 centimetres of proximal and 2 centimetres of distal overlap of normal large bowel on either side of the stricture. The stent should be centred across the stricture. Looking at the gastrografin enema films during the endoscopic procedure can be helpful in determining the positioning of the stent. In addition, fluoroscopic and endoscopic visualisation are used during the stent deployment. It is important to

Dr Maher Abbas speaks on 'Endoscopic options for colorectal cancer' on 30th January at the Surgery Conference at Arab Health 2018.

maintain the wire access at all time and not to lose it once access across the stricture has been established. Upon manipulation of the stricture, especially in the setting of malignancy, edema and bleeding occur and can make the procedure more difficult even impossible at times if access across the lesion needs to be re-established for a second time.

Being cognizant of the wire position at all times is critical especially in cases where the endoscope needs to be withdrawn in order to advance a delivery device over the wire but outside the endoscope. It is important to familiarise oneself with all the technical instructions of the particular stent device used during the procedure. Having the company representative present at the first few procedures can be beneficial to the patient and the surgeon alike. It is important to recognise that some delivery devices can only advance through the working channel of an adult colonoscope or sigmoidoscope.

Caution is of paramount importance when deploying the stent. The stent should always be deployed over the wire and never alone as the risk of perforation is much higher if a stent delivery device is advanced solo. Once the stent is deployed, the delivery device is withdrawn but the wire access is maintained in case a second stent is needed. That is rarely the case. Confirmation of the stent deployment is obtained with fluoroscopy. A properly deployed stent will have a centre waist in the area of the stricture and will have partial expansion initially. The radial force inside the stent will help expand it further during the first 24 hours following the procedure.

An abdominal film is obtained in the operating room to confirm the location of the stent, degree of expansion, and to check for any evidence of perforation such as free air. A full liquid diet is typically resumed within 24 hours in most patients. A second abdominal film is taken on the first post-procedural day and on as needed basis thereafter. For patients with permanent stent placement, I perform stent surveillance every 4 to 6 months. It is unclear at this stage whether routine stent surveillance is of any value. A research study is currently underway to evaluate whether stent surveillance is necessary. Some patients with metastatic disease are living longer because of the various chemotherapeutic agents and whether the primary stented tumour continues to grow or not is unclear.

However, from personal experience, I have not witnessed tumour ingrowth that has caused local obstruction. Occasionally a patient can present with bleeding that requires endoscopic fulguration to control. Patients are instructed to remain on a low residue diet and to keep the stool soft with the help of stool softeners or a gentle laxative such as milk of magnesium on an as needed basis.

CONCLUSIONS

Endoscopic stenting has emerged as a viable alternative to surgical intervention to treat patients with a variety of malignant and benign conditions of the colon and rectum. The majority of stent procedures are performed as a definitive procedure to palliate unresectable malignant obstruction. However, the role of stenting as a bridge to future surgical intervention is currently evolving with recent data suggesting several advantages over operative intervention in the emergency setting. Such advantages include a shorter length of stay, fewer complications, a lower stoma formation rate, and less morbidity.

Currently endoscopic stenting plays a limited definitive role in the setting of benign strictures but it can be used effectively as a bridge to planned surgical intervention. The use of stents to treat acute postoperative anastomotic complications is intriguing but data is very limited and additional studies are needed to investigate such role. Surgeons involvement in endoscopic stenting coupled with anticipated technological innovations will undoubtedly increase the number of patients treated with therapeutic endoscopy in the future. AH

References available on request.

Dr Maher Abbas is a Speaker at the Surgery Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

ROLE OF HEALTH PROFESSIONALS IN TOBACCO CONTROL

By Javaid Ahmad Khan, Professor, Section of Pulmonology and Critical Care Medicine, and Ayesha Butt, Medical Student, The Aga Khan University, Karachi, Pakistan

The tobacco epidemic and its ramifications

Tobacco consumption is a grave public health issue, being the leading preventable cause of death, causing 7 million deaths per year worldwide. Developing countries, home to 80% of the 1 billion smokers present globally, have to shoulder the greatest proportion of the burden of tobacco related mortality and morbidity. For example, the prevalence of tobacco intake was estimated to be 15.2% in Pakistan, reaching up to 40.9% among males aged 40-49 years.

Tobacco use has a myriad of deleterious ramifications: health related, social and economic. Tobacco is responsible for causing many pulmonary and extra pulmonary ailments like chronic pulmonary and cardiovascular diseases, reproductive disorders, head and neck and lung cancers as well as a wide array of other cancers. Smoking is responsible for over a quarter of all cancer deaths. Moreover, second-hand smoke takes 600,000 lives a year, mostly of women and children. In addition, according to the World Health Organization (WHO), annually US$500 billion in economic damage is attributed to smoking.

Unfortunately, the tobacco epidemic continues to spread, especially in the developing world, in many different forms like cigarettes, shisha and smokeless tobacco. It is the need of the hour to actively try to curb the propagation of tobacco use at all levels in the society. In this regard, health professionals, including physicians, nurses, midwives, dentists and pharmacists, have a unique and highly significant role.

Role of health professionals

Health professionals are revered in their communities and are considered epitomes of scientific knowledge leading people to value their advice and opinions. They can use their position as role models, in controlling tobacco use at multiple levels and in different capacities.

As individuals

At an individual level, health personnel should assess their patients for tobacco use or exposure and counsel them. It is recommended to use the 5 A's approach for this: ask about tobacco use, advise users to quit, assess inclination to quit, assist in cessation and arrange follow-up or referral. Abstinence rates increase by 30% as a consequence of simple physician counselling while interventions with nurses at the helm, increase quitting rates by 50%.

Furthermore, the chances of a people quitting increase substantially when they receive a consistent message from different health professionals.

Current US clinical practice guidelines recommend that "all physicians should strongly advise every patient who smokes to quit because evidence shows that physician advice to quit smoking increases abstinence rates". The recommendations stem from a diverse array of studies that, in meta-analyses, demonstrated an odds ratio of quitting smoking of 1.3 with physician advice as compared with not receiving advise.

Even basic health education has profound effects. More than 36,000 tobacco users were provided health education about their tobacco habits at an annual examination, as part of a prospective intervention study in India. After a decade, smoking cessation rates were as follows: 11% of men, and 37% of women had quit tobacco use compared with 2% and 10%, respectively, of the control cohort.

This is further corroborated by a recent study that shows the effects of a brief smoking cessation advice delivered by a vascular surgeon to patients of peripheral arterial disease; a higher interest in quitting was exhibited by patients receiving the intervention compared to the control group (95.4% vs 85.7%). People who expressed a stronger desire to quit had a higher smoking cessation rate compared to those with a weak desire (37% vs. 23%). Similarly, in another randomised controlled trial, patients receiving intensive smoking cessation interventions had higher quit rates compared to those receiving minimal interventions (21% vs. 7%).

The use of different methods by health professionals to promote smoking cessation has yielded higher quit rates. A dramatic increase in smoking cessation of 82% was seen in Cochrane systematic reviews of randomised control trials when different techniques where used: physician counselling combined with pharmacotherapy or telephone or in person counselling. Telephone quitline counselling is an important method as it has its utility in a myriad of populations and overall pooled odds ratio of smoking cessation with quitline counselling is 1.6.

Furthermore, physicians have a unique opportunity to persuade patients to quit because they are present in the most momentous moments in a patient's health events, which are teachable moments. A ▶

teachable moment, like a vascular procedure or a general or orthopaedic surgery, correlates with higher quit rates as patients respond better to counselling at such critical moments.

Anti- Tobacco advocacy

Health professionals can play a crucial role as leaders by de-normalising the use of tobacco and advocating policy changes for tobacco control. This includes promoting smoke free workplaces, increasing availability of tobacco cessation resources and rallying for measures like increasing taxation on tobacco products. They should also be involved in campaigns to raise awareness about deleterious effects of tobacco and dissuade youngsters from taking up smoking. Health personnel can exert their leadership position at community, national, or global levels, starting from small measures in their own vicinity and lobbying for larger legislative and political measures as the opportunity presents. Moreover, health professionals, in their capacity as scientists, can create awareness and educate funding and research organisations about the hazards of tobacco. Medical faculty also have a significant role as educators in training the next generation of health professionals.

The importance of de-normalising tobacco use is delineated by the results of the tobacco control programme initiated by the state of California in 1989. The programme initially focused on direct cessation efforts and later the emphasis was placed on de-normalising tobacco use, creating smoke free spaces and preventing the youth from taking up smoking. These mass scale efforts yielded commendable results as the adult smoking prevalence rate dropped 28 %.

Health professionals can form alliances as individuals, as well as between societies and organisations. They should be alert about the activities of the tobacco industry and take measures at their own level e.g. prohibiting sale and consumption of tobacco in their vicinities and declining grants from the tobacco industry for their work.

Barriers to health professionals' involvement in tobacco control

Lack of knowledge and skills

There is a lack of knowledge and skills among health professionals about tobacco cessation. Their curricula do not comprehensively cover the magnitude of the tobacco issue and ways to practically control it.

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A cross-sectional survey among German general practitioners showed 54% of GPs had treated fewer than 10 patients for smoking cessation within the last three months of the study, 23% of GPs lacked education or training in tobacco control, and only one-third of GPs viewed their training as sufficient. The factors responsible for low smoking cessation activity were found to be: perceived inadequacy in training (odds ratio 2.70), followed by dearth of demonstration material (2.10) and scarcity of time (1.65, 1.02 – 2.66). Furthermore, a clear dose-response relationship was discovered between training time and tobacco control activities. A research conducted in Nordic countries found a proportion of 40% (Sweden), 45% (Norway), 52% (Iceland) and 72% (Finland) of GPs who had never received any training about smoking cessation. In addition, a study among health professions students showed wide discrepancies with 98 % of dental hygiene students considering themselves well-trained to help patients quit spit tobacco use while no other programme had a higher percentage than 34 %. Similarly, a survey of nursing schools in Asian countries found that there was an absence of cessation content in 49% schools and less than 10% schools covered cessation interventions in detail.

High prevalence of tobacco use among health professionals

Prevalence of tobacco use among health professionals is often similar and sometimes higher than the general population. In China, 61.3% of male physicians, smoke compared to 66.9% of the males in general population. However, three times more female physicians smoke than the general female population (12.2% vs 4.2%). In a study conducted among primary healthcare physicians in Bahrain, among male physicians, 12% were current 'water pipe (shisha) only' smokers whereas 4% and 2% were 'cigarette only' smokers and both, respectively. Similarly, in a research in Cyprus, 28.2% healthcare professionals were found to be smokers.

A survey among medical students at the Aga Khan University, Karachi, Pakistan showed that 14.4% of participants were current smokers (22.0% male and 3.8% females) and 3.3% ex-smokers. Only 55% of current smokers intended to give up smoking.

Some of the statistics reported by Global Health Professionals Survey (GHPS) about smoking prevalence in third year students can be seen in Table 1. The prevalence of smoking among health professions students is higher in developing countries compared to developed countries. For e.g., the prevalence is only 6% in USA and 4-6% in Australia.

The prevalence of smoking among health professionals in some Middle Eastern countries is can be seen in Table # 2.

This is a worrying trend because usually healthcare workers who are smokers are less likely to advocate tobacco cessation to their patients and their advise lacks credibility in the eyes of the general population even if try to do so. Researchers have made the observation that in countries where smoking prevalence in physicians is equal or greater than that of the general population, tobacco control efforts are usually inadequate. Hence, it is particularly challenging to convince the general population in developing countries to stop smoking because a large percentage of physicians there are tobacco users themselves.

Time constraints

Many physicians are cynical about brief advice during a short clinic visit being fruitful. However, even very brief smoking cessation advice of 30 seconds has been shown to have

a noticeable impact. In usual circumstances, the process of assessing and advising the patient takes less than 3 minutes.

Fear of affecting doctor-patient relationship

Some healthcare personnel feel that asking about smoking status and advising smokers to quit might strain their relationship with patients, especially in certain cultures. However, surveys have shown that receiving smoking cessation advice increases patient satisfaction.

THE WAY FORWARD

Improve curricula and training

There is a dire need to redesign curricula to inculcate the appropriate attitude, information and skills amongst health personnel and students. Researches have proven the utility of training in improving tobacco control efforts. A recent study exhibited that a short training (intervention) resulted in paediatricians engaging more effectively and actively in smoking cessation. Intervention group had a greater likelihood of making referrals to the Smoking Cessation Trust, recommend the use of nicotine replacement therapy (NRT), schedule a follow up and refer caregivers to smoking cessation programs. Similarly, a modular tobacco control training conducted in India for community health workers resulted in the percentage of health workers scoring more than 60% increasing from 40% in the pretest (about tobacco control) taken before training to over 80% in the post-test.

Concerted action

Tobacco control involves a myriad of health disciplines. Building alliances among the health professional associations in a vertical way will maximise the effectiveness of measures. For e.g., the Thai Health Professional Alliance against Tobacco includes 17 allies from a diverse range of health professions such as medical, nursing and traditional medicine, amongst others. Another example is the National Alliance for Tobacco Control Pakistan, which also works in a concerted manner for tobacco control.

Smoke-free areas

Making medical institutions smoke-free leads to amelioration of air quality and of the health of people working there. In addition, it reduces social acceptance of smoking and imparts a clear message to the society against tobacco usage.

Smoking cessation clinics, resources and pharmacotherapy

The availability of cessation resources and counselling should be increased to help health professionals quit so they can become better role models. Nicotine replacement, bupropion, and varenicline are first-line agents used for smoking cessation. NRT, used in conjunction with behavioral therapy, increases quit rates by 50% to 70%. Moreover, cytisine is also a very important emerging cessation agent due to its effectiveness, affordability and low cost per quality-adjusted-life-year. Cytisine is more effective compared to nicotine replacement therapy: 1-month continuous abstinence rates were found to be remarkably higher with cytisine therapy than with nicotine replacement therapy (40% vs.31%).

Conclusions

Considering the enormity of the tobacco issue and its spread, the role of health professionals in controlling it becomes paramount. Hence, they must try to overcome all obstacles to contain the spread of this rampant problem. Doctors and other health professionals are supposed to be role models for society. If a member of the general public sees a person related to the health profession smoking or using tobacco, then the credibility of the anti-smoking message is lost. Hence, efforts must be made to ensure that health professionals try to quit the use of tobacco themselves, so that they become better role models and their advise has credibility. The issue of tobacco is an appalling one and it is the duty of health personnel to actively play their part at the individual, community, national and international levels to control the spread of tobacco use because they are the members of society best equipped in terms of knowledge, skills and credibility to tackle this issue.

References available on request.

Dr Javaid Khan is a Speaker at the Respiratory Medicine Conference scheduled to be held from 31st January to 1st February 2018 at the Arab Health Congress.

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Generating Value in Developing Healthcare Systems

Emerging markets pose great opportunities for developing value-based healthcare systems using a leapfrogging approach in a technology-driven world

By Jad Bitar, Partner & Managing Director at The Boston Consulting Group Middle East and Emile Salhab, Principal at The Boston Consulting Group Middle East

In the global endeavour to manage the cost of healthcare, clinicians and policymakers alike have redirected their focus to generating value. Their approach consists of analysing the resources used and results achieved in well-defined patient populations (for example, diabetics or the frail elderly) using information documented by health systems regarding large variations in health outcomes as well as extensive differences in clinical practice. To harness the benefits of value-based healthcare, payers, providers, and policymakers will need to devise solutions to overcome the fundamental challenges posed by systematically collecting and analysing comprehensive health outcomes data. However, the vast majority of emerging markets lack the necessary infrastructure—including IT systems, disease registries, and integrated health IT systems—needed to collect and effectively exploit this data. Herein lies both the obstacle and the opportunity.

Opportunity in the Absence of Infrastructure

Emerging markets are not burdened by legacy systems and the onerous complexity of integrating separate data sets – so they are ideally positioned to leapfrog existing technologies in improving and developing their healthcare systems. In particular, the widespread penetration of mobile communications works to their advantage, as it enables them to introduce innovative approaches to connectivity and data collection and scale them up rapidly.

This approach follows suit of other experiences in emerging markets in areas such as mobile telecommunications and mobile financial services: entrepreneurs have developed entirely new infrastructures and services from scratch, bypassing the replacement or revision of traditional landline networks and physical networks of bank branches. The result is a leapfrogging effect, whereby emerging markets surpass their peers in technological development in a remarkably short amount of time.

Leapfrogging: A Timeless Technique

As World Economic Forum defines it, leapfrogging is a way for less-developed economies to use innovation "to accelerate development and achieve results equal to or better than those of mature economies, in less time."

To apply the concept, we focused on Saudi Arabia and more specifically Coronary Artery Disease (CAD) patients, given that the healthcare system represents an accurate sample of the problems that emerging markets face when collecting and analysing health outcomes data. Our analysis of the CAD treatment pathway in Saudi Arabia identified three major obstacles in the way of adequately collecting and analysing the International Consortium of Health Outcomes Measurement (ICHOM) standard outcome metrics.

The first obstacle is the typical fragmentation of clinical care, particularly given the limited availability of integrated care in Saudi Arabia. Patients typically visit several caregivers and facilities resulting in the multiplication of the patient medical records across providers, limiting the availability of a holistic patient's medical record. In addition, patient records are for the most part still handwritten, contributing further to data fragmentation and entry errors (according to the Saudi health ministry, only about a third of hospitals and a mere 5% of primary care centers have electronic medical records (EMRs). The third obstacle is that of incomplete clinical data as cardiologists don't usually collect data on many of the outcome metrics that ICHOM has identified as critical, and patients rarely report back on their health status in the months and years after surgery.

We collaborated with BCG Digital Ventures, a BCG subsidiary that designs and develops digital businesses, to develop a prototype to illustrate how new technologies can address these challenges and facilitate value-based healthcare in emerging markets. BCG Digital Ventures helped us develop a prototype for a mobile application that allows patients to collect and track their health outcomes data using their smartphones. To emphasise the collective effort necessary to collect health outcomes data, and the importance of collaboration among providers and patients, the prototype was named "Our Health Journey."

Our Health Journey fills the relative absence of integrated health IT infrastructure in Saudi Arabia as well as the country's remarkably high level of smartphone penetration to create a cost-effective bottom-up infrastructure for the collection of CAD-related outcomes data. (Nearly 80% of the Saudi population uses smartphones; there are currently 179 cell phone subscriptions per 100 people). The primary feature of Our Health Journey is a cloud-based integrated medical record that patients can complete using their smartphone. Medical data (demographics, treatment and outcomes) is collected in one digital platform that enables continued, comprehensive data collection through accessible means.

Our Health Journey illustrates the effectiveness of the leapfrogging approach, highlighting what could be possible if national health ministries, as well as large payers and leading providers, were to adopt it in a systematic fashion. Such an app could easily track a variety of outcome sets, and with an intuitive user interface and benefits for the customer as well, it could easily contribute to a global benchmarks database for the comparison and analysis of health outcomes.

The systematic measurement of health outcomes is a foundational element and arguably the most vital aspect of establishing a value-based healthcare system. Conducive ▶

to this effort is the recent development of comprehensive global standards by the nonprofit International Consortium of Health Outcomes Measurement (ICHOM), an organisation which brings leading physicians and patient groups together from around the world to develop a consensus around the minimum set of outcomes for a given condition or disease.

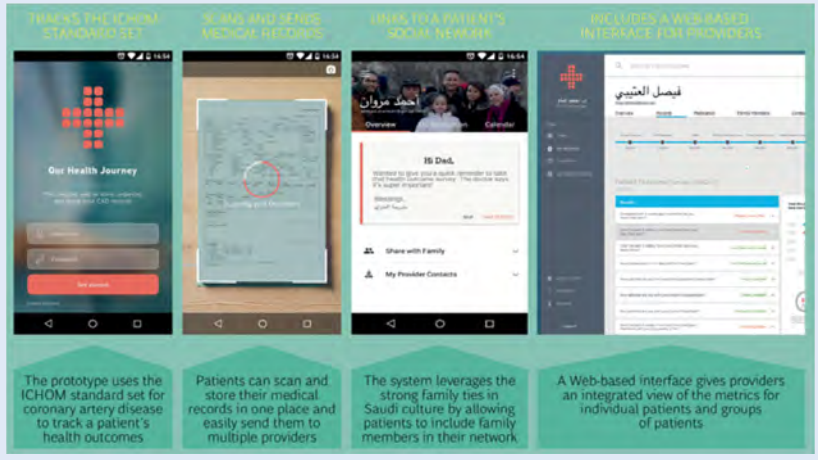
A Collaborative Effort

As emerging markets develop and adopt innovative solutions in an effort to leapfrog, national health ministries can play a central role in supporting the development of value-based health care. Public health authorities must set standards for tracking health outcomes, design incentives to drive improvement, and establish a legal framework for handling confidential patient data that not only protects individual patient confidentiality but also makes anonymised data available for comparison and identification of best practices. Health ministries must also optimise the private-public partnerships identified by the World Economic Forum as critical enablers of leapfrogging in healthcare.

We present six principles to help providers, payers or regulators get started on this journey:

- Adapt metrics to resources: Value can already be created by tracking a limited set of outcomes and could gradually expand when tracking becomes available for the complete set.
- Leapfrog using technology: A standalone system, such as the prototype for Our Health Journey, is only one such approach. Others could build on existing applications not intended to measure health outcomes—much like what M-Tiba does in the area of health spending.
- Embed data collection along the care pathway: Data collection process should be an integral part of the care pathway
- Free up physician time through task shifting: Physicians are scarce resources in most health systems. Free up their time by automating and shifting responsibility for data collection.
- Create transparency for all stakeholders: The more stakeholders who have access to outcomes data, the more likely the data will spur changes in clinical practice or patient behaviour, which will generate value in healthcare. Fortis Healthcare makes its CAD outcomes data public on the company website and updates it every six months, a highly advantageous practice for Fortis but also for the healthcare industry as a whole.
- Improve practice: To improve clinical practice, clinicians need to "interrogate" the data by analysing it, figuring out what it means, and considering the implications for how they deliver care. AH

▼TABLE 1: "Our Health Journey" Collects and Tracks Health Outcomes



Source: BCG Analysis

Jad Bitar is Partner & Managing Director at The Boston Consulting Group Middle East

Emile Salhab is Principal at The Boston Consulting Group Middle East

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Banking of clinical biospecimens for effective personalised medicine

By Fay Betsou, PhD, HDR, Chief Scientific Officer, IBBL (Integrated BioBank of Luxembourg), Luxembourg

Clinical biospecimens are used not only for clinical diagnostic purposes but also for research purposes, either as preclinical models or for the identification of biomarkers of disease. The mission of a biobank is to support research by systematically collecting, processing, qualifying and distributing biospecimens. In order for biobanks to fulfill this mission, several technical/scientific issues have to be dealt with, taking into account the most recent scientific results.

Efficiently utilised biospecimens are accurately identified and accompanied by relevant and verified data (clinical, pathological, pre-analytical). They have appropriate concentration, purity, integrity, and homogeneity for the end-uses and those that correspond to cases and controls are of comparable quality. Relevant committees and working groups of the International Society for Biological and Environmental Repositories (ISBER), have developed documents and tools to ensure biospecimens can be used efficiently.

The ISBER Best Practices: This document contains a description of effective practices for the management of specimen collections and repositories. Adherence to ISBER Best Practices is on a voluntary basis. The ISBER Best Practices are periodically reviewed and revised to reflect advances in research and technology. The fourth edition of the Best Practices is being published in the first quarter of 2018.

The Self-Assessment Tool: This is a survey allowing participants to "assess their degree of compliance with the ISBER Best Practices". It provides a risk-balanced score, based on a proprietary algorithm, which can be used as a quantitative quality indicator by those biobanks who decide to implement a quality management system. It supports continuous improvement and facilitates accountability to stakeholders.

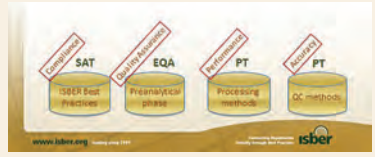
Clinical biospecimens stored in biorepositories are intended to be used for biomarker identification and validation, among other things. The performance of such a biomarker greatly depends upon the pre-analytical variations of the samples utilised for its initial identification. Quality assurance therefore is of utmost importance, making it possible to establish the right correspondence between processing methods and end-use biomarkers. The ISBER Biospecimen Science Working Group (BSWG) has developed the following educational and quality assurance documents and tools:

The Sample PREanalytical Code (SPREC) was developed in 2009. Informatics tools have been developed, which facilitate SPREC implementation. The SPREC allows biobanks to document the in-vitro preanalytical history of biospecimens in a standardised way.

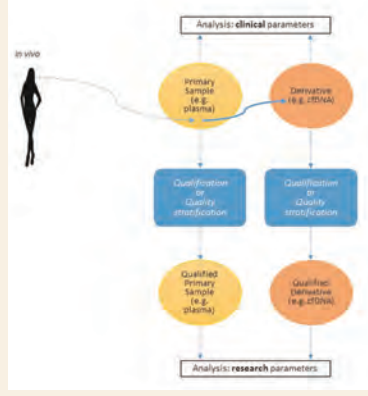
Having established and updated a biospecimen science literature compilation, the BSWG did a critical review of more than 600 of these publications. The aim was to find biospecimen QC tools (markers or assays) that could be used to define sample quality. At present, there are few QC tools that are either predictive of downstream method feasibility and reliability, or diagnostic of upstream biospecimen processing steps. The most appropriate quality control tools, in terms of molecular diagnostic performance, and feasibility of application were selected by consensus. QC assays allow biorepositories to objectively assess the fitness for purpose of biospecimens.

ISBER, together with the Integrated Biobank of Luxembourg (IBBL), has developed a biospecimen Proficiency Testing (PT) programme for biorepositories, in compliance with ISO 17043. The PT programme allows biobanks to assess the efficiency of their biospecimen processing methods, and the accuracy and precision of biospecimen QC methods. It supports biorepository accreditation initiatives, facilitates implementation of new QC tools and allows evaluation of their performance by comparing them to previously used QC methods. PT is another step towards standardised and accurately characterised biospecimens. The 2018 schemes include DNA extraction from whole blood, RNA extraction from whole blood, DNA extraction from FFPE cells, RNA extraction from FFPE cells, DNA extraction from frozen tissue, RNA extraction from frozen tissue, cfDNA extraction from whole blood, DNA quantification and purity, RNA quantification and purity, RNA integrity, cell viability and tissue histology.

▼FIGURE 1: Biobanking quality assurance tools



▼FIGURE 2: Sample preparation and qualification for use in research



The BSWG also performs experimental work, for example on RNA stability at room temperature. Stability studies allow evidence-based biobanking.

The Preanalytical External Quality Assurance (EQA) survey allows biorepositories to assess the quality assurance of their preanalytical phase (Fig. 1).

Professional biobanking, with appropriate quality assurance and evidence-based procedures, will contribute to the reduction of the irreproducibility of research results and will enable effective implementation of personalised medicine. AH

References available on request.

Dr Fay Betsou speaks on 'Biobanks and personalised medicine' at the Public Health Forum scheduled to be held on 29th January 2018 at the Arab Health Congress.

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SUSTAINABILITY IN SURGERY:

Achieving Excellence in Surgical Practice

By Professor Ali Al Dameh, MD, FACS, FRACS, Consultant Surgeon, Emirates Speciality Hospital, DHCC, Dubai

We are what we repeatedly do. Excellence then, is not an act but a habit."

William Durant

Surgery is a demanding career with great rewards and equally great challenges. In order to sustain our careers as well as the careers of our colleagues, it is important to understand and address the physical, psychological and spiritual challenges of surgery. With rare exception, the majority of surgeons who prematurely leave surgery do so because they find the work to be physically, emotionally or spiritually incompatible with the vision they have for their life. Understanding these issues and providing solutions to improve surgeon wellness can help prevent societal loss of these highly trained professionals and suffering for surgeons and their families.

"In the classic training program, we have taught how to perform surgery, but we have not taught how to live as a surgeon."

D Campbell

Although many surgeons truly love their work, 60% of surgeons would retire if they could. The average age for leaving the practice of surgery is less than the expected age of 65 and has been reported to be as low as 57. This exodus of practicing surgeons is a loss to society, particularly given the significant shortage of surgeons worldwide. It also reflects tremendous personal loss since the most common cited reason for early retirement is burnout. Four dimensions play an important role in understanding the challenges surgeons face and developing strategies for a rewarding career in surgery.

1. Physical well-being

Some illnesses that limit a surgical career are unexpected and not preventable, but others are easily detected and effectively treated with appropriate use of healthcare services. More than 25% of surgeons over 50 fail to schedule a screening colonoscopy, cardiac exam, and, for the men, a prostate examination.

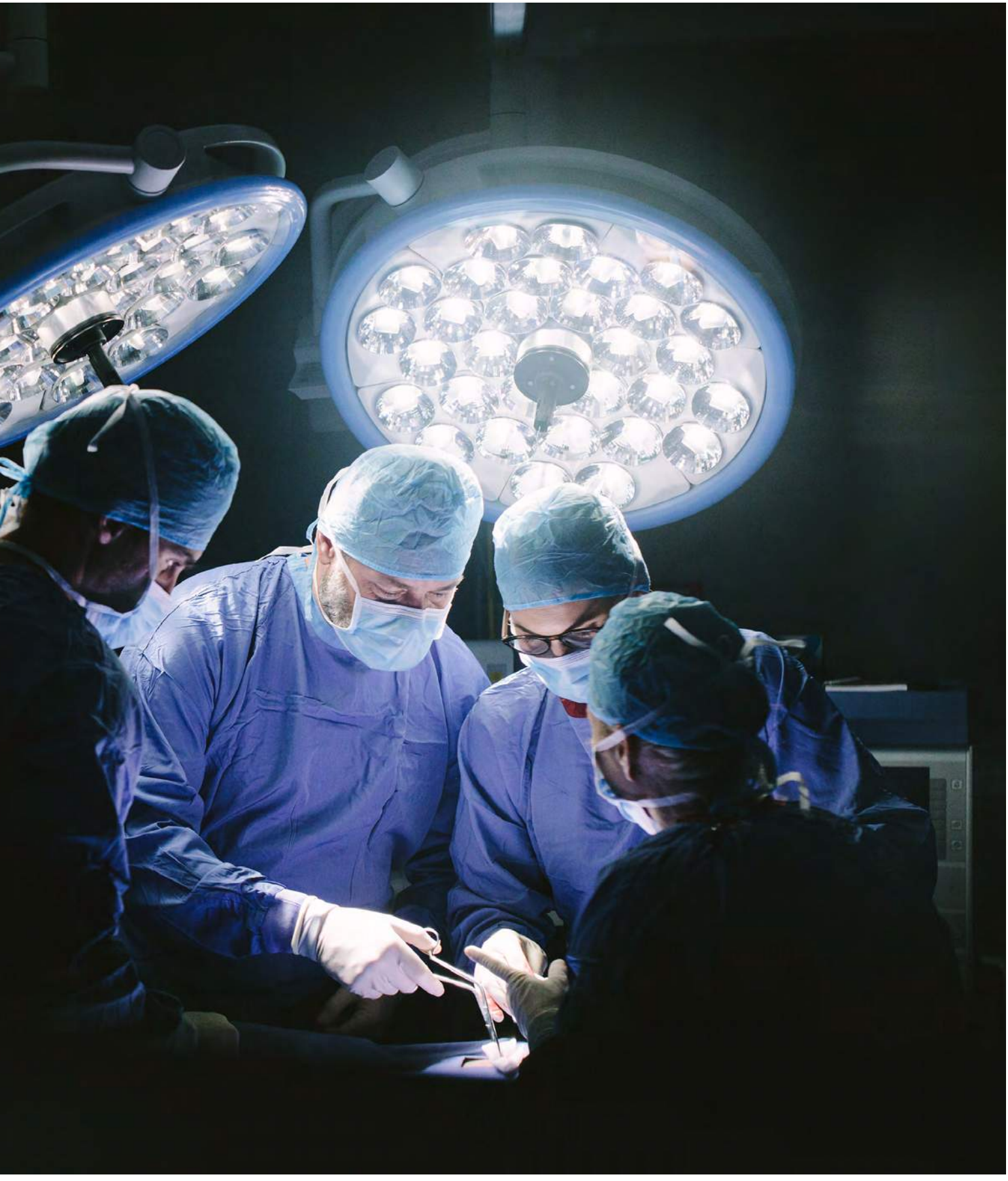
"Sadly, a surgeon can much more easily obtain a detailed ergonomic assessment and direction for improvement of his or her golf swing than of his or her surgical "stance" or movement."

A. Park

Performing surgery is physical work and therefore has associated specific work-related injuries. In general, the factors that increase the risk of musculoskeletal injury are awkward body posture, frequent repetitive movement of the upper extremities, and prolonged static position. The focus required during surgery results in particularly long periods of time in a static position, greater than that is seen in most other professions.

There are also numerous design issues that contribute to the ergonomic stresses of surgery. Primary among them is that the operating room design has not significantly changed in the last 50 years. Most operating room tables were designed for open procedures. They are adjustable between 72.5 and 121.5 cm, and therefore do not go low enough for an ergonomically appropriate position for minimally invasive procedures, particularly if the patient is obese.

The instruments and monitors used for minimally invasive surgery can also ▶



Professor Ali Al Dameh is the Conference Chair of the Surgery Conference at the Arab Health Congress

be problematic as they were initially modified from instruments used by otolaryngology. For example, the traditional "tower" configuration of monitors used in otolaryngology is a significant ergonomic issue for minimally invasive surgeons since the screen should always be in front of the surgeon and not to the side. Not being able to move the monitors to this position increases the risk of neck injury.

The handles for instruments used in minimally invasive surgery come in only one size, compared with eight sizes of surgical gloves, a fact that creates issues for surgeons with smaller hands (glove size ≤ 6.5). In addition to being an awkward size for many surgeons, instrument handles often require non-ergonomic motion, particularly for surgeons with smaller hands.

Finally, because of length and other design requirements for laparoscopic instruments, 4 to 6 times more force is required to use these instruments when compared to instruments used in open surgery. The lack of smaller instruments and this need for increased force places women at particular risk for instrument-related ergonomic injury. Solving these ergonomic design issues requires collaboration between manufacturing companies, engineers and surgeons, a process that is now underway.

Exercise plays a particularly important role in the prevention and treatment of musculoskeletal pain from ergonomic injury. Of all forms of exercise, strength training is shown to have the most improvement in musculoskeletal pain in the first two months of exercise, which continues to improve with continued exercise, and persists over time. Yoga, Tai Chi and Pilates may be particularly good exercises for surgeons since they require core strength through rotational movement. The role of exercise in maintenance of health cannot be over emphasised.

Sleep deprivation and chronic sleep restriction are major contributors to poor health and loss of well-being. For surgeons who take a call and experience sleep deprivation, the issue is not only loss of sleep, but an inability to "catch up" on lost sleep. Adults require 8 hours of sleep a night, with only a small percentage who do well with 7 hours of sleep. However, 60% of surgeons reported an average of less than 6 hours of sleep per night, resulting in chronic sleep restriction. Being on call and working the next day was the norm for previous generations, but based on these data this schedule may not lead to optimal patient care. The use of caffeine to counteract sleep deprivation may also be problematic, since increasing amounts of caffeine can negatively affect surgical performance.

"Surgeons share an unwritten but understood code of rules, norms, and expectations. This code includes coming in early and staying late, working nights and weekends, performing a high volume of procedures, meeting multiple simultaneous deadlines, never complaining, and keeping emotions or personal problems from interfering with work. These are hallmarks of dedicated professionals that should be celebrated and rewarded. However, there is a fine line separating dedication from overwork; if unchecked, overwork could lead to counterproductive, unhealthy, or even self-destructive behavior that may affect patient care."

CM Balch

2. Emotional well-being

Practicing surgery is not easy, and most who choose to be surgeons know and embrace this fact. The act of operating on another human being is stressful, and requires psychological fortitude as well as skill. As a result, the surgeon-patient relationship is unique, and results in deep and special bonds with patients. The surgeon-patient bond is accompanied by a strong, culturally reinforced sense of responsibility. The unspoken implication is that surgeons are responsible for all that happens after a procedure and therefore should be available ▶

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at all times. Unfortunately, as a result, those who seek time to rest or are suffering for any reason (physical, psychological or spiritual) often feel that they are somehow "less".

Additional stressors for practicing surgeons include medical errors, adverse outcomes and malpractice lawsuits, all of which are associated with an increased risk of burnout and depression. In these situations, the surgeon inevitably becomes a "second victim" as a result of emotional trauma.

This trauma adversely affects the ability to work, particularly in the areas of memory, recall of knowledge, and attention. Becoming a "second victim" is not an uncommon situation. All physicians experience errors and adverse outcomes. 42% of all physicians will be sued during their career, a number that increases to 90% for surgeons. Focus therefore on emotional integrity by protecting and nurturing important relationships; use debriefing strategies with trusted friends and family after stressful events; and seek professional help for symptoms of depression or anxiety.

3. Burnout

"Burnout" is characterised by a combination of losing enthusiasm for work (emotional exhaustion), viewing and/or treating patients and colleagues as objects (depersonalisation) and nurturing the feeling that others could do your job better than you (low personal achievement). Burnout occurs in all specialities, but is particularly prevalent in the surgical specialities with up to 42% of surgeons meeting the criteria for burnout. The incidence of burnout for all physicians has increased over time, which can be attributed in part to changes in the delivery of medical care which have increased job stress without increasing job satisfaction.

All physicians will experience some or all of the components of burnout during their career. The key is to recognise these symptoms when they occur and intervene quickly and effectively. The first step, which may fly in the face of surgical culture for many surgeons, is to acknowledge this is real, and not a sign of personal failure. Individuals can then experiment with different interventions and strategies for physical, emotional and spiritual self-care.

It is important to not be isolated; "Human beings heal by telling stories." Having a safe space to "debrief" by sharing the events of the day cannot be overemphasised as a tool in preventing and treating burnout. Therefore, protecting and nurturing close relationships at and outside of work is an essential component of physician self-care. Mindfulness, other meditation practices and/or religious practices are also effective tools in preventing and treating burnout. Physicians who practice mindfulness and learn mindful communication show improved overall burnout scores as well as improvement in each of the three domains of burnout (emotional exhaustion, depersonalisation and achievement).

"Burnout is not a problem of people but of the social environment in which they work."

Our goal as a profession should to be identify personal or career limiting issues in our colleagues and ourselves early enough to prevent suffering and, if not recognised, true tragedies. We should also work together to change our environment and our culture to promote and encourage self-care and health.

4. Spiritual well-being

Human beings have a need for meaning in their life and their work. Spirituality provides the context for that meaning, and is an essential part of human wellness. Burnout, often described in emotional terms is also a spiritual malady, "a deterioration of values, dignity, spirit, and will." The importance of spirituality is recognised by surgeons. Along with protected time for relationships, surgeons rank meaning in work and "focusing on what is most important in life" as the most essential strategies to promote wellness. The perspective gained and tools learned through a spiritual practice allow physicians to gain control by changing their perspective, which may be the single most powerful antidote to physician stress and burnout. Developing a spiritual strategy to deal with the pressure and stress of work can lead to seeing work as not a place where energy is expended, but a place where renewal can occur though the meaning and challenges encountered every day.

The importance of true rest, not just for physical recovery but as a spiritual practice, cannot be overstated. Taking a full day, or even a half-day, to just play, rest, and relax is amazingly restorative. Taking a "digital time out" can be an important part of recovery from work. The constant stimulation of the digital world we live in can compound the stress we feel at work. Finally, taking the vacation days that you are given should be considered important ways to improve spiritual well-being.

The practice of surgery offers the potential for tremendous personal and professional satisfaction. Few careers provide the opportunity to have such a profound effect on the lives of others and to derive meaning from work. Seen through the lens of spiritual self-care, times of stress can be viewed as a moment to step back, an opportunity to evaluate priorities or even a time of professional growth. In this context, a bad day (or longer time period) is not necessarily a sign of burnout, but may be a sign to focus on renewal.

Conclusion

The art of surgery requires surgeons to be physically, emotionally and spiritually sound. Surgeon well-being should therefore be both an individual and institutional priority. Individually, surgeons should consciously develop plans for well-being that incorporate aspects of physical, emotional and spiritual self-care. Surgical groups should develop curricula and ensure that the principles and practice of self-care are taught and understood. These principles include attention to routine health care, exercise, healthy food, ergonomics, sleep and adequate rest as well as the presence of trustworthy friends to share struggles and joys.

Institutions should develop proactive plans to support personal wellness such as insuring comfortable places to rest, eat and talk and providing healthy food in the workplace. All surgeons and administrators should work to develop policies and a culture that recognises the importance of appropriately limiting time in the hospital, supporting individual efforts at self-care, and providing the time for genuine renewal.

These are the eternal duties of a Physician: First ... to heal his mind and to give assistance to himself before giving it to anyone else– Epitaph of an Athenian Physician, 2AD

By adhering to these principles, a surgeon could achieve clarity of purpose and focused attention–the essence of excellence.

Professor Ali Al Dameh is the Conference Chair of the Surgery Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

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OMNIA WINS Global Excellence Award

With around 3 million page views, around 200,000 users, 7000 members, and more than 25,000 products on its portal, Omnia, the global medical directory, has seen its leads generating businesses worth millions of dollars and is consistently growing – all in the short span of less than a year.

By Arab Health Magazine Staff

Bridging the gap between exhibitors and visitors all year round, Omnia, the all-encompassing digital platform and global medical directory was launched in January last year at the 2017 Arab Health Exhibition in Dubai, UAE. Within a short span post its launch, this online platform that connects healthcare companies with potential customers beyond the show floor, 365 days a year, was awarded the Global Excellence Award in London, UK, in December 2017 in the Digitally Driven category.

"It is an honour to be recognised with such a prestigious award as it validates our approach to providing significant value to our exhibitors by enhancing their reach to a global marketplace all-year round expanding beyond the horizons of the limited days of the exhibition," said Joseph Chackola, Director, Informa Life Sciences, Dubai, UAE. "This award illustrates the significant impact Omnia's user-centric platform has had on delivering intrinsic value both to our vendors and buyers, and as a creative tool to strengthening Informa Exhibitions' competitive position in the global events marketplace. As we continue to constantly improve and extend our platform, and with the hard work and commitment shown by our team in driving innovation, the recognition bestowed on Omnia will propel us to scale greater heights as we are focused on creating solutions to meet the needs and exceed the expectations of our exhibitors and members."

Designed to identify and reward best practices that help to create an outstanding customer experience at the show level, the GE Awards program was launched by Informa Exhibitions, Informa's Global Exhibitions Division.

One of the most important features of the Omnia platform is that it offers access to company and product information 365 days of the year, whenever and wherever you need it. What's more, users can directly connect with healthcare manufacturers year-round and from across all markets globally.

"Under the Omnia portal, we currently have four of the major Informa Life Sciences events including Arab Health, FIME, Africa Health and MEDLAB Middle East," explains Joseph Chackola. "In 2018, however, we will bring the rest of the Informa healthcare events under this platform. The focus will be on 'Omnia 360°' which breaks down all geographic boundaries as registered members reap the benefits of year-round access to the portal and users can now interact with products beyond the show floor any time of the year, including watching product demonstration videos, viewing PDFs and brochures or downloading catalogues from multiple companies all in one user-friendly platform."

With an average of over 1000 products that go live on the portal every week, and a healthy trend of visitors spending upwards of 13 minutes on the site including 13 pages per session, Omnia is steadily growing and going forward, every member will be guaranteed leads, visibility and year-round presence on the portal. "Our Vision 2020 is to make Omnia 360° the umbrella for all Informa Life Sciences events including opening up an e-commerce portal and eventually, as a dream, we hope to open out to include exhibitors from outside of Informa as well," he added.

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CALL FOR HEALTHY
lifestyle interventions to combat NCDs

By Kamakshi Gupta, Communications Analyst at Dubai Health Authority

Health organisations across the world are grappling with the growing burden of non-communicable diseases (NCDs). According to 2017 statistics released by the World Health Organization, 1.6 million deaths annually can be attributed to insufficient physical activity.

The irony of these statistics is that a majority of the behaviours that cause NCDs are actually modifiable. These include: tobacco use, physical inactivity, unhealthy diet etc. And yet, globally the numbers seem to keep rising.

In the UAE, governments at the federal and emirate-wide level are developing a number of policies and strategies to tackle and prevent the onset of NCDs and to educate those with NCDs to better manage and control their conditions.

According to Fatima Abbas, Director of Policy and Strategy Department at the DHA, said: "The government has put happiness of people as a priority and health is the most important component of happiness. One of the main priorities of the DHA's 2016-2021 strategy is health promotion and disease prevention and while at the government level this will be a long-term goal and a continuous one, a recent initiative that took place in Dubai has provided a launch pad to the population to take up healthy living."

Known as the Dubai Fitness Challenge 30x30, it was announced by HH Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Dubai Executive Council. The call to the challenge has been astounding as the whole city came together to fulfill the challenge which included 30 minutes of activity for 30 days from October 20 to November 18, 2017. The city's various fitness centres provided free classes during this period while the government entities in charge of the Challenge put up a host of family-oriented activities over the course of five weekends. The scale of these activities was impressive, and in sync with the true spirit of Dubai. Participants could download the DFC app, which helped them track their activity, and also gave access to sign up for free fitness classes. Free group fitness classes were available during these carnivals and several food and beverage outlets also dished out healthy meals.

Kamakshi Gupta is Communications Analyst at Dubai Health Authority

Health experts in the emirate have since lauded the 30-day challenge. Amar Bashir Sulieman, Consultant, Strategy and Organizational Development, Health Policies and Strategies Department at the Dubai Health Authority, said: "There is no doubt that we

have a high prevalence of diabetes, prediabetes and obesity. Lifestyle modification is key to managing such NCDs. One of the reasons for such a high prevalence is the fact that changing one's existing lifestyle is extremely difficult so such an initiative is of vital importance because it provides a motivational boost and a launch pad in a way for the community to make physical activity a part of their regular lifestyle. It is also effective because it empowers the individual, engages him and puts him in the driver's seat to manage his health. Habits usually form within 21 days and for those participants that completed the challenge incorporating fitness into their lifestyle will become easier."

Personally, this is good news for me for I have now completed the 30x30 challenge. However, on a serious note, the challenge has taught me that 30 minutes of everyday activity is so doable. We spend more time on our smartphones, over coffee and over other mundane things that we do not even realise has taken up our time.

Dr M. Hamed Farooqi, Consultant Endocrinologist and Director of the Dubai Diabetes Centre at DHA recommends that participants create a supportive and conducive environment that will encourage fitness. "We often tell our patients to find exercise partners; exercising with friends and family can help make it a regular habit because you are accountable and will avoid skipping classes. Additionally it provides motivation, positive competition and a supportive environment."

Dr Farooqi says there is no doubt that physical activity can reduce the risk of many chronic conditions including coronary heart disease, stroke, type 2 diabetes, cancer, obesity, mental health problems and musculoskeletal conditions.

In a 2014 health survey conducted by the Dubai Health Authority and Dubai Statistics Centre, health experts interviewed over 3,298 families consisting of over 13,000 individuals that included both Emirati and expatriate families. The study indicated that nearly 39 per cent of men and 31 per cent of women were overweight and nearly14 per cent of men and 21 per cent of women were obese. About 19.6 per cent of Emirati men and 18.5 per cent of Emirati women suffered from hypertension.

The International Diabetes Federation has indicated that nearly 19.3 per cent of the population is diabetic and nearly 20 per cent are pre-diabetic and a large number undiagnosed.

Dr Farooqi says, "Prediabetes is the common precursor to diabetes. Patients with prediabetes do have elevated blood sugar levels but the level is not high enough to be classified as diabetes. A large number of people with prediabetes do not even realize that they have this condition. Approximately three out of four people with prediabetes will eventually develop diabetes. The good news, however, is that there are plenty of preventive measures one can take to stop or delay the onset of diabetes. Lifestyle modification is the key to achieving success. Can you imagine what a positive impact it will have if most of pre-diabetics in the country decide to reverse their condition?"

"The government has put happiness of people as a priority and health is the most important component of happiness. One of the main priorities of the DHA's 2016-2021 strategy is health promotion and disease prevention and while at the government level this will be a long-term goal and a continuous one, a recent initiative that took place in Dubai has provided a launch pad to the population to take up healthy living."

According to Dr Eldaw Ali Suliman, Advisor, Strategic Planning at the DHA, "Dealing with NCDs requires a comprehensive and multi-sectoral approach, which the Authority has in place as part of its health strategy. An important component of that is actually public outreach, awareness and campaigns to help change modifiable risk factors and prevent the community from developing NCDs as well as educating those with NCDs to manage their condition proactively. That's why such initiatives which encourage positive lifestyle can make a huge difference to the community and motivate them to lead a healthier lifestyle."

Dr Fathia Al Mazmi, Head of Section, Strategy Department and public health expert at the DHA, says, "For all health systems in the world, prevention is a vital because not only is it linked to the wellbeing of an individual but also due to the fact that the economic burden of NCDs on any economy is substantial. Prevention is important for the health of the individual, the wellbeing of his family, and for overall community welfare." AH

To know more, please attend the Public Health Conference scheduled to be held from 29th January to 1st February at the Arab Health Congress

Facts on Non-communicable Diseases

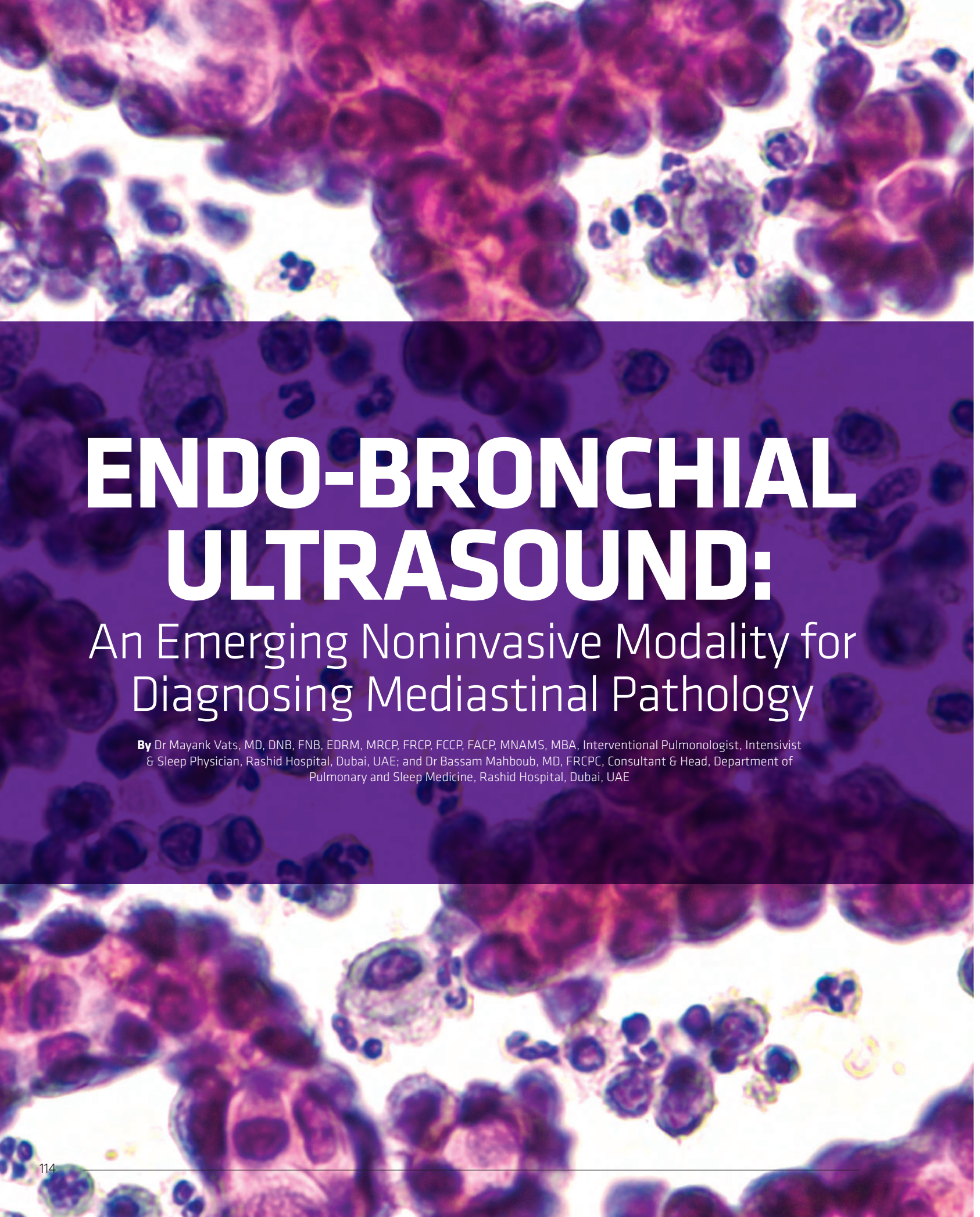
(Source: WHO, June 2017)

- Non-communicable diseases (NCDs) kill 40 million people each year, equivalent to 70% of all deaths globally.
- Each year, 15 million people die from a NCD between the ages of 30 and 69 years; over 80% of these "premature" deaths occur in low- and middle-income countries.
- Cardiovascular diseases account for most NCD deaths, or 17.7 million people annually, followed by cancers (8.8 million), respiratory diseases (3.9million), and diabetes (1.6 million).
- These 4 groups of diseases account for over 80% of all premature NCD deaths.
- Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD.
- Detection, screening and treatment of NCDs, as well as palliative care, are key components of the response to NCDs.

Modifiable behavioural risk factors

(Source: WHO, June 2017)

- Modifiable behaviours such as tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol, all increase the risk of NCDs.
- Tobacco accounts for 7.2 million deaths every year (including from the effects of exposure to second-hand smoke), and is projected to increase markedly over the coming years.
- 4.1 million annual deaths have been attributed to excess salt/ sodium intake.
- More than half of the 3.3 million annual deaths attributable to alcohol use are from NCDs, including cancer.
- 1.6 million deaths annually can be attributed to insufficient physical activity.



ENDO-BRONCHIAL ULTRASOUND:

An Emerging Noninvasive Modality for Diagnosing Mediastinal Pathology

By Dr Mayank Vats, MD, DNB, FNB, EDRM, MRCP, FRCP, FCCP, FACP, MNAMS, MBA, Interventional Pulmonologist, Intensivist & Sleep Physician, Rashid Hospital, Dubai, UAE; and Dr Bassam Mahboub, MD, FRCPC, Consultant & Head, Department of Pulmonary and Sleep Medicine, Rashid Hospital, Dubai, UAE

Endobronchial ultrasound (EBUS) is a technique that uses ultrasound principles with bronchoscope to visualise mediastinal structures adjacent to it. EBUS-guided sampling of mediastinal lymph nodes to diagnose mediastinal pathology is becoming the standard of care because of high diagnostic informative value and low risk of procedure.

The clinical application and diagnostic benefits of EBUS have been established in many studies over the years and now EBUS has been incorporated into routine practice at pulmonology units and has replaced more invasive methods such as mediastinoscopy for staging lung cancer or for evaluating mediastinal lymphadenopathy and mass lesions.

Two types of EBUS exist: radial probe EBUS (RP-EBUS) and convex probe EBUS (CP-EBUS or Linear Probe). The first CP-EBUS bronchoscope was introduced two decades back and later, many manufacturers also introduced technically advanced CP-EBUs with varying degrees of anterior and posterior movements and size (internal and external diameter) of the scope with their dedicated TBNA forceps.

Indications of EBUS:

- Staging of non-small cell lung cancer (NSCLC): EBUS-guided trans bronchial needle aspiration (TBNA) has higher diagnostic yield than conventional TBNA in all lymph node stations except sub carinal lymph nodes in determining the lymph node involvement in NSCLC. Its ability to precisely visualise the airway wall invasion helps to categorise the tumour (T) component of staging and surgical resection planning.
- Evaluation of mediastinal lesions, intrapulmonary pulmonary nodules, and endo bronchial lesions: EBUS helps directly to visualise, sampling and diagnosing various mediastinal pathologies viz Mediastinal Lymph nodes, Mediastinal Mass, etc. It can characterise the intra-parenchymal and endobronchial lesions and help to determine the likelihood of malignancy based on sonographic appearance. EBUS-TBNA can visualise and allow sampling of pulmonary nodules that are not visualised by fluoroscopy and may avert the need for surgical procedures. RP-EBUS is primarily the investigation of choice for peripheral pulmonary lesions not accessible by EBUS.
- Guidance of endo-bronchial therapy: EBUS provides useful information during various interventions including resection of endobronchial lesion, stricture dilatation, stenting, laser therapy, and argon plasma coagulation.

Benefits of EBUS:

- Knowledge of mediastinal anatomy and lymph node stations for learning purpose
- Safe procedure with high diagnostic accuracy
- It can be performed with local anaesthesia and procedural sedation as OPD basis
- EBUS-TBNA of mediastinal and hilar lymph nodes can be performed real-time using CP-EBUS or sequentially using RP-EBUS
- Trans-bronchial biopsy of peripheral pulmonary nodules can only be done sequentially using RP-EBUS
- EBUS-TBNA may avoid the use of more invasive interventions for diagnosis of mediastinal pathology

Contraindications: These are usually similar to contraindications to flexible bronchoscopy as follows:

- Life-threatening/unstable/ongoing cardiac arrhythmias
- Current or recent myocardial ischemia/ infract
- Poorly controlled heart failure
- Severe hypoxemia secondary to pulmonary disease
- Uncooperative patient
- Patient is on current anti-platelet/ anticoagulant medicines
- Coagulopathy/Thrombocytopenia

Prerequisites for EBUS Procedures:

Physicians should have extensive knowledge of mediastinal lymph node stations and sonographic anatomy of airway wall along with the hands-on experience of biopsy and handling of the samples. The endo-bronchial ultrasound image visualises distinct layers of the bronchial wall with mucosa, submucosa, cartilage, perichondrium, connective tissue and adventitia. Mucosa, endo chondrium, peri-chondrial layer and adventitia are hyperechoic while submucosa, cartilage and connective tissue appear hypoechoic.

*Preparation for EBUS: P*atient should be fasting for 4-6 hours with well informed consent and the procedure should be done in a well-monitored room, usually a bronchoscopy suite.

Anaesthesia: EBUS is usually performed under moderate or deep sedation and local anaesthesia. Local anaesthesia is given by nebulising 2% lidocaine and spraying lidocaine spray in the posterior pharynx. Additional 2 ml aliquots of 2% lidocaine can be instilled during insertion and procedure, if needed (Spray as you go Technique).

EBUS can be done in GA if patient is not cooperative or it is a planned prolonged procedure. The use of a laryngeal mask airway allows TBNA of para-tracheal nodes. The size of endotracheal tube should be at least 8.5 or larger to facilitate EBUS insertion and movement considering the large size and less flexibility as compared to conventional bronchoscope.

Equipment

CP-EBUS bronchoscope:

Olympus BF-UC160F-0L8 has linear curved array ultrasonic transducer of 7.5 MHz at the distal tip, which has capability of displaying B-mode and colour Doppler mode.

The field of view is 80°, and the direction of view is 35° forward oblique. The outer and inner diameter of the bronchoscope are 6.2 mm & 2 mm. The dedicated 21/22-gauge needle has echogenic dimpled tip to enhance visibility by ultrasound. The maximum extruding stroke is 40 mm with safety mechanism that stop at 20 mm. The needle has internal sheath which prevents contamination of sample by bronchial wall tissue.

RP-EBUS probe:

The system has ultrasound processor and balloon catheter that are attached to the probe. The 20 mHz is the standard probe. However, 30 mHz probe provides a more detailed image of the airway wall and surrounding structures. These probes have diameters of 2.5 mm; hence, a bronchoscope with channel size of 2.8 mm is required. The 20 mHz ultra-miniature radial probe is smaller so it can be inserted through the 2mm working channel and can extend further into sub-segmental bronchi.

Patient Positioning and Preparation: EBUS is usually performed on supine position with the operator standing on the head end of the bed with strict visual monitoring. The monitoring devices are placed onto the patient, supplemental oxygen is administered by nasal cannula, ▶

and intravenous access is established before starting the procedure. Eyes should be covered to prevent splashing of normal saline, secretion, or blood into the eyes.

Procedure Details

CP-EBUS: Routine bronchoscopy should be done first to determine airway anatomy and exclude any endo-bronchial lesion. CP-EBUS is usually performed orally with mouth guard. The image quality is lower to that of a regular bronchoscope. A disposable latex balloon is attached to the ultrasound probe (but usually not needed). The tip of the bronchoscope should be positioned more anteriorly while passing through the vocal cords to avoid sticking the EBUS bronchoscope on the posterior part of vocal cords. If balloon is used then the balloon is filled with water to achieve better contact with the airways and better images. Lymph nodes are identified with its typical sonographic appearance of heterogeneous structures and the capsule. Lymph nodes should be differentiated from vascular structures, which are more hypoechoic. Doppler can better differentiate between the two by assessing blood flow. All mediastinal lymph node stations should be evaluated systematically as mentioned in figure below.

Sub carinal lymph node can be visualised either from right main or left main bronchus. The bronchoscopic and ultrasonic views can be toggled alternatively or two-screen display of both views can be used in the monitor. The tip should be flexed up for ultrasound image and down for endoscopic image. Freeze the ultrasound image to know the size of lesions.

Real-time TBNA: Real-time TBNA is defined as simultaneous sonographic visualisation and sampling of the lesion. Once the target lesion is identified, 21/22-gauge needle is inserted through the working channel of the bronchoscope and fastened to it. The tip of bronchoscope should be in neutral position to allow the sheath to come out of the distal end of working channel. The needle should remain within the catheter during passage through the working channel in order to prevent damage to the bronchoscope. Once the catheter emerges out of the bronchoscope, the needle is advanced from the catheter and locked into position. The insertion point of needle is localised and it is then pushed through the bronchial wall into the target lymph node under direct ultrasound visualisation.

With the needle in the target lymph node, the internal sheath is removed. This cleans the lumen of the needle system, which usually becomes contaminated with bronchial cells. Suction is applied using a 20-ml syringe, and the catheter is moved back and forth. Suction is released and the needle is pulled back into the flexible catheter. The entire trans bronchial needle system is then removed from the bronchoscope in a single, smooth motion. The tissue core is removed from the needle lumen by reinserting the internal sheath.

Table 1: Comparison of the two types of EBUS[3]

	Radial probe EBUS	Linear probe EBUS
Transducer	Rotating mechanical transducer	Fixed array of electronic transducer aligned in a curvilinear pattern
View	360° to the long axis of scope	60° parallel to the long axis of the scope
Frequency	20 MHz (12, 30 also available)	5–12 MHz
Tissue penetration	4–5 cm	5 cm
Image quality	Very good. Allows airway layers to be identified	Currently not possible to identify airway layers
Real time TBNA	Not possible	Possible
Doppler to indentify vessels	Not possible	Possible

Table 2: Advantages of EBUS guided TBNA

Advantages over conventional TBNA	Advantages over mediastinoscopy
Direct visualisation of node	Minimally invasive
Superior sensitivity	Day care, no general anesthesia
Real-time sampling: less risk of major vessel puncture. Access to hilar nodes	Real time imaging. Access to hilar nodes
More robust EBUS-TBNA needle: larger needle, tissue size	Cost saving: not in theatre, outpatient
Cost saving: not in theatre, outpatient Equipment, staff, repair costs: conventional	Shorter procedure than mediastinoscopy
Image capture	Can be performed by trained respiratory physicians
Better access to remote nodal stations	

EBUS: Endoscopic bronchial ultrasound; TBNA: Transbronchial needle aspiration

Table 3: Relative diagnostic utility of mediastinal staging investigations based on data from systematic reviews and meta-analyses.[4]

Technique	Sensitivity	Negative-predictive value	Prevalence (range)
Cervical mediastinoscopy	78-81	91	39 (15-71)
Conventional TBNA	76-78	71-72	75 (30-100)
EBUS- TBNA	88-93	76	68 (17-98)

All figures in percentage

The number of needle aspirations per site should be 3-7 to gain better yield of sampling. If the TBNA is done for NSCLC staging, the sampling should be started from N3 followed by N2 and N1 lymph nodes to avoid contamination and upstaging.

RP-EBUS: Bronchoscopy with at least 2.8 mm working channel is required for RP-EBUS. When the bronchoscope is in the airway and around the target lesion, the radial probe is placed in a catheter sheath and inserted through the working channel of the bronchoscope. The probe is positioned at the target level and the balloon is filled with water till it has firm contact with the airway. Complete circular image of airway wall and surrounding structures is obtained when the balloon has firm contact with the airway wall. RP-EBUS gives 360° image of the airway wall and surrounding structures.

If patient does not tolerate complete obstruction of airway, the balloon can be filled partially and applied to the airway wall in semicircular manner.

Sequential TBNA: Sequential TBNA is defined as localisation of lesion first and subsequent sampling of the lesion. When the ultrasound identifies the target lesion, the radial probe is removed from the working channel of bronchoscope and TBNA needle is introduced through it. TBNA of the lesion is performed using technique similar to conventional TBNA. Sequential TBNA can also be used to localise and sample intra-parenchymal lesion. The probe should be introduced using catheter with extended working channel and placed exactly on the lesion. With guide sheath in position, the radial probe is removed and biopsy forceps or brush is used to sample the lesion through the guide sheath. It can also be combined with virtual bronchoscopic navigation system.

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Post-Procedure: Continuous monitoring of cardiac rhythm, BP, heart rate, respiratory rate, oxyhemoglobin saturation, assessing for hemoptysis & pain is usually done after the procedure until the effects of sedation and local anesthesia have been resolved. Patient should be kept NPO until the gag reflex returns (2 hrs). A chest X-ray should be performed to evaluate complications. Patients must have stable vital signs, be alert and oriented with baseline ambulation status before discharge.

Complications of EBUS: In experienced hands EBUS-TBNA are usually safe procedures. No serious complications were found on a systematic review of effectiveness and safety of CP-EBUS-TBNA of regional lymph nodes. Reported complications are agitation, cough, hypoxia, laryngeal injury, fever, bacteremia and infection, bleeding, pneumothorax, and broken equipment becoming stuck in the airway. Complications related to upper airway local anesthesia are laryngospasm, laryngeal edema, bronchospasm, methemoglobinemia, and cardiac arrhythmias. Complications attributable to procedural sedation are respiratory depression, cardiovascular instability, vomiting, and aspiration.

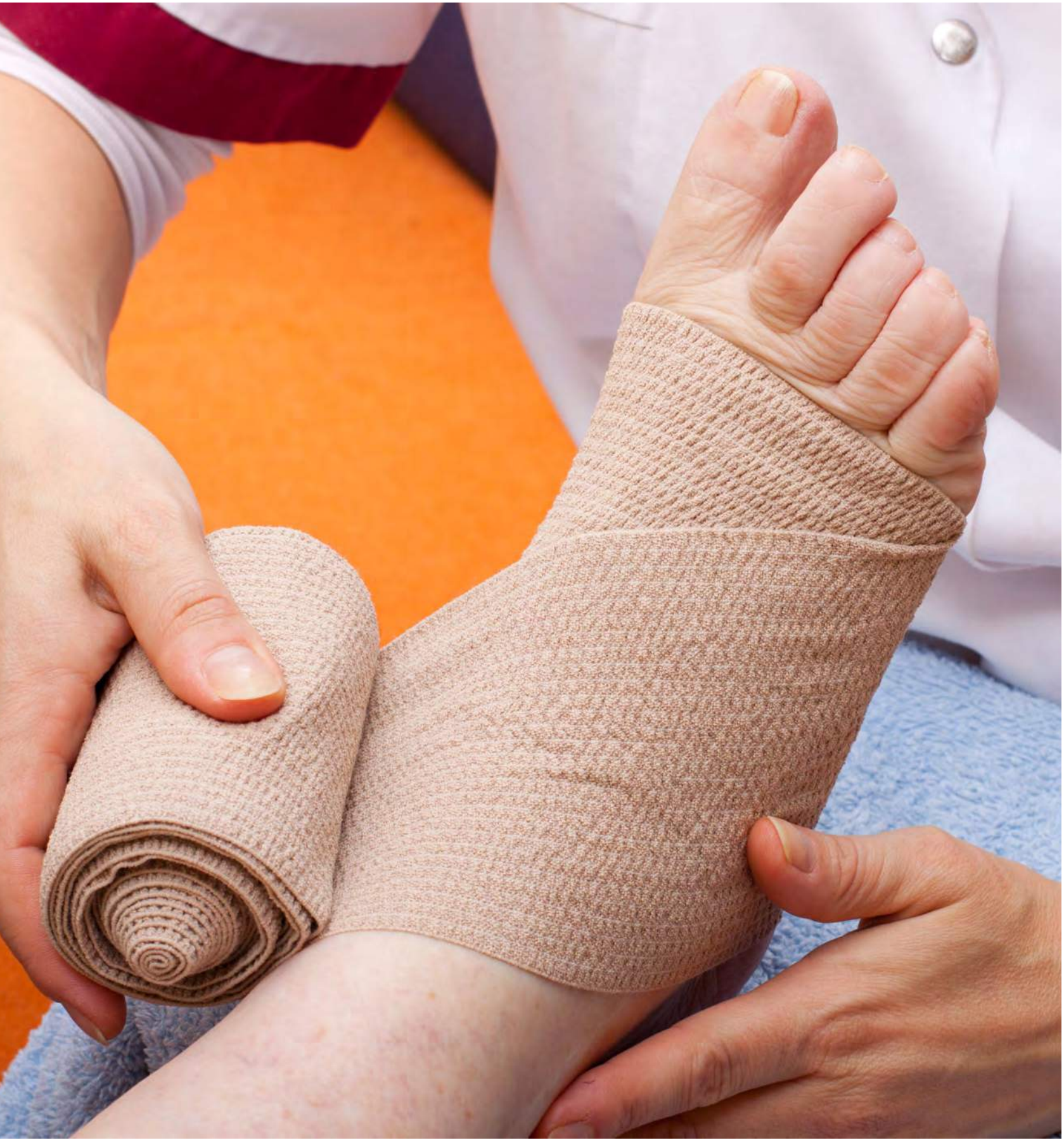
Specimen Preparation: Aspirated specimen is smeared onto glass slides and air dried so that an on-site cyto-pathologist can evaluate the specimen. The use of rapid on-site evaluation (ROSE) significantly improves the diagnostic yield of TBNA, is cost-effective and avoids need for further biopsies without loss in diagnostic yield and also reduces the complication rate of bronchoscopy. Histological cores are fixed with formalin and sent to the pathology department. The samples can be used for molecular analysis.

EBUS Training: As EBUS-TBNA is a new emerging technique, a large number of pulmonologists need training It is advised that a pulmonologist should perform 50 EBUS procedures with and without supervision to be adequately trained. Evidence-based protocols for teaching EBUS-guided TBNA are necessary. An EBUS computer simulator can accurately discriminate between operators with different levels of clinical EBUS experience and help in assessing training and evaluating competency.

Conclusion

EBUS TBNA is very safe and cost/time effective, minimally invasive procedure in experienced hands to evaluate mediastinal and pulmonary pathology and should be encouraged in all multispeciality tertiary care hospitals. AH

Dr Bassam Mahboub is the Conference Chair and Dr Mayank Vats is a Moderator at the Respiratory Conference scheduled to be held from 31st January to 1 February 2018 at the Arab Health Congress.



Making the Case for MORE HOMECARE

By Tina Marrelli, RN, MSN, MA, FAAN; Author of Home Care Nursing: Survival in an Ever-Changing Care Environment

There are many drivers that support providing more healthcare in the home. Not every health condition can be cared for in the home, but more could be; and perhaps with lower costs, higher quality, improved experiences and increased comfort.

When people are asked where they would wish to be cared for, they usually say "at home." How does the healthcare system move from a building-intensive and uber-specialised model to a person-centred one at home? There is almost no greater sacred place or space than our homes. Homes represent who we are: the food, beverages, furnishings, traditions, neighbourhoods, gardens and pets are all reflections of ourselves. Healthcare should be no different. Life-long health habits and behaviours are learned and honed across years in homes. Where better to initiate and continue health education and care than at home?

The model visualised makes the home the central place around which all other healthcare revolves; this is a very different construct from most healthcare today. Home is where people usually want to be, and where health decisions are made every day including diet, lifestyle, and other choices. The following eight areas address some of the factors for making care at home more desirable and practical.

1. The ageing of the world's population. Much has been written about the grey tsunami. We know that the oldest old (those over age 85) are one of the fastest growing segments of the population. It is recognised that many aged people need assistance with activities of daily living and personal care. The question then becomes: how do we best care for this growing population? For example, what are the metrics that measure how well we are doing and what feedback should be sought from the care provided? Many older adults do not have one healthcare condition, but may have several comorbidities impacting their health.

How does the healthcare system move from a building-intensive and uber-specialised model to a person-centred one at home?

Practical Application: Consider models and processes that bring healthcare to the person at home when possible. Consider the very frail oldest old, the homebound, the chronically ill and others where the logistics and experiences of getting out to go to the doctor's office is an ordeal from a mobility and safety perspective. Now consider how we can get needed healthcare to these homes and who is best skill-matched to provide such care and support?

2. Much care can be safely provided at home with knowledgeable nurses and other clinicians. Care has been provided in homes for hundreds of years. In the United States, Medicare, Medicaid and private insurance, covers care in the home. This coverage is complex with a number of requirements. Generally, there must be physician orders for care and for any changes to that plan of care. Other requirements and structures also make obtaining care or obtaining enough hours of needed care a difficult process. The nurse who admits and cares for patients in homes must have a specialised knowledge base to provide care and have their organisation receive appropriate reimbursement for medically necessary services. In addition, there are numerous standards related to documentation of the care provided. Homecare is complex and this is the reason it is a nursing specialty. The complexity of the rules alone is sometimes akin to fitting a round peg into a square hole.

Practical Application: The payers determine the rules and sometimes the person needing the care does not "fit" neatly into the model. Try to envision a healthcare space where the person is assessed and then services are based primarily on the assessed needs without the complex and sometimes byzantine frameworks that create episodic and uncoordinated care, particularly when the person must traverse across healthcare settings. ▶

3. Emerging models of care that make the nurse central to the care of the patient and family constellation. In the home as a healthcare setting, the nurses function somewhat autonomously and provide of broad range of care and care management. Nursing is an important specialty of care in the home, with a focus on promoting health and healthy habits, education, and practical applications of care that support health and function. Homecare nurses employ many skills and clinical reasoning or critical thinking strategies in care planning to help patients reach their unique, identified goals. In homecare, nurses use skills such as observation and assessment, specialised teaching and training, management and evaluation of the patient's plan of care, providing injections, caring for urinary catheters, and providing skin and wound care. For example, wound care could include assessment and management of the wound, teaching and training related to the wound, hands-on care of the wound, and infection control and prevention.

Practical Application: Nurses can play a pivotal and leading role in reframing healthcare and bringing healthcare back to homes and communities. Think of Lillian Wald and other nurse leaders who are the benchmark for what health and healthcare in communities could "look like".

4. The team focus. There is an adage that, "no one is as smart as all of us." In home care and hospice at home, the care is not "siloed," the team communicates and coordinates and the patient is an active participant in care, care planning and in the identification of goals. There may be nurses, therapists, such as an occupational therapist, a physical therapist, speech-language pathologists or speech therapists, a social worker, a home health aide, chaplains and others. Each of these team members contribute their expertise to the plan of care so patients meet their identified goals and reach positive outcomes in a timely manner.

Practical Application: How does this model get replicated and enhanced in other care settings? What is the overlap and contribution of each team member to ensuring safety and quality? This interprofessional care and care planning is very important for patients and families as healthcare team members are role models for health, effective communications and advocacy.

5. The home environment as the setting for healthcare. Homes and housing are as unique as the people that live in them. In the hospital, patients are generally wearing the same clothes (a hospital gown), eating the same foods (the offerings from the kitchen), visitors must come at certain hours and may need to be a certain age and more. In the home environment, it is the homecare nurse or other team member who is invited in. The visiting nurse must establish a rapport and connect with the patient and family to "admit" them to the homecare programme

and then provide care. This is an entirely different headset from that seen in the hospital. The nurse or therapist is on the patient's home turf. And think of what else we have in our homes; our own ways of cooking and eating, different ways of keeping a home or house "clean", and pets that might not qualify as house pets by some people. (As a visiting nurse for many years, I have met patients with squirrels, crows and snakes as pets and more!). All these moving parts of complexity come together in a home visit and, when it works, great nurses make it look easy. It is not.

Practical Application: Nurses providing care in homes must have the well-honed interpersonal gift of "meeting people where they are" and acceptance of varying lifestyles, and "be able to converse and interface with new patients and their families on any number of topics. This comfort level with a diverse and changing "caseload" of patients does not happen overnight, and is forged through an effective orientation and with ongoing education, mentorship and role modelling.

6. Technology and its use to improve safety, quality and costs. There has been much in the literature and news about the safety and quality equation in healthcare. Sadly, some have estimated medical errors may be the third leading cause of death in the U.S. behind heart disease and cancer. If true, this is an untenable position from a cost perspective—and not solely in dollars of course. The emergence of technology to identify potential problems, such as drug interactions, to avoid additional tests such as in duplicative X-rays, and e-based educational programmes and innovations is a great thing for patients and clinicians alike. Telehealth, electronic health records and documentation software and systems can help with improving care and coordination which are needed from safety, quality and costs perspectives.

Practical Application: Embrace and learn new products as they become available and have the potential to help patients and families. Seek to become a "super user" should the opportunity emerge. Provide input to better enhance the products and their functionality.

Nurses providing care in homes must have the well-honed interpersonal gift of "meeting people where they are" and acceptance of varying lifestyles, and "be able to converse and interface with new patients and their families on any number of topics.

7. Caring for people across the life span and where they are. When caring for people of all ages and health challenges, it is important to be cognisant of their socioeconomic and psychosocial support circumstances. This is why care in the home is so different—it is holistic. For example, does the premature infant have the formula needed to grow and meet developmental and other goals? Does the frail elder, who lives alone and cannot leave their home unattended, have access to good foods and nutrition that support health needs? Is there a social worker who can help identify community resources and linkages to assist this patient and family? The types of people cared for in home care have a broad range of diagnoses. They can range from an older, obese adult with hypertension and chronic lower leg wounds to a young adult after a traumatic injury who is on a ventilator, with a tracheostomy and more.

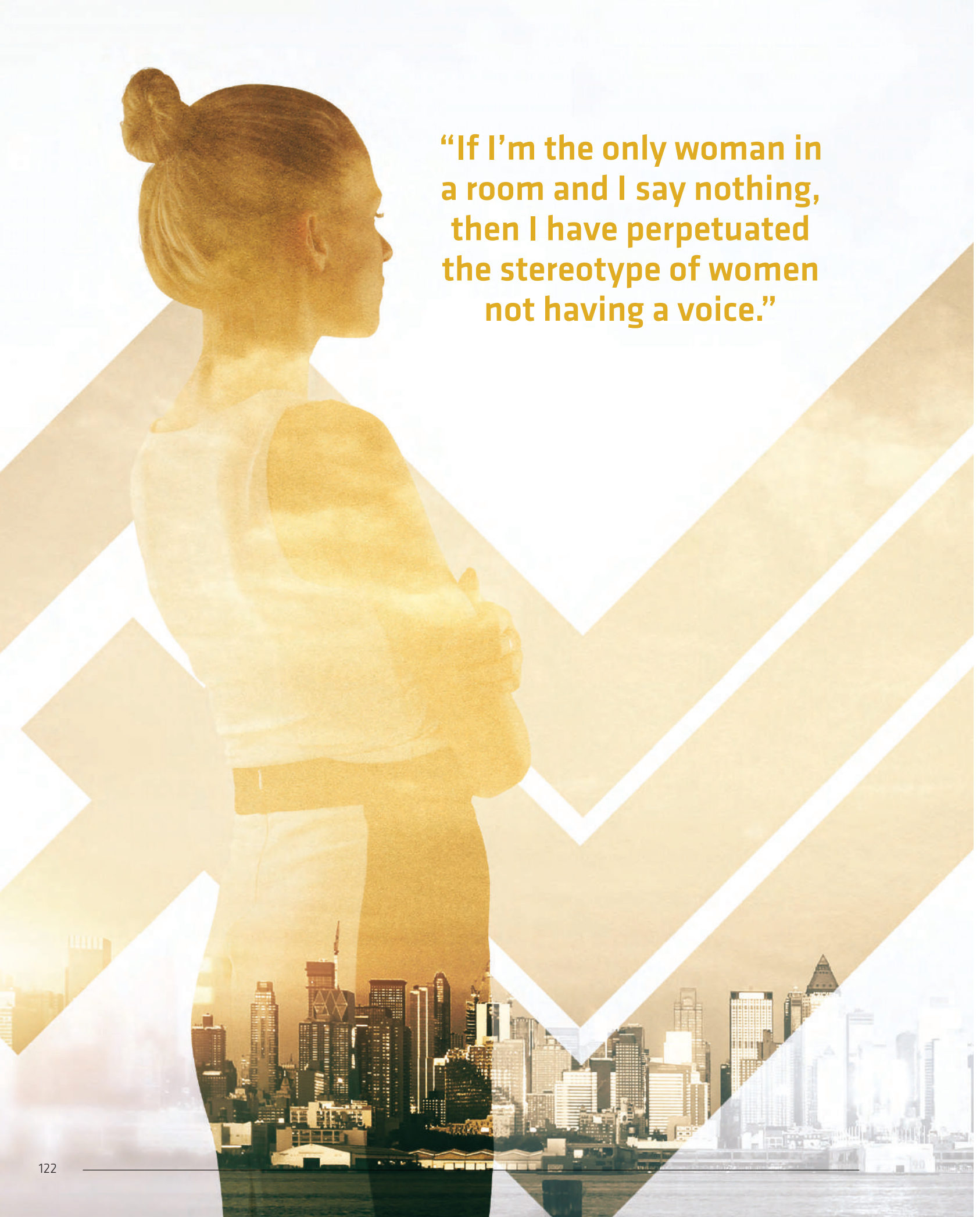
Practical Application: Try to see people, families and their homes as a reflection of themselves. Skillfully and kindly frame questions to elicit information to be sure there is (enough) food, there is working heat or electricity and air conditioning, that they can afford their medications, and other resources to support health at home. These factors are important parts of health and care and can be determined during effective home visits.

8. Family, friend and other "lay" caregivers are starting to be recognised as an untapped resource. Who knows their family member or loved one the best? This is so fundamental. We must return to a common-sense structure for healthcare, and support these most important caregivers as part of the team! Some years ago I was in Thailand and Korea making presentations about homecare. I remember touring a hospital and thinking: "how neat is that; seeing family members in the hospital room and bringing in food." These family members, friends, partners and others should be more formally recognised and educated to improve care and outcomes. This is particularly true in some hospitals and health systems as this could assist in discharge planning and care once back at home.

Practical Application: Embrace these caregivers for what they are: an engaged and interested care team member. Visit www.e-caregiving.com for resources related to educating and supporting caregivers.

This is the time to think about how to "reframe" healthcare. If home was the central place for health and healthcare, think of the costs that might be saved from a quality, safety, and costs perspective. For example, medication errors and related costs could decrease as there is only "one" patient usually in the home receiving care. Talk about a person-centred model—it does not get any more individualised than that. It might also be time to have one glossary and language for healthcare. There should not be "medicalese" spoken by healthcare professionals and another easier language for patients and families. For safety and respect reasons, patients need to know the correct terms, such as atrial fibrillations and others terms whenever possible. This "same language" may assist in clarity of communications from a safety perspective.

Healthcare has been highly specialised and we have an ageing population where this complexity might not be the best model. Perhaps it is time for a more thoughtful way to provide compassionate care. Ask questions. Consider who might be the best direct care worker or nurse for a specific patient or patient population. In thinking about reframing or restructuring models to make the home the centre of care, think of costs and the "true value" of person-centred, holistic care. This is especially true in hospice care, which I believe leads the models in truly person-centred care. Think of the healthcare world as you want it for yourself and your loved one. It may be a vision of the model where healthcare began – in the home. AH



“If I’m the only woman in a room and I say nothing, then I have perpetuated the stereotype of women not having a voice.”

TACKLING THE GENDER GAP AT THE HIGHEST LEVEL

'The under-representation of women in healthcare leadership is truly a global problem'

By Arab Health Magazine Staff

Despite great strides being made over the last 50 years in closing the gender gap in the workplace, and in particular appointing more women to the top jobs in the boardroom, more still needs to be done by companies and organisations to improve the balance of female representation.

In few other places is this more acutely felt than in the healthcare industry. Even in a socially enlightened country like the United States, women hold just 26% of hospital CEO positions and 21% of executive positions at Fortune 500 healthcare companies, even though they comprise 78% of the healthcare work force. The pattern seems to be repeated in other socially progressive countries. For example, in the United Kingdom, a recent report revealed that while the percentage of female chief executives was found to be encouraging at 42.6%, the representation of women in other key roles was less so, with only 26.3% of finance directors and 24.6% of medical directors made up of women.

Annette Walker, president of strategy at Providence St. Joseph Health in the US and chief executive officer for St. Joseph Health and who was named one of the 25 top women in healthcare in 2017 by *Modern Healthcare* magazine, told the STAT news website that solving the issue will require a sustained and concerted effort from players across the industry.

She explained, "Like many societal challenges, the root of this problem is multifaceted and nearly impossible to pin on one factor. Gender stereotypes still play a role, along with balancing family responsibilities and work schedules, parental leave policies, and access to professional networks, contacts and sponsoring structures that are vital channels for promotions. And sometimes women themselves temper their own aspirations, believing their upward mobility may be limited.

"I recognise that some of these factors are beyond individuals' control. Nevertheless, I believe that we owe it to our patients, our employees, and the communities we serve to do everything we can to increase the number of women in leadership roles."

Building a Critical Mass

Pamela Paulk, President of Johns Hopkins Medicine International is another prominent female executive who has robust views about how changes can be ushered in. She believes the biggest problem is that there simply aren't enough women in key positions to have a critical mass. This imbalance puts extra pressure on women who are represented to feel more of a sense of responsibility, to make sure they speak up and present their thoughts at the table.

According to Paulk, the world as a whole does not have enough women in leadership positions in healthcare and the under-representation of women in healthcare leadership is truly a global problem.

"For example, anywhere I go in the world for a leadership meeting, I write down the number of men and the number of women who are in attendance. The highest I've ever gotten at a leadership meeting is 30% women, and that is at Johns Hopkins. There are many places in the world where I may be one of only three women who are in the room. If I'm the only woman in a room with and I say nothing, then I have perpetuated the stereotype of women not having a voice," she says.

Beyond an Organic Shift

The only surefire way of addressing these problems is to have greater numbers of women represented in leadership. Paulk believes if you get more women around the table, there will be more conversations with different perspectives and this imbalance will then resolve itself. However, the simple truth is that there is not enough time for this shift to happen organically.

"We have to push the issue and invite more women to the table," argues Paulk. "And that will take the support of everyone in the room—including the men. I can't wait for the day when we can stop saying "the first woman president," "the first female head of the orthopaedic society," and instead, women leaders become so commonplace and so natural that we don't have to make these distinctions anymore. That's where I believe the future of healthcare is headed."

According to the Association of American Medical Colleges, of the 83,472 students who enrolled in medical schools in the US in 2013 about 38,950 were women or 46.7%. However, the percentage of women in medical school has slightly decreased over the past decade. In 2004, women made up ▶

Pamela Paulk, President of Johns Hopkins Medicine International

48.2% of the 70,816 med school enrollees.

Paulk believes that there is equality when looking at the number of students who are graduating with medical or other advanced degrees and at the physician leaders who are also taking the stage. "We just need to support women in their continued growth, and we need to make leadership more attractive by ensuring the presence of more women as role models."

Taking Practical Steps to Empower Women

There are many practical steps by which Paulk and her colleagues at John Hopkins Medicine International are trying to empower women. She explained: "We make sure that women are very purposefully represented in our own leadership teams that we send into the region and the leadership teams that we've hired to work at our affiliates. Additionally, we include women as the clinical and nonclinical subject matter experts we send to the region to provide training and conduct research.

"When we are at our global affiliates, I know that many women leaders—myself included—reach out to our female counterparts on the ground to make connections, share information and forge bonds that are supportive."

An example of this was when Paulk and her colleagues presented the award-winning women's health programme, A Woman's Journey in Saudi Arabia last year. A number of expert female physicians addressed more than 400 women across all levels at their partner John Hopkins Aramco Healthcare - a first-of-its-kind healthcare joint venture between Saudi Aramco, a world leader in energy, and Johns Hopkins Medicine - and gave them health information to help them be advocates not just for their families, but also for themselves.

"We also offered some incredible professional development opportunities to women in healthcare in the Arab region. Again in Saudi Arabia, we have been developing collaborative programmes that are advancing healthcare by elevating the role of nurses in the healthcare team. These programmes have been very well received. In many places around the world, nurses still are primarily women and because of the deficit of women leaders in healthcare in general, nursing is a great place to reach women and develop them into leadership positions."

Being an Effective Leader

Paulk firmly believes that the basic competencies for leadership are the same no matter who the person is or what gender they are. There are more similarities than differences in the way effective female and male leaders lead.

"That said, I think the differences that do exist have a powerful impact on people and organisations. From a positive perspective, I think women have more peripheral vision—they tend to take in more of the big picture. Women take more time and don't necessarily go to the solution immediately. They listen more and try to find a collaborative answer or solution, one that is going to address the concerns of the maximum people.

"I think men and women both bring unique and valuable skills and perspectives into leadership settings, which is why it is important to have them both represented on every leadership team."

In the past, whenever someone has believed in Paulk and her abilities and asked her to take on an opportunity, she has always said 'yes' because of a strong desire to be a standard bearer for all women.

She explained: "I'm not like all women, but I'm representative of all women. If I'm given an opportunity that's really important, then I have to say yes on behalf of all women. And then I owe it to them to do something with that opportunity. I can't waste a chance to make an impact, and I can't let down the people who don't get the same kind of opportunities that I do. I take that very seriously. I feel like my mission is bigger than me, and I've just been incredibly lucky to be a representative."

Collective Problem Solving

Paulk is a passionate believer in the power of group solutions. The challenge for her is to create a team that works synergistically to help solve problems so organisations can continue to lead in patient safety, education and research innovations.

"I think women do a really good job of contributing to team synergy and collective problem solving for the greater good. We are used to working in teams, whether that team is a family or our larger community. Women's backgrounds often teach us how to get things done by pulling people together, even with limited resources. I think women, in particular, bring an amazing skillset that helps healthcare organisations balance business realities with the most fundamental aspects of their mission."

Of all the issues facing the healthcare industry, promoting the development of women leaders and making sure that the right strategies are in place to do this appears to be of primary importance. Workplace diversity is seen as an agent to transform the way healthcare is delivered on a global level. AH

For more information, please attend 'The BIG debate: how can women really enter into executive roles and drive change in healthcare facilities' scheduled to be held on 29th January 2018 at the Connected Care Conference at Arab Health Congress.

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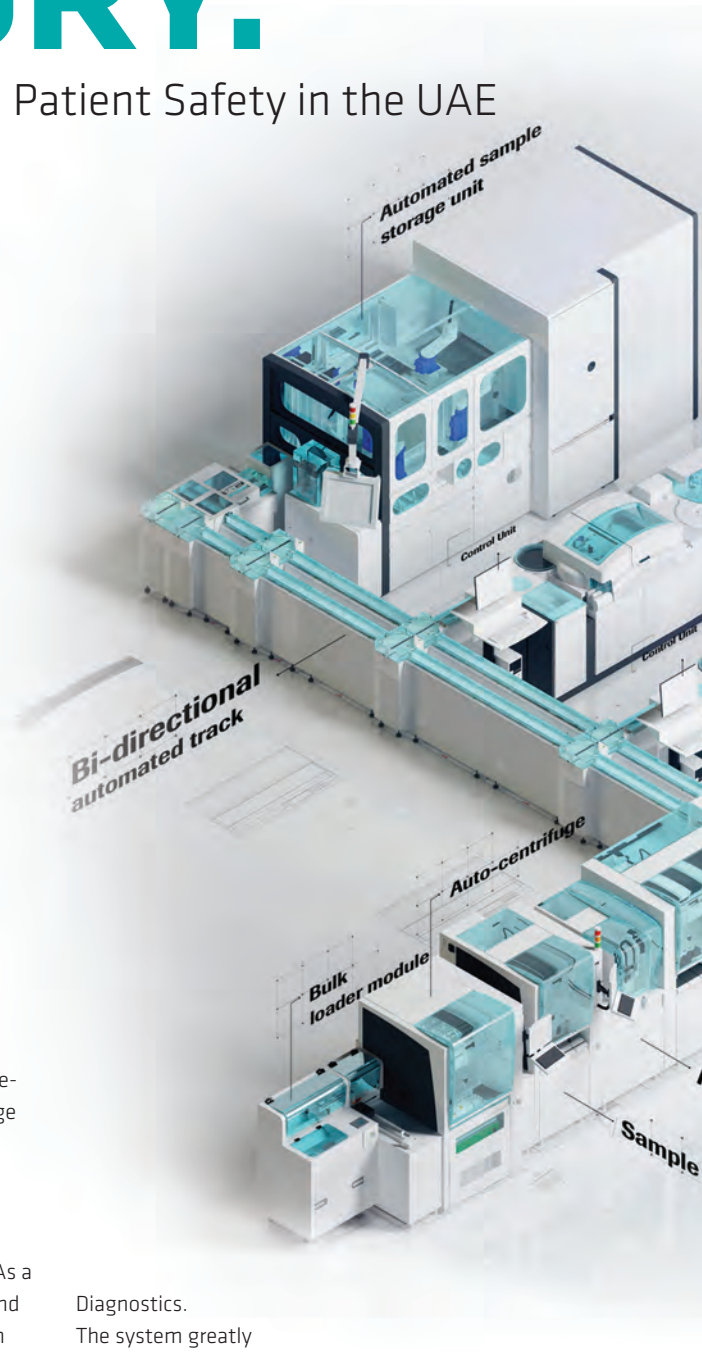
THE AUTOMATED LABORATORY:

A New Benchmark for Quality Standards and Patient Safety in the UAE

By Arab Health Magazine Staff



Worldwide, the ageing population and their need to consume more healthcare-related services are on the rise. Coupled with the increased ability to diagnose chronic diseases and illnesses, the need for more cost effective clinical laboratory results is now greater than ever before. Increasing the efficiency to maximise the productivity and manage costs has become critical for the long-term success of the clinical laboratory.

Years ago, it would have been difficult to imagine a time when a patient specimen would reach the laboratory and be logged-in, sorted, analysed, resulted and stored without human intervention. With recent applicable advances in medical laboratory automation and exciting innovations, this is now a reality.

In December 2016, National Reference Laboratory (NRL), a Mubadala Company created in partnership with and managed by Laboratory Corporation of America® Holdings (LabCorp®), became the first fully-automated referral laboratory in the UAE. With a continuous focus on quality, NRL is also the largest laboratory network in the Middle East accredited by the College of American Pathologists (CAP).

Arab Health magazine spoke to Dr Jay Murthy, Technical Director of NRL, who oversaw the installation of the total automation system.

Project Development

As Dr Murthy explains, accurately defining the scope and tasklist for the project was essential in order to execute the installation in less than three months without disruption to the daily laboratory operations. "The fact that we were able to achieve our implementation timeline was remarkable because of the logistical challenges involved in a project of this scale," Dr Murthy says.

A key factor contributing to the success of the project was that NRL's main testing facility in ICAD, Abu Dhabi, is a purpose-built laboratory with the necessary flooring infrastructure to accommodate the system. Due to the special suspended flooring, no structural changes were required to install the new equipment. "Every square metre of flooring has its own water, drainage and electrical supply, thus making the equipment easy to install," Dr Murthy explains.

Business as Usual

The laboratory operations flow continued throughout the installation as each automated module was installed one-by-one. The NRL team was able to manage the entire project without interruption to testing departments.

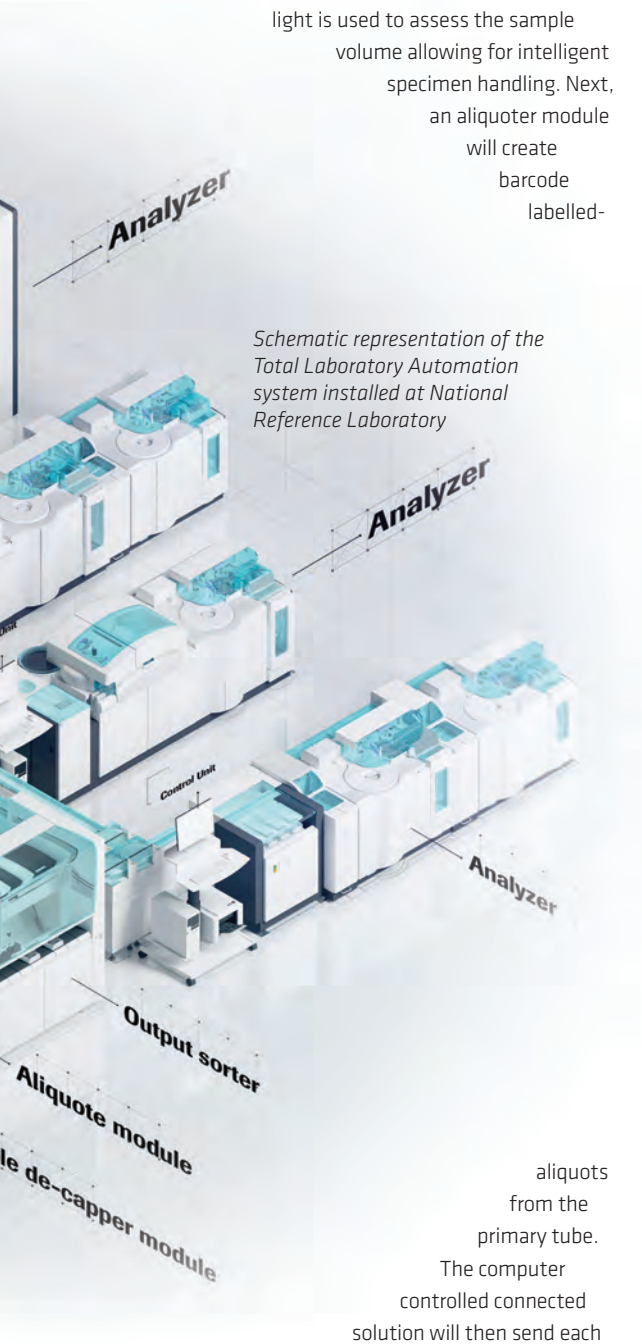
During the installation, the NRL team created a number of backup systems to ensure sustained operational processes. As a College of American Pathologists (CAP) and ISO 15189 accredited laboratory, validation was performed for each module as per international quality control guidelines.

A Cut Above the Rest

The Total Laboratory Automation system implemented at NRL is one of the latest innovations by the diagnostics leader, Roche Diagnostics. The system greatly improved NRL's workflow by physically connecting the different instruments used throughout the three phases of the testing process: pre-analytics, analytics and post-analytics.

The journey of the patient sample tube starts by travelling through the Pneumatic

Tube System (PTS) to the Bulk Loader which sorts the incoming tubes based on size, weight and label colour. If required, the sample is then sent to the centrifugation module followed by de-capping of the tube. CCD cameras capture images of the tube to identify sample integrity (HIL) and a laser light is used to assess the sample volume allowing for intelligent specimen handling. Next, an aliquoter module will create barcode labelled-aliquots from the primary tube. The computer controlled connected solution will then send each tube to the targeted analyser for analysis. Following analysis, the tube is sent, through an automated track system, to the post analytical unit which is a refrigerated sample storage unit. Any sample stored in the post-analytical module can be retrieved and sent to analysis again with just a mouse click.



Schematic representation of the Total Laboratory Automation system installed at National Reference Laboratory

Dr Murthy finds that this solution, connected to pneumatic sample delivery system, is what really differentiates this project from others.

The brain controlling the operation of this connected system is a middleware innovative solution, designed to make the different parts of the system work flawlessly together and allows for the entire production line to be monitored and controlled efficiently.

NRL has also implemented a post-analytic Auto Verification System. This automated process allows the comparison of patient results to laboratory-defined acceptance criteria. If the results are within the accepted parameters they are automatically released without human intervention. "Therefore, the technical staff may focus on abnormal results that require manual verification. This operational efficiency increases the attention and focus given to the abnormal results, which in turn greatly enhances the standard of care and patient outcomes," says Dr Murthy.

The Human Element

A frequently asked question, regarding the use of robots and automation technology, is whether it means that human input is no longer required; a topic that Dr Murthy says was an important consideration when evaluating the feasibility of the project at NRL.

"In the beginning there was an element of reluctance by the staff, as the robotic component dictated that staff and automation must work together on every process from technique to workflow. However, once trained, our staff quickly saw the benefits of the system," Dr Murthy explains. "Creating efficiency doesn't mean that we need fewer people, it simply means we are able to free up the skill sets of the technologists, who can work in the esoteric testing areas in our various centres of excellence. Automation facilitated our ability to further develop our in-house technical talents."

Dr Murthy gives an example of how NRL has been able to improve the testing turnaround time and free up resources. "Before the automation setup, the processing of high volume tests was more labour intensive. Our highly experienced and qualified medical technologists would have to manually de-cap, sort and load thousands of samples, which could take 8 – 12 hours. Automating these tasks reduced this time to less than an hour."

Enabling Future Growth

Through its network of ten laboratories, NRL currently processes more than 500,000 tests per month for over 200 clients across the MENA region. As Dr Murthy explains, one of the key benefits of the automated system is the enhanced quality and accuracy it brings in the pre-analytical areas. It provides a standardised process that further enables NRL to streamline its operation and deliver high-quality patient results in the shortest time possible. Immediately after the go-live, there was an improvement of the turnaround time of up to 48% for some specific routine tests.

Dr Murthy continues: "With respect to volumes, our core laboratory is now able to accommodate significantly higher volume without the cost of additional equipment or manpower. Utilising our current complement of analysers more efficiently due to the streamlined pre-analytical processing has allowed us to exceed a total of 7 million tests in 2017 and have substantial room for growth in 2018."

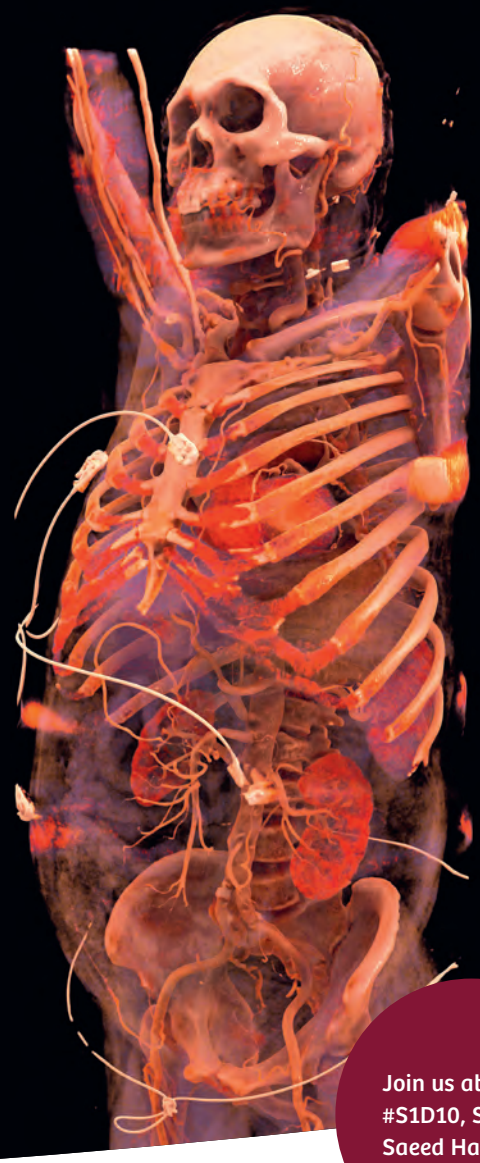
Supported by the well-developed laboratory management systems, the Laboratory Information System and other advanced connectivity solutions in which NRL has invested, this Total Laboratory Automation system is one of the key components that drive the future growth of the company.

A Look into the Future

NRL plans to continue to evaluate quality, patient-focused technology in the areas of robotic automation. The future is bright for these enhancements not the least of which are automated phlebotomy, transportation processes using drones and artificial intelligence. These advancements will provide greater access to healthcare for rural areas that are now challenged to attain the level of healthcare they need.

NRL remains true to its vision to increase the spectrum, coverage and overall efficiency of laboratory testing, to implement international best practices of reference laboratory processes and to set the benchmark for quality standards in the region. With the introduction of the first Total Laboratory Automation solution among the referral laboratories in the UAE, NRL continues to realise its vision. AH

Let's shape the future of healthcare together



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*Siemens AG, "Sustainable healthcare strategy – Indicators in fiscal 2014", page 3–4

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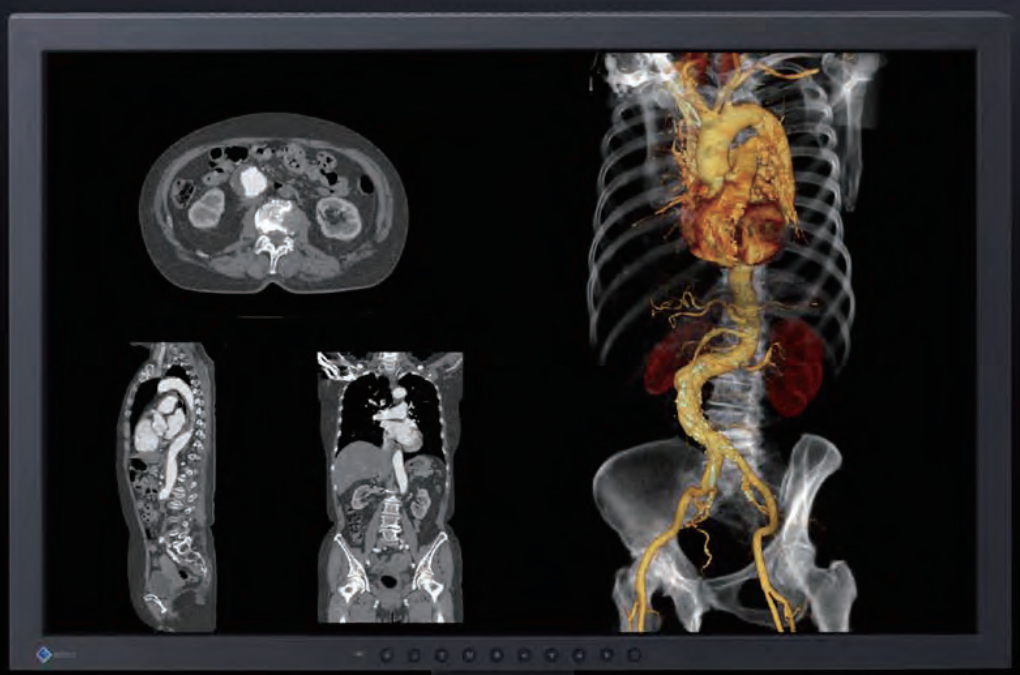

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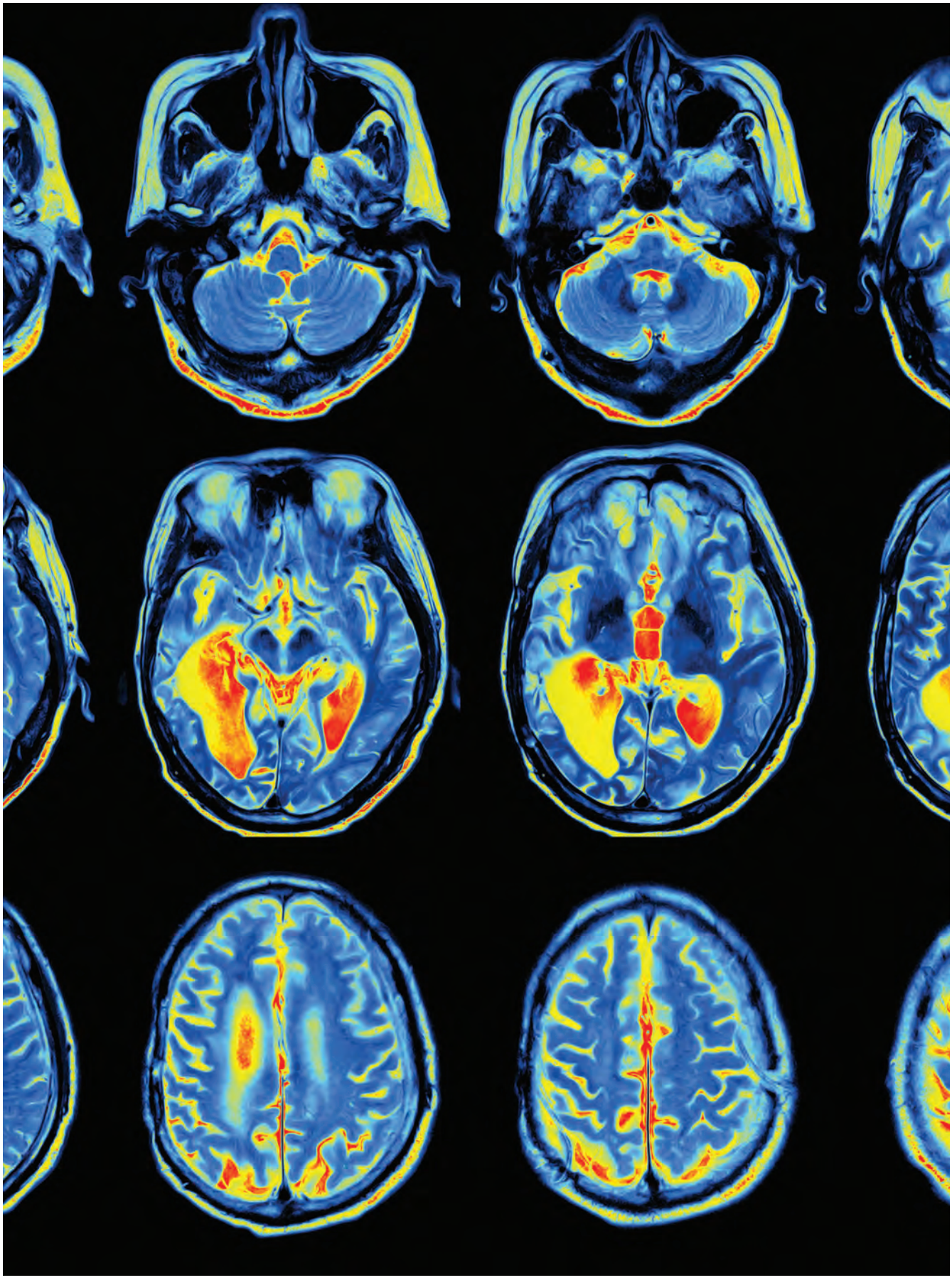

A JOURNEY OF DISCOVERY...

developing quantitative biomarkers for MRI of the brain

By Prof Dr Paul M Parizel, MD, PhD, Chair of the ESR Board of Directors, European Society of Radiology (ESR) and Professor and Chair, Department of Radiology, Antwerp University Hospital (UZA), University of Antwerp (UA) and Wim Van Hecke, PhD, MSc, CEO, icoMetrix, Belgium

From looking at pictures to measuring parameters

During the past decade, we have witnessed a paradigm shift in the use of radiology in medical practice. While radiology continues to provide a cornerstone of advanced diagnostics and quality care, increasingly, medical imaging is being used for follow-up and monitoring a large spectrum of medical conditions. Thanks to the development of new technologies, we have entered into an era in which imaging techniques contribute to our fundamental understanding of physiological processes in health and disease. In particular for disorders of the central nervous system, new imaging and post-processing techniques (perfusion imaging, diffusion weighted imaging, diffusion tensor imaging, diffusion kurtosis imaging, spectroscopy, etc), have made a significant impact on clinical patient management, therapeutic decision-making, and outcome prediction.

But, despite cutting-edge scientific developments and expanded clinical applications, radiologists still rely mainly on visual assessment ("eyeballing") to interpret radiology examinations. The traditional process of "visual image interpretation" by radiologists has remained essentially unchanged for over a century. And while this approach may be more or less 'good enough' to suggest an initial diagnosis, it is definitely not acceptable for the interpretation of follow-up examinations. Radiologists encounter great difficulties when comparing current images with previous studies. It is extremely difficult to accurately assess subtle changes from one examination to the next (for example in the shape, size and structure of a tumour). This is due to variations in patient positioning, sequence, equipment, protocols and parameters, window settings, etc. In addition to these technical limitations, visual assessment is also prone to subjective interpretation variations, failures of perception, lack of knowledge and human error. These factors lead to significant inter-observer, and also intra-observer variations in the visual inspection of imaging data.

Fortunately, things are changing, due to the introduction of "imaging biomarkers" in research and, even more importantly, in daily clinical practice. The word "biomarker" implies a measurable parameter that can be used as an indicator of a particular disease or some other physiological state of an organism. In a "white paper", the European Society of Radiology (ESR) stated that the development of new imaging biomarkers has a high impact in terms of patient management, assessing risk factors and disease prognosis. In particular, "imaging biomarkers" are of great value to extract quantitative, objective, reproducible parameters, thus improving the value of imaging in clinical practice.

Thanks to the development of new technologies, we have entered into an era in which imaging techniques contribute to our fundamental understanding of physiological processes in health and disease.

The advent of imaging biomarkers to clinical neuroimaging is a game changer. ▶

They provide innovative ways to explore new research avenues, and approach clinical questions. Both the pharmaceutical industry and the regulatory bodies are increasingly relying on imaging studies to provide surrogate end points in clinical trials (a surrogate end point is defined by the National Institutes of Health as "a biomarker intended to substitute for a clinical endpoint"). It is important to find out what works, and what doesn't, quickly, cheaply and efficiently. Quantitative imaging biomarkers are helping drug companies to make "go/no-go" decisions about new products; in many cases, this obviates the need for more expensive and time-consuming exploratory trials, and it saves time and money. Healthcare is progressing towards evidence-based and personalised medicine, and doctors are rapidly adopting decision-support tools, all of which require the input of quantitative data and objective metrics.

There is a strong need for objective biomarkers in clinical practice. Basically, any feature that can be detected on an imaging study can now be used to quantify specific biological processes. Examples of quantitative neuroimaging biomarkers include: volume measurements (hippocampus, gray matter, whole brain, etc), apparent diffusion coefficient (ADC), fractional anisotropy (FA) or mean diffusivity (MD), cerebral blood volume and flow (CBV & CBF), etc. Radiologists are adopting imaging biomarkers in combination with advanced image processing techniques. Table 1 shows an overview of clinically relevant biological parameters and the quantitative imaging tools to study them.

Multiple Sclerosis as a model for the rational use of MRI Biomarkers

To illustrate the growing importance of neuroimaging biomarkers, let us focus on patients with Multiple Sclerosis (MS). When doctors need to compare MRI examinations of the same patient, obtained at different time points, from different institutions, on different MRI machines, it is nearly impossible to accurately detect changes in the number of white matter lesions ('lesion load'), or to identify and count new and enlarging lesions. It is like trying to count the black

Dr Wim Van Hecke is the co-founder and CEO of icometrix and is an international expert in MRI analysis and advanced neuroimaging techniques and applications

spots on a Dalmatian dog running at full speed. Moreover, in addition to changes in the number, shape and activity of demyelinating plaques, the brains of patients with MS also undergo subtle modifications in brain volume. These small changes are impossible to detect by visual inspection, and yet, they have important clinical consequences. Fortunately, today, for patients with MS, imaging biomarkers provide the neuroradiologist and neurologist with key information on how the disease is progressing and whether the patient is responding to the treatment.

Several imaging biomarkers, such as volumetric assessment of brain structures (tissue segmentation), have been shown to have excellent sensitivity and specificity for diagnosis or prognosis of various neurological diseases.

A prerequisite for the adoption of neuroimaging biomarkers is standardisation of image acquisition, data processing and analysis and image interpretation (i.e. generating a report). MRI protocols and sequences must be reproducible, accurate and sensitive; quality assessment should be an integral part of this process. Methods used for analysis should be adequate and observer-independent. Ideally it should be possible to compare a biomarker in a single patient to a healthy control group (reference values). The key words in this chain of production are "standardisation" and "validation". Individual radiologists need to rely on computers, which are able to handle large data sets, perform centralised analysis and automated quantification.

Neuroimaging biomarkers for measuring volumes and changes in volume

Two types of neuroimaging biomarkers can be distinguished: cross-sectional and longitudinal. In the cross-sectional approach, we extract and measure volumes in a 3-dimensional MRI dataset of a single subject. The volume of the whole brain, or part of the brain (grey matter, white matter, cerebrospinal fluid, hippocampus, ...), can be computed through segmentation techniques. These methods rely on "segmenting" brain tissue from the surrounding scalp and other extracerebral tissues.

▼ **TABLE 1.** Overview of quantitative imaging techniques

Type of information	Acquisition technique	Imaging biomarker
Anatomical	CT, MR	# of lesions, volume, (local) atrophy, ...
Structural	DWI, DTI	cellularity, axonal/myelin damage, ...
Functional	fMRI, rs-fMRI	(task specific) brain activation
Dynamic	perfusion MRI (DSC, DCE), ASL, perfusion CT	vascularity, CBV, CBF, MTT, capillary permeability, ...
Molecular	PET, SPECT, MRS	receptors, metabolism, biochemistry, ...

Parizel PM, Van Hecke W. How to keep your integrity when performance sponsored (imaging) trails. J Am Coll Radiol 2011; 12: 842-847.

The probabilistic modelling of voxel intensities exploits the fact that different tissue types have different MR image characteristics. Volumes in millilitres for each class can be computed, by simply multiplying the sum of the tissue segmentation over all voxels by the voxel volume. For example, in patients with MS, it becomes possible to perform volume measurements of, for example, total brain volume or FLAIR white matter hyperintensities.

Longitudinal neuroimaging biomarkers take into account two (or more) MRI scans of the same subject, obtained at different time points, to calculate volume changes in brain volume. This makes it possible to evaluate MS patients for progressive brain shrinkage (atrophy), a parameter reflecting neuro-axonal and myelin loss, and which is increasingly being used as an outcome measure in MS treatment trials. Longitudinal methods for brain atrophy typically match two MRI scans using registration techniques and directly extract small changes in brain volume from this process. A similar approach can be used for the longitudinal segmentation of white matter lesions.

Adding quantitative MRI biomarkers takes clinical neuroimaging to the next level. But in order to successfully introduce quantitative biomarkers in the clinical imaging pipeline, several important elements should be taken into account:

- Accuracy and reproducibility: Many software applications offering cross-sectional brain volume measurements, based on a single MRI scan, have errors in the range of 1 – 1,5 %, which is too much if the expected yearly rate of volume loss is far less than 1%. In other words, measurement errors should be small enough to be reliable in individual patients, and the results should be clinically meaningful. Fortunately, there are now certain softwares such as MSmetrix (CE marked) or icoBrain (FDA cleared), which were developed especially for monitoring MS and provide measures for atrophy and lesion load with measurement errors as low as 0,13% for whole brain atrophy. It is only when measurement errors are so low that meaningful conclusions for individual patients can be drawn.

Prof Dr Paul M. Parizel has always had a strong interest in new developments in neuroradiology, such as the introduction of biomarkers, and the evolution towards standardised reporting.

- Scan time is money. Currently, the average MRI protocol for MS patients represents about 20 to 35 minutes of scan time. Typically, such an optimal scanning protocol would include a 3D-FLAIR sequence, diffusion-weighted imaging, T2-weighted sequence, 3D-T1-weighted images before and after Gadolinium-chelate injection. Biomarkers will only be successful if they can be derived from the standard imaging protocol for MS, without the need for additional (lengthy) sequences.
- Integration into the standard workflow: The idea is that biomarkers should help doctors, and not generate extra work. Radiologists and neurologists alike don't have time to perform additional post-processing for every patient. Ideally, the post-processing should be linked to the patient informatics, to automatically generate reports that include biomarker information about the lesions and cerebral atrophy. The radiologist should report back to the neurologist, qualitatively if not quantitatively, about the lesion status and the atrophy of MS patients, covering the following points: comparison with previous scan(s); evidence of new disease activity; number of new lesions (T2/T1); lesion size; overall assessment, including presence (definite/probable) and extent (number of new/enlarging lesions or gadolinium-enhancing lesions) of disease activity; change in T2 lesion volume; and evidence of brain atrophy.

How to transmit this information to the clinician

Today, MRI biomarkers are already an important factor for making therapeutic decisions. Efficient patient follow-up requires effective and consistent communication between the neurologist and radiologist. Unfortunately, most MRI reports are still written in prose, and do not make use of the full potential embedded within the MRI data sets. I strongly believe that communication regarding MRI findings between the (neuro)radiologist and the neurologist can be improved with automatically computed, quantitative values for the relevant imaging biomarkers. To this end, the (neuro)radiologist should have easy access to approved tools for calculating these biomarkers. Furthermore, when following the evolution of changes in an individual patient, comparisons could be made of biomarker values against relevant populations (e.g., healthy controls, MS patients that respond well to therapy, etc). Obviously, relevant confounding factors (such as age and sex) should be taken into account.

Conclusion

The introduction of (neuro)imaging biomarkers has led to a significant improvement in the diagnosis, management and follow-up of patients with MS. Standardisation of MRI acquisition protocols, and improvement of quantitative reporting tools provides a better understanding of the natural history of MS, and allows accurate treatment monitoring, for the greater benefit of patients. TR

Prof Dr Paul Parizel is a Speaker at the Imaging and Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

PATIENTS FIRST:

Promoting best practices in medical imaging departments

By Prof Dr Graciano Paulo, Professor of Medical Imaging & Radiotherapy, IPC, ESTESC - Coimbra Health School; and Past President, European Federation of Radiographer Societies, Coimbra, Portugal

In the last decade, we have witnessed a massive technological evolution that has paved the way for the onset of new scientific developments, dramatically changing our social habits and our way of living.

There is a new "digital society" on the rise characterised by special skill sets, large amounts of information, a new way of using Internet technology and one that is more demanding, pressuring governments and institutions to adapt to this new digital age.

It is understandable that the two social sectors more exposed to this "new social order" are education and healthcare, where good and effective communication plays an essential role and becomes more demanding every day.

This new paradigm is a key driver for a(n) (r)evolution in the daily practice of health professions, which is seeing an increasing demand for a permanent focus on patient care and safety, based on high professional standards.

Healthcare is characterised by specific features such as:

A. the failure of patients to make the right choices, due to asymmetry of knowledge between them and healthcare providers;

B. the fact that patients create an agency relationship with healthcare providers, delegating to them the decision about the care delivered.

Due to these characteristics and also because of the fact that patients are fragile when they need care, there is a natural tendency for patients to rely on healthcare professionals.

It's in this complex socio-technical environment that radiographers must be aware of their roles and responsibilities to:

- ensure professional autonomy and accountability;
- develop good personal and professional relationships;
- demonstrate an ethical and knowledgeable understanding of the profession;
- apply professional practice in securing, maintaining or improving health and well-being;
- develop knowledge, skills and competencies that underpin their education and training thereby contributing to the wellbeing of the patient;
- understand that professional advancement arises out of evidence-based practice and is acquired through focused research.

Prof Dr Graciano Paulo is a Speaker at the Imaging & Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress

Evidence-based practice is the best way to achieve this demand for patient care and safety as it combines the best research evidence with clinical knowledge and expertise, addressing the patient in a holistic way.

Since the radiographer is the ultimate interface between patient and technology, it is crucial to create a real teamwork concept, using guidelines for the roles and responsibilities of each team member as the pathway to minimise practice error thereby maximising patient and staff safety.

A real well-functioning teamwork between radiographers, radiologists, medical physicists and other health professionals is needed to improve efficiency in radiology departments, with the aim to create synergies and to maximise each profession's knowledge for the benefit and safety of the patient.

Thus, it is crucial to implement a patient care-based model by providing team members with clear guidance, as a tool to enable them to undertake their role with professionalism and be able to identify when errors occur and how to recover and correct those errors.

Healthcare organisations are complex socio-technical environments where highly differentiated health professionals come together to provide, what is expected to be, the best quality of care to the patients.

However, it is important to be aware that an asymmetric scientific and professional knowledge between health professionals and even within each profession is a reality and consequently, a barrier to implement a harmonised practice.

The department leaders have the responsibility to create and maintain a good working atmosphere by developing well established communication channels and by empowering all staff members.

Implementing system changes calls for understanding the paradigm shift of the social behaviour, influenced by the digital era and the need to make adequate adaptations.

Healthcare organisations are open systems, influencing and being influenced by the internal and external environments. It is crucial for radiology departments to adapt to this new era. The benefits are manifold: to improve efficiency; to increase visibility in patient clinical workflow; to avoid commoditisation and, last but not the least, to improve the partnership between patients and radiology professionals. TR

References available on request.

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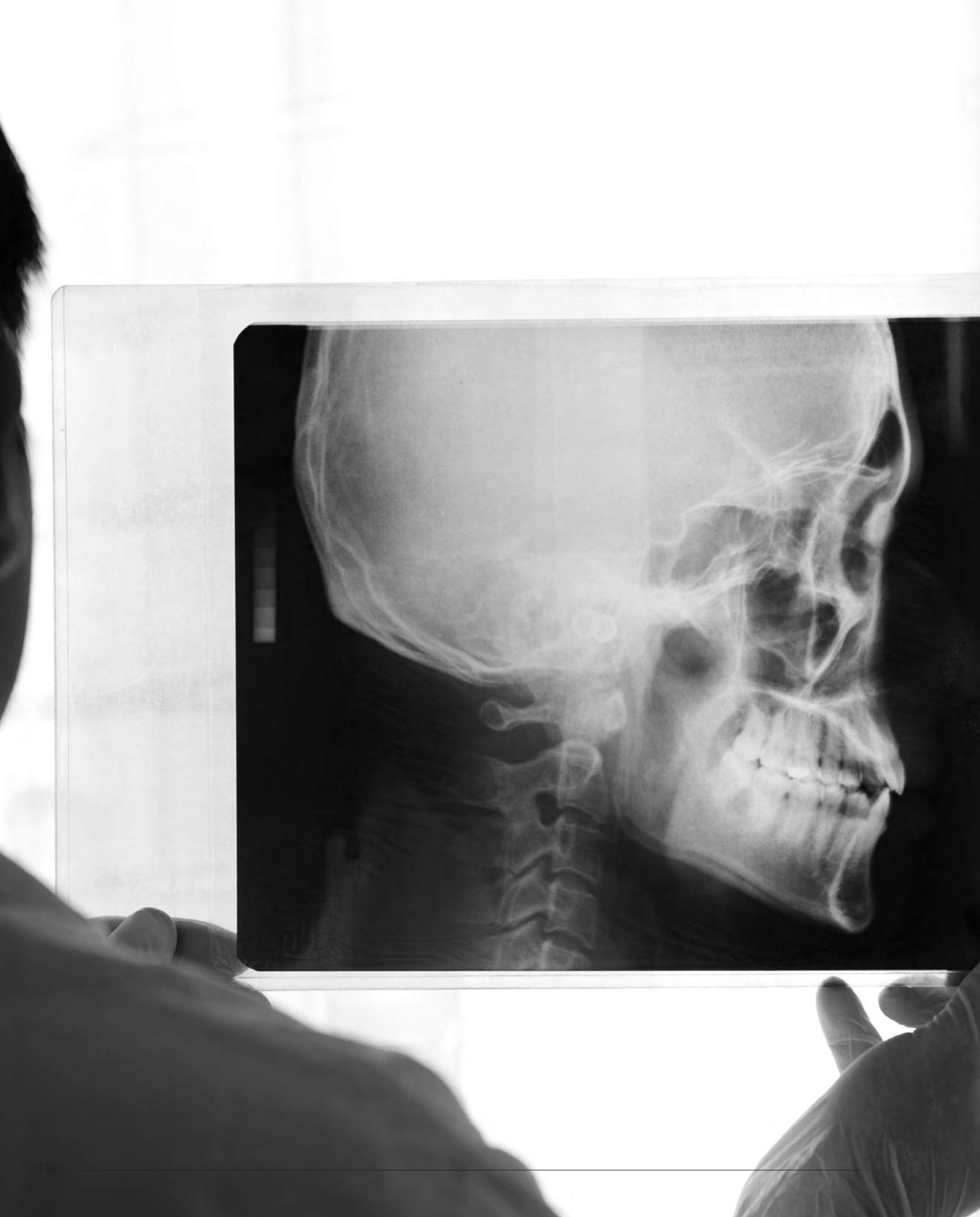

THE RADIOLOGY REPORT:

Its history, likely future development and its place in medical communication

By Dr Adrian Brady, Consultant Radiologist, Mercy University Hospital, Cork, Ireland; and Chair, Quality, Safety & Standards Committee, European Society of Radiology

Over the 120 years intervening between Dr Morton's letter to a colleague – describing his findings on an abdominal radiograph – and today, the speciality of radiology has changed hugely.

What is the key day-to-day activity of diagnostic radiologists? Many among us consider that the interpretation of imaging studies represents our principal contribution to patient care, and the main focus of our clinical activity. Indeed, interpretation is the key skill which we believe we possess and develop throughout our careers, and without which our input into patient management would be insignificant and meaningless.

However, interpretation alone is of little benefit to patients, and to those clinicians who refer patients to us for investigation, if we cannot communicate the results of that interpretation coherently and consistently. In other words, the quality of our work depends greatly on the quality of our reports. We all think we know how to report; it's what we do every working day. But most of us have received little or no formal training in reporting, and frequently the training we have received has taken the form of an effort on the part of a trainer to pass on his or her personal language or grammatical biases, rather than any broader effort to encourage analysis of the quality and meaning of our principal work product.

It can be considered that the first ever radiology report was the publication by Röntgen reporting his initial experiments with x-rays in December 1985 (Eine neue Art von Strahlen, *Aus den Sitzungsberichten der Würzburger Physik.-medic. Gesellschaft Würzburg,* pp. 137–147, 1895). One of the earliest clinical reports of a radiograph still extant is a letter from Dr William Morton of New York to a colleague in May 1896, describing his findings on an abdominal radiograph, specifically mentioning all visible skeletal structures and the absence of renal calculi. Dr Morton's report was handwritten and in prose, and apart from the quality of his handwriting (beautifully legible), differs little from prose reports of today.

Over the 120 years intervening between Dr Morton's letter and today, the speciality of radiology has changed hugely. We have many modalities of investigation available to us today which were undreamt of in previous decades. Our ability to investigate the anatomy, pathology, structure and function of the human body would seem miraculous to colleagues from the past. Yet the fundamentals of communication of information to referrers would appear largely unaltered: sentences and paragraphs, describing findings and relevant negatives, and concluding with possible diagnoses and suggestions for further investigation, if appropriate.

There is nothing inherently wrong with this format of communication. It has served patients well. However, it may not represent the best way possible of conveying information and may not be what referrers or patients need. Many authors have written about what constitutes a "good" report, and there is little consensus in the literature. Some advocate for well-constructed complete sentences, using a hierarchical, precise vocabulary. Others believe that adherence to grammatical rules is less important than

ensuring all appropriate information is included, perhaps in bullet-point format.

One author has usefully summarised the qualities of a good report as the six "Cs": Clear, Correct, Confidence level (which should be indicated), Concise, Complete and Consistent. Many publications have explained the possible misinterpretations of loose forms of language, and the forms of words that reduce referrer confidence in radiology reports; I will outline many of these examples in my talk at the Arab Health Congress.

"Hedging" is a particular problem in radiology. Perhaps because of a lack of confidence in our own abilities, or arising from a desire to convey the inherent uncertainty of conclusions drawn from limited data, we often use language that diminishes the certainty (and therefore the usefulness) of our reports. Some radiologists go further, and deliberately insert hedging language into reports to ensure they can never be accused of having been wrong; that may well be, but they are not really being helpfully right either.

There has been considerable research into what referrers actually want from radiologists in our reports, and this can vary depending on the clinical practice of the referrer and the particular circumstances of the patient. In some instances, a short report stating "normal" is what is wanted, but usually only if the patient has no specific symptoms (e.g. a pre-operative chest x-ray). More complex studies require more detailed reports.

Family practitioners (as opposed to hospital-based specialists) often prefer longer lists of (relevant) differential diagnoses, and guidance regarding further investigations (radiologic or other). Conversely, they usually are less interested in having reports contain technical details regarding how studies were performed, contrast administration etc. Ideally, reports should be tailored somewhat to the specific referrer; after all, a request for a radiology investigation is akin to a request for a clinical consultation by a colleague. Our response should not be generic, but should reflect the specific clinical needs of the patient and the originator of the consultation request.

Increasingly, patients are viewing their own radiology studies and reports,

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either in conjunction with their doctors, or independently, and radiologists must also bear this in mind when phrasing reports. Inappropriate or flippant language must be avoided. Radiology reports are communications between doctors, not directly between a radiologist and a patient, and should be factual, using correct and precise language. However, the language chosen should reflect the possibility that the patient may also be shown the report; some sensitivity is required.

Reports may also be used to explain findings to patients; given that images may convey meaning much more effectively than descriptions of those images, a likely future trend is the incorporation of selected images into reports, with creation of multi-media reports, including annotations. Software developments to easily enable this are not yet widely available.

The widespread availability of PACS/RIS systems has brought about many changes in radiologists' work practices. Not least among these is the shift from dictating reports onto tapes, which were then transcribed by transcriptionists (many of whom were familiar with our individual linguistic quirks and cadences), to the use of Voice Recognition (VR) dictation.

We can no longer rely on transcribing colleagues to pick up and correct our mumbles or incoherences; these are now translated into language by software which does not really "understand" language in the way humans do. Thus, errors in VR-produced reports are very frequent, and often very significant. The erroneous inclusion or omission of a "not" can completely change the intent of a report, and the outcome for a patient. Therefore, with the adoption of VR, the responsibility of the reporting radiologist to correct errors in their own reports before final verification has become very important. We may find it onerous, time-consuming and irritating to have to do this, but we could be considered negligent if we decline to fulfil this responsibility.

PACS/RIS also provides an opportunity for the most-significant likely future trend in radiology reporting, the adoption of structured reporting as the norm. Templates for structured reports can be embedded in VR systems, and used as the basis for ensuring complete, consistent reports, regardless of the reporting radiologist.

Large-scale projects are underway, led by a number of radiology organisations, particularly the ESR and RSNA, to develop, peer-review and validate structured reporting templates for a wide range of body systems, modalities and clinical indications, and discussions are underway with software vendors regarding how these may best be incorporated into reporting systems. The ESR has recently endorsed a position paper supporting the adoption of structured reporting as the future of radiology reporting, and there is no doubt this will become the appropriate standard of radiology practice in the near future.

An additional benefit is the ability to data-mine structured reports for common data elements, based on the use of a standard lexicon of terms, for the purposes of research and teaching.

In my talk at the Arab Health Congress, I will expand on these themes, and I look forward to fruitful discussion and engagement with colleagues at the Congress. TR

Prof Adrian Brady is a Speaker at the 18th Imaging and Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

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A SMARTER WAY FORWARD.

RADIOGRAPHY EDUCATION:
The current and future picture in Arab countries

By Mohamed Abuzaid, RT, M.Sc., Ph.D., Assistant Professor**,** Medical Diagnostic Imaging Department, University of Sharjah, UAE

Radiographers, also known as Radiologic Technologists, Diagnostic Radiographers and Medical Radiation Technologists, are healthcare professionals who specialise in the imaging of human anatomy for the diagnosis and treatment of pathology.

A career in radiography calls for various skill sets starting with excellent communication skills, professionalism, integrity, critical thinking, and problem-solving. The current radiographer practice in the Arab countries—in terms of education, skills, job status, job description and the future perspective—vary greatly in comparison to that of an international organisation or the practice in other countries and therefore, needs to be identified and planned within the perspective of international standards and promises.

Arab countries currently consists of the 22 Arabic-speaking countries that occupy an area stretching from the Atlantic Ocean in the west to the Arabian Sea in the east, and from the Mediterranean Sea in the north to the Horn of Africa and the Indian Ocean in the southeast. Attempting to understand the various professional qualifications in many Arab countries was very difficult, as there is no organisation to regulate this profession. There is apparently lack of co-operation and communication between universities, schools offering radiography education and training.

A simple web search for societies or associations for radiographers in Arab countries will end with the deceptive result that there is no dedicated radiographer organisation body; few Facebook pages represent personal or regional academic or social activities. The website of the International Society of Radiographers and Radiological Technologist (ISRRT) was shown as the regional coordinator with representation from only three Arab countries (Lebanon, Morocco, and Tunisia). The importance of such a body cannot be overlooked. In addition to being professional organisation, such institutions also undertake the tasks of conducting educational workshops, conferences,

providing Continuous Medical Education (CME), Continuing Professional Development (CPD), support the rights of the profession, and undertake various other activities through its role as a non-governmental organisation in official relations with international organisations.

It is imperative to formulate a body that can be entrusted with the role of reviewing the status of radiography professions in term of legal, administration, standard qualifications and skills required to practice. Such an organisational body would be able to initiate the holding of forums to discuss education and regulation matters directly affecting professional practice, facilitate the link and association with other international and national organisations, and provide support, education and training programme to those in the radiography profession.

It is noticed that the majority of universities and institutes in Arab countries deliver a Bachelor's degree in radiology comprising of four years study duration. There are other countries that offer a three-year diploma in some institutes which are directly managed by the Ministry of Health. The graduates often work in Medical Imaging, Radiotherapy and Nuclear Medicine. To work in Ultrasound, a postgraduate degree or clinical experience is required in most of the countries while there are still some countries that do not permit the radiographer to work in ultrasound imaging. Most of the graduates were identified as competent to work in general radiography, portable, OT, fluoroscopy, dental and mammography.

Regarding Computed Tomography and Magnetic Resonance Imaging, there was a noticeable variation in the study programme as well as graduate competencies. Most of the programmes offer clinical practice during the study period which ranged from 500 to 1550 clinical training hours, whereas some programmes established a one-year internship programme in the last year of study.

Licensing of radiographers for practice is organised by different stakeholders in Arab countries and not by professional bodies. It varies from requiring no licensing exam for the graduates who obtained their degrees from local universities to requiring a licensing exam for every radiography professional who would like to practice and waiving of the practicing review for radiographers who obtained a licensing practice in USA, UK and other select countries.

Prof Mohamed Abuzaid is an Assistant Professor in Medical Diagnostic Imaging at the College of Health Sciences, University of Sharjah, UAE

Postgraduate studies in radiography are presently available only in two countries across the Arab nations. Sudan has five universities offering the course while the Kingdom of Saudi Arabia has two universities offering PG programmes in radiography. Although postgraduate programmes in Sudan started in early 2000, it is clear that these programmes are not able to attract international students and/or go beyond the boundaries of the national arena.

Future challenges

In order to improve the current status of radiography profession, many challenges ought to be taken into account:

Radiographer competency: With medical imaging becoming highly advanced; no person will be able to master the entire field of radiology. However, the integration of technology in work encourages the development of knowledge so as to be able to provide a high level of clinical effectiveness. Radiographers should be able to determine their core competency areas to provide comprehensive services, and integrate the applications of information technology to create added value for the referring clinician.

Research: Research in radiology is an integral part of clinical and physics research domain. The lack of research output by radiographers in the Arab nations can be attributed to many reasons such as lack of research skills, lack of support from radiologists, administrative workload, and failure to recognize the merits of research. A policy to improve research culture should therefore be adopted by universities and professional bodies. Individuals should be motivated, educated and trained to participate in research.

As low as reasonably achievable (ALARA): Radiographers are considered the key personnel in radiation protection and patient safety, and it is therefore very important to understand how to apply ALARA to protect patients and other personnel when working in radiation and to be aware of ways to reduce the level of radiation exposure. It takes effort to implement the ALARA principles successfully.

Expand the radiographer's work role: Image interpretation equips radiographers with the skills to interpret radiological images correctly. Many countries worldwide including UK, Australia, Denmark, Norway, etc. study the ability of radiographers to do image reporting. The UK has designed programmes and systems to prepare the radiographer for image reporting, which is currently integrated with the National Health Services (NHS). The radiographer's accurateness and confidence in participating in preliminary clinical evaluation (PCE) and definitive reporting is critical and requires the support of and collaboration among universities, professional bodies, and health institutes.

A career to be proud of

Although radiographers' roles are often viewed negatively by many individuals, including those in the profession, this may lead to anxieties, loss of professional identity and diminished self-satisfaction. However, there are opportunities for radiographers to advance their roles and achieve their potential through collaboration, communication and building strategies.

I believe there are no limits for anyone willing to progress; and there's also no limit to what we can achieve; and together we can. TR

Prof Mohamed Abuzaid is a Speaker at the Imaging and Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

Will Digital Breast Tomosynthesis (DBT) replace Digital Mammography (DM) for breast cancer screening?

By Dr Nehad Kazim Albastaki, Senior Radiologist and Lead of Breast Imaging, NMC Royal Hospital, Abu Dhabi, UAE

The widespread implementation of mammography screening has decreased the mortality of breast cancer. Despite recent controversies regarding the benefits of mammography screening, and the age at which screening for mammograms should begin, mammography remains the most widely utilised tool for early detection of breast cancer.

On the other hand, it is also evident that mammography remains an imperfect tool when breast tissue is dense. A standard two-view analog or digital mammogram does not detect all cancers. Thus, the sensitivity of mammography decreases as the density of breast tissue increases. Digital breast tomosynthesis (DBT), often referred to as three-dimensional (3D) mammography eliminates the overlapping tissue problem.

Clinical Application

1. Improves Cancer Detection Rate (Image 1)

A study published in a 2014 edition of the Journal of the American Medical Association (JAMA) showed that digital breast tomosynthesis can locate significantly more (41%) invasive cancers than can conventional digital mammography.

Multicenter studies evaluated differential screening performances of digital mammography combined with tomosynthesis and compared with digital mammography alone in breast density.

Most trials concluded that addition of tomosynthesis to digital mammography for screening was associated with an increase in cancer detection rate and a reduction in recall rate for women with both dense and non-dense breast tissue. These combined gains were largest for women with heterogeneously dense breasts, potentially addressing limitations in cancer detection seen with digital mammography alone in this group, but were not significant in women with extremely dense breasts.

Limitations of this study include its retrospective design, collection of data at the population level rather than the patient level, and insufficient follow-up to determine if increased invasive cancer detection improved clinical outcomes. For women classified as having dense breast tissue, most have heterogeneously dense breasts, mandating caution in drawing conclusions regarding the performance of tomosynthesis for the small proportion of women with extremely dense breasts.

2. Reduction in Callback Rates

The newly updated National Comprehensive Cancer Network (NCCN) guide explains: "Multiple studies show combined use of digital mammography and tomosynthesis appears to improve cancer detection and decreased call back rates."

3. Improved Lesion Characterisation and BI-RADS

DBT improves Breast Imaging Reporting and Data System (BI-RADS) assessment. Accuracy in lesion characterisation for BI-RADS 3 into benign lesions BI-RADS 1 & 2. It also improves positive predictive values for BI-RADS 4 lesions and recommends biopsy.

Technical Revolution

The sensitivity of mammography for detecting breast cancer in dense breast is less than optimal, primarily because the breast is a 3D structure that is projected onto a 2D radiographic image. This means normal breast tissue can conceal a tumour. DBT is a 3D radiographic technique that reduces the effect of overlapping tissues in breast cancer detection.

In tomosynthesis, the x-ray tube moves over a range of angles about a pivot point located above the digital detector to obtain a series of low-dose digital projection radiographs. The detector may be stationary or rotate about the pivot point. The x-ray tube may temporarily halt as each projection is acquired or may move continuously during acquisition.

A computer algorithm reconstructs a 3D image. The images are usually viewed as a "movie-loop" in which adjacent x-y planes are displayed sequentially. Imagers are able to see structures within the breast without overlap. The tumour is clearer, easier to see, and separate from structures in the breast.

Drawing shows how DBT images are obtained. Multiple low-dose x-ray projection images are acquired in an arc and used to reconstruct a 3D image of the breast.

DBT Consideration

1. Dose

Combining Digital Mammography and Digital Breast Tomosynthesis almost doubles the dose when compared to DM alone. One DBT is equal to two doses of DM. The dose may reduce to almost half if DM is replaced by 2D synthetic views (DBT reconstruction into 2D). Although the combined dose is still within the accepted level set by MQSA, the dose may reduce to almost half if DM is replaced with 2D synthetic views (DBT reconstruction into 2D).

2. Other technical issues: Time consuming/ High storage capacity/Viewing limitations on PACS or CD:

Currently there is no approved current procedural terminology (CPT) code or standard additional reimbursement for DBT imaging, but as additional data from large prospective trials become available, it is hoped that a new reimbursement code will be created.

With the additional images in the reconstructed DBT stack, interpretation times will undoubtedly increase. Recent studies have estimated that the addition of DBT images to DM images in the combo mode will approximately double interpretation time. Although this is a challenge, we were able to handle the increased interpretation time required without increasing our staffing or dramatically changing our schedule.

Because both the DM images and DBT

projections must be stored, picture archiving and communication system (PACS) storage requirements will increase. The average combined DBT and DM study produces approximately 1 GB of data. The data can be stored at 4:1 lossless compression to decrease the total size of the dataset to 250 GB, although this is more than 10 times greater than the size of a compressed four-view DM set.

3. Learning Curve and DBT Training

Currently, radiologists, physicists, and technologists are required by the Mammography Quality Standards Act (MQSA) to complete 8 hours of dedicated tomosynthesis training before clinical implementation. Although initial training is invaluable, experience is the only true trainer. In our opinion, when DBT is implemented in a clinical practice, it is best to start with high-volume screening so that the large variation in normal and benign findings can be appreciated with DBT before implementing the new technology in more complicated settings, such as diagnostic workup or in patients who have had breast conservation therapy, where scars and radiation changes may make diagnosis extremely challenging.

Controversies

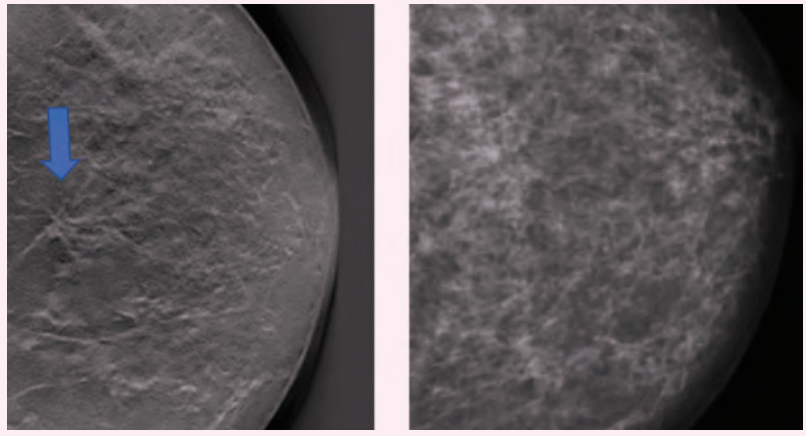
1. Not All Cancers Are Visible with DBT (Image 2)

*There are few cases in which both Digital Mammography (DM) and DBT did not clearly demonstrate a malignant lesion, which then was detected with another modality or manifested as a symptomatic lesion. This finding was not depicted with either DM or DBT. This case emphasises the fact that although masses and architectural distortion often are better detected and better characterised with DBT than with DM, if a malignancy does not manifest with these imaging characteristics, it may not be detectable with DBT.

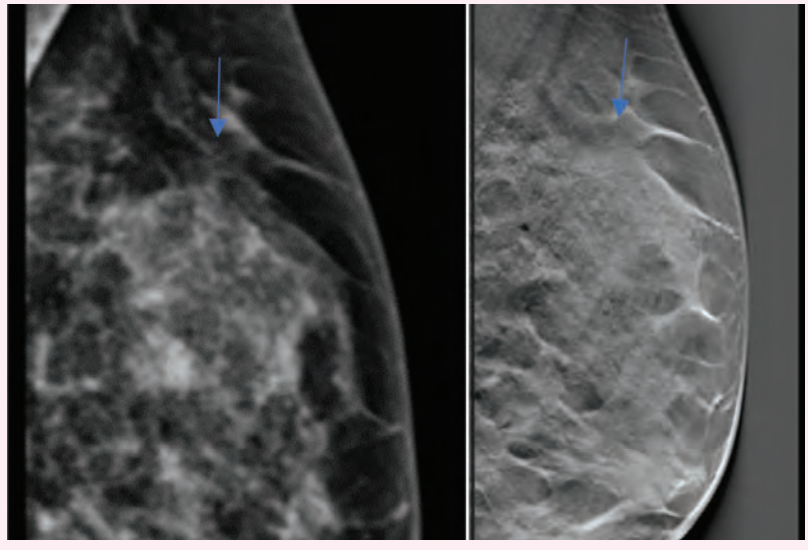
2. False-Positive Findings and recall rates are high

Despite the advantages that DBT can provide, there are limitations. Because of decreased overlapping of breast tissue, benign lesions that previously had been concealed (ie; cysts, lymph nodes) are more readily detected with DBT and may prompt further work up. In particular, architectural distortion associated with benign lesions such as radial scars become much more obvious with DBT. Lesion features associated with benign outcomes (ie; macroscopic fat, localisation in the skin) must be recognised so that unnecessary callbacks do not occur when typically benign lesions are seen better with DBT.

▼IMAGE 1: Asymptomatic women came for routine screening and detected small invasive cancer only with DBT.



▼IMAGE 2: Symptomatic women came with tenderness in Left Upper Outer Quadrant (UOQ) and a tumour that is not discernible on both digital mammography (left), digital breast tomosynthesis (white arrow), which shows the slice where the lesion is in focus. The lesion was invasive ductal carcinoma, grade 2.



Conclusion

DBT improves the accuracy of finding cancers and reduces the recall rate especially in women with dense breasts. There is promising evidence from ongoing trials that soon DBT will establish its place in breast cancer screening. However, some technical aspect and dose issues need to be improved as well as which population and how often to be screened should be taken into consideration!

Screening with DM has been proven to reduce mortality, which is the gold standard of evidence for screening interventions. However, further studies on screening with DBT are needed to prove its effectiveness on reducing interval cancers and mortality rates. TR

References available on request.

Dr Nehad Kazim Albastaki is a Speaker at the 18th Imaging and Diagnostics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

IN THE KNOW

FUJIFILM SonoSite - Innovation for Better Patient Outcomes

Article provided by Fujifilm

Fujifilm may be most widely known as a company dedicated to photography, but healthcare technology is rooted in the company's very beginnings.

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FUJIFILM SonoSite, Inc. is the innovator and world leader in bedside and point-of-care ultrasound, and an industry leader in ultra high-frequency micro-ultrasound technology. Headquartered near Seattle, the company is represented by 26 subsidiaries and a global distribution network in over 100 countries. SonoSite's portable, compact systems are expanding the use of ultrasound across the clinical spectrum by cost-effectively bringing high-performance ultrasound to the point of patient care.

According to Diku Mandavia, MD, FACEP, FRCPC, Chief Medical Officer and Senior Vice President, Fujifilm SonoSite Inc. and Fujifilm Medical Systems U.S.A., Inc., "Today, we have a larger and aging population, sicker patients with more chronic conditions, an increasing cost of care per individual, poor healthcare outcomes, expensive technological advances and an unsustainable trend in expenditures. A focus on patient-centered care is critical and it is the individual patient experience that drives our quest for innovative solutions to improve care and outcomes for patients. Fujifilm is constantly challenging and evolving our ideas to improve the lives of people around the world. Point-of-care ultrasound is increasingly used in diagnostic and procedural guidance applications that increase patient safety and workflow efficiency while decreasing complications and costs. We are proud to develop tools that empower clinicians in providing the best care possible."

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Since its inception, SonoSite's lightweight, robust products have created and led the point-of-care ultrasound market. From sophisticated urban hospital emergency departments to clinics in austere, remote villages, SonoSite systems are used by over 21 medical specialties and provide clinicians around the world with a cost-effective tool for improving patient safety and workflow efficiency. SonoSite's impact on global health was recognized in July 2012 when, as part of the 50th Anniversary of the Seattle World's Fair, the Washington Global Health Alliance chose to showcase SonoSite's NanoMaxx® ultrasound system as an outstanding Washington-state innovation that addresses global health concerns.

The seven and a half months (roughly 1,700 hours) the SonoSite team spent observing and working with point-of-care users paid off when the Industrial Designers Society of America (IDSA) awarded SonoSite the Silver in the 36th Annual International Design Excellence Awards (IDEA). FUJIFILM SonoSite's SII Ultrasound Machine was among more than 1,700 projects from 30-plus countries that competed in IDEA 2016.

Currently, SonoSite has in excess of 145 patents and holds a number of prestigious design awards. It continues to be the world leader in point-of-care ultrasound.

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Each year, KLAS - an independent healthcare research agency interviews thousands of healthcare professionals about the products and services their organizations use. This year's KLAS report, Ultrasound Imaging 2017, shows that SonoSite is the most adopted and widely considered vendor for point-of-care ultrasound.

"While KLAS did not target organizations using SonoSite, nearly two-thirds of respondents using GE Healthcare, Philips, Siemens, or Toshiba Medical in other ultrasound areas were found to be using SonoSite for their current point-of-care ultrasound. Providers are also considering SonoSite most often for future point-of-care ultrasound requirements, followed distantly by GE Healthcare and Siemens."

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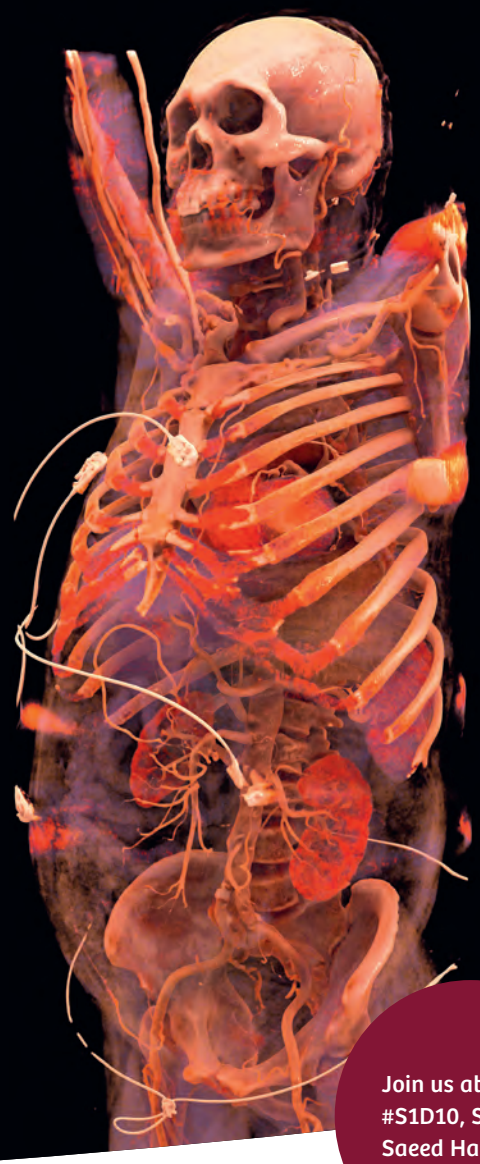

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*Siemens AG, "Sustainable healthcare strategy – Indicators in fiscal 2014", page 3–4

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DUBAI HEALTHCARE CITY AUTHORITY steps up efforts to build a safer healthcare system

Patient Safety Movement Foundation and Dubai Healthcare City Authority launch first Patient Safety Movement in the Middle East

By Arab Health Magazine Staff

The Patient Safety Movement Foundation (PSMF) has launched the first patient safety movement of its kind in the Middle East that aims to eliminate preventable deaths. The movement, which is being spearheaded by the Dubai Healthcare City Authority (DHCA), kicked off with a roundtable on the Patient Safety Movement that took place on November 7, 2017.

According to Dr. Ramadan AlBlooshi, CEO, Dubai Healthcare City Authority– Regulatory, "Eliminating preventable deaths as an objective serves all stakeholders in the health system. A platform such as the Patient Safety Movement Foundation goes beyond a country's geographical borders and touches a key element of patient care – patient safety at all levels. Through this movement, Dubai Healthcare City Authority will spearhead an essential conversation among the region's hospitals, governments, medical device companies and other healthcare players towards a shared goal."

Commenting on the DHCA's commitment to building a safer healthcare system, Joe Kiani, founder of the Patient Safety Movement Foundation, said: "This is an incredible move by the Dubai Healthcare City Authority to address patient safety. This is the first incredible step to enabling hospitals to open the conversation and put into place programmes that properly protect both the hospital and patient from hospital errors to improve patient safety."

The topic of patient safety is a shared responsibility and of vital importance across the globe. In the United States, where the PSMF originated, the focus is on collaborating and breaking down information silos that exist between hospitals, medical technology companies, the government and other stakeholders. Working in collaboration with industry leaders, the Patient Safety Movement Foundation has developed actionable patient safety solutions (APSS) that has enabled thousands of hospitals to prevent hospital errors and increase patient safety.

To date, more than 3500 hospitals from 43 different countries have signed commitments to the Patient Safety Movement Foundation to work towards avoiding preventable deaths and hospital errors. These commitments have saved over 69,519 lives in 2016.

In Dubai and across the Middle East, DHCA is introducing the movement to provide a medium for the exchange of actionable ideas within healthcare systems to improve the coordination of care for patients and positively impact their quality of life and those of their loved ones.

The Dubai Healthcare City Authority Roundtable helped identify patient safety themes, establish the scope and framework of the movement and discussed partnership opportunities.

Working towards preventing preventable deaths

More than 200,000 people die every year in U.S. hospitals and 3 million worldwide in ways that could have been prevented.

The Patient Safety Movement Foundation was established through the support of the Masimo Foundation for Ethics, Innovation, and Competition in Healthcare to reduce that number of preventable deaths to zero by 2020 (0X2020).

Improving patient safety will require a collaborative effort from all stakeholders, including patients, healthcare providers, medical technology companies, government, employers, and private payers. The Patient Safety Movement Foundation works with all stakeholders to address the problems with actionable solutions for patient safety.

The Foundation also convenes the annual World Patient Safety, Science & Technology Summit. The Summit brings together some of the world's best minds for thought-provoking discussions and new ideas to challenge the status quo. By presenting specific, high-impact solutions to meet patient safety challenges, called APSS, encouraging medical technology companies to share the data their products are purchased for, and asking hospitals to make commitments to implement APSS, the Patient Safety Movement Foundation is working toward zero preventable deaths by 2020. ▶

Joe Kiani: A beacon for patient safety and innovation in healthcare

Joe Kiani, Chairman & CEO of Masimo, is responsible for creating the Patient Safety Movement Foundation & Coalition and the World Patient Safety Science & Technology Summit.

Kiani founded the Patient Safety Movement Foundation (PSMF) in 2012 with a mission to reduce the more than 200,000 preventable patient deaths that occur in U.S. hospitals every year. Under his leadership, the Patient Safety Movement held the first Patient Safety, Science & Technology Summit in January 2013 with former US President Bill Clinton as the keynote speaker. Kiani convened hundreds of leading clinicians, hospital CEOs, and medical technology CEOs from around the globe and at this Summit, launched an aggressive goal – ZERO patient deaths by 2020.

As the founder, Chairman, and CEO of Masimo Corporation, a global medical technology innovator, Kiani has been a beacon for patient safety and innovation in healthcare for more than 20 years. His dream of transforming patient care thrives today as he works with legislators in Washington, D.C., to affect public policy that supports innovation and promotes good healthcare decisions.

In 2010, he created the Masimo Foundation for Ethics, Innovation and Competition in Healthcare to encourage and promote activities, programs, and research opportunities that improve patient safety and deliver advanced healthcare worldwide—fostering access to innovative medical solutions for those who may not otherwise benefit from their lifesaving capabilities. In 2011, he founded the Masimo Political Action Committee to spotlight the important issues that will shape healthcare policy.

Joe Kiani has won many awards, including the Ernst & Young National Entrepreneur of The Year 2012 Life Sciences Award Winner.

The 2018 World Patient Safety Science and Technology Summit will be co-convened in London, UK, with the European Society of Anaesthesiology (ESA) and supported by Rt Hon Jeremy Hunt MP, Secretary of State for Health, England.

How it all began: The history of the launch of the Patient Safety Movement Foundation

When the 1999 report To Err is Human: Building a Safer Health System was released by the US-based Institute of Medicine, it was the first time the impact and consequences of medical errors were quantified. The report generated a sort of enlightenment that led many like-minded people to form organisations to combat medical errors and hospitals to begin implementing processes to reduce harm.

Joe Kiani, Founder, and Chairman of the Patient Safety Movement Foundation, floored by the alarming statistic that 98,000 Americans were dying from preventable causes in hospitals, began to ask questions and track what was being done in the United States to reduce these unnecessary deaths.

In November 2010, over a decade later, the Office of Inspector General (OIG) published a report which revealed that the number of Medicare beneficiaries who had experienced an event that contributed to their death had reached 180,000. Kiani realised the problem was not getting better, rather it was growing rapidly. Something needed to be done.

Kiani continued to hear about countless families, like Rory Staunton and Leah Coufal's families, who lost their lives under

preventable circumstances. These stories helped fuel the mission of ZERO preventable deaths by 2020, a bold but necessary goal that the Foundation believes in wholeheartedly because ONE preventable patient death is one too many.

In 2012, tired of general inaction and apathy, Kiani had identified an immediate need to bring all stakeholders across the continuum of care together to take action, thus forming the Patient Safety Movement Foundation.

The Patient Safety Movement Foundation convened the first annual Patient Safety, Science & Technology Summit in 2013. The Summit brought together the world's leading clinicians, hospital CEOs, patient advocates and government leaders to identify primary patient safety challenges and provide tested solutions called Actionable Patient Safety Solutions (APSS). Hospital attendees made formal commitments to implement processes to reduce preventable deaths in their hospitals, and healthcare technology companies signed the Open Data Pledge to share data for the sake of patient safety.

In 2017, the Patient Safety Movement Foundation held its 5th Annual World Patient Safety, Science & Technology Summit and announced over 69,519 lives saved because of commitments made by over 3,526 partnered hospitals. This announcement showcased how far the Foundation has come, and how much further it must go to reach ZERO preventable deaths by 2020. AH

The Patient Safety Movement Mission

- With the ultimate goal of achieving ZERO preventable deaths by 2020, the Patient Safety Movement mission includes:
- Unify the healthcare ecosystem (hospitals, healthcare technology companies, government, patient advocates, clinicians, engineers, etc.)
- Identify the challenges that are killing patients to create actionable solutions (Actionable Patient Safety Solution)
- Ask hospitals to implement Actionable Patient Safety Solutions (APSS)
- Ask healthcare technology companies to share the data their devices generate in order to create a Patient Data Super Highway to help identify at-risk patients
- Promote transparency and aligned incentives
- Promote patient dignity & love
- Empower providers, medical, nursing & pharmacy students, patients and families on patient safety

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How useful is a diagnosis of autism?

By Prof Katrina Williams, APEX Australia Chair of Developmental Medicine, University of Melbourne; Director - Neurodevelopment & Disability, The Royal Children›s Hospital; Honorary Research Fellow, Murdoch Children's Research Institute, Melbourne, Australia

Australian playwright Tom Middleditch said recently: "Most of the people that are making stories now with autistic characters in them are making them from the checklist of stereotypes that exists in pop culture, rather than from a lived experience, understanding where those behaviours come from" (*The Age,* 5th November 2017).

His words recognise that we have to see beyond the stereotypes to better understand autism – a reflection that is as true for discovery research and the provision of best care as it is for fiction.

The two big questions for autism today are what are its causes, and how do we best improve the lives of those with autism? These questions are not mutually exclusive. In other fields, including neurology, biological advances in our understandings of genetic, cellular or other causal mechanisms have led to changes in intervention that have improved outcomes. It is hoped a similar approach will work for autism. However, changes to intervention based on known causes take time to develop, test and implement.

We are therefore faced with a dilemma for both discovery research and best care. Causation research benefits from homogeneity of cohorts to achieve results and to best understand the scope of application of the findings. This is true even with advances in technology that allow assessment and processing of large numbers of participants for a lower cost and more rapidly than five years ago. To deliver best care we also need

to understand more than whether a child has autism or not. We need to understand their behaviours, the context in which they occur and their associated strengths and difficulties, as well as known triggers for the behaviours or approaches that have assisted. In brief, for both we need more than a diagnostic classification alone can provide.

However, currently in clinical care and research we rely heavily on diagnostic classification. This may, at least in part, explain why progress has been slower in autism in which imaging, cellular and genetic techniques have only provided answers in a minority, albeit an increasing minority, of presentations. It may also explain why evidence about personalised interventions for children with autism based on clinical characteristics is not yet possible.

Diagnostic classification has value, traditionally being used to describe constellations of symptoms or signs that assist decision-making about necessary investigations, selection of effective interventions and understanding prognosis. In autism we continue to use umbrella terms to diagnose autism according to current classification systems like the International Classification of Diseases version 10 (ICD-10) or the Diagnostic and Statistical Manual of Mental Disorders, version 5 (DSM-5). What is clear is that current classification systems for autism do not describe one pattern of behaviours, strengths and difficulties.

In autism we aim to achieve early diagnosis to ensure children are provided with opportunities for early intervention. Problems specific to young children or those who have verbal communication difficulties exist. This is because they cannot explain their experiences of pain or impairment, the motivation for their behaviour or describe the way they feel. In this group we still do not have reliable and valid ways of measuring behaviours, with assessment prone to variation depending on the observer's perspective and expertise. To add to the complexity, the behaviours can change depending on the environment and are occurring during a time of rapid skill acquisition and expected behaviour change.

In clinical care using DSM or ICD classification systems for a diagnosis of autism is rarely sufficient for the family to understand their child. It does provide a language that can improve the way a family understands their child's behaviour and also a 'broad brush' picture of the strengths and difficulties their child has. In Australia and some other countries a diagnosis of autism also provides a pathway to services or funding. As such this diagnostic label has another value for a child and their family. However, when funding or services are 'one size fits all' based on a diagnostic classification for such a broadly defined disorder it is apparent that some families will get more than they need and others less, while some families with a child with similar strengths and difficulties but no diagnosis may miss out.

What is needed is more information than a diagnosis provides, namely information about the activity and participation impacts that a child is experiencing, their learning and communication abilities and whether there are any features that could be linked to known causes. Three systems or approaches can add value to an autism assessment and how we think about best care and discovery research. The first is the International Classification of Functioning, Disability and Health (ICF), the second the concept of quality of life (QoL) and, more recently, the Research Domain Criteria (known as RDoC).

The International Classification of Functioning, Disability and Health (ICF) is a framework that assists in thinking about a person's health condition, their body structures and functions, activities and participation in the community, and how these interact and are influenced by their environment and other personal factors. It has been developed to assist with understanding a person within their family and community, and to assist shifting the focus from impairment and its correction to improving activities and participation through whatever means, including environmental adaptation. The ICF assists with bringing societal elements to best care and understanding the impacts of behaviours.

A person's experience of their life and its quality can influence much that we do to support them and their family. Recently there has been increasing knowledge that autism severity is not directly linked to QoL and more broadly that families value QoL highly as a desired outcome for planned interventions. QoL is also increasingly used in economic evaluations and may assist us to tailor what we do to benefit individuals and ensure optimal use of inevitably finite resources.

The Research Domain Criteria describe 'constructs', such as 'cognitive systems' and likely mutually exclusive 'subconstructs' under them. For example 'cognitive systems', whose 'subconstructs' include 'attention', 'perception', 'cognitive control' and 'working memory'. For each 'subconstruct' there are 'elements', if known, for genes, molecules, cells, circuits, physiology, behaviour, self-report and paradigms also described. RDoC assists with our understanding of biological and other underpinnings that are on the pathway to a person's behaviours and characterises behaviours beyond categorising them as present or absent.

The advantages and potential disadvantages of persisting with a diagnostic classification of autism has become a hot topic, but it may be better to consider the things we need to achieve for children with autism, and then to select the best approach to achieve these goals. For example while one approach may be best for clinical care or service development, something different may be best for research, training, or advocacy. In this way we are trying to find an approach that is 'fit for purpose', explicitly acknowledging different approaches as best practice for different situations, rather than expecting to resolve tensions based on history, status quo or preference.

Rather than being satisfied with a diagnosis of autism, we must seek to understand each child's strengths, their difficulties, their environment and the complex ways in which these interact to impact their activities, participation and QoL. We must also be aware that while genetic understandings of autism are increasing there are now known to be single gene changes that can lead to different behaviours and that different genes have been identified that lead to the same diagnoses. As such phenotype, clinical and functional understandings will continue to be important in deciding best care and support. To assist with research that will identify cause, and to provide best care for children and their families, we need to bring together the best of all the models of care that are available and seek to understand the mechanisms on the path to behaviours.

Prof Katrina Williams is a Speaker at the Paediatrics Conference scheduled to be held from 29th January to 1st February 2018 at the Arab Health Congress.

MEDICAL EQUIPMENT PROCUREMENT STRATEGY

Project-Specific or Standard Approach?

By Ahmad Jawhar, Managing Director and Co-founder of Healthcare Consulting and Planning (HCP), Beirut, Lebanon

Project owners are continuously faced with the challenging question of whether to procure the medical equipment during an early construction stage to alleviate concerns related to site coordination and pre-installation requirements as well as post-installation civil works; or to delay procurement until advanced stages of construction, liberating themselves from making important and costly commitments way before the hospital's commissioning and soft opening.

Each procurement strategy has its advantages and disadvantages, and it is quite difficult to make a general guiding statement of preference for one over the other. The decisive factors are many, and they vary according to the specifics of every project. Some of those factors are financial, such as availability of funds, while others are administrative, relating to operational aspects, including staffing and phasing, and some are technical, dealing with the issue of site preparedness and the risks emanating from lack of general contractor coordination with medical equipment suppliers. Technical issues and concerns related to site preparedness will be emphasised in the subsequent paragraphs of this article, many of which would be lessened (if not totally alleviated) when professional medical equipment planning is invested in the project from the beginning.

Proper planning for medical equipment will ensure, to a large extent, the smooth integration of the majority of a hospital's

medical equipment devices that do not require special pre-installation coordination by the building contractor, or post-installation civil works. Such devices can be delivered, installed, and commissioned by the equipment suppliers, with hardly any building contractor intervention, provided the equipment has been properly planned-for during the design phase, and assuming that design standards and norms are adhered to, and proper project management and coordination are in place.

This leaves a small percent of medical equipment that are fixed to the building structure, and/or those which require specific moderate to major pre- and post- installation works within the activity space where the said equipment is to be installed. This type of equipment is known as group 1 medical equipment. These specific works cannot be performed prior to equipment selection, as they constitute execution of manufacturer-issued installation shop drawings. Such drawings are not only manufacturer-specific, but they are also model-specific and sometimes affected by optional accessories procured by the institution with the said medical equipment system. Pre-installation works include the distribution of services and utilities, installation of ceiling rails, placement of floor fixation plates, etc., while post-installation works may include floor vinyl closure after cable or floor ducts penetrations, false ceiling closure after installation of ceiling rails, reinstallation of light wall partitions, re-painting jobs, etc.

The dilemma is mostly concerned with this small percent of the overall medical bill of quantity, which, when converted into financial figures, yields a considerable percent of the overall medical equipment budget.

So how far in advance shall the equipment selection and procurement take place to ensure a smooth execution of builder's works and to minimise (if not eliminate) corresponding variation orders? The traditional answer would be to embed all group 1 equipment within the builder's works contract. This traditional approach has the advantage of involving the building contractor with site coordination tasks and other medical equipment related responsibilities as soon as construction is initiated, while keeping the actual equipment selection in the hands of the owner. These apparent advantages, however, come at a high cost. In order to maximise the benefits of this approach, the owner must select, commit and purchase the related equipment at an early stage of construction. In addition to contractor fees, this solution involves mobilisation of substantial capital sums and purchasing sophisticated and technologically-driven medical equipment systems many months or even years before they are put into final use. In addition to this direct cost, the owner would sustain major indirect costs related to procurement of medical equipment ahead of anticipated operation, including the loss of cutting-edge technology (if systems become old or obsolete), the loss of warranty for idle systems, the effect of environmental conditions, the cost of storage, etc.

Delaying the procurement process and even dissociating it from the construction process on the other hand has numerous advantages ranging from financial to technical. Such advantages are observed and materialised only in cases where proper medical equipment planning has accompanied the design from beginning to end, resulting in a sustainable facility ready to receive the medical equipment systems at any time during the final phase of construction or even after full facility commissioning and handing over. In this case, the medical equipment tender terms and conditions would have to include, in addition to all standard requirements, a civil works clause, describing, for rooms where group 1 systems ought to be installed, the additional works required to prepare those rooms, and to re-finish them after equipment installation, rendering them ready for final use by the hospital operator. These additional civil works will be financially reflected by an increase in the total cost of initial equipment acquisition. Such increase or additional costs are typically abortive in nature and should be properly and thoroughly calculated and analysed when making such a strategic decision. The final outcome should provide the decision makers with a comprehensive financial analysis that takes into consideration in addition to equipment acquisition cost, the cost of abortive works as well as indirect savings realised from delaying the procurement until anticipated time of operation, staying up to date with cutting-edge technology, avoiding the loss of warranty for idle systems, etc. When all variables are added up, it is very likely that abortive costs become insignificant.

So what is a preferred approach, methodology and chronological framework for efficient acquisition of medical equipment systems for new hospitals?

Certain specific tasks and corresponding milestones related to procurement of medical equipment must take place in order to reach the soft opening successfully. These tasks would typically start around 18 months prior to the planned soft opening of the hospital. They include: ▶

Phasing of Operation

For large hospitals, it is wise to identify the bed capacity and other services intended for startup year and following years leading to full capacity. This will not only affect equipping the hospital, but will also affect stocking of expensive materials, staffing and other resources among many other operational requirements. Identifying the startup and consequent phases' capacities does not imply the number of beds only, but more importantly the type of services intended. For instance, some clinical services may be postponed either fully or partially depending on the outcome of the operator's strategic plan.

Updating of Medical Equipment BoQ and Specifications

During the design phase, all tender documents including the medical equipment bill of quantity (BoQ) and tender specifications would have been prepared to fulfill a comprehensive 100% functional capacity. Following the strategic phasing, the same documentation should be modified and updated to reflect the needs of the phasing strategy as well as emerging advancements in technology.

Packaging of Medical Equipment by Speciality or Trade

It is very rare to find one supplier that can supply and support the full spectrum of medical equipment required for a general hospital with high levels of professional capabilities. At the same time, it is very important to utilise the knowledge, expertise and experience of local suppliers who have invested years and years in building up their companies and resources in certain lines of business. For instance, we may find an imaging equipment distributor who has been in the market for decades and has established a gold record of achievements and reputation, yet this supplier cannot supply the project with hospital beds or surgical lights for example. This supplier must not be excluded nor should he be forced to buy off-the market products to comply with tender conditions.

For these and many other reasons, the preferred method used in medical equipment procurement, when adequate project management resources are available, is to divide the equipment BoQ into packages and tender accordingly starting with pre-qualification of suppliers, knowing that the same company may qualify for certain packages but not for others.

Ahmad Jawhar is an international expert on healthcare technology planning and management with 30 years of experience in biomedical and clinical engineering, facility and medical equipment planning and medical project management.

Typical packages include medical imaging, laboratory, dental and dental lab, medical furniture, operating tables and lights, monitoring, cardiology, ENT, neurology, infusion devices, etc.

Tendering, Evaluation and Contract(s) Awarding

Standard processes may be followed for bidding and tender evaluation (technically and financially), details of which will highly depend on the project owner's adopted model of procurement.

Execution of Contracts

This includes delivery, storage, site inspection and preparedness, unpacking, initial testing, installation, site closure civil works, testing and commissioning, training, handing over and post-installation follow up including maintenance and updates.

Proper undertaking of the above tasks, accompanied by professional project management skills are instrumental for the successful implementation of the equipment commissioning and preparation for utilisation process. The details of these task groups are standard in nature, and may be the subject of a future article.

In conclusion, project specifics will dictate the most suitable medical equipment procurement strategy. Whenever possible, it is advisable to defer the commitment and selection of advanced medical equipment systems until the operational model and phasing strategy have been well identified. While doing so, all efforts should be made to achieve a successful, efficient and cost-effective framework for project implementation that includes, among other things, a balanced strategy for procurement of medical equipment systems. AH

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تجربة دبي الصحية

Dubai Health Experience

DUBAI HEALTH EXPERIENCE (DXH)

Creates a global healthcare market place for health tourists

Article provided by Dubai Healthcare Authority

Many patients from the more developed parts of the world today travel outside their home countries for health-related services. This is due to a number of different factors including the better quality of healthcare infrastructure, the opportunity to combine medical treatment with tourism, low cost of travel, and readily available information on the internet.

Dubai's attractive location, especially its easy access to the East and the West, along with the availability of talent and technology has enabled the city to develop a strong and favourable opportunity to develop its health tourism offerings. Joint efforts between the private and public sector and several key public and government institutions, has contributed to the growth and development of a robust health tourism sector in Dubai.

Dubai Health Experience - Finger on the pulse

In 2016, Dubai witnessed an overall growth of 9.5 per cent in the number of medical and health tourists in Dubai - the emirate received 326,649 international medical tourists. A majority of international patients came from Asia (37 per cent), followed by Arab and GCC (31 per cent) and Europe (15 per cent).

Revenue generated from international

patients was worth over AED 1 billion, reinforcing the growing contribution of the sector to the national GDP.

Orthopaedic, dermatology and ophthalmology were the most sought medical and health tourism specialities. However, Dubai is also well known for cosmetic, dental and fertility treatments.

Dubai – a favourable Health Tourism Destination

Dubai actively promotes seven different specialities under the health tourism umbrella i.e. orthopaedic, ophthalmology, cosmetics, dental aesthetics, weight loss surgeries, fertility treatments and health checkups. The availability of treatments spans a full range of medical services including services that can restore an individual's health without medical intervention.

Today, Dubai is able to appeal to a wider audience who may be on the lookout for more wellbeing-related treatments in line with international benchmarks. Integrated health centres in Dubai like DNA Health for instance, located at the Jumeirah Al Qasr five-star hotel, next to the award-winning Talise Spa, offers complete health check-ups along with a holistic written lifestyle plan, consultation with a functional medicine consultant, nutritionist and stress management consultant. The Retreat Palm Dubai, the region's first holistic wellbeing resort on the Palm, offers health checkups along with three to seven days of a complete detox plan with consultation, food and stay. It also offers wellness packages for adults and children, including weight management. The hotel includes the Rayya Wellness Centre, a homegrown brand, a spa, a recreational centre and a nutrition clinic.

Dubai also offers a range of medical spas and treatment centres that have professionals licensed by DHA and offer various alternative treatments like homeopathy, Ayurveda, etc.

The objective is to provide patients with the highest medical service standards using state-of-the-art technology accompanied by highly specialised and educated staff, following only the leading global standards.

Creating a brand for Dubai's Health Experience

Dubai Health Experience was launched in April 2016 by His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and Chairman of the Executive Council, as a continuation of 'Dubai, a Global Destination for Medical Tourism' project. The Health Tourism Council, continues its efforts to enable Dubai to become a global health tourism destination and a gateway to the finest medical experts and premier accredited healthcare facilities while providing a unique experience to visitors in the iconic city of Dubai.

This vision has now become a reality as Dubai continues to be one-stop medical tourism destination in the region and the 16th medical tourism destination globally. Dubai has also been elected to the position of 'Chairmanship of the Global Healthcare Travel Council' in recognition of the Emirate's leading position in the global medial tourism sector. The position also enables the Emirate to share knowledge and best practices with other destinations in an effort to move towards a new era of globalising medical and health tourism.

Dubai was previously recognised for its medical tourism capabilities as the Emirate received the 'Innovation in ▶

Medical Tourism' in Greece in May 2015. In September 2015, Dubai received 'The Best Integrated Destination for Medical Tourism' during the Tenth International Exhibition and Conference on Medical Tourism. Dubai was also named in the 2016 'Highly Commended Destination of the Year' by the prestigious International Medical Travel Journal (IMTJ) Award in Spain.

Dr Layla Mohamed Al Marzouqi, Director of the Health Tourism Council commented: "Our goal is to continue to position Dubai as the prime destination for health tourism through a combination of world-class infrastructure, cutting-edge technology and expert medical practitioners. We believe that Dubai has what it takes to become the preferred destination for medical and health treatments, and our objective now is to create wider awareness about the facilities and services that DXH Group members provide and showcase the length and breadth of their expertise to an international audience."

An Inclusive Patient Journey starting from www.dxh.ae

With the availability of modern technology and infrastructure, each patient can investigate and arrange healthcare facilities remotely using a trusted website and medical facilitators.

Dubai's efforts are aimed at easing the entire patient journey starting from the time a tourist plans to access healthcare outside his home country. DXH.ae, the official health tourism website of Dubai is easy to navigate and allows those who are seeking a uniquely integrated medical tourism experience the chance to identify their desired medical treatment, fly to Dubai, enjoy the Dubai experience, fully recuperate and then return home.

The website provides medical tourists the opportunity to compare and choose from over 400 healthcare packages that are designed to meet each individual's requirement. The packages clearly outline the cost, inclusions, and exclusions. The comprehensive packages listed on the portal combine both leisure and health including hotel accommodation, visa and insurance along with the selected medical treatments. The portal also offers options to request an appointment and 24x7 live chat.

To make the experience even more convenient, DXH also launched the mobile app which is designed to allow medical tourists access to information about hospitals and clinics, doctors and DXH medical packages at any time. Medical tourists can download the DXH app from both Android and Apple stores.

Creating an Experience

The Health Tourism Council is constantly collaborating with vital partners, including the private and the governmental sector to create an experience for the incoming medical tourist. The objective is to identify the key areas of the journey, and look for ways to enhance the patient experience.

In this regard, the Dubai Health Authority (DHA) and the General Directorate of Residency and Foreign Affairs Dubai, GDRFA-Dubai, signed a Memorandum of Understanding (MoU) to promote medical tourism in Dubai, exchange knowledge and elevate the health services offered at DHA facilities. It aims to strengthen Dubai's position as a global destination for medical tourism by easing visa procedures for medical tourists entering Dubai.

The Health Tourism Council is working with Emirates Airlines as a strategic partner of the initiative to develop health tourism products that will be promoted through their travel desks. This partnership aims to cultivate Emirates Airline's international status and widespread travel routes to fulfill DXH goals of attracting medical tourists from across the globe.

DXH also signed a Memorandum of Understanding (MoU) with The Health Bank this year with the aim to drive medical tourism in the region. DXH SmartCare by The Health Bank, is an exclusive product for DXH and provides health tourists with a single point of contact, seamlessly combining healthcare coordination, flight booking, visas, accommodation, airport transfers, leisure activities and post-treatment support. DXH SmartCare transcends far beyond a simple health tourism service. Medical tourists are now able to see the features of The Health Bank on DXH's website www.dxh.ae, and they can opt for three types of membership and consultation services.

Keeping the interests of patients at heart

Dubai's strategy for health tourism is designed to keeps the interests of the patients at heart. It includes a charter of patients' rights and responsibilities which enables medical tourists to better understand their rights before arriving in Dubai for healthcare.

Additionally, the DHA has created a medical complaints procedure for anyone unhappy with the services they have received from a health professional or facility in Dubai. The process has been designed to address issues based on the level of severity, and provide families with a clean timetable for resolution.

To facilitate the arrival of medical tourists, the DHA works with a third-party company to provide coverage. This policy, according to the DHA, is an important "safety net" in the event of any unforeseen complications that may arise from treatment in the emirate.

The insurance policy - which is underwritten by Alliance Insurance Company and is backed by Alliance Global and Lloyds of London - provides cover while in the UAE for a variety of situations, including emergency medical expenses and up to $50,000 for each insured individual. Any individual receiving treatment is automatically covered for additional expenses in the event of an unexpected complication stemming from a planned procedure in any facility included in Dubai's medical tourism programme. The policy is made available at the time of booking an initial appointment, and accompanying family members can buy the protection at the same time for Dh150 per person.

Unlocking business potential for DXH Group

One of the main pillars of the initiative is private healthcare facilities. The strategy is focused on building strong ties with Dubai's finest healthcare providers to create an unparalleled experience for medical and health tourists. The listed healthcare facilities are currently all developing packages for medical tourists and enhancing their existing services.

Starting with 26 DXH Group Members, the DXH Group today embraces 45 of Dubai's leading healthcare providers from hospitals and specialised clinics to day-surgery centres.

All the participating group members go through an evaluation process which involves each facility meeting rigorous requirements and standards, on-site inspections and ongoing reviews by DHA's Health Regulation Department to ensure quality, safety and service standards for Dubai's inbound medical and health tourists.

Furthermore, the Health Tourism Council actively promotes the packages listed by the DXH group members on the website and other marketing collaterals and campaigns. The recent speciality campaign was targeting dental, orthopaedic, wellness and fertility treatment packages in the GCC market.

Dubai has recently participated in trade-related events along with the DTCM (Department of Tourism and Commerce Marketing) and the Ministry of Economy to promote the Dubai Health Experience to the travel and business sector, driving awareness and interest in Dubai as a destination that goes beyond the 'medical' aspect and now includes the overall 'health' and wellbeing of visitors.

Infrastructure for the future

One of the key attributes of a city that makes it competitive is its infrastructure. In the health and wellness sector too, it is imperative that the infrastructure that supports the industry is robust and constantly expanding to keep up with growing demand.

Dubai has around 3,000 private health facilities ranging from hospitals and specialised clinics to day-surgery centres with around 35,000 health specialists from more than 110 different nationalities working in the sector. These numbers are expected to grow to 40,000 specialists and 4,000 health centres by 2020.

In addition to these internationally accredited healthcare institutions, the city has evolved to become a modern megapolis, with some of the most breathtaking tourist attractions including The Palm Jumeirah, the Burj Khalifa, Dubai Mall, among others. Combine this with luxury hotels, and an excellent transport system, and the allure of Dubai as a destination for health and wellness tourism cannot be disputed.

As Dubai and DXH look at the next stage of health and wellness tourism – the future looks very bright. The strategy for the rest of the year and in 2018 is to continue to drive awareness of Dubai as a destination for health and wellness tourism through international trade events and wider collaboration with health and medical institutions, medical professionals and government bodies. AH

Will You Meet the MEDICAL TOURISM BRANDING CHALLENGE?

By André Taylor, International business management consultant, keynote speaker, and founder of Taylor Insight Worldwide, LLC, New York

We have become a world of brands. Buyers gravitate to brands they identify with, and that feel right to them. This fact exists not only in retail, but in every sector of our lives. Educational institutions such as Harvard and Oxford Universities have long been brands, well-defined in the minds of parents and students, locally and abroad. Now, in the medical tourism industry, which continues to grow internationally, and as organisations explore how to attract patients, you may be wondering how to meet the unique branding challenge in this market. In an industry where training and focus is on providing the best in patient care, the strategies and tactics associated with branding and marketing may not come to you, naturally.

As consumers, we rely on brand names to gauge quality and relevance. We compare what is available, choose what we should buy, decide where we should go, and determine whom we should listen to, based on what attracts us, which is largely the strength of the brand. Marketers describe this decision-making process as being connected to the "brand promise." When your brand is well defined, others know what to expect from you, and every time you "deliver" on this promise, it is reinforced. We develop strong bonds and links to brands and become wed to those brands that meet and exceed our expectations. Over

time it becomes difficult to separate someone from their chosen brand. The same effect can happen to you and your organisation as a player in the medical tourism sector.

The medical procedure you offer can be a brand, your organisation can be a brand, and the doctors caring for patients can be a brand. While this concept may feel in conflict with the seriousness of your area of speciality and your medical practice, branding is an important consideration in a market where the patient may have little to base their selection on. To your prospective and existing patients, you represent a positioning in the mind that is comprised of your offering, how you communicate this offering, how your organisation is "packaged" in its marketing materials, its reputation, and the experiences of former patients. Your objective as an organisation is to become intentional about the brand messaging you deliver, communicating and underscoring that you offer the finest care and the highest levels of professionalism.

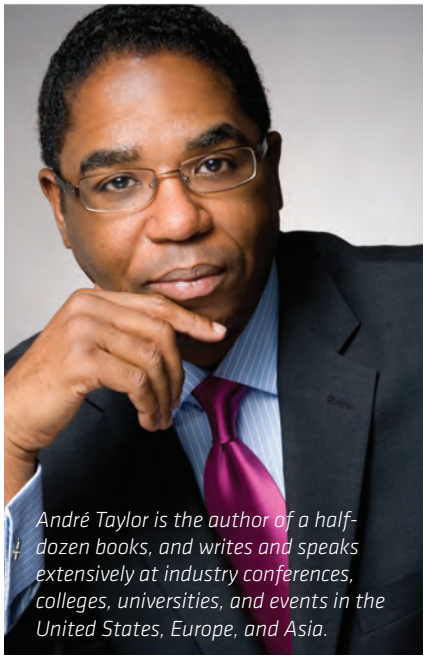
If you have travelled recently, you've certainly seen articles in airline magazines denoting the "Top Doctors," in a particular city. Health organisations have become savvy to the branding opportunity and how it attracts patients who want to be cared for by the best. This is essential when it comes to elective procedures.

Patients want not only to address their medical concerns, but let others know it was done so, by a special doctor or organisation. I was once delivering a seminar to a group of medical professionals when a New York-based dentist bristled, "What is this brand stuff? I'm an expert at giving people beautiful smiles!" It was during this exchange that she revealed the basis of her brand positioning, despite her overt objection to the discussion. As I got to know more about her, I realised she was passionate about creating dentures that could not be distinguished from natural teeth, because of her own experience, losing a large number of her teeth as a teenager. What this dentist yelled out, during that seminar, was the basis of helping her define her own unique brand – and why patients might seek her out for care.

Medical professionals are walking around with strong personal brands they have developed over time. Sometimes these brands are purposefully created and other times they are unintentionally created. Sometimes the professional knows they are expressing and communicating a personal brand. Others times they are completely unaware. By understanding more about the branding process, you can be more deliberate in the message you send to the market. Let's explore what a personal and organisational brand is.

It is a way of distinguishing who you are, what you do, and what you have to offer to your patients, your profession, and to the world.

Establishing a brand goes beyond creating a name, image, logo, or being part of a category of health providers. It goes beyond your medical training, your C.V., and job title. It explains why you are different and says something no one else can say. It's creating a unique position and association in the mind of others – first and foremost amongst your patients. ▶



André Taylor is the author of a half-dozen books, and writes and speaks extensively at industry conferences, colleges, universities, and events in the United States, Europe, and Asia.

A crisp, well-defined brand is your way of giving patients confidence that they are making the right choice, entrusting you, with their medical care.

In medical tourism branding, it's important to understand what's going on in the minds of prospective patients. Medical care is a personal undertaking, and there are many fears associated with a prospective patient, making a decision to put themselves in your care. Your branding has to overcome the fact they are unfamiliar with you, and have limited information on which to judge your ability to meet their needs other than what is communicated by you. They may have fears about the quality of your care, and in travelling from another country, the qualifications of your caregivers, the safety of the procedure, the cleanliness of your facility, the quality of your instruments, and medical supplies, and even the safety of your country and neighborhood. Differences in marketing and advertising customs, and the fonts and colours used in your country, can also cause a prospective patient to consider carefully if they are making the right choice with your organisation.

Begin the branding or re-branding process by listing the concerns a patient might have. As you shape your brand message, and your marketing execution, you can then put deliberate emphasis on a message that weds your prospective patient's concerns with your capabilities and strengths.

Step 1: Identify your uniqueness. What do you do, and how do you do it in a unique way? How can you summarise your capabilities in a compelling sentence? Make sure this sentence is from the patient's point of view, not from your point of view as a medical professional.

Step 2: Address the psychology of the patient. Shape your message deeply in response to the psychology of the patient. List the objections they might have in dealing with your organisation and then address those objections in positive, confident, and comforting language.

Step 3: Identify how your branding message will be communicated. There are so many marketing options today, you have lots of choices. The key is developing your brand messaging into a compelling headline and narrative that has emotional impact with your prospective patient. This means, great copy in your advertising, great voiceover in your radio or online marketing, etc.

Step 4: Eliminate any and all "conflicts" to your brand. Take a judgemental look at your organisation and uncover and adjust anything inconsistent with the brand positioning and messaging that you have defined. Look beyond the marketing message to the "patient experience," from beginning to end to make sure what you say about your organisation can be seen and felt by your patient.

Step 5: Identify the marketing activities, partnerships, and projects you will take on as an expression of your brand. Today, patients expect health organisations to be deeply engaged in their communities, helping to address global health issues, by contributing to causes, mentoring others, and taking a position on issues. Use your social media platform to reinforce your brand positioning by engaging in the right discussions. This is a place where your prospective patients will certainly look to gauge your brand credibility.

Final Words

In every industry and profession there are high-end and low-end brands. This is neither good nor bad, but rather appropriate approaches to branding based on the goals of the organisation. In medical tourism, however, you must always aim to be high-end, even when priced lower than in your patients' country. The underlying message of your brand must be that your organisation and services feel like care patients would pay a premium for. Only then, will you meet the medical tourism challenge which is convincing your patient that travelling to you means receiving the best medical care in the world. AH

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INTERNATIONAL MEDICAL TRAVEL

Telehealth & Telemedicine Innovations

By Irving Stackpole, President of Stackpole & Associates, Inc., Rhode Island, USA

International medical travel is often thought of as innovative and disruptive. Yet within this category of cross-border medical service demand and supply, there are even more innovations occurring, especially with regard to technology, and specifically, telemedicine and telehealth.

For decades, most people – including healthcare professionals - believed that, "All healthcare is local." For this cultural reason, international medical travel ("medical tourism") has been thought of as different, even "exotic."

More than One "Mode"

Medical travel is generally defined as an individual travelling to a distant location, often across a national border, for the express purpose of consuming health or medical services. And according to the World Trade Organization (WTO), this type of cross-border trade in services is described under the General Agreement on Trade in Services (GATS), and is referred to as "Mode 2" cross-border trade.

In telehealth or telemedicine, the patient (or consumer) is in one location and the professional services provider in another location as the service is provided; this is an example of "Mode 1" cross border trade.

Telehealth & Telemedicine – Some Definitions

Telemedicine, in its broadest sense, describes the delivery or provision of healthcare services by means of an electronic device. The first time a doctor called a patient by telephone to discuss her diagnosis was probably the initial "telemedicine encounter."

The World Health Organization traces the history: Telemedicine, in its modern form, started in the 1960s in large part driven by the military and space technology sectors, as well as a few individuals using readily available commercial equipment. Examples of the early technological milestones and telemedicine include the use of television to facilitate consultations between specialists at a psychiatric institute and general practitioners at the state mental hospital and the provision of expert medical advice from a major teaching hospital to an airport medical center.

Telehealth, on the other hand, is a much broader term, which includes not only the provision of medical services, but also education and training.

Telemedicine is broadly understood as a way of making available the expertise of medical services providers to other providers and consumers at a distance.

In telehealth and telemedicine terms, the location of the patient (or consumer), and the provider serving the patient (person-to-person) is the "originating site", and the location of the expert or resource providing consultation, oversight, analysis or a second opinion is called the "distant site".

Types of Encounters

There are three types of telemedicine encounters:

- Provider to provider
- Provider to consumer
- Provider to provider plus consumer

Education or coaching might be considered another type of telemedicine encounter, although these are generally considered telehealth encounters, because medical services are not provided or consumed.

Telemedicine encounters which are interactive, and occur in real time are sometimes referred to as "synchronous". A very common type of synchronous telemedicine encounter is remote patient monitoring (RPM), where biometric data such as heart rate or blood glucose level are recorded in one location and are viewed simultaneously in another location. Another example would be if a dermatologist in Berlin were viewing real-time video of a skin lesion in Delhi; this telemedicine encounter is occurring in real time, and would therefore be considered synchronous.

Telemedicine encounters can also be "asynchronous", where information is recorded, and forwarded to another provider for interpretation, and the analysis or results then returned to the originating provider. A radiological image is a very common example of "store and forward", asynchronous telemedicine.

Telehealth encounters, on the other hand are often considered educational or lifestyle enhancing, and may include continuing medical education, information or image databases which are stored in one location and accessed by providers or consumers remotely, or consumer health information and engagement. Increasing access to the Internet and wide distribution of computers and portable devices which can retrieve information and images has been a boon to telehealth. Consumers are beginning to use a broad array of self-monitoring devices, with benchmarks, comparisons, and analysis available through remote, telecommunications enabled channels. This direct to consumer channel has even been given its own label, "mHealth".

One can easily imagine a future where consumers monitor important personal biometrics, and if these fall out of normal range, can virtually access an educator, coach or medical provider.

Growth in Telemedicine & Telehealth

There are a number of factors driving the growth of telemedicine and telehealth. While this is certainly not an exhaustive list, providers which are interested in exploring how digital health, telemedicine and other technologies can further enable or enhance their practice should not only explore the clinical and market potential, but also the potential obstacles in the jurisdictions being considered.

Access: Telemedicine & telehealth make available intellectual property and expertise to a wider audience than could otherwise access these resources. The historical model of a hospital-based medical or healthcare provider, which consumers, families and/or patients travel to in order to receive care is deeply embedded in many societies and cultures. And yet, there are vast populations scattered by distance or cultural barriers who are unable to access fixed location providers of doctors, yet who nevertheless would benefit from access. Populations resident in rural, even remote areas historically have had difficulty accessing healthcare and medical services. The obvious opportunity to bring healthcare and medical expertise to these populations has prompted governments, as well as providers to develop and deploy telehealth and telemedicine services.

Telemedicine has lowered barriers of access to diagnostic and therapeutic expertise around the world, and has the potential to do even more.

Provider Availability: Between and among regions, and certainly between and among nations, there is significant uneven distribution of healthcare providers. The doctors, nurses, midwives, technologists ▶

and other health professionals may be limited in numbers, and are certainly limited in terms of space and time. The needs of patients don't often follow the distribution pattern of where these providers are located. Telemedicine and telehealth enable providers to be available virtually in locations, and at times where and when they would not otherwise be. This is a significant advancement to population health and the well-being of the providers and consumers who are able to take advantage of the availability of these providers.

Mode	Type	Modes of trade in health services
Mode 1	Cross-border supply of services	Trade across borders through mail and electronic media; shipment of samples; analysis of information
Mode 2	Consumption abroad	Care for foreign patients Health profession educational services for foreign students
Mode 3	Commercial presence	Establishment of foreign companies, subsidiaries, or foreign investment for the management or provision of health services
Mode 4	Presence of natural persons	Temporary movement of health personnel to provide services abroad Short-term health consulting assignments

Clinical Specialisation: There are specific clinical conditions which are few and far between, even rare. In these cases, there may be only a handful of providers with experience in, and expertise with these rare conditions. In these circumstances, without access to telemetry and telemedicine, the providers treating these individuals with rare conditions would not have access to such singular expertise. Notice that the need for this expertise is not specific to developing countries or regions and may occur in industrialised locations as well.

Technology Advances: The rate of advancement in medicine and healthcare is growing, and the technologies which may significantly benefit patients may emerge in one location, and not where a particular patient-provider encounter occurs. Through telehealth educational encounters, such as accessing scientific papers and diagnostic images, a provider in one location may recognise a sign or symptom which she would not have otherwise identified. This insight may then lead to different treatment options which would not otherwise have been available to either the provider or the patient. The technological advances in the general markets may also enable more accurate faster diagnosis and treatment.

Acceptance & Consumer Engagement: The rapid and widespread distribution of mobile devices among populations in both developed and developing regions has increased access to the Internet and a wealth of information. Health and medical services have been affected by this digital revolution. Consumers are able to access information about particular health and medical topics, and to communicate with others, regardless of where they are located. Acceptance of digital tools to obtain information about healthcare and medical services is driving the adoption of, and desire for telemedicine and telehealth.

The rapid acceptance of telehealth and telemedicine among consumers comes with its own challenges. Consumers may access information and resources which lead to incorrect conclusions ("I have XYZ disease"), or to demand for services which are not appropriate or are of questionable value.

Balancing the value of engaged healthcare consumers with the need for governments and societies to manage medical services, and providers' experience will evolve, if unevenly, over time.

Application in International Medical Services

The applications of telemedicine & telehealth for cross-border healthcare service delivery should be immediately apparent. Already, radiological images are being digitised and transmitted across town, and across the world for analysis, and second opinions. Remote patient monitoring is commonplace. And providers around the world are quickly adopting the video features of portable devices to send and receive both synchronous and asynchronous information to help with diagnoses and treatments.

There are, however, a host of obstacles preventing the widespread and consistent utilisation of telemedicine between and among countries. Laws and regulations, medical malpractice and liability insurances and definitions can vary significantly between and among nations, limiting the ability of providers and consumers to fully utilise emerging technologies, and therefore, realise their benefits. The variations between and among countries can increase the complexity for providers which wish to implement telemedicine programs, and for consumers who wish to access them. Abu Dhabi, for example, has one standard of provision of telemedicine services to patients and another which covers provider to provider consultations and these services can only be provided when each of the facilities is properly licensed.

Obstacles & Challenges to Growth

The relative novelty of telemedicine and telehealth in the digital age is certainly one of the significant challenges. Technology and deployment is moving faster than standardisation and regulation. Remote patient monitoring, especially for chronic conditions, communication and counselling between and among providers and patients at originating sites with experts at destination sites, as well as treatments such as psychotherapy are well established. The evidence is less clear in maternal and child health, paediatrics, and urgent care triage, for example.

Licensing is a significant obstacle to care being provided across national borders. Doctors and other healthcare professionals, though they may be fully licensed within their jurisdictions, may not be licensed, or eligible for licensure based on the requirements of the jurisdiction where the patient and her provider are located. The medical malpractice and liability dimensions of medical services being provided at distance are also not well established. There are significant barriers to providers at a distance site legally delivering care, for example, at an originating site via digital technologies.

Another extraordinarily important challenge associated with telemedicine and telehealth is privacy. The security of images and information about particular patients transmitted from an originating

site to distant site must be carefully managed and certainly compliant with both jurisdictions. To further complicate privacy and confidentiality, the standards and technologies associated with encryption continue to evolve, requiring providers and governments to remain observant, even vigilant in monitoring how information and images are transmitted stored and retrieved.

Creating a Telemedicine/Telehealth Programme

With this multitude of potential markets, rapid technological development and consumer acceptance, many providers and governments are encouraging the development of telemedicine and telehealth programmes. Experience has shown that the following strategic considerations are critical for success.

Vision, Mission and Goals: With so many wonderful advances in technology, it is often very tempting to initiate a telemedicine programme based on the latest or newest device. However it is extremely important to start with a clear vision, mission and goal in mind. Staying focused on the intended outcome can help avoid errors of enthusiasm and other traps which lead to disappointment.

Budget & Governance: Establishing a clear and realistic budget of the telemedicine programme is essential. Overly optimistic estimates of fee-for-service revenues or government payment, and an underestimation of the complexity (therefore costs) associated with regulatory compliance are often at the root of programmes which don't meet expectations.

Policies & Procedures: The leadership team must at the outset take the time to draft complete policies and procedures. In a rapidly evolving market such as telemedicine, the only way to keep pace with change is to start with a solid foundation. Policies must clearly establish, for example, the role of patient and provider consented participation, with comprehensive array of forms requiring provider and patient signatures. Documentation, records of credentials and provider privileges, prescribing guidelines and rules are also must-haves in the initial policies and procedures for a successful telemedicine programme. In addition, operational guidelines, staffing requirements and (unfortunately) disaster plans must all be in place.

Marketing: Of course, internal and external communications and promotions are needed about the telemedicine, telehealth programmes. Communicating to providers through emails, conferences, newsletters and events are necessary to assure proper uptake and realistic utilisation.

Telemedicine and telehealth programmes thus offer an exciting vision for the future of international healthcare. With thoughtful development, realistic development and transparent management, telemedicine and telehealth programmes will offer significant benefits to patients and providers. AH

The author wishes to acknowledge the assistance of Dale Van Demark of McDermott Will & Emery in the preparation of this article.

The UAE revs up its HEALING TOUCH

By Nick Hernandez, MBA, FACHE, CEO, ABISA - a global healthcare consultancy specialising in healthcare strategy and physician engagement, strategic telehealth initiatives, and global oncology initiatives.

With its strategic geographic location, robust infrastructure, unique retail offerings and a range of entertainment and leisure options, the UAE has emerged as one of the most popular tourist destinations in the world. The distinctive features that has transformed the nation into a global hub of tourism including its hospitality services, holistic approach to destination management, and connectivity are luring medical tourists as well. Continued investment in the healthcare industry to expand and improve the quality of its services has made medical tourism one of the fastest growing markets in the UAE, cementing its position as a highly preferred destination for medical tourism.

Growth Potential

UAE Vision 2021 focuses on becoming the economic, touristic and commercial capital for more than two billion people by transitioning to a knowledge-based economy. The rise of medical tourism is certainly helping to live up to that vision, with the UAE Ministry of Health and Prevention (MOHAP) projecting over a million medical tourists visiting Dubai every year by 2020. The UAE healthcare industry is expected to grow at a compound annual growth rate (CAGR) in the range of 7 –12.5% during 2015-2020 and medical tourism is one of the key factors driving this growth. The result is that UAE medical tourism revenues are forecast to surge to $700 million by 2020. According to Business Monitor International, medical tourism revenues for the UAE are to grow at 15% per annum.

Electronic Health System

In 2008 MOHAP launched Wareed, an

electronic healthcare information system that virtually links all the MOHAP's hospitals and clinics in Dubai and the Northern Emirates. The system provides a centralised platform to store patient data, which enables physicians to quickly access a patient's medical history and other critical information. In October 2017, MOHAP launched its new service, 'VitalsLink,' which is part of the Wareed healthcare technology system. This enables the monitoring of critical signs of patients, including blood pressure, temperature, respiratory information which are then recorded automatically in the Wareed system, allowing doctors to make decisions about the quality of treatment according to the data and patterns they have collected.

Eye on Dubai

Dubai is indeed becoming more and more of a hotspot for medical tourism, fuelled in a major way by its English speaking medical staff and virtually no waiting queues for treatments. Currently over 300,000 people visit Dubai each year for healthcare, seeking this destination for its high healthcare standards as well as its location. This industry is an attractive and lucrative market for all medical sectors in the UAE and it is estimated that medical tourism in Dubai is growing at 10-15% per year. A key area of interest for medical tourists is plastic surgery and the country has done much to cater to this need. For example, in the United States there is 1 plastic surgeon per 50,000 residents and in Brazil (a commonly referenced country for plastic surgery) there is 1 plastic surgeon per 44,000 residents. The UAE, however, has one of the highest concentrations of plastic surgeons – 1 per 18,000 residents.

Telemedicine

Mubadala Development Company, an investment and development company owned and operated by the Government of Abu Dhabi, established a joint venture with Swiss company Medgate to establish the Abu Dhabi Telemedicine Centre (ABTC) in 2014. The business operates 24 hours a day, 7 days a week, providing consultations by phone from a staff pool of general practitioners who are specially trained to practice telemedicine. In seeking a diagnosis, they use a series of questions applying the same medical methodology of elimination as in a hospital or clinic setting. ABTC has also developed a free mobile application, TeleMed, to enable patients to send photos of an affected area of the body, labels of medication they are using, or any other photos that may assist in their diagnosis. This joint venture has helped relieve local hospitals of the burden of being inundated with non-emergency cases. It is also cost-efficient and convenient for the patient who can now be diagnosed and receive guidance on treatment while at home.

DHA's Plans

From its current set up of 3,000 private health facilities including hospitals, specialised clinics and day-surgery centres, Dubai plans to expand to 4,000 health centres by 2020. Money is also being poured into healthcare IT as it seeks to beef up infrastructure and improve upon healthcare services offered. The healthcare IT market in the UAE is expected to grow at a CAGR of 11.12% during 2014-2019. In April 2016, the DHA unveiled the Dubai Health Experience. Said to be the world's first comprehensive electronic medical tourism portal, it includes a detailed Patient Bill of Rights and Patient Protection Plan and serves as a gateway for all health, hospitality, travel, and visa services. The site also enables potential medical tourists an option to buy medical malpractice insurance.

Several smartphone apps have been launched by DHA in recent years targeting specific focus groups. These include apps for diabetes patients to better manage their illness and self-monitor their health; fully-personalised, evidence-based content for expectant mothers to help them navigate through pregnancy, childbirth and parenthood; DHA Library app to enable easy access to the Rashid Medical Library's collection of digital content; and others that enable users to search for physicians, facilities and healthcare packages.

Outside of information technology, the DHA is executing strategic initiatives with various key partners including Dubai Tourism and Commerce Marketing (DTCM), Emirates Airlines, and The General Directorate of Residency and Foreign Affairs Dubai. The objective here is to align strategic partners with the UAE Vision 2021 plan.

UAE Strategy

The UAE is well positioned for further advancement in the medical tourism industry because of its world-class doctors and state-of-the-art medical facilities, impressive regional infrastructure and safety, and newly designed processes to make medical travel easier. The UAE Ministry of Health and Prevention is cracking down on healthcare organisations and medical providers, utilising surprise inspections to enforce safety regulations in an attempt to ensure the highest levels of care.

Going forward, the UAE will undoubtedly focus on areas that are high drivers of medical tourism such as cardiology, cosmetology, neurology, and rehabilitation. Some of the key specialities attracting medical tourists to Dubai are assisted reproductive techniques, bariatric and weight-loss surgeries, dental care, dermatology, ophthalmology, orthopaedics, and plastic surgery.

Furtherzore, it is expected that the UAE will continue to work very hard on its efforts at medical tourism to compete with countries that offer healthcare services to medical tourists at very low costs—countries such as India, Malaysia, and Thailand. To this end, acceptance of global insurance networks will help to expand the reach of those who desire to be treated in the UAE.

Other Considerations

The UAE, however, does have some challenges to its healthcare system. Establishing a high-quality healthcare system that delivers improved outcomes that are the best, not only in the region but also around the world, is the benchmark that it needs to set itself. This needs to be paired with a credible and effective public health policy that addresses some of the key factors that undermine health such as the rise in obesity and diabetes. What the UAE must also be careful of is losing some of its residents to external medical tourism programmes. Currently a large number of residents leave the country to seek healthcare services in countries such as Germany, Thailand, the United Kingdom, and the United States. The key driver in many of these cases is cost. In places such as Thailand (as well as India and Malaysia), costs of some healthcare services can be one third of what the charges are in the UAE. AH

PICTURESQUE PHILIPPINES
raises its stakes in the medical tourism arena

Article provided by St Luke's Medical Center, Philippines

Travelling outside one's country for medical care has resulted in a multi-billion dollar global industry that is projected to hit $32.5 billion by next year. In recent years, it has become a common decision for people residing in larger economies to travel to lesser developed countries in order to avail of multi-speciality world-class medical services at a lower cost.

As a country steadily growing as a select tourist destination for health and wellness, the Philippines is known for providing an excellent standard of medical care at affordable prices. Situated in Southeast Asia, the Philippines is an archipelago made up of thousands of islands, giving tourists innumerable places to visit, from forests thriving with wildlife and white sand beaches to historic landmarks and urban havens. It is home to scenic attractions and relaxing vacation spots, allowing patients a safe, calming environment to heal.

Medical tourism in the Philippines caters to approximately 80,000 to 250,000 patients annually. According to the latest data released by the Department of Tourism, the Department of Health, the Department of Trade and Industry and Board of Investments–who have developed a joint programme to promote medical tourism in the Philippines–62 hospitals around the country are now internationally accredited. This is a result of the numerous efforts from the government and private sectors, who have invested in healthcare and tourism infrastructure, directing the healthcare community to adopt the best practices and state of-the-art medical technology.

The Philippines has ranked 8th on the list of top medical tourism destinations compiled by the International Healthcare Research Center and the Medical Tourism Association (MTA), a global non-profit association for medical tourism and international patient industry. The country has been lauded for its internationally-trained, English-speaking medical professionals, state-of-the-art medical technologies, and distinct brand of hospitality and compassion.

Some of the speciality care services bringing international tourists to the country include aesthetic and uncomplicated procedures such as cosmetic surgery, wellness treatments and dentistry. In addition to this, Philippines also offers a wide array of medical services (including plastic surgery, organ transplantations, joint replacement and eye operations), paired with low-cost medical procedures and hospital fees. Not only do foreigners avail of healthcare in the Philippines, but Overseas Filipino Workers (OFWs) or Filipino citizens residing in other countries also actively return to take advantage of the economical prices of medical care in the country.

Aside from the standard services offered, medical tourism packages are also available at hospitals in the Philippines. Hospitals facilitate even non-medical arrangements such as airline booking, visa extension, hotel accommodation, shuttle services, and leisure travel.

To steer itself to the top of the list of medical tourism destinations, Philippines is continuously striving to improve its health-service offerings by focusing on quality healthcare. Aiding in this ambitious growth is one of the country's - and the world's - leading hospitals, St Luke's Medical Center which has established itself as a model of excellence in patient care, performing the latest procedures, introducing topnotch medical equipment, and maintaining a brilliant staff of experts, compassionate nurses, scientists, and medical students. Testaments to St Luke's world class quality medical services are its accreditations and key affiliations with prestigious international organisations.

St Luke's Medical Center has grown to be the most respected and recognised healthcare institution in the Philippines. Its two facilities in Quezon City and Global City, Taguig are at par with the most advanced hospitals around the world. AH

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By placing a sterile bag of the O_2 TopiCare Woundsystem around the leg/wound, the bag can be filled directly with oxygen from a concentrator (or another oxygen source), for example an Everflo. An Everflo creates a pressure system of about 30 mbar that is perfect for allowing the highest amount of oxygen to be absorbed by the blood with topical application.

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Very good results with the O_2TopiCare wound management system

Even if all other therapy possibilities have been exhausted, chronic wounds can begin to heal through the oxygen application of the O_2 TopiCare wound management system.

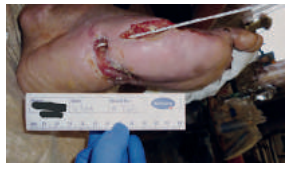
In the case illustrated here all other therapies had failed. Wound healing was stimulated however through the O_2 TopiCare wound management system.

Approved as medical device with CE 0197

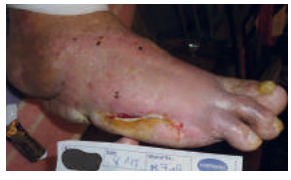
Application:

- **diabetic foot lesions**
- **can avoid amputations**
- **ulcus cruris**
- **slow-healing wounds**

Wound condition at therapy commencement



After 10 months TopiCare therapy



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IN THE KNOW

Well-being at the touch of a button

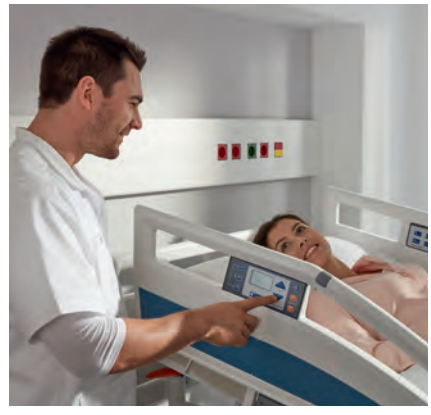
The integrated control panel of the new Evario hospital bed

Article provided by Stiegelmeyer

Hospital beds are expected to meet an extremely broad range of requirements. The tasks they are faced with in the various hospital units are so wide-ranging that you could be forgiven for thinking that the answer is to use a variety of special-purpose models. But wouldn't it be easier and more user-friendly, as well as more cost-effective, to have one model of bed that would meet every need? This is precisely the approach taken by Stiegelmeyer in developing the Evario.

The Evario is suitable not only for day-to-day patient care, but also for intensive care and for promoting a speedy recovery. The Evario is our new hospital bed for all wards. One of the greatest strengths of this bed is its innovative operating concept. Intuitive control panels are available as an alternative to the practical LCD handset. These stylish flat control elements are integrated into the Protega safety sides on both sides. On the inward facing side, there is a clear and simple control surface for the patient, while the outward-facing side displays additional options for nursing staff or technicians. The panels give the patient four options for adjustment that are often used during the daily routine: bed height adjustment, movement of the backrest and thigh rest as well as the change from a lying position to a comfortable sitting position. Reading, eating or standing up are made easier, the person's well-being increases, and recovery is promoted.

The outward-facing side of the panel is designed with a display and makes it possible to select separate control levels for nursing staff and technical personnel. In addition to normal adjustments, this can be used to select medically indicated positions such as a Trendelenburg position. In an emergency, a nurse can also set the bed to the CPR position immediately without much effort. As a practical and positive aid for nursing staff, 3 preset backrest positions that are often required in day-to-day use are provided (15°, 30°, 45°). They can select these positions at the touch of a button on the Evario control panel while staying close to the patient. A cardiac chair position can also be set quickly using the arrows on the display.



About Stiegelmeyer

The Stiegelmeyer-Group stands for premium quality hospital and care products, developed specifically for the complex demands of day-to-day medical practice. With our innovative hospital and nursing beds as well as the matching furniture systems and accessories, we are a leading manufacturer in Germany, Europe and the world.

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AristoTech: We bring your design to life

Article provided by AristoTech

AristoTech Medical Forgings and Services specialises in contract manufacturing of orthopaedic devices and medical products, implants and instruments worldwide.

Based near Berlin, Germany, the company supplies OEM companies with standard and customized medical devices that meet ISO guidelines for safety, quality and efficiency.

AristoTech Industries offers expertise from design and development, engineering and product testing through finished goods manufacturing to logistical services as cost-effective solutions.

This distinctive expertise allows the company to realise innovative projects beyond the standards; products can be designed according to individual customer requests in order to support quick and efficient market entry. Whether tooling or finished parts, each item undergoes continuous rigorously intensive inspection in AristoTech´s in house laboratory. To guarantee the best possible quality, the highest standards of measurement and inspection are applied according to ISO 13485 standards - all Made in Germany.

Standard product designs can be chosen off the shelf, saving costs and time for processing customized tools.

AristoTech's product designs are available for:

- Titanium Hip Stems
- CoCr/Stainless Steel Hip Stems
- Press-Fit Acetabular Cups
- Cemented Acetabular Cups
- Dual Mobility Cups
- Femoral & Small Bone Plates

Depending on customers' requirements, the company supplies semi-finished, finished, packed and/or sterile products and offers all logistical services.

State-of-art machining technologies include closed-die forging and bone in-growth coating, with 3D metal printing in the near future.

AristoTech has long-term, global experience in manufacturing medical devices and processing all kinds of implants.

This expertise, and a highly qualified engineering team, offer cost-effective, German-made medical solutions to the world.

For more information, please visit www.aristotech.de or contact us on phone: +49 3371 4060 200, fax: +49 3371 40640-215 Email: service@aristotech.de

IN THE KNOW

ClinicAll provides solutions for the digitalization of the hospital

Article provided by ClinicAll

The objectives for the future of hospitals are clear: Steamlining clinical processes, reducing personnel expenditure especially in administration, minimizing error rates. And, above all: More comfort and improved treatment quality for patients. The result is a very demanding set of tasks that hospital operators find themselves confronted with to face all future challenges.

Since more than 10 years, ClinicAll is dedicated to the development of digital systems for hospitals. Over the years, a comprehensive, holistic system has emerged, comprising dedicated software and hardware components.

A uniform system for doctors, staff and patients

Doctors and staff need to be digitally supported to handle an ever-increasing amount of patient data. Digitalization will lead to significant savings in time and cost. In addition, patients need to feel well cared for: Higher patient comfort does improve the recovery process.

ClinicAll developed a unified system for clinic-wide communication as well as sharing and editing information. It is easily accessible to everyone in the hospital and is simple, comfortable and enjoyable to use. Throughout the hospital, all terminals – as well as devices in nurse rooms, doctor's offices or mobile devices – are connected to the main hospital information system.

Possibilities and examples of successful digitalization

By joining forces with specialist software and hardware providers, ClinicAll has already successfully rolled out a multitude of new functions. These include food ordering or bed control, a soft nurse call that is interconnected to a room status display, and an on-screen messaging system for patients and staff. Doctors can use their smart card to log in at any terminal and discuss medical results with patients.

In Slovenia, a clinic has been equipped with terminals where patients check-in at the hospital on their own. Even their treatment plans are handed over to them automatically. In the Arabian Peninsula–a market that is very high-tech savvy–digitalization has already been taken a few steps further than in Europe. Food ordering, blood analysis, lab data, patient results, treatment routines – information and processes are integrated into one big clinic digital network, again accessible via the ClinicAll software.

A vital advantage of digitalization is that it eliminates various error sources. When data are always automatically checked for plausibility – for example when patients order their food – the possibility that something goes wrong is drastically decreased.

Together with our long-term software and hardware partners, ClinicAll are able to deliver turnkey digital systems for every hospital that, whenever the time comes, also can be expanded to include additional digital functions.

For more information, and to invest in the digital future of your hospital, please visit www.clinicall.com

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IN THE KNOW

Study shows low mortality, stroke risks for minimally invasive aortic valve replacements

Article provided by Baylor St Luke's Medical Center

An analysis of more than 1,000 minimally invasive aortic valve replacements and more than 400 additional associated procedures over a five-and-a-half-year period performed by Dr Joseph Lamelas, professor and associate chief of cardiac surgery in the division of cardiothoracic surgery at Baylor College of Medicine, showed low stroke rates and high survival rates in all age groups within 30 days of surgery. His report appears in the *Journal of Thoracic and Cardiovascular Surgery*.

Aortic valve replacements are performed when treating aortic valve stenosis or aortic valve regurgitation. Aortic valve stenosis occurs when the aortic valve opening is narrowing and restricts the blood flow from the left ventricle to the aorta. This makes the heart work harder to pump blood to the body. Aortic valve regurgitation takes place when there is a leakage of blood through the aortic valve into the left ventricle.

Lamelas performs a minimally invasive procedure to replace the aortic valve. The procedure requires only a two-inch incision between the ribs rather than opening the breast bone. This results in a shorter stay in the hospital and a faster recovery time.

To document the results of this particular approach, Lamelas assessed more than 1,000 of his aortic valve replacement procedures over a five-and-a-half-year period. He also assessed more than 400 additional concomitant procedures, meaning the patient had an aortic valve procedure with another procedure such as mitral valve repair or ascending aorta replacement. The procedures were performed when Lamelas was with Mount Sinai Heart Institute in Miami Beach, Fla., between January 2009 and July 2015. Lamelas currently conducts surgeries at Baylor St Luke's Medical Center.

Dr Joseph Lamelas is professor and associate chief of cardiac surgery in the division of cardiothoracic surgery at Baylor College of Medicine

Lamelas and colleagues compared patients less than 80 years old to those over 80 years old.

They found the mortality rate in patients who only had the aortic valve replacement was 1.3 percent and 3.2 percent in the group that had a concomitant procedure. The risk of stroke was 0.8 percent and 1.1 percent, respectively, in both age groups.

"We found that the risk for mortality and stroke was a little bit higher for older patients, but not statistically significant compared to the younger patients," said Lamelas.

In addition, they found low rates of complication in all age groups, a significantly reduced length of stay in the hospital, low postoperative complication rates and a low postoperative length of stay. In the concomitant group, results also were similar.

"These results further demonstrate that there is no need to do a full sternotomy if we have this procedure available," said Lamelas, who is a pioneer in the field of minimally invasive heart surgery and has developed facilitating instruments for the procedure.

Others who took part in the study include Dr Maurice Mawad, Dr Roy Williams, Ursula Weiss Keller, Qianzi Zhang and Dr Angelo LaPietra with Mount Sinai in Miami.

Lamelas receives honoraria from Medtronic, St Jude and On-Q and has ownership interest in Miami Instruments.

For more information contact International Services at Baylor St Luke's Medical Center via email at international@stlukeshealth.org or call +1 832 355 3350 or visit www.stlukesinternational.org

Plan for 2020 UK Hospital Launch Furthers Cleveland Clinic's Global Stature

Article provided by Cleveland Clinic

In a world that is now more connected than ever, Cleveland Clinic is expanding its international presence to further the health system's mission by providing world class care to all patients – no matter where they live.

Cleveland Clinic's international commitment began years ago when patients started traveling from all over the world to receive high-quality care from its team of highly specialized medical experts in Cleveland, Ohio.

As the need for this type of care grew, so did Cleveland Clinic's footprint.

The first international hub opened its doors a decade ago in Toronto, offering both publicly funded and private services in an outpatient setting. In March 2015, the launch of Cleveland Clinic Abu Dhabi, a 364-bed hospital offering 13 floors of critical and acute care services, extended the group's reach into the Middle East. Since opening, the facility has tripled its capacity, recording more than 337,000 patient encounters last year, including 285,000 outpatient visits, more than 39,000 emergency visits, 5,400 inpatient admissions, and more than 9,200 surgical cases.

Cleveland Clinic now has its focus on the year 2020. On course to meet its open date, the 200-bed Cleveland Clinic London will specialize in cardiology, gastroenterology, neuroscience, and orthopedics, as well as offering more than a dozen other subspecialties and nearby medical office space.

"The continued international expansion is intended to further our mission of education, research, and clinical excellence," said William Peacock, Chief Operations Officer for Cleveland Clinic. "We believe that by sharing best practices, innovative techniques, and patient-centered care, we can improve healthcare around the world."

Known for innovative treatments and patient experience, Cleveland Clinic's integrated healthcare network spans 19 U.S. states, including a facility in Nevada that focuses on brain health and a hospital in Florida. The latter facility has a sizeable contingent of Spanish-speaking staff and treats many patients from Latin America and the Caribbean. Meanwhile, patients in emerging markets such as China and India can access Cleveland Clinic through a dedicated network of in-country offices and representatives on the ground.

Cleveland Clinic Abu Dhabi has emerged as a regional center for medical innovation and education, forming partnerships with major academic and research institutions within the United Arab Emirates. Earlier this year, it launched a locally based internship program to nurture the next generation of Emirati caregivers, while regional firsts at its Heart & Vascular Institute have included the implantation of a leadless pacemaker, an ablation procedure performed with zero fluoroscopy exposure, and the introduction of a comprehensive remote monitoring program for patients with cardiac implants.

In Shanghai, Cleveland Clinic has forged a relationship with a third-party healthcare provider that is building a hospital and will share best practices with its Chinese counterparts.

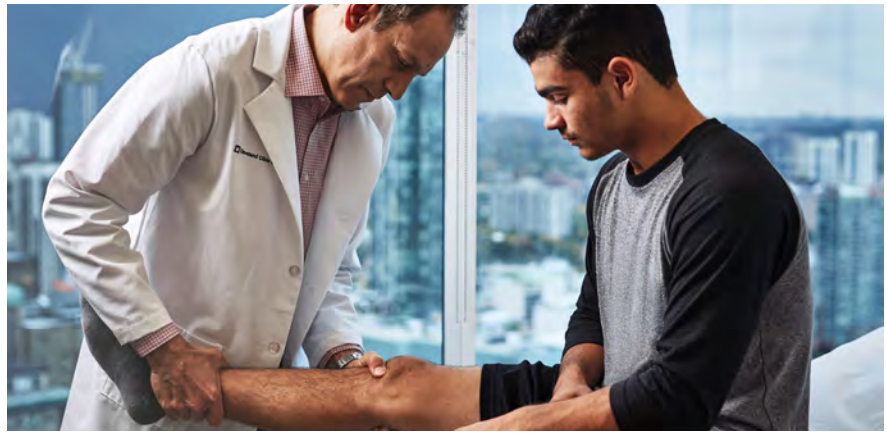
Closer to home, Cleveland Clinic Canada works with the country's Ministry of Health and Toronto Academic Health Science Network (TAHSN), composed of the University of Toronto and 13 affiliated hospitals, to boost treatment standards and build infrastructure to support the country's publicly funded healthcare system.

"Cleveland Clinic's international activities have raised the bar in other countries in terms of healthcare standards and treatment outcomes," Peacock added. "Our reputation for physician-led, patient-centric care in the United States stretches back almost a century, and we are now keen to extend our expertise to patients in new markets across the world and build a truly global network."

Advances in telemedicine, such as video consultations, and health information technology have boosted the group's overseas operations, enabling US-based physicians to share their world-class expertise with the global medical community. Such arrangements have a transformational effect on healthcare in emerging economies, and it's not just the patients who benefit.

"This is an exciting time for our organization," Peacock said. "We have had the opportunity to help so many more people, and we look forward to improving the lives of all the patients we serve."

For more information, please visit my.clevelandclinic.org



Cleveland Clinic's first international hub in Toronto, Canada, specializes in Executive Health and Sports Health programs

IN THE KNOW

Artificial Intelligence and the Future of Medicine

Article provided by Johns Hopkins Medicine International

Two decades ago, the ability to do medical consultations with a doctor, a nurse or a pharmacist via electronic devices such as cell phones or iPads seemed far-fetched. However, the swift evolution in technology, the acceptance of online transactions as a way of modern life and the adoption of electronic medical records and privacy protocols enabled the surge of telemedicine as we know it today.

Johns Hopkins and its affiliates are among the many health providers who are using telemedicine to connect physicians with patients around the world. The technology enables them to extend their reach and improve their efficiency and effectiveness while still maintaining a high standard of care and attention to patient safety. Additionally, it saves patients the time and cost of unnecessary travel.

In the midst of this new phase in healthcare, what does the future of technology and medicine look like? Where should healthcare leaders invest? I propose we focus on artificial intelligence.

Artificial intelligence is currently seen as the Holy Grail in medicine, because of the prospects of it taking precision medicine to the next level by helping diagnose and monitor rare diseases. However, I suggest the applications will be much wider and accessible.

In the future, an asthmatic patient will be able to connect his electronic medical records to a smart speaker like Amazon's Alexa. The device will be able to correlate the patient's lung condition to atmospheric pollution and accurately predict asthma attacks. It will save lives, time and money.

This article is authored by Mohan Chellappa, President of Global Ventures and EVP at Johns Hopkins Medicine International

As people adopt online technology as part of their health routines – from telemedicine to wearable devices – the prospect of integrating artificial intelligence to medicine is tangible and revolutionary.

Remember, the Internet was first developed for defense purposes. Three decades later a majority of people in the world has access to it, changing business, travel, education, communications and health administration, to name a few industries.

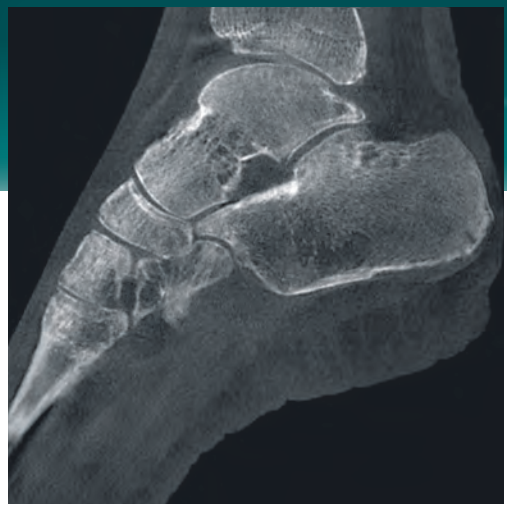
It has not been without shortcomings, particularly as it relates to sensitive information, and the medical field must take note to avoid repeating the same mistakes.

At Johns Hopkins, our experts are working on how to apply artificial intelligence in healthcare. Recently, they have developed an algorithm based on artificial intelligence and machine learning that can correctly identify patients with sepsis, even before they show symptoms. Sepsis, a potentially deadly bacterial infection, affects more than a million patients in the United States every year. The new tool also recommends the best course of treatment. The impact of this work is so promising, that Johns Hopkins is now piloting a real-time surveillance tool using this method to see if it can help improve outcomes and reduce costs.

Artificial intelligence has a lot of potential and the United Arab Emirates is making leaping steps. The country recently appointed His Excellency Omar Bin Sultan Al Olama as Minister of State for Artificial Intelligence, a first in the world. With this appointment, the government is looking to use artificial intelligence to reduce traffic accidents, minimize chronic diseases, run space experiments, manage energy facilities, and improve the quality of water and environment.

This move shows that as leaders, we must plan for a future where artificial intelligence is part of everyday life, a future that holds the promise of making medicine more accessible to all.

For more information, please visit www.hopkinsmedicine.org/international



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IN THE KNOW

Hand surgery changes young man's life

20-year-old opens hand for first time since he was a baby

Article provided by Cook Children's

For most of his first 20 years, Michael Jankowiak never played ball or even owned a toy. His debilitating cerebral palsy wadded his fingers into a tight fist. He barely moved his hands, except to drive his electric wheel chair.

Then, during a visit to his neurologist at Cook Children's, everything changed. Fernando Acosta Jr., M.D., told Michael's mother, Lynn, about a surgeon who could possibly make a big difference in her son's life.

He told her Pamela Sherman, M.D., performed a special type of surgery on children with disabilities. The goal was to help patients with significant contractures (the permanent tightening of muscles, tendons, ligaments or skin) to clean the palms of their hands and improve their hygiene.

But the side effects were, as Lynn puts it, "pretty remarkable."

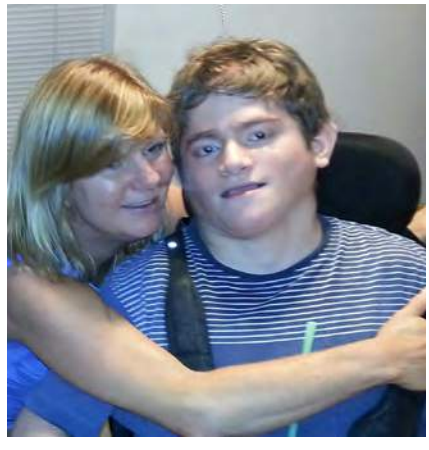
Patients who need this surgery often demonstrate limited function with the contracted limb preoperatively. The surgery's focus? To help prevent skin deterioration in the palms and elbows, as well as make nursing care, dressing and bathing easier.

"Placing the upper extremity in a more functional position and releasing contractures often has a wonderful added benefit," Dr Sherman said. "Suddenly, the patient has a hand that they are able to use to push a wheelchair control, use a communication board or hold an object. A little goes a very long way for them."

For Michael, the procedure was life-changing.

"This surgery has given him something new with his life," Lynn said. "He has never been able to find a toy that he could play with. He can now even hold the ball and drops it for the dogs to play with him."

For the first time since he was a baby, Michael, who is now 24, can open his left hand and play with a toy. Michael can even hold his own glass and bring it to his mouth to take a drink.



After receiving a second surgery on his right hand, Michael can now play on his iPad.

"I don't think he cares what he is watching near as much as just having the control of changing videos," Lynn said. "It would be my wish that every child with contracted hands could have the opportunity to have this surgery."

What may have seemed so routine to most families has been nothing short of a miracle to Lynn because of how far her son has come.

Lynn described her first few months after she learned Michael had cerebral palsy as "fuzzy." She lived in a terrified blur of emotions and cried for that first year.

But through her tears, Lynn kept her resolve, beginning with one decision – Michael would be transferred from their home in Abilene to be treated at Cook Children's in Fort Worth.

"To see your baby crawling, trying to learn to walk and then all of a sudden he's not moving, was horrible," Lynn said. "If he had not gotten transferred, Michael would not be alive. I believe that with all my heart. I would not go anywhere else."

The first month he stayed in the intensive care unit. Since then, Michael was treated in a number of areas at Cook Children's, including Infectious Disease, Neurosciences, Heart Center, Radiology, Surgery and Rehabilitation Services.

And now, after two decades, Lynn still believes Cook Children's works miracles for her son.

"It's really the entire system," Lynn said. "Everybody works so well together. I remember how I felt from the first time I walked in at 2 in the morning. You knew you were going to be treated well and your child was going to be taken care of by everyone."

For more information, please visit
cookchildrensinternational.org
Phone: +1-682-885-4685
Email: international@cookchildrens.org

The PVC-free way

Article provided by PolyCine GmbH

PolyCine GmbH is a German manufacturer of polypropylene-based films and tubes used in the manufacture of flexible pharmaceutical packaging systems. The most common application areas of the company's products are standard IV, special IV, apharesis, haemodialysis, drainage and fluid collection and CAPD. PolyCine manufactures only non-PVC films because PVC-free plastic has the advantage of being less permeable to water vapour than conventional PVC-based films. Another most significant advantage is the fact that there is less leaching of active ingredients into the plastic.

PolyCine's products are made from a transparent multilayer coextruded polymer. The films and tubes can be produced in any dimensions required and to extremely narrow tolerances. The products are extruded in a class 10.000 cleanroom environment and meet requirements of the European Pharmacopeia 3.1., ISO 10993 and USP Class VI. The production is also certified to ISO 9001 standards.

Since its foundation in 2002 the company has set standards in cost-effectiveness and high-quality products. Thanks to its innovative approach and constant reinvesting in the company PolyCine is enjoying 20% growth per year. It currently employs 70 people in Germany and has also an office in China. This year the company will introduce a new sales specialist for the MENA region Mr Zurab Malakmadze at the Arab Health Exhibition and Congress to be held in Dubai from Jan 29th to Feb 1st 2018.

For more information, please visit www.polycine.com

Amoena® Recovery Care:

Total patient care after breast surgery

Article provided by Amoena

Providing complete care from the start, Amoena Recovery Care products are designed to meet the specific needs of women immediately following breast or chest related surgeries and treatments, such as:

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The future of care

At Ospedale San Raffaele, we bring together pioneering scientific research and first-class care for patients

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

Ospedale San Raffaele is among the few centers in the world which **perform pancreatic islet transplantation** (i.e. the cells in the pancreas that produce insulin) to treat type 1 diabetes patients who do not respond to conventional therapies. The transplant aims at recreating the function of insulin-producing cells in a host organ (e.g. the liver). This technique has made huge progress along the years, but it still has some limits, involving immunosuppressive regimens and rejection risks like all transplants. Our researchers at **San Raffaele Diabetes Research Institute (DRI) are currently studying new treatment perspectives using stem cells**, differentiating insulin-producing from pluripotent stem cells. In the future, this may allow to rely on an endless source of cells that produce insulin and to modify such cells so that the immune system does not recognize and attack them.

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

IN THE KNOW

Hip and Knee Replacements at Rush: In for the Long-Run

Article provided by Rush University Medical Center

Pioneering new ways to prolong the life of hip and knee implants. Discovering approaches to improve the patient experience through observation, research, and innovation. Collaborating with other healthcare professionals and applying best practices to deliver optimal outcomes.

These are just some of the reasons Rush University Medical Center is recognized as a global leader for hip and knee replacement surgery. When more than 8,500 U.S. doctors were asked by Medscape where they would send their family members for care of a complex problem, Rush ranked among the top 5 medical centers for hip replacements.

The world-renowned board-certified, fellowship-trained joint replacement surgeons at Rush have helped transform how hip and knee replacements are performed by continually asking themselves: What can we do to improve our patients' quality of life?

Hip and knee replacement surgeon Tad Gerlinger, MD, at Rush University Medical Center in Chicago provides world-class care, including minimally invasive and complex revision procedures.

Specialized joint care

Thanks to the large volumes of hip and knee replacements they perform, surgeons at Rush are well-positioned to answer this question.

"We continually apply the latest evidence-based medicine and re-evaluate our processes to do what's best for patients," says Tad Gerlinger, MD, a joint replacement surgeon at Rush.

And because they focus exclusively on hip and knee care, they can zero in on ways to achieve their patients' goals and produce optimal outcomes in the following ways:

- Minimizing pain
- Promoting mobility
- Reducing hospitalization time
- Avoiding revision procedures
- Reducing surgical complications

Setting the standard: A legacy continues

Surgeons at Rush have a long history of observing problems in the clinical setting and finding solutions through collaborations in the lab and among other healthcare professionals. They have helped revolutionize joint replacement with many advances, including the following:

- Co-developed cementless implants
- Developed a replacement hip that employed a cementless thigh bone component
- Pioneered minimally invasive knee and hip replacement, including performing the first minimally invasive total knee replacement as an outpatient procedure

That legacy of continually improving delivery of care continues today, including these efforts:

- Participating in the design and evaluation of new devices, such as the REDAPT cup – a tool designed for challenging revision surgeries that promotes fixation and stability
- Seeking biological markers, and ultimately blood or urine tests, to help identify early warning signs of failing implants
- Identifying less painful and invasive ways to detect infection and avoid unnecessary procedures
- Using advanced technology to develop models that will help implant manufacturers and surgeons prevent corrosion and other complications that lead to implant failure
- Developing new ways to support and engage patients through text messaging

"Rush really sets the standard of hip and joint care because we are innovators in our field and rapidly integrate proven technologies and techniques in the care of joint replacement," says Gerlinger.

Giving patients a second chance

While working to avoid the need for revision surgery, joint replacement surgeons at Rush also lead the way in performing revision surgery. They treat a high volume of patients with failed hip and knee replacements – including many international patients.

Your trusted hip and knee care partner

Rush has provided outstanding joint replacement care to patients from all over the world. Its International Health Services program provides personal assistance to patients from outside of the U.S., their families, and referring physicians before, during, and after their visit to Rush.

MORE INFO:

To refer a patient to Rush, call Rush International Health Services at 001-312-563-2488. Or visit www.rush.edu/international for more information.

gmc|prevent
german medical concepts

IN THE KNOW

Making rapid strides into the future!

The 'RescueCard' accessory is the most widely used emergency data card across the world.

Article provided by german medical concepts AG

German medical concepts AG developed the world's first early warning system for sudden infant death, heart attacks, strokes and epilepsies in form of a ring.

It offers the opportunity of continuous measurement and online detection of the pulse amplitude at the finger artery with a ring with detection of blood pressure, heartrate and pulse character. It has currently the highest measurement accuracy with a real-time data evaluation online via web browser.

The core piece is a nanotechnology-based measuring foil. The gauge factor (GF) gives the sensitivity of pressure sensors. Our foil has a GF of 2000! The data transfer is via Bluetooth to smartphone app, on-board computers of cars, buses or trucks, via Bluetooth WLAN Converter to a hospital monitor and many other target devices.

The smartphone app is connected to the web-based emergency data platform "Medical Login". Web-based, Medical Login offers worldwide and multilingual access to previously stored emergency data via a PC, tablet or even a smartphone. The "RescueCard" accessory is the world's most widely used emergency data card.

For more information, please visit www.gmc-ag.com
Contact info: Karl-Schiller-Str. 5,51503 Rösrath Germany

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IN THE KNOW

Balance-pads: Proprioception creates new applications in therapies and sports

Article provided by AIREX®

Since the late 1980s to the early 1990s, the healthcare sector has realized that the main cause of back problems in industrialized countries is a specific lack of stimulation. In our affluent society, the stimuli are gone from everyday life. Solid-surfaces such as tiled floors, paved roads, hardwood floors, etc. underutilize our depth sensitivity. This restricts the communication between our muscles and our nerves, causing our proprioceptors to wither away in the truest sense of the word. The sense of position, tension and movement in our depth sensitivity is being minimized. The surface sensitivity with the mechanoreceptors which are as responsible for our sense of balance as our middle ear also suffers.

The consequences are neuromuscular imbalances, which negatively affect the segmental stabilization of our spine, posture, and sense of balance. This lack of general proprioceptive stimulation makes our backs prone to all sorts of back problems and can cause many other issues.

This form of defective mechanical and neurophysiological strain affects control and regulation processes that should be considered, especially in neuroorthopedics.

In early 2000, the first study results confirmed the lack of proprioception. In rehabilitation, unstable surfaces were increasingly used to treat back patients with great success. This action potential in the proprioceptors that modern life was keeping too low has been increased many times over and the patients' sense of balance has improved. In addition, it helped to create high stimulation of the deep-down muscle fibers that are primarily responsible for stability.

The Balance-pad is an essential tool in contemporary physiotherapy, since it not only makes the therapist's and the patient's work much easier, but also results delivers great results in a relatively short treatment period.

The AIREX® Balance-pad is one of the most effective, yet simplest aids for use in physiotherapy, rehabilitation and preventive treatment both for general patients and competitive athletes. The special waffle and nub structure on the top and bottom offers a slip resistance while also pleasantly stimulating the foot receptors during barefoot balance training. The 6 cm thickness gives the Balance-pad the desired destabilizing properties. The foam gives way and the body is constantly challenged to maintain its balance and stabilize the joints. This means that more muscles are worked more deeply than would be the case if the same exercises were done without a Balance-pad. The control function of the brain is activated and the receptors in the joints and fascia system are increasingly addressed.

The new product line brings a variety of additional options to address the isolation principle as well as global muscle chains. The Solid Balance-pad achieves a milestone. It is not quite as unstable as its predecessors and thus even more sensitive and easier to use, for example, for neurology patients and with people with severely limited sense of balance, as is often the case with older people.

Regular exercise on the Balance-pad

AIREX®

Test our products at Arab Health!
Booth: Z3.C11

Balance-pad Solid

- More variety for training & exercise
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- Perfect for functional fitness & CrossFit
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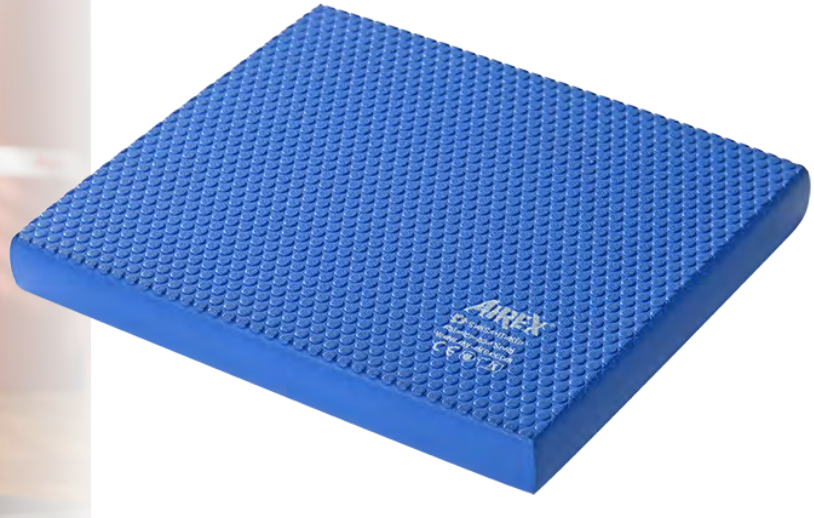
- Specific AIREX® Academy education concept: X-Balance® Functional Therapy



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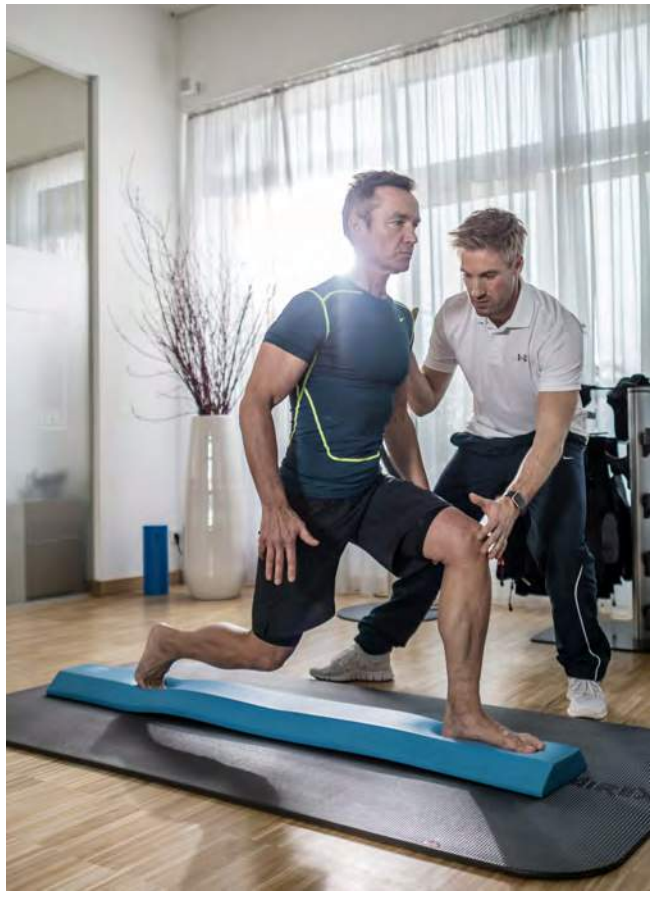
IN THE KNOW



trains the neuromuscular system by increasing the demand for a stable posture. It also optimizes the postural system and improves motor skills. Correct application may result in better central motor control due to the quantitative and qualitative increase in afferent input. This means that all of the basic motor skills such as strength, stamina, flexibility, coordination, and balance are stimulated, as well as the mental component, providing a holistic solution, both physically and mentally.

Special features:

The AIREX® Balance products are active therapy and training devices made of the familiar soft AIREX® foam material. The Balance-pad with its smooth surface is ideal for starting out with barefoot balance training.

Training with the Balance-pad can purposefully improve conditional and coordinative abilities in combination, for example strength, endurance, differentiation and balance.

Slip-proof

Surface structure and special foam technology prevent slipping.

Comfortable

Soft, supple and cushioning insulating.

Hygienic

Simple to clean, antimicrobial finishing.

AIREX® soft foams are treated with antimicrobial finishing for permanent and effective protection against bacteria and fungi.

About AIREX®

As the global market leader, AIREX® bears responsibility. Fitness, holistic training methods and rehabilitation require outstanding quality. This is expressed in the sum of the product benefits. Extensive experience paired with Swiss premium quality are incorporated in the continuous further development of our gymnastics mats.

The unique closed-cell specialty foam used in AIREX® products was developed over the course of many years. Extremely durable, the material is supportive on the one hand and warm, soft and cushioning on the other hand. This makes exercises extremely easy on joints, tendons and muscles for efficient training.

For more information, please visit www.my-airex.com

Carestream Introduces Workflow Orchestrator to Enhance Clinical Communication and Collaboration

New Orchestrator Boosts Quality and Speed of Radiology Reading Workflows; Adds Chat Modules, Alerts and Screen Sharing

Article provided by Carestream

Carestream Health will demonstrate its new zero footprint Workflow Orchestrator that can enable greater productivity, quality and collaboration for radiology reading workflows at Arab Health 2018 (Booth #S3F10).

The Workflow Orchestrator is native to Carestream's Clinical Collaboration Platform. The Orchestrator's productivity module directs imaging exams first to appropriate clinical subspecialists, and then to all available radiologists as needed to satisfy desired turnaround times. Exams also can be assigned to specific radiologists according to a referring physician's preference and existing affiliations with hospitals or healthcare facilities. The platform's workload balancing functionality can optimize reporting times.

"We are helping to change and improve the way radiology exams are read by managing workflows according to the desires of each healthcare provider," said Ludovic D'Aprea, Carestream's General Manager for Healthcare Information Solutions.

"Instead of radiologists looking for an exam to read, images are now addressed to the most appropriate radiologist as dictated by their qualifications and the preferences of each healthcare provider," he explains. "Our goal is to simplify the reading process while simultaneously optimizing the quality of radiology reporting."

Subspecialty reading is designed to deliver a higher level of quality and accuracy to help enhance patient care. "These enhancements to the Clinical Collaboration Platform can help radiology groups develop

stronger relationships with healthcare providers by delivering a higher level of service," said Mr. D'Aprea.

The quality module offers comprehensive management reports for peer review, while the communication module enhances collaboration through use of chat capabilities, alerts and screen sharing for radiologists, technologists and onsite physicians. Worklists can be categorized by type and user profiles contain subspecialty, main location and credentials.

Administrative features allow corrections to exam data and the ability to add specialties for radiologists and manage worklists for specialty reading. Carestream's Vue Motion enterprise viewer allows referring physicians to securely view a patient's imaging exam on mobile devices and discuss a patient's condition with radiologists if needed.

"The new Workflow Orchestrator's imaging analytics, together with Carestream's native multimedia reporting

capabilities and advanced machine learning algorithms integrated from a third party, will equip radiologists with reading tools that can help prioritize exam reading and enhance the quality of care," said Mr. D'Aprea.

To view information about the wide range of Carestream products and systems being demonstrated at Arab Health 2018 please visit carestream.com/arabhealth18

IN THE KNOW

American Hospital Dubai launches American Heart Association's Resuscitation Quality Improvement (RQI) Program to boost cardiac arrest survival

Becomes the first to implement the AHARQI System outside the US

Article provided by American Hospital Dubai

The American Hospital Dubai has announced it is going ahead with its plans to implement the Resuscitation Quality Improvement (RQI) Program of the American Heart Association (AHA). With the successful deployment of the system, the hospital will become the first healthcare facility in the Middle East to implement the AHA-branded version of the pioneering training program from the AHA for high-quality cardiopulmonary resuscitation (CPR) and improved patient outcomes.

CPR may seem to be a basic skill for healthcare providers but research has shown that psychomotor skills related to resuscitation can decay within just three to six months – far before the two-year standard when basic and advanced life support skills are currently evaluated. American Hospital Dubai knows the importance of high-quality CPR in saving more lives and has implemented the RQI program to help staff maintain skill competency and achieve better patient outcomes through regular, low-dose/high-frequency high-quality CPR training.

Peter Makowski, CEO, American Hospital Dubai, said: "The American Heart Association created RQI to teach healthcare providers high-quality CPR in a more effective, concise and convenient way that drives them to practice and retain these skills with confidence. The system will allow the American Hospital Dubai to ensure their healthcare providers regularly refresh CPR skills and perform with confidence during an emergency. We always strive to offer the best and most innovative healthcare solutions to our customers. The deployment of the RQI system is

one more system in place to help ensure that our team of healthcare providers are prepared to handle cardiac arrest related emergencies at any time."

RQI is intended to improve Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS) skills, while making training more convenient for healthcare providers. Students can take the cognitive components of testing online and then test their psychomotor skills with real-time feedback by performing CPR at mobile Simulation Stations equipped with adult and infant manikins. At each RQI Station, a tablet connects the student to training material and provides helpful audiovisual feedback for compressions and ventilations, monitors the quality of performance and provides reinforcement or suggestions for improvement.

The *2010 American Heart Association Guidelines for CPR and ECC* and the 2013 CPR Quality Consensus Statement state that high-quality CPR should be recognized as the foundation for all other resuscitative efforts because it increases patient survival. The AHA RQI program helps provide better CPR. Learn more about the problem of rapid skills decay and the solution that RQI offers at www.heart.org/RQI.

For more information, please visit www.ahdubai.com

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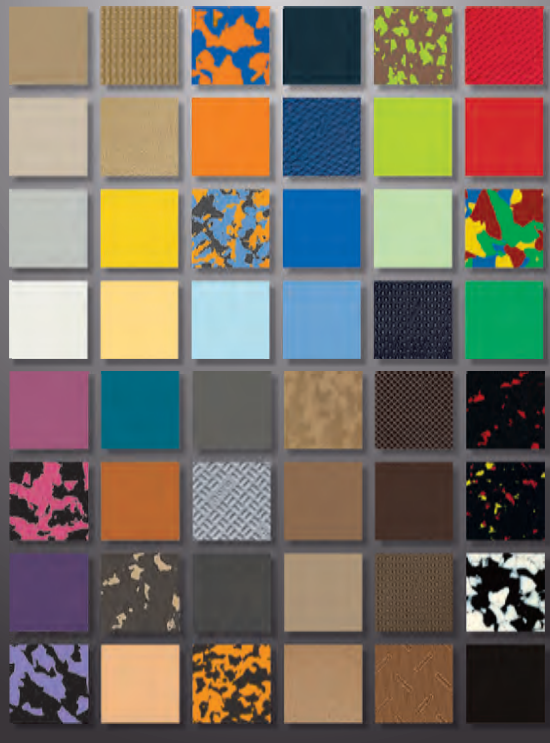

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IN THE KNOW

VibraVest: Providing Advanced Lung Secretion Clearance While

Allowing an Active Lifestyle

Article provided by OxyCare Medical Group

OxyCare Medical Group, a company specializing in oxygen and ventilation technology, has designed this high frequency chest wall oscillation vest. Failure to remove secretion may lead to increased rates of respiratory infection, hospitalization and reduced lung function. With a physician's prescription and guidance, patients can tailor VibraVest treatments to their needs. Multiple settings allow for various treatment settings that serve both adults and children with respiratory diseases or chronic lung conditions.

Treating respiratory diseases with the VibraVest is as simple as putting on a button-up shirt. The patient chooses one of nine possible settings using a handheld control attached to the left side of the vest. A battery pack fixed to the right side of the vest provides power for mobile treatments. We highly recommend an inhalation treatment previously (e. g. with the mobile mesh nebulizer OxyHaler), to moisten the secretion. Moistening facilitates expectoration for the patient.

The VibraVest works with High Frequency Chest Wall Oscillation, short HFCWO. Using small battery-charged motors to vibrate vertically along the chest and back, the VibraVest reduces the secretion's viscosity, helping the patient to mobilize secretion and cough it up. Simultaneously, the product encourages blood circulation and lymph flow. This is achieved without cables, pipes or wire to external devices.

The High Frequency Vibration Vest VibraVest can operate in three different settings:

- During percussing, all motors pulse and knock in recurring rhythms at the torso. Thus, muscle cramps are resolved and blood circulation and lymph flow are stimulated.
- During vibration, all motors are active. They work in pre-set intensity to oscillate deep muscles and relief pain, additionally to stimulate blood circulation and lymph flow.
- During drainage, all motors work successively. By doing so, lymph flow and depletion of metabolic products are animated and blood circulation is encouraged.

The VibraVest can bring relief and help deliver a more productive cough in these diseases and conditions:

- Chronic Obstructive Pulmonary Disease (COPD)
- Cystic Fibrosis
- Bronchiectasis
- Emphysema
- Pneumonia
- Muscular Dystrophy
- Amyotrophic lateral sclerosis (ALS)
- Primary Ciliary Dyskinesia (PCD)

Lightweight and non-restrictive, the VibraVest leaves the user fully mobile during treatments. Users can go for a walk in the park, move around the house, or relax in front of the television.

- Without compression on the thorax, unlike other products on the market.
- Treatments can be administered while sitting, standing, or laying down.
- (This is a great feature for patients with ALS or Muscular Dystrophy.)
- The rechargeable battery pack offers several hours of life
- Easy to store and easy to carry; perfect for the respiratory patient who travels.
- Available in six sizes, therefore suitable for children and adults.
- Three modes of oscillation treatment (Drainage, Vibration, Percussion).
- Three adjustable intensity levels (Soft, Medium, Intense), Quiet during operation.
- DC power option allows users to recharge the vest at home or in the car.

The VibraVest is available in USA and Canada under the brand name AffloVest with FDA certification.

For more information, please visit www.oxycare.eu

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IN THE KNOW

Gimmi® GmbH – German pioneer in microinvasive surgery

Article provided by GIMMI®

The GIMMI® GmbH company can look back on over 85 years of experience with medical instruments and equipment in the international surgical market.

The customer can choose from products for open surgery, endoscopy and a comprehensive repertoire of electronic equipment, as well as endoscopes and accessories.

Gimmi®'s main focus lies in endoscopy – primarily in the field of microinvasive surgery. This medium-sized firm offers leading products for the medical market.

These have yielded three considerable advantages for patients: a faster post-operative healing, better cosmetic results and higher comfort.

According to Prof. Dr. Henning Niebuhr, Hanse Chirurgie, Hamburg, "In search of instruments for microinvasive surgery, I found Gimmi because they were the only company to have brought two things together: first, an extremely small instrument diameter, and second, an exceptionally high strength and hence, stiffness of the instruments."

New products are tailored to the requirements of practice and lay claim to a high level of functionality, with simple handling and high quality. The electronic components can especially be mentioned here as it allows for easy operation, using only a few buttons with self-explanatory buttons.

Gimmi®'s products have received international awards for their stability and compactness features. Furthermore, the meaningful addition of consumables

and reusable components completes our product range. These include around 8,000 products, catalogued in an easy to navigate manner according to the disciplines of Surgery, Gynaecology, Urology, Arthroscopy, Paediatrics and Laparoscopy. Here too, the user will easily find the right product and can quickly compile a list of the components of interest.

It is Gimmi®'s avowed goal to work in partnership with its customers. This enables a cooperative, dialogue-oriented cooperation with the goal being to successfully shape a joint future.

The company: Past and today

The company was founded in 1932 by Rudolf Gimmi. Today, more than 85 years later, we have focused on micro-, minimally invasive surgery and the networking of our equipment systems.

The basis of a modern company are the people we work with. Solid products, customer service, satisfied employees and an implemented company philosophy confirm a high level of customer satisfaction.

Today, Gimmi is in the fourth generation - complemented by a trusted partnership with the Vitalmex Group. As the largest healthcare provider in Mexico, Vitalmex provides „integrated solutions for service solutions". With this background and the wide range of products from GIMMI® we are very well prepared for the common healthcare challenges.

For more information, please visit www.gimmi.de

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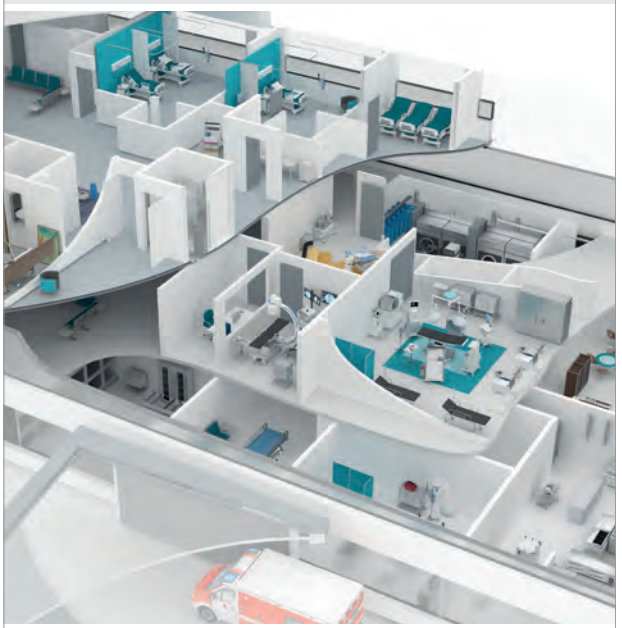

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LiKAMED: FOCUSED ON DESIGN AND QUALITY

Article provided by LiKAMED

For 39 years now, LiKAMED has been successful within the market in the medical sector with medical chairs, beds and matching accessories as well as customised equipment carts. By consistently aligning its product quality across the entire product life cycle and on functionality measured against the customer's needs, a highly specialised company was able to grow in the Kraichgau region. The companies LiKAMED GmbH, LiKAMED Pulverbeschichtung GmbH & Co. KG and LiKAMED Service GmbH & Co. KG form a successful unit together.

Experience the NEW LiKAMED products live at the Arab Health 2018 in Dubai:

SILOVO®: The compact bed chair

SILOVO is the perfect entrance into the world of LiKAMED bed chairs. Because of its flexibility regarding the configuration and the options, every wish can be fulfilled. The compact design, combined with many options which can be attached to the bed chair make it a perfect fit for dialysis and many other medical fields.
All models can be stepless adjusted via back-, seat- and foot part as well as height adjustment. This ensures that the patient has an easy step in and step out while it gives the nurses a perfect working height. The optional fifth motor enables the patient to adjust the footrest by himself. In case of emergency, the Trendelenburg position can be reached with the manual controller. The maximum patient weight is 230 kg.

SENSA® i: Flexibility, Quality and Design at its best

The new SENSA i series sets new standards for therapy chairs! In addition to its proven quality, it is characterized by a new design and complete flexibility. To achieve the highest level of comfort and safety for patients and operators has been the focus of the new series, combined with developing a flexibility that is so far unrivalled.Besides adding the Trendelenburg position as a standard, focus was also given on increasing the comfort for patient and operator. Among other things, this is reflected in the wide choice of various upholstery cushions. The new modular concept makes it even easier to design your desired therapy chair. You can select from different types of upholstery, castors, footrests and many other options, according to your individual needs. This makes SENSA i the ideal choice for a wide range of applications, whether it is dialysis, oncology, blood donation, infusion or transfusion, as well as countless other medical fields.

LiKATRAINER active: Improves the mobility of your patients

The LiKATRAINER active is a light, portable and high-quality leg trainer specially designed for active muscle exercise (without motor). It intended for mobilisation of patients with minor physical disabilities and has been specially designed for daily use in hospitals, medical practices and retirement homes. The LiKATRAINER active is conveniently and easily positioned where required with the porter trolley. The six double castors prevent tipping and ensure stability along with the integrated central locking. A special safety function on the porter trolley protects the patient, even when moving the chair.

The classics from LiKAMED on show at Arab Health 2018 include:

SENSA® Flex: Minimal space requirement with maximum comfort for patients

SENSA Flex has been developed for the specific needs in oncological day-care hospitals and the infusion and transfusion medicine and is additionally qualified for use in general medical practices. It only requires very little space – but at the same time, offers high stability and safety against overturning and is also certified by TÜV.

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For more information, please visit www.likamed.de

IN THE KNOW

A promise to children and families around the world

Nemours.
Children's Health System
Your child. Our promise.

Article provided by Nemours Alfred I. duPont Hospital for Children

Children deserve the best care possible, no matter where they live. That's why doctors and families around the world turn to Nemours Alfred I. duPont Hospital for Children. As an internationally recognized children's health organization—and renowned for its pediatric orthopedic expertise—it provides highly specialized care with respect for each family's unique health, cultural and financial needs.

Nemours/Alfred I. duPont Hospital for Children is consistently rated among the best children's hospitals in the nation by U.S. News & World Report. And while this level of pediatric care is not always available around the globe, it is the Nemours promise to help every child, everywhere, have a healthier future.

What began in 1940 as a pediatric orthopedic institute is now a world-renowned full-service children's hospital, designed by families for families. The thoughts and ideas of children, parents and caregivers helped inspire the design of its space—an environment to promote children's physical, emotional and spiritual healing. Nemours has created a children's hospital like no other in the region, giving its patients and families the promise of even better days to come.

At duPont Hospital for Children, you can expect:

- Advanced inpatient and outpatient pediatric care in more than 30 specialties
- Delaware's only Level I Pediatric Trauma Center
- Intensive and acute pediatric care in a family-centered, kid-friendly environment
- Research that helps advance breakthroughs and cures
- Convenient service in your community through our care network, Nemours duPont Pediatrics

Highlights of the newly expanded hospital:

- Spacious single-patient rooms—all with a view to the outside, two TVs (one for the patient, one for the family), bathrooms with a shower, and pullout beds for parents to stay in the room with their child
- Rooms that accommodate special needs families
- Playroom, family solarium, lactation room (for nursing mothers), and washer and dryer on every unit
- Discovery Zone Presented by DuPont, an Xbox-powered digital wall that kids can interact with and forget, for a few minutes, that they are ill
- Technologically advanced 44-bed Emergency Department and AstraZeneca Treatment Area with 44 bays

Nemours International Medicine Program:

- Expedited appointments with a specialist are available.

For more information:
Email: InternationalMedicine@Nemours.org or call +1 (302) 651-4993 (Monday–Friday, 8 a.m. to 5 p.m. EST). www.nemours.org

Castors for hospital and care beds

Article provided by Tente

TENTE is synonymous for innovative and high-quality designs in every aspect of castor development.

High quality standards during the development refined production techniques during the manufacturing stage have made us the market leader. Every TENTE castor is certified according to DIN ISO 9001 manufactured and tested according to EN 12526 - EN 12533 standards.

One of TENTE's specialty areas are castors for the hospital and care market. Experts in this sector also refer to us as the "hidden champions" of the hospital bed castor market segment. This area has particularly high demands.

Deciding factors: durability, stability, washability, easy manoeuvrability.

Raw material used in the production of these castors, are resistant to most cleaning agents and disinfectants. Protected precision ball bearings allow regular cleaning without problems. Like any other TENTE castor made for the medical industry, these won't leave markings – no matter what floor they roll on.

Various locking and brake options play an important part in this area.

TENTE offers compatibility and interchangeability for the health care industry. The use of different fittings allows for an easy exchange of current castors with TENTE castors. TENTE covers every aspect and fulfills your wishes.

For more information visit TENTE at Arab Health from 29th January to 1st February 2018 in Za'beel Hall Z3.B38 or visit us: www.tente.com

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Wermelskirchen. Telefon: +49 2196 / 99 - 380
E-Mail: jvukovic@tente.de, Internet: www.tente.de

IN THE KNOW

NovaPED S90 elements

Add-on parts for S90 orthopaedic foot supports

Article provided by Schein

Form elements for stabilising, reinforcing or cushioning our S90 orthopaedic foot supports in film technology. By heating the adhesive film and the film side of the orthopaedic foot support, all elements can be welded together without the use of adhesive. This means that you save time – and further processing by means of grinding is made much easier thanks to the welded bond. From heating to a glossy finish, you can individualise the orthopaedic foot supports quickly and with little effort in just a few steps.

ARU®leicht

The high shore hardness of approx. 58° Shore A makes ARU®leicht particularly suitable for corrective use. In addition to the material sheets, we already offer ready-made elements to enable you to quickly cater for various indications.

ARU®fant Color "Stone"

ARU®fant Color is made from micro cork with a Shore A hardness of approx. 50°–55° that is particularly suited for corrective use.

Multiform

Multiform is used primarily in supportive applications (approx. 30° Shore A). Thanks to its characteristics, Multiform is particularly easy to weld and grind. The heel elevation and supination and pronation wedge are particularly suitable for flexible and shell-like orthopaedic foot supports.

p2 resorb

p2 resorb (approx. 17° Shore A) can both cushion and dampen. It is characterised by its quick recovery, high longevity and abrasion resistance. p2 resorb dampens undesired vibrations and cushions overburdened areas of the feet.

Supersorb

Supersorb is a material for tread damping and cushioning. It has both damping and elastic, cushioning characteristics. In order to exploit the viscoelastic characteristics of the material to their full extent, it should not be glued across its full surface if possible.

For more information, please visit www.schein.de

WERKSITZ from Germany –
The specialist for workplace ergonomics

IN THE KNOW

WERKSITZ contributes to health and increased performance.

Article provided by Werksitz

WERKSITZ has been providing their customers with optimum ergonomic products since 1980 and have developed an extensive range of swivel chairs and workplace floor mats in standard and customised designs for industry, trade, laboratories and sheltered workshops. The contemporary seating and standing comfort of their products meet all special workplace requirements, therefore making a significant contribution to health and productivity.

WERKSITZ places special emphasis on quality products that are reliable, durable and backed by a long-term warranty. The modular design offers users maximum flexibility and investment security along with a spare part replacement guarantee for all components.

WERKSITZ work chairs meet the stringent DIN 68 8877 occupational health and safety standards and are manufactured in accordance with the certified DIN ISO 9001 quality management system. The work chairs are tested by TÜV Rheinland and bear the GS certification mark. WERKSITZ effectively counteracts back pain with its ergonomic work chair concept and ensures a healthy, comfortable sitting position at work.

For more information, please visit www.werksitz.com

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IN THE KNOW

Kuwait family turns to Lurie Children's for specialized care

Article provided by Lurie Children's Hospital of Chicago

The Ahmad family has travelled the past two years from Kuwait to come to Ann & Robert H. Lurie Children's Hospital of Chicago to receive treatment for their son, Ali's spina bifida. As an extraordinary place for healing and family-centered care, the hospital's evidence-based design and advanced technology helps our outstanding caregivers provide quality care to the world's most critically ill children.

The family was connected to Lurie Children's Hospital through their government, because it is one of the top 10 hospitals in the U.S. Lurie Children's ranks 7th nationally and qualified for the Honor Roll in the 2017-18 *U.S. News & World Report* Best Children's Hospitals rankings. The Honor Roll designation is awarded to hospitals that scored in the top 10 percent in at least three specialties. It has established medical and surgical leadership that provides cutting-edge and thorough treatments for the most complex pediatric needs, including:

- Brain tumors
- Cancer care
- Cardiology and cardiovascular surgery
- Neurosurgery
- Pediatric surgery
- Plastic surgery
- Transplants

"The staff is very nice and the doctors are very professional. We are happy," stated Ghadeer, Ali's mom. Pediatric providers have collaborated in overseeing Ali's specialized treatment. Lurie Children's medical staff includes over 1,445 physicians and 200 Advance Patrice Nurses and Physician Assistants in 70 pediatric specialties. Lurie Children's is the largest pediatric provider in the region, with more than 744,000 patient visits and cared for more than 208,000 individual patients in fiscal year 2017.

"The international office arranged everything before we came," stated Ghadeer. The International Patient Services (IPS) department at Lurie Children's works with patients and families from outside of the United States seeking pediatric healthcare services. They are committed to providing family-centered care to all patients. The IPS department assists families through every step of receiving care at our institution, from referrals to treatment and discharge. The team provides immediate access to interpreters through a combination of in-person interpreters, video and telephonic interpretation. The IPS department also aids families with their plans to return home.

The Ahmad family greatly appreciates all the work that has been done by the staff and is pleased how every request for Ali's needs was met. Lurie Children's is not only focused on treating children's illnesses, but is also committed to offering creative and educational programs, activities and other resources to support the patients and their families emotionally, socially and developmentally. Families have access to an interdisciplinary team, which includes child life specialists, creative arts therapists, activity coordinators, teachers and volunteers to help patients and families with respite and distraction. Together with the patient's medical team, they address the needs of the whole family for the best possible patient experience.

The Ahmad family from Kuwait received treatment for their son, Ali's spina bifida, at Ann & Robert H. Lurie Children's Hospital of Chicago

The Ahmad's have already recommended Lurie Children's to other relatives and families in Kuwait. They returned home safely and Ali is reunited with his two older sisters.

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

Innovation in the Treatment of Knee Pain at RAK Hospital

Article provided by RAK Hospital

When dealing with knee joint pain, going under the knife is never an easy decision. Despite the fact that technology has tremendously progressed making surgeries a relatively painless affair, many people have apprehensions about it. At the same time, living with a painful condition that gets progressively worse is not an option either. Our aging population in particular has little patience or the strength, not to mention many other health issues that can cause complications, to be able to stand a surgery.

Fortunately, we have reached a stage in medical science that surgery is no longer the only answer to treat knee joint issues. The exciting field of regenerative medicine, especially stem cells, has given hope to millions of patients across the world to heal naturally, particularly in cases where the condition is beyond repair surgically. In this context, stem cells, with their ability to develop or take on the characteristics of other types of cells, have been extremely successful. The treatment is useful for patients suffering from rheumatoid arthritis, osteoporosis, knee injury, torn cartilage or tendons and rotator cuffs. The self-healing process begins when healthy cells are injected to replace damaged cells in our bone, cartilage and fibrous tissues to help restore them.

RAK Hospital, which offers a complete solution for bone and joint problems, has been distinctive in this regard and boasts of a world-class team of orthopedic consultants and support staff. The hospital primarily aims to put people back on their feet while preserving the natural joint in a painless manner and as quickly as possible. The idea is to explore non-surgical options extensively and through case-by-case diagnosis based on the patient's medical history, physical examination and specialized studies, so that doctors are able to treat each patient's specific needs.

This is why RAK Hospital is also offering a complimentary second opinion to those who

have been advised knee replacement. Patients just have to upload their standing knee-bearing X-ray at corporate.communication@rakhospital.com and get a complimentary second opinion from world-renowned orthopedic surgeon, Dr William Hodge. Through this endeavor that extends to patients across the world, the hospital hopes to help patients ensure a painless recovery.

In the UAE, where thousands of people suffer from knee joint problems, regenerative treatment is the best possible solution. The key, however, is to address the pain early so that the road to recovery can be quick. Even a slight swelling could be a warning sign of a more serious condition. The more common symptoms of knee joint problems include limping, locking of the knee, redness and swelling around the knee area, and the inability to extend the knee, etc., and it is best to consult a doctor when facing any of the above.

At the same time, a complete solution to joint problems is never possible without a multidisciplinary approach and physiotherapy is an important aspect of that. Once again, the RAK Rehabilitation Center stands tall for its state-of-the-art therapies that help build strength in patients who are recovering from knee bone issues. Not only that, but physiotherapy is also instrumental in correcting the gait, strengthening the leg muscles and improving agility and balance.

Having said that, there's no denying that in some cases surgical intervention is necessary. RAK Hospital has the distinction of being the first hospital in the UAE to introduce gyroscope-based technology for a more accurate alignment in knee replacement. The technique, applied in few hospitals world over, not only reduces post-operative discomfort, allows lesser blood loss and shorter recovery period, but also increases the shelf life of the implant significantly. Led by a team of renowned orthopedic surgeons – Dr Yash Gulati, Dr John Bera, Dr Shreerang Joshi and Dr Hodge – the surgeries have proved particularly beneficial for older people, those with weak knees and knee injuries.

For more information, please visit www.rakhospital.com

IN THE KNOW

Computerised individual solutions for orthopaedic and sports insoles

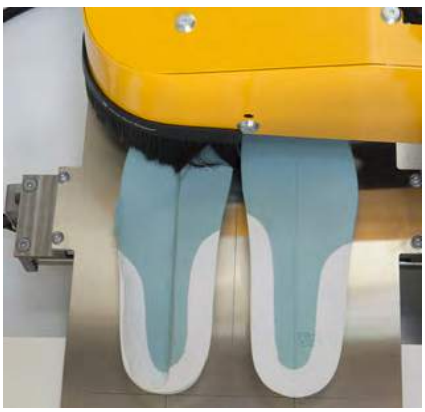
Article provided by Orthema

It was a disillusionment born out of sports injuries and botched rehab attempts with second-rate insoles that propelled Marcel Herzog to establish the Orthema Group, a leading world player in the field of orthotic insole production.

Somewhat of a polymath, Herzog, who is educated in sports science, looked past the limits of technology and saw opportunity. "I was looking for solutions," explains the affable Herzog from the company's headquarters in Rotkreuz. "I wanted to eliminate muscular pain by correcting gaits, but I was also looking for ways to optimise power transfer for elite athletes."

The emergence of new technologies in early '90s America inspired Herzog to pursue avenues that would be quicker, more efficient and more productive than conventional methods. After enlisting the help of Swiss engineers to launch the first machine in 1993, Orthema was officially founded in 1999.

Keeping pace with technology even today, the device takes a 3D measurement analysis of your foot, relying on more than 500 sensors. The data is relayed to the on-hand orthotic expert, who



uses the software to carry out in-depth analysis on the client's weight-bearing and nonweight-bearing gait, streamlining it into one tailor-made solution. Once the insole material is chosen, Orthema's CNC milling machine hooks up to the system and grinds the exact foot profile.

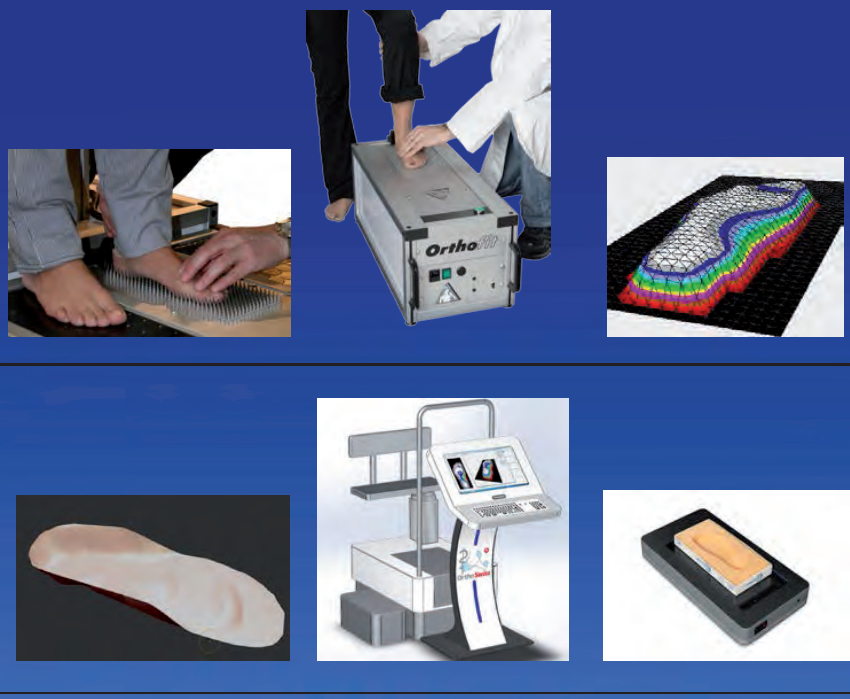
The ingenious bit of kit that promises he sensation of "walking on clouds" is the brainchild of keen skier Herzog, who explains how the system was intended for top athletes and the military but attracted resounding attention after its launch. "We were quickly approached by the orthopedic industry, which saw the advantages it would bring to patients."

Today the company has a presence in more than 50 countries and, while it serves the public daily, the Orthema machines still play an instrumental role in high-level sports, kitting out the German football team with custom-made insoles as well as big names in tennis, athletics and other sports. The team designs and produces everything in Switzerland. "The machines are nothing without a competent user though," adds Herzog. "But that's exactly why we also vet our clients for the requisite expertise, so that all the components fall into place." The brand, he explains, will also soon be available for franchising abroad.

But while the genesis for Herzog's lifework was primarily to cure injury-plagued athletes, he is clearly proud of how his creations continue to tread a reliable and durable path around the world, eliminating pain and improving people's souls.

For more information, please visit www.orthema.com

The Orthofit Measuring Center



The Orthema Milling Center

Ask for more information about prices and franchise concept:

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CH – 6343 Switzerland

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Fax: +41 41 798 04 35

Email: sales@orthema.com
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ARAB HEALTH

IN THE KNOW

ENDOCAM Logic 4K

The new Sharp. The new Authentic. The new Efficient.

Article provided by Richard Wolf GmbH

Richard Wolf GmbH raises image quality in endoscopy to a new level with pin-sharp 4K resolution technology. The optimally tailored system components ensure image reproduction that matches the natural state of the image, at the same time operates energy efficient, and is ergonomic and compact.

4K entails a resolution of at least 3840 x 2160 pixels and this represents a fourfold increase compared with the existing HD standard. In order to get this pixel power on the road, Richard Wolf with its long tradition of innovation, has strategically bundled all of its in-house expertise: telescope, light, signal processing and the latest production technology melded into one system, providing a solution from a single source.

Optical systems and light cables: Optimum match guaranteed

The new sharp begins with the completely new telescope developed in-house for the rigid 10 millimeter endoscope. This generates a homogeneous, illuminated image with sharp margins. Specially doped glass material is used for the lenses to minimize any optical errors.

The light source plays an important role in implementing the new sharp. The latest light cables with correspondingly high transmission and a powerful LED light sources are used for the 4K version. The light power therefore keeps pace with the increase in resolution. It is precisely tailored to the requirements of the new camera system.

Lower power consumption reduces development of heat

The new compact is manifested in the ergonomically shaped camera head with reduced dimensions and weight. Richard Wolf uses a new generative method here in order to manufacture the metallic camera casing utilizing a 3D printing process. The result is that the camera head is a comfortable fit in the user's hand and it is also tangibly lighter. The stainless-steel material can be autoclaved and is ideal for chemical sterilization procedures. It is therefore classified as sterile and may be used without the need for any additional covers.

Richard Wolf reaches a new level of efficiency as a result of the reduced power consumption in various areas. The LED technology demonstrates significant savings over the previous gas discharge lamps. At the same time, the company has succeeded in using more powerful and very efficient electronic components in the camera head. It consumes around 30 percent less electricity and this is demonstrated in a significantly lower development of heat.

Precise image of reality without extrapolation

The advantages of the system from a single source continue behind the camera head since the powerful signal handling processes the 4K signal in the original resolution for the new authentic. Cables, connectors and controllers are consequently designed so that the significantly expanded data volume is free of loss. This increases the failsafe performance and the faithful visualization of the original image – very much the new authenticity.

At the same time, Richard Wolf has the experience and the ability to generate additional benefits from the surveyed data. Special visualization processes improve tissue differentiation, illuminate critical areas of an image, and clearly visualize structures situated in bright but overexposed regions.

For more information, please visit www.richard-wolf.com

Hecht-Assistent® Lab Products – for Liquid Handling and so much more ...

Article provided by Hecht-Assistent

There are thousands of Assistent® precision instruments and devices – for the daily work of physicians, laboratory staff and on ward.

Assistent® offers a big range of products to pipette or dispense nearly all kinds of liquids – even aggressive liquids – from 5 µl up to 100 ml. Products with the brand name 'Assistent' combine highest possible precision with simplest operation.

On the internet you can find the complete delivery program – e.g. the Assistent Waterbath Thermostate digital; Liquid Handling Products such as Conformity certified maintenance-free Piston Stroke

Pipettes, Micro Pipettes Digital with stepless volume adjustment and tip ejector; Single and Multi Channel Pipettes, Digital Burettes, Micro and Macro Pipetting Aids. Perfect ... is the Assi-Stepper – the small manual dispenser, conformity certified, for quick and repetitive dispensing of liquids. In combination with 'precision dispenser tips' up to 49 repetitive pipetting steps can be done without refilling. This is useful in the microbiological, immunologic and biochemical field etc.

Details on the internet are available under www.assistent.eu or at lab dealers – worldwide. For more information, contact us on +49 (0) 9779 /808-0.
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Meet us at ACHEMA 2018 in Frankfurt/Main - Germany

Feel better with medi

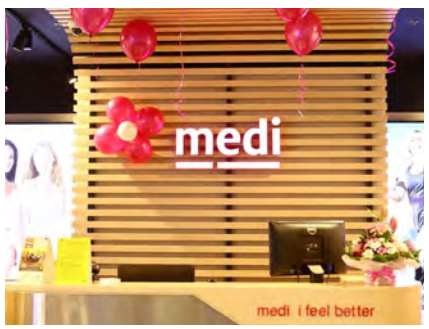
Article provided by medi

Germany's medi has become a reliable partner in the countries of the Middle East for innovative compression concepts for the treatment of venous diseases, insoles and orthopedic braces for sports-related injuries and degenerations.

To meet customers at the point of sale, medi has recently opened its first concept store in one of the most vibrant cities in the world– Dubai. Since June 2017 the BurJuman mall is home for the German medical aid brand with the magenta logo. "In our new shop, customers will find both medically sound products for the therapy of lymphedema, varicose veins or injuries to the muscular-skeletal system as well as sports and fashion-related products to enhance performance and beauty. Athletes can also access our CEP sports compression stockings, the most famous sport socks worldwide for runners, cyclists, golfers or those enjoying skiing in the Mall of the Emirates," says David Reich, responsible for the business development of medi in the region.

Medical specialists, physiotherapists and retailers seeking for product advice or that want to co-operate with medi in the UAE will now also benefit from detailed information on the new digital platform www.medi.ae. Lots of news to enable people to feel better!

For more information, please visit www.medi.ae



Cathejell - For Smooth Catheterisation

Article provided by Montavit

Cathejell is a sterile, transparent and water soluble lubricant gel which allows catheterisation or the insertion of other medical instruments into the urethra to be gentle and free of pain. The gel is available as lubricant gel with local anaesthetic and disinfectant (Cathejell Lidocain C), with local anaesthetic only (Cathejell Lidocain) or as a plain catheter lubricant gel (Cathejell Mono).

SAFETY

- Shortly after injection the urethral mucosa is evenly covered by a lubricant film for a smooth and gentle passage through the urethra into the bladder
- Provides superior sliding quality and high tolerability and preserves the delicate mucosa
- The disinfectant properties of the Cathejell Lidocain C reduce the risk of infection

BENEFITS

- RELAXED - due to a local anaesthetic (lidocaine), the urethra is relaxed and the catheterisation will be free of pain
- COMFORTABLE - tapered, gently rounded applicator
- CONVENIENT - the accordion syringe opens easily by breaking off the closure tip and enables application with only one hand
- HYGIENIC - steam sterilised, no ethylene oxide residues

FEATURES

- All Cathejell versions are perfectly suited for use in the operating theatre, the doctor's office and in homecare
- The Cathejell accordion syringe permits the single-handed opening and soft instillation
- First steam – sterilised single use catheter lubricant worldwide since 1986
- New Cathejell Applicator for use in gynaecology and proctology
- Easy single handed opening of the snap off tip
- Accordion syringe allows smooth and gentle instillation and easy dosage with one hand
- Sterile, water-soluble and crystal clear gel
- Production in Austria in compliance with ISO 9001/13485
- Free of Parabens
- Approved by leading Endoscope manufacturers

COMPOSITION

1) Cathejell Lidocain C: sterile, anaesthetic, antiseptic, water-soluble, clear lubricant gel
Agent: Lidocaine + Chlorhexidine
Contents (1g gel contains): 20mg Lidocaine-hydrochloride
0.5 mg Chlorhexidine-dihydrochloride

2) Cathejell Lidocain: sterile, anaesthetic, water-soluble, clear lubricant gel
Agent: Lidocaine
Contents (1g gel contains): 20mg Lidocaine-hydrochloride

3) Cathejell Mono: sterile, watersoluble, clear lubricant gel
Contents (1g gel contains): plain sterile gel AH

MORE INFO
For more information call +43 (0) 5223 57 926 or email pharma@montavit.com or visit www.montavit.com

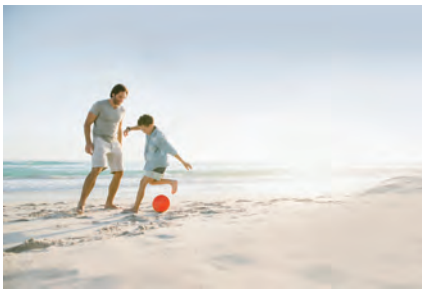
IN THE KNOW

High-quality, innovative medical technology solutions

Article provided by KLS Martin Group

The KLS Martin Group is a globally leading supplier of medical technology solutions for almost all surgical fields. In accordance with our company philosophy "Surgical Innovation is our Passion", we develop medical technology solutions such as implant systems, high-frequency devices, surgical lasers, sterilization containers, OR lights, surgical instruments and complete solutions for the operating room.

Driven by our slogan, we have set a number of new standards. For example, with distractors that allow guided bone growth to regenerate and repair severe injuries and deformations. With an innovative ultrasound procedure and resorbable implants that



make second interventions for implant removal obsolete. Or with a holistic solution that brings the virtual workflow into clinical reality and allows individualization of patient implants. In the field of electrosurgery and laser surgery, we are especially known for our electrosurgical unit maXium®, reusable systems for vessel sealing and our surgical laser Limax® for metastasis surgery.

Innovation at KLS Martin is mostly the symbiosis of completely different influences and suggestions; hand in hand developed by KLS Martin employees, surgeons, research facilities and the industry. If you are looking for a partner for your surgical idea, please do not hesitate to contact us.

In addition, KLS Martin offers people who want to advance medical technology an outstanding work environment – with excellent development opportunities and a very high quality of life.

For more information, please visit www.klsmartin.com

POLYCINE

FLEXIBLE PHARMACEUTICAL PACKAGING

PolyCine GmbH in Schiffweiler Germany is a specialist manufacturer of polypropylene-based non-PVC films and tubes used in the manufacture of intravenous bags and CAPD systems.

The company's products are made from a transparent multilayer coextruded polymer. Both films and tubes can be produced in any dimensions required and to extremely narrow tolerances. The products are coextruded under clean room conditions and meet the requirements of the European Pharmacopeia 3.1. and USP Class VI. Production is also certified to ISO 9001 standards.

PolyCine's pp-based APP-series (Advanced PolyPropylene) provides high-quality and cost effective film and tubing solutions for a variety of applications.
The most common application areas of our APP products are: standard IV-solution, special IV-solution, CAPD, haemodialysis, aphaeresis, drainage and fluid collection.
The company has customers in more than 40 countries. Since its foundation in 2002 PolyCine GmbH has set standards in quality, innovation and cost effectiveness. This year PolyCine is glad to introduce a new sales specialist for the MENA region Mr. Zurab Malakmadze (zurab@polycine.de). For more information on our products please contact our sales team or visit our website at **www.polycine.com**

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'GET UP'

THE SWIVELLING HANDLE SYSTEM FOR RADIOLOGY FROM FEBROMED

Safety for patients and health benefits for personnel

Febromed GmbH & Co. KG, the expert in delivery room equipment and medical accessories from Oelde, Germany, has developed 'get up', an innovative handle system for radiology. The new swivelling system was installed for the first time in a state-of-the-art CT scan room at the Institute of Diagnostic and Interventional Radiology and Neuroradiology at Essen University Hospital.

For a secure grip

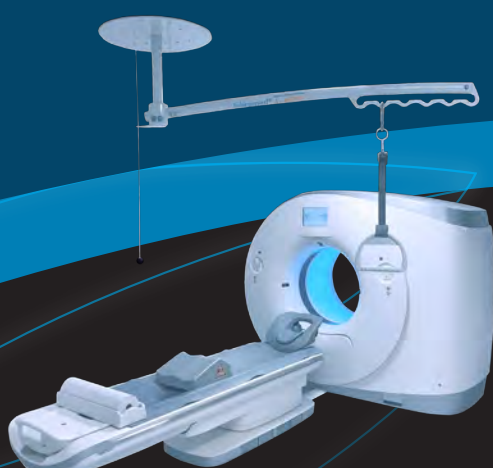
Many patients find getting onto the examination table for a CT scan difficult. In particular, restricted mobility leads to uncertainty as the patient is positioned and arranged, thus placing increased physical strain on care personnel, predominately in the back area. The new 'get up' handle system from Febromed offers a solution: this swivelling system helps patients get onto the table before their scan and stand up again safely and comfortably afterwards. It minimises the risk of falling and provides a secure grip. It helps personnel by reducing the physical strain of their job. As a result, the organisation as a whole benefits: since the actual physical strain on personnel is significantly reduced, employee sick leave due to back pain is also minimised.

Positive experiences

After installing the handle system in May 2017, the Institute of Diagnostic and Interventional Radiology and Neuroradiology at Essen University Hospital has consistently had positive experiences. As Anton S. Quinsten, Ltd. MTRA, reports, 'We are really happy with the "get up" system from Febromed. The first few months have shown that the handle system is considered a real asset by both patients and personnel.'

Space-saving and durable

The 'get up' handle system is designed for space-saving mounting on the ceiling and can be swivelled by 360°. The structure can be locked in 15° increments so that the system is always in the optimal position for the patient. This purely mechanical construction ensures easy handling and extended durability.



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Article provided by Montavit

MMM has been operating worldwide as one of the leading system providers in the service of health since 1954. With a complete range of products and services relating to all aspects of cleaning, disinfection and sterilization systems for the areas of Healthcare and Life Science, MMM has positioned itself as a crucial quality and innovation driver in the German and international market. Their products are individually adapted to the requirements of customers all over the world. The high vertical range of manufacturing in their production plants ensures that they fulfil the strictest demands of quality in the medical technology sector. More than 1100 employees apply their expertise and dedication to the mission of the MMM Group: Protecting human health. AH

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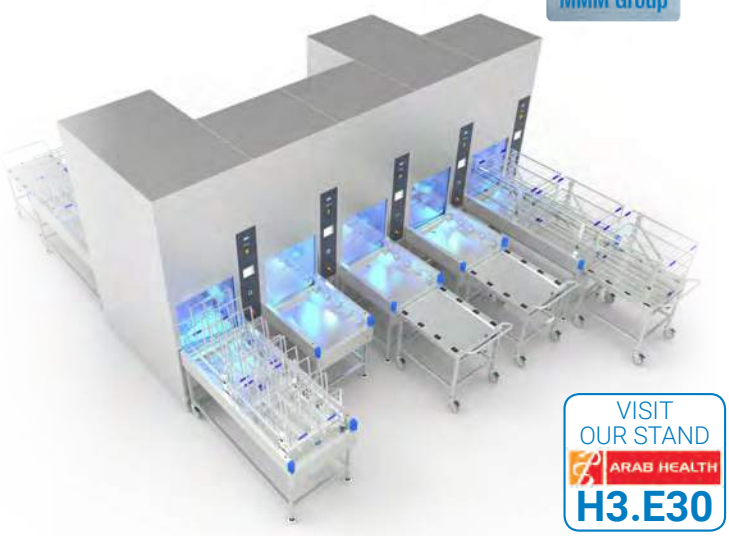

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Discover Intersurgical's full range of respiratory care solutions at Arab Health 2018

Article provided by Intersurgical

Intersurgical will be showing their full range of respiratory products in the UK Pavilion, in Hall 7 at Arab Health 2018.

Intersurgical is a leading designer and manufacturer of respiratory care products, offering flexible patient solutions for airway management, anaesthesia, critical care and oxygen & aerosol therapy.

On show will be its range of airway management devices, from the innovative i-gel® supraglottic airway to laryngeal mask airways as well as extensive range of anaesthesia breathing systems and accessories for use in the operating room, recovery and emergency care.

Also on display will be Intersurgical's non-invasive ventilation products, Trachseal™ Closed Suction Systems, its extensive Oral Care range and accessories for use in the critical care environment, along with its product range for fixed and variable concentration oxygen therapy, aerosol (humidification) therapy and nebulisation therapy.

Intersurgical provide best practice respiratory product solutions for patients and clinicians, offering quality, innovation and choice.

Come and meet the team in the UK Pavilion, in Hall 7.

You can get involved with the conversation on Twitter by following @Intersurgical, @Arab_Health and by using #AHC18.

For more information, please contact:

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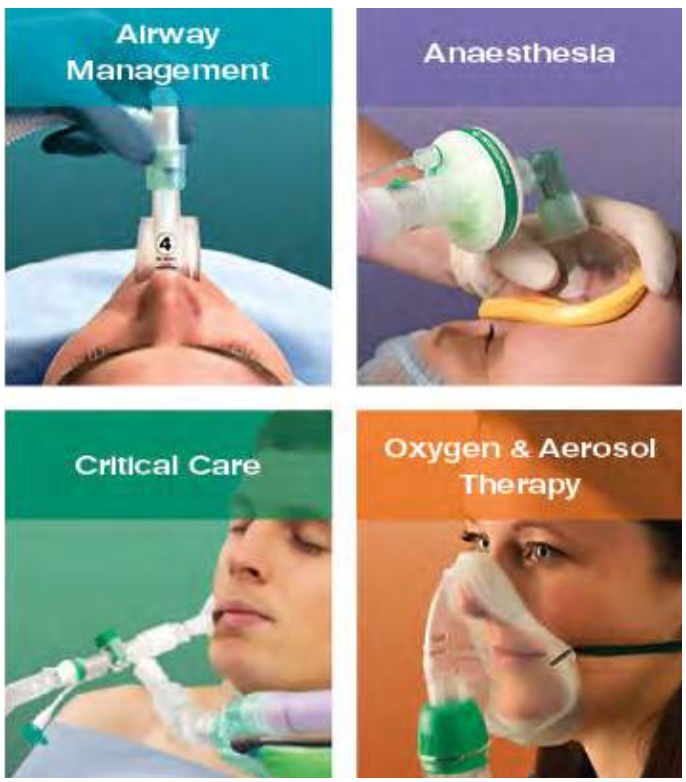

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IN THE KNOW

IV Clear™ – Improving the Patient Experience

Article provided by Covalon

Built on Covalon's innovative dual antimicrobial silicone adhesive technology, IV Clear™ securement dressings provide effective, comfortable protection against the pathogens most commonly associated with dangerous and costly central line-associated bloodstream infections (CLABSI)*[1,2,3]. Dual antimicrobials, chlorhexidine and silver, work synergistically throughout the entire surface of the dressing to provide broad spectrum activity against a wide variety of gram-negative and gram-positive bacteria, yeast and fungi[4], while its transparency allows complete visibility of the insertion site for the entire wear time of up to 7 days. "My son has had 11 years of painful dressing changes. It's stressful for both of us. He's upset I'm hurting him and angry at the pain I'm causing him. And it breaks my heart to have to hurt him every week I do a dressing

change. We just tried IV Clear and it was amazing. It's the first time I've been able to do a completely pain-free dressing change!"[5] Covalon researches, develops and commercializes new healthcare technologies that help save lives around the world. Covalon's patented technologies, products and services address the advanced healthcare needs of medical device companies, healthcare providers and individual consumers.

** In vitro effectiveness does not predict clinical performance*

References:

[1] DiTizio V., Romano M. A Novel Antimicrobial Clear Silicone Dressing with Chlorhexidine and Silver. Poster Publication: Association for Vascular Access Annual Scientific Meeting, San Antonia USA, 2012.

[2] A Human Repeat Patch Study. Covalon Technologies, Data on file.

[3] Hidron at al., Antimicrobial Resistant Pathogens Associated with Healthcare-Associated Infections: Annual Summary of Data Reported to the National Healthcare Safety Network at the Centers for Disease Control and Prevention, 2006-2007, Infect Control Hasp Epidemiol 2008; 29:996-1011.

[4] Blom K., Werthen M. Medibiome, Moindal, Sweden. A laboratory study of the synergistic effect of chlorhexidine and silver. Poster Presentation at Wounds UK 2014 and SAWC 2015.

[5] IV Clear Facebook Page Review. (2017, July 25).

For more information, please visit www.covalon.com.

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* Kills 99.99% of bacteria and yeast commonly associated with CRBSIs. *In vitro* effectiveness does not predict clinical performance.
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IN THE KNOW

Exploit Potential and Save Costs with BEWATEC Modules

Article provided by BEWATEC

BEWATEC's digital clinic portal makes time in the clinic more beneficial for patients and eases the stressful everyday life of doctors and nurses. This is not just with entertainment offers but also services that relieve the burden on doctors and nurses and better incorporate patients in the clinic's internal processes. This is how the bedside terminal has become a service terminal that provides access to e-health services and digital applications right at the patient's bed via modules.

The patient questionnaire is an important quality management instrument for a clinic. The digital module brings the questionnaire directly to patients using the BEWATEC terminal. This is convenient, relieves the burden on nurses and saves 50% of the process costs because there is no expenditure on printing, distribution, collection and recording the forms.

The Clinic Content module brings information to the patients in a modern and attractive format and uses the BEWATEC tablet as an interactive marketing tool. In addition to services such as libraries and clinic hairdressers, patients can also inform themselves extensively about the clinic.

During hospital stay, patients deal with all of the issues concerning their illness in great detail. The therapy video module supports the clinic in providing patients with comprehensive and tailored information using, for example, videos, texts and images.

BEWATEC is constantly setting new trends for the hospital sector and has been enhancing and refining the range of devices for single-user TV solutions to develop a multimedia tablet optimized for clinical use as a digital patient infotainment solution at the point of care. More than 150,000 BEWATEC devices are already in use worldwide.

For more information, please visit www.bewatec.com

IN THE KNOW

The Latest Generation of Table Filling Modules for Infusion Bags

Medical therapies and applications are being customised to an increasingly significant extent. KIEFEL, based in Freilassing, Germany, will be exhibiting a space-saving table filling module at the 2018 Arab Health Exhibition in Dubai with a view to accommodating the growing demand for personalised medication.

Article provided by Kiefel GmbH

Kiefel, the medical technology specialist, has developed a table filling module that fills and plugs bags semi-automatically, enabling individually prescribed liquid medications and small filling orders to be transacted quickly and easily. The pharmaceutical industry, laboratories, hospitals or large pharmacies can use this module to fill individual dosage volumes of 20ml or more with absolute reliability. The table filling module is characterised by space-saving features such as a particularly low floor space requirement and is modularly expandable.

Flexible and safe

The flexible table filler is particularly appealing due to its high filling accuracy and automatic retractive suction to prevent dripping. The fully-integrated and fully-automatic Cleaning in Place (CIP) and Sterilisation in Place (SIP) systems ensure that production conditions are hygienically flawless. The basic model with additional options will be presented at the 2018 Arab Health Exhibition at BOOTH Z3. C10.

FACT BOX

The Kiefel table filling module with Smartfill technology – all the benefits at a glance:

- fill volumes starting from 50 ml
- high degree of filling accuracy
- users can adapt the bag uptake process to their own requirements and observe the process through a viewing window
- fully-automatic and fully-integrated CIP/SIP system
- interface to superordinate systems such as MES or ERP
- user-friendly operation
- space-saving device with a particularly low floor space requirement

About Kiefel GmbH

Kiefel GmbH develops and produces high quality machines for manufacturing plastic films. Our customers include well-known manufacturers from the automotive, medical engineering, refrigerator and packaging industries.

We employ around 530 people at our headquarters in Freilassing. Kiefel is globally present thanks to our own sales and service branches in the USA, France, the Netherlands, Russia, China, Brazil, Indonesia and India, as well as our sales partners in more than 60 countries. Kiefel also owns the automotive specialist SWA based in the Czech Republic, the Dutch thermoforming toolmaker Bosch Sprang, and the Austrian Mould & Matic Solutions, supplier of tools and automation solutions.

Kiefel table filling module with Smartfill Technology

Kiefel GmbH is a member of the Brückner group based in Siegsdorf, a global leader in constructing machines and system for the plastic and packaging industry with around 2,400 employees.

For more information, please visit www.kiefel.com
Contact info: Reinhold Plot, KIEFEL GmbH
Sudetenstraße 3 83395 Freilassing Germany
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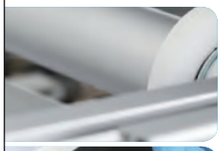


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IN THE KNOW

Multi-Modality LCD Displays from Ampronix offers first universal solution for replacement of old legacy displays

Article provided by Ampronix

The cumbersome Cathode Ray Tubes (CRTs) have been around for decades and are still used in a wide range of applications. However, CRTs are projected to be completely replaced by their successor, the lighter, cost-effective and versatile flat panel. It is said that the CRT/flat panel transition took place 5 years ago in most developed regions including Japan, Western Europe, and North America. Developing countries are still using CRTs and their transition is projected to follow within the next 10 years.

Historically, the medical industry has not set universal standards for medical grade displays, making the replacement of CRTs with new flat panels, a problematic challenge in terms of compatibility with legacy modalities. Video signals from modalities are very unique and completely different from IT and video production displays.

With the CRT/flat panel transition, a new set

of requirements arises. New flat panel medical displays are expected to have more realistic and brighter resolution, lower power consumption, no radiation, fewer repairs than CRTs, low cost of ownership, longer life span, less weight and most importantly, compatibility with all modalities. Not many manufacturers have been able to develop a flat panel display that meets all these requirements; however, Ampronix Medical Devices has accomplished this.

Ampronix's Modalixx™ LED Display, is a universal solution compatible with Cath Lab, MRI, CT, RF rooms, Mobile C-Arm, Computed Radiography (CR), PET scanner, as well as Nuclear Medicine modalities and is capable of receiving any video signal parameter. Equipped with a set of inputs of 1 to 5 BNCs and 15 pin D-Sub connectors, Modalixx™ provides the broadest range of analog connectivity and converts small matrix pictures from legacy analog modalities into brilliant 2 megapixel images. Modalixx™ is setting a new universal standard in medical imaging technology.

Ampronix is a world-class manufacturer of innovative technology and renowned authorized reseller of the Medical Industry's top brands since 1982.

For more information, please visit www.ampronix.com or contact us on info@ampronix.com

IN THE KNOW

Augmented Intelligence in Health Imaging – A Model for UAE

By Dr Anjum M. Ahmed (MBBS, MBA, MIS, ITIL), Global Director – Imaging Information Systems, Agfa HealthCare

The field of medical imaging has witnessed a revolution thanks to the digital transformation initiatives and availability of advanced clinical applications. New imaging techniques are helping radiologists, cardiologists, oncologists, and other diagnosticians with greater anatomical and clinical details, highlighting the need for fast access to imaging reports, collaborative workflows and Augmented Intelligence.

Augmented Intelligence is the intersection of machine learning and advanced AI applications, where clinical knowledge and medical data converge on a single platform. The potential benefits of Augmented Intelligence are realized when it is used in the context of workflows and systems that healthcare practitioners operate and interact with, and amplifies human intelligence.

Agfa HealthCare's approach of building an ecosystem of Augmented Intelligence powered by machine learning, cognitive reasoning and task-based rules engine on its flagship Enterprise Imaging platform will help enable delivery of innovative solutions.

Enterprise Imaging is key to enabling intelligent workflows

While radiology has been leading from the front when it comes to digital transformation with transition from film to PACS, this transition in other medical imaging specialties has been slow, or followed a standards-based approach.

Even within radiology, the challenge of enabling collaborative workflows between oncologists and radiologists, or within cardiology between invasive and non-invasive workflows remained unaddressed with departmental PACS solutions.

Agfa HealthCare's thought leadership in the field of medical imaging is well recognized and we envision following factors to consider when it comes to enabling intelligent workflows in medicine:

- Helping reduce care variance
- Leveraging clinical data for learning and decision making
- Task-based workflow optimization
- Role of medical imaging in helping improve speed and quality of care
- Facilitating early adoption of AI and smart technology for care providers

Step 1: Remove departmental imaging silos and consolidate Imaging Health Records

What did we learn from EMRs? (Electronic Medical Records)

With EMRs, care organizations were successful in consolidating patient centered medical record data. However, a consolidated imaging health record gap still remained unaddressed, because images remained in their own vertical silos.

Keeping in mind the recent advancements in medical imaging, and as radiology moves out of the traditional basement to operating rooms, to the point of care and even patient's home thanks to smart applications and devices, the traditional departmental PACS approach has created not only clinical collaboration challenges, but Information Technology infrastructure and integration issues as well.

"For our medical school, we're building a data repository for all clinical data that we call a "data lake". The idea is that all of the clinical data will sit in the data lake in a de-identified fashion, available for research and to feed into our machine learning projects."

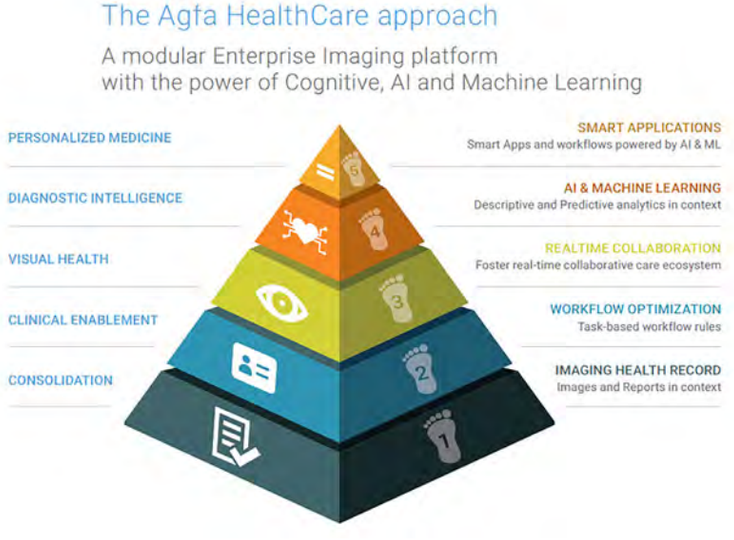
Dr Max Rosen

Chair of the Department of Radiology

UMass Memorial Medical Center, USA

Step 2: Task-based Workflow Optimization

AI will not replace radiologists or other physicians, but in fact enhance and streamline their workflow even further by empowering them in their ecosystem, and help them make intelligent decisions. As technology advances further and diagnostic capabilities improve,



so does the impact on how caregivers provide care, demanding more access to diagnosticians in a fast and efficient manner.

Radiologists will be at the forefront when it comes to helping deliver quality care, with diagnostic reports and peer collaboration. Enterprise Imaging, powered by AI, will help improve radiology tasks even further with task-based workflow optimization.

Our respondents emphasized the need for exploring capabilities of machine learning and AI in addressing certain mistakes and errors that could alert radiographers and radiologists, and automate certain non-essential tasks to ease workload.

"We should free our experts to undertake expert work by removing as many non-essential tasks for them as possible."
Angie Craig
Assistant Director of Operations and Performance
Leeds Teaching Hospitals Trust, NHS UK

Step 3: Enable Multi-disciplinary visual collaboration

Technology should enable cross-departmental real-time communication and specialist collaboration, to help improve care-pathways. Agfa HealthCare's modern Enterprise Imaging platform not only removes traditional barriers to medical imaging, but also enables multispecialty care team collaboration. Clinicians engaged in academic research will realize more benefits with an Enterprise Imaging solution that helps foster collaborative engagement between clinical and research teams.

Step 4: Disseminate Diagnostic Intelligence with AI

As we breakdown silos of imaging workflows and enable multidisciplinary consolidation and collaboration, the power of a consolidated platform results in creation of a vast data lake, ready for analysis by radiologists, diagnosticians, researchers and academics to help improve quality of care by better understanding disease and population health data.

This helps care organizations progress

from Descriptive to Predictive Analytics models to improve early detection of diseases, and introduce care plan models that help enforce and improve patient engagement and compliance.

"One still needs fully trained diagnostician to verify AI. Medicine and Radiology is still (at least partially) an art."
Dr Heshan Panditaratne
Consultant Radiologist
Calderdale and Huddersfield NHS Foundation Trust, UK

"In my group, we've already demonstrated that an AI system for chest x-ray triaging and prioritization can lead to much faster reporting turn around time. We've also shown potential diagnostic benefits in early detection of lung cancer."
Giovanni Montana
Professor of Data Science
University of Warwick, UK

Step 5: Personalized Medicine and Smart Applications

Care organizations and health authorities across the globe are faced with pressing population health challenges. Whether it comes to detecting cancers, or chronic diseases, Machine Learning and Advanced Analytics will help improve radiologists and diagnosticians focus less on manual repetitive tasks, and more on improving care pathways.

"I think one of the biggest contributions deep learning / artificial intelligence will realistically make to me as a radiologist in the near future is not directly helping with image interpretation, but in bringing the relevant information out of the clinical information system (CIS) / electronic medical record (EMR) and presenting it to me in a meaningful way to better inform my clinical judgment. Incorporating this directly into the report will be how we can really add value as radiologists using deep learning. It not only will streamline my workflow but also be a major step towards more personalized medicine in radiology.

"This definitely will help the patient directly but also better inform their clinician about tailored options for their precise care as personalized medicine expands. The image "pre-screening" will be in select areas and grow over time. Where it leads and how quick it gets there is obviously the big question."
Dr. Bill Anderson
Zone Medical Director Diagnostic Imaging
Alberta Health Services Edmonton Zone, Canada

Let's Talk

As Agfa HealthCare celebrates 150 years of innovation in the field of imaging, join us for a dialogue and allow us to provide you, the Thought Leaders, a hands-on learning experience. We encourage you to reach out to us at Arab Health 2018, to discuss your imaging workflow challenges, and how we may help you transition towards our Next Gen Enterprise Imaging solution powered by Augmented Intelligence.

Visit us @ Arab Health 2018, booth # S1C20, Sheikh Saeed Hall 1.
For more information, please visit www.global.agfahealthcare.com

IN THE KNOW

Mayo Clinic Ranked No. 1 Hospital in the United States

Article provided by Mayo Clinic

Mayo Clinic was again named the best hospital in the United States in *U.S. News & World Report's* annual list of top hospitals. Mayo Clinic was also ranked the No.1 hospital in Arizona, Florida and Minnesota.

Mayo Clinic has ranked at or near the top of "Honor Roll" hospitals throughout the history of *U.S. News & World Report*'s Best Hospitals rankings.

'Breadth of excellence'

Mayo Clinic is part of a select group on the *U.S. News* Honor Roll recognized for "breadth of excellence," according to the magazine. The Honor Roll consists of 20 hospitals with the highest combined overall scores in 16 medical and surgical specialties. Hospitals are measured for various factors, including safety, survival, patient services and reputation with other specialists.

Mayo Clinic is No. 1 overall in the magazine's annual Honor Roll ranking of its 2017-18 Best Hospitals list. Mayo Clinic also ranked No. 1 in six specialties:

- Diabetes and endocrinology
- Gastroenterology (GI) and GI surgery
- Geriatrics
- Gynecology
- Nephrology
- Neurology and neurosurgery

Mayo Clinic ranked No. 2 in four specialties: cardiology and heart surgery, orthopedics, pulmonology and urology.

Mayo Clinic ranked No. 3 in cancer and No. 4 in ear, nose and throat.

Mayo Clinic has more No. 1 rankings than any other provider based on factors such as reputation, mortality index, patient safety, nurse staffing and magnet status, patient services, and technology. Mayo Clinic staff work to deliver the highest standards of care and transform scientific discoveries into critical advances for unmet patient needs.

Consistently top ranked

"Mayo Clinic is consistently top ranked more often than any other hospital because of the thousands of people here who shared a vision," says John Noseworthy, M.D., president and CEO, Mayo Clinic. "Our physicians, scientists, researchers, educators and allied health staff bring their expertise to focus on the individual needs of each patient."

More than 1.3 million patients from around the world seek Mayo Clinic's expertise each year. Mayo Clinic's physicians are salaried to eliminate any financial pressure from patient care decisions.

More than 150 years of quality

Mayo Clinic's commitment to quality dates back more than 150 years to when the Mayo brothers invented the team-based approach to medicine – an approach that is continually evolving. Mayo Clinic's experts work across specialties to provide comprehensive and coordinated care for patients with the most serious and complex conditions.

This *U.S. News & World Report* honor follows a recent Mayo Clinic report, Remarkable Moments of Sharing, which provides insight into what makes a top hospital and highlights Mayo's effect on the economy, health system and patients.

"Our patients tell us that the Mayo Clinic experience is unparalleled, offering answers quickly and giving them confidence and hope," Dr Noseworthy says. "Our unwavering focus on the patient is the bedrock on which Mayo Clinic is built."

Many outside agencies rate quality in healthcare. Mayo Clinic is the only healthcare organization that consistently ranks among the top providers in the U.S. regardless of the quality measure used.

This is the 28th year that *U.S. News & World Report* conducted a rankings list, which encompasses 16 medical specialties. *U.S. News & World Report* analyzed data for 4,500 medical centers to determine the rankings.

MORE INFO

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IN THE KNOW

The revolution in 3D imaging

New Ziehm Vision RFD 3D CMOSline helps to improve surgical outcomes and patient satisfaction

Article provided by Ziehm

The mobile 3D C-arm helps to improve surgical outcomes and patient satisfaction while optimizing costs. Building on more than 10 years of experience in 3D imaging, the Ziehm Vision RFD 3D features cutting-edge CMOS technology, bundling 2D and 3D functionality for greater intraoperative control, reducing the need for postoperative CT scans, and costly corrective surgeries. This mobile C-arm is thus ideal for high-end orthopedic, trauma and spinal interventions as well as for highly specialized maxillofacial and cochlear procedures, for instance.

CT-like image quality

The Ziehm Vision RFD 3D is the only mobile 3D C-arm with a flat-panel detector now also featuring the latest CMOS technology for imaging excellence. The enhanced imaging chain enhances resolution with crystal clear visualizations of the finest anatomical structures, complemented by SmartScan functionality for the complete imaging information in real time. The powerful 25 kW C-arm propels today's surgeon to the forefront of intraoperative 3D imaging.

Extended intraoperative imaging capabilities

The Ziehm Vision RFD 3D offers unprecedented performance across the most varied and challenging application spectrum. This versatile device combines 2D excellence with advanced 3D technology, delivering high-end multidisciplinary capabilities for hybrid room applications and specialized procedures such as cochlear and maxillofacial. Precise information from every angle during the procedure helps to avoid unnecessary postoperative CT scans and corrective surgery.

Image-guided surgery and workflow wizards

Designed to help surgeons meet their quality demands quickly and efficiently, the Ziehm Vision RFD 3D redefines daily clinical OR routines with image-guided surgery and workflow wizards. The Ziehm Vision RFD 3D builds confidence by enhancing intraoperative control and by pulling the postoperative CT scan forward to the OR. This translates into better patient outcomes and unprecedented usability for massive efficiency gains.

Benchmark dose settings and hardware improvements

The Ziehm Vision RFD 3D is designed to meet growing demand among surgeons and their staff for minimized dose exposure without compromising on image quality. Revolutionary dose settings and enhanced SmartDose features cut exposure during 3D imaging significantly. The Ziehm Vision RFD 3D thus improves quality of care for patients, staff and surgeons.

Different volume sizes for the ideal resolution

The Ziehm Vision RFD 3D CMOSline1 offers the freedom to choose from a range of 3D volume sizes to meet diverse needs in clinical routine. In addition to the standard volume of 16 cm x 16 cm x 16 cm, the system now also provides two further volume sizes for specialized applications.

A dedicated larger field of view with 19.8 cm x 19.6 cm x 18.0 cm (axial x sagittal x coronal) covers larger anatomical regions and delivers more structure for procedures such as pelvis urgery with 512^3 voxel. The higher number of voxels in all volume sizes guarantees a better resolution without increasing dose levels from those used with the convenient 320^3 voxel.

Further, with an edge length of 10 cm x 10 cm x 10 cm, the mobile 3D C-arm provides a suitable option for Zoom-In or intraoperative imaging in cochlear implantation.

CMOSline systems

The new Ziehm Vision RFD 3D is part of the new Ziehm Imaging CMOSline. This leading-edge product line is aimed at professionals who are not content with the ordinary and who strive for the exceptional. CMOSline premium systems offer a Ziehm Imaging CMOS detector and the groundbreaking Beam Filtration2 technology. This combination allows for excellent image quality with a lower dose.

[1]CMOSline represents a system configuration that is based on a Ziehm Imaging CMOS flat-panel detector.

[2]The technology Beam Filtration reduces dose exposure for all CMOSline systems in comparison to conventional filtration techniques (Status before September 2017). Data on File. Results may vary.

For more information, please visit www.ziehm.com

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IN THE KNOW

Ultrasound guided regional anesthesia increases efficiency and patient outcome

The newly formed strategic alliance combines B. Braun's leadership in regional anesthesia and Philips' leadership in image guided therapy solutions with the aim to make regional anesthesia and vascular access easier to perform, leading to enhanced patient care and hospital efficiency.

Article provided by B. Braun

B. Braun Melsungen AG, the global leader in regional anesthesia and pain management, and Royal Philips, a global leader in ultrasound and image guided therapy solutions, have announced a multi-year strategic alliance to innovate ultrasound-guided regional anesthesia – a rapidly growing alternative to general anesthesia and vascular access. Leveraging the companies' combined deep clinical expertise and R&D capabilities, as well as sales and service channels, B. Braun and Philips are jointly developing and commercializing solutions to support anesthesiologists and hospitals in critical areas of regional anesthesia. These solutions are intended to enhance needle visualization and guidance, as well as optimize procedure workflow and resource planning. The alliance will also focus on vascular access procedures, such as those used to insert catheters into deeply seated veins as part of a catheter-based treatment.

Benefits for hospitals and patients

Regional anesthesia involves the injection of an anesthetic in the proximity of a nerve, targeting areas of a patient's body that are subject to surgical intervention. Regional anesthesia can have significant advantages over general anesthesia for both patients and hospitals. Patients undergoing regional anesthesia typically benefit from reduced opioid consumption and fewer side-effects, such as nausea. Moreover, regional anesthesia may lead to faster post-surgical recovery, allowing patients to ambulate or leave the hospital sooner, which benefits both patients and hospitals. Therefore, it is not surprising that the global demand of mobile ultrasound systems is strongly increasing.

As a platform for these innovations, B. Braun and Philips have presented the new Xperius ultrasound system, which will be available as a cart and ultra-mobile tablet version. Based on the input of clinical experts, Xperius was specifically designed to support the needs in regional anesthesia at the point of care. The system offers an intuitive user interface and exceptional image quality for confident needle targeting and positioning, as well as ergonomic features such as the articulating arm. Xperius complements B. Braun´s innovative offering in the field of ultrasound guided regional anesthesia which includes the newly launched peripheral nerve block portfolio comprising Stimuplex® and Contiplex® Ultra 360®. It has also been specifically designed to support future innovations for needle visualization and guidance.

The two companies will offer education, training, service and support that will enable anesthesiologists and healthcare providers to extract maximum benefit from the system. "Our customers are looking for fully integrated system solutions that address all aspects of their everyday work in caring for patients, including the enhanced efficiency needed to meet ever increasing demand for their services," said Dr Meinrad Lugan, Member of the Board for the Hospital Care Division at B. Braun. "This new alliance with Philips illustrates our commitment to sharing expertise, not only with our customers, but also with other key technology players, to meet healthcare needs and challenges faced today and into the future."

Xperius Ultrasound system

- Intuitive UI with touch screen
- Enhanced ergonomy: Articulating arm
- Easy to maneuver stationary unit as well as tablet version n Enhanced needle visibility while using B. Braun's echogenic needles

For more information, please visit www.xperius-bbraun.com

Xperius is the new mobile ultrasound system specifically designed as the platform to support current and future integrated solutions in ultrasound-guided regional anesthesia

Dr. Schumacher GmbH: Convenience is the key

Article provided by Dr. Schumacher GmbH

Dr. Schumacher GmbH is going to present its new concept for simplicity in disinfection and hygiene at ARAB HEALTH from 29 January – 1 February 2018, and AEEDC from 6 – 8 February 2018. Customers will have the chance to learn more at Dubai International Convention and Exhibition Centre.

Dr. Schumacher, the hygiene expert, chose to focus on the user's perspective when developing this concept. The practical orientation system enables end users to carry out hygiene and disinfection procedures in a safe and economical way, while bringing transparency into the disinfectants' products range.

The result:
The Dr. Schumacher Hygiene Levels PREVENT :: PRESERVE :: PROTECT®.

All PREVENT level products are designed to create a safe environment for patients, staff and visitors in areas like public corridors and waiting rooms. Preventative disinfection measures can inhibit the spread of pathogens.

The PRESERVE area concerns outpatient or inpatient treatment scenarios in which the risk of infection increases due to a variety of influences. The goal is to ensure hygiene at the point of care.

In critical areas of medical facilities as well as in outbreak situations, the focus of hygiene is on maximum effectiveness. The aim of PROTECT measures and products is to protect health and prevent further impairment of already weakened persons in high-risk areas such as isolation and intensive care units.

The products for the hygiene levels PREVENT, PRESERVE and PROTECT are color-coded to make the application as safe and easy as possible. Users know intuitively which measures and products have to be used in the respective use case.

According to Managing Director Michael Aupke, "We´ve listened very carefully to our customers and realised what the market desperately needs: to be safe. Convenience is the key – the new hygiene levels provide the framework for efficient and user-friendly hygiene. Or as we say: Safety made simple."

About Dr. Schumacher

For 40 years Dr. Schumacher GmbH has been an internationally recognised specialist for the development and production of disinfection, hygiene and care systems in all medical areas. Employing nearly 1,500 people in eight countries, the family owned German company headquartered in Malsfeld/Hesse is producing disinfection and cleaning products for skin, hands, instruments and surfaces. Dr. Schumacher is one of the largest manufacturers of wet and dry wipe systems in Europe, with its own production of soft cloth systems and wet wipes. A distribution network in about 70 countries emphasises the international scope of the hygiene specialist.

For more information, please visit
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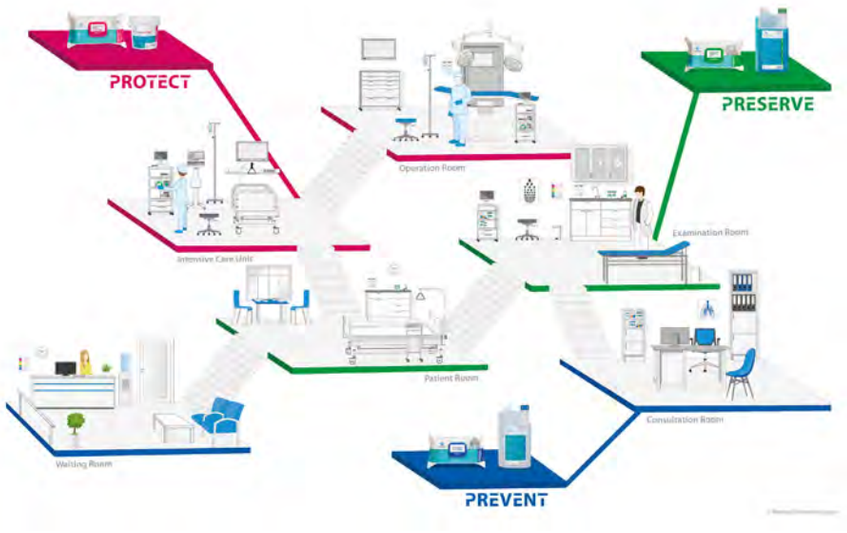


IN THE KNOW

Professional medication dispensing for challenging numbers of patients in Chinese outpatient hospital pharmacies

Article provided by Willach Pharmacy Solutions

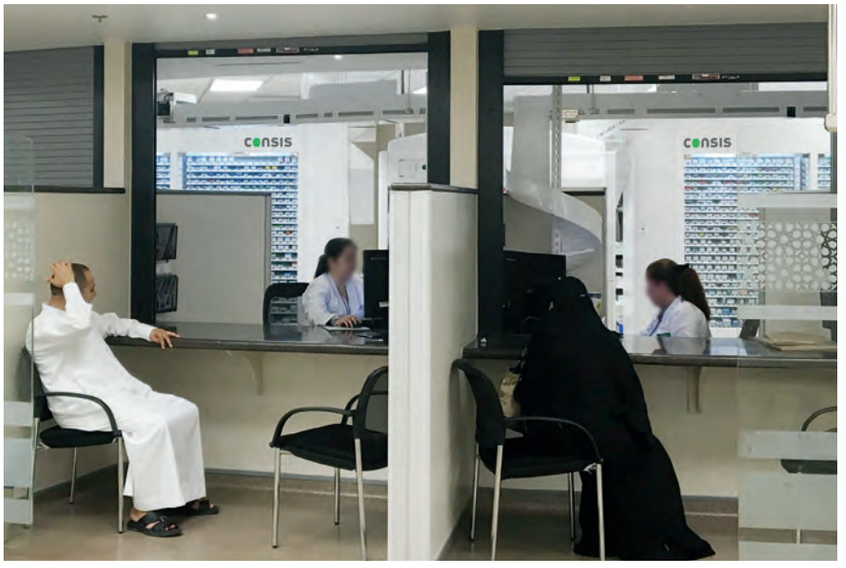
With a population of more than 1.1 billion people, China is one of the world's largest healthcare markets. The Chinese government is trying to optimise the quality of healthcare services, but dealing with the sheer numbers of medicine items dispensed each day is already a massive challenge.

It is common practice for patients to come to hospitals to consult doctors as they would in health centres, and to receive their prescriptions for immediate collection in the outpatient hospital pharmacies. This is especially true of patients with chronic diseases who come from the countryside to collect a three-month supply of three or four different types of medicines. In total, an outpatient hospital pharmacy dispenses up to 50,000 medicine packages per day. Furthermore, it's hard to find enough qualified staff at an affordable cost. Preparing and checking thousands of prescriptions tires staff and increases the risks of the wrong medication being dispensed.

Pharmacy automation is the only way to address all of these issues: it is tireless and reduces dispensing errors; it can process larger volumes of packages more quickly; and it frees up pharmacists' time for all areas of patient consultation and care.

To dispense up to 50,000 packages a day, automation technology needs to split into parallel systems. Up to six robots supply more than twelve dispensing counters. The dispensing burden on each robot may be more than 8,000 packages per day, with multiple packages per prescription. So, the only fast and reliable principle capable of doing this over prolonged periods of time is parallel ejection from several storage channels. The channel principle allows very compact storage and lines up the same drugs in an inclined channel, releasing them by ejection mechanisms. Gravity then pulls the packages onto conveyor belts for transport to the exit points. The bottleneck for each automation is the loading speed. The advantage of channel storage is that the manipulators for automated loading can carry up to ten packages at once, almost completely refilling a channel in a single motion. This means reloading speeds of up to 1,200 packages/hour become possible.

The set-up described above can, of course, be scaled accordingly (e.g. only one or two robots for smaller pharmacies) without losing system efficiency and serves as a raw model of automating for other high-volume markets, such as the Middle East.



Automatic dispensing with CONSIS robots from Willach Pharmacy Solutions (Germany) to consultation areas in Saudi Arabia.

The CONSIS.H robot from Willach. It can dispense and reload more than 8,000 packages per day.

Automatic dispensing with CONSIS robots from Willach in a Chinese outpatient hospital pharmacy.

About Willach Pharmacy Solutions

Willach provides high-quality products and develops extremely efficient solutions for the storage and dispensing of medicine packages and medical consumables in public pharmacies, hospital pharmacies, hospital wards and medical care centres.

For more information, please visit www.willach-pharmacy-solutions.com

NEXOR.Suite® Planning Guide for Critical Areas in Hospitals

Article provided by NEXOR Medical

NEXOR Medical Germany, a specialist in hospital engineering and medical devices, has launched its Planning Guide as a tool to support all stakeholders involved in hospital projects.

The Guide offers guidance, highlighting critical aspects in architectural design, hospital engineering and pre-fabricated/ modular solutions mainly for OR-Blocks, ICUs and other clean-rooms in healthcare. Beside basic planning concepts, existing standards are explained and the most frequently asked questions are addressed.

At NEXOR Medical we are convinced that successful Hospital Projects require an integrated view of all relevant areas of expertise involved, from design to execution.

Currently NEXOR Medical is executing among others 6 projects/132 OR´s for All Indian Institute of Medical Sciences in Bhopal, Raipur, Patna, Jodhpur, Rohtak and Jabalpur in cooperation with its local partner in India.

During Arab Health Exhibition you can get your personal copy of the planning guide and talk to our experts at booth no. Z3.J10, alternatively you can apply for your personal copy at info@nexormedical.com

For more information on the company and its services, please visit www.nexormedical.com

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Are You Ready To Be The Unexpected Hero?

ZOLL's Virtual Rescue

IN THE KNOW

Article provided by ZOLL

In 2002, ZOLL® launched the AED Plus® defibrillator with real-time CPR feedback through Real CPR Help®. For the first time, rescuers received feedback for high-quality CPR. Today more than half a million AED plus automated external defibrillators (AEDs) are providing medics and lay rescuers everywhere with the best support when treating victims of cardiac arrest.

The new ZOLL AED 3™ takes our Real CPR Help® technology to the next level with enhancements that can help further support the delivery of high-quality CPR. It delivers unmatched support for rescuers together with low total cost of ownership.

CPR required

The current guidelines of resuscitation councils throughout the world are clear: Successful defibrillation must be supported by high-quality CPR. But what is high-quality CPR? The Guidelines call for chest compressions at a rate of 100 to 120 per minute at a depth of 5 to 6 centimeters.

So how can rescuers tell if they are in compliance? The importance of early, uninterrupted chest compressions is emphasized throughout the Guidelines. Rescuers should not have to guess. They need certainty, and that certainty may well give them the power to save a life.

Like all of ZOLL's defibrillators, the ZOLL AED 3 is equipped with Real CPR Help to let rescuers know, in real-time, when they are in compliance with the Guidelines.

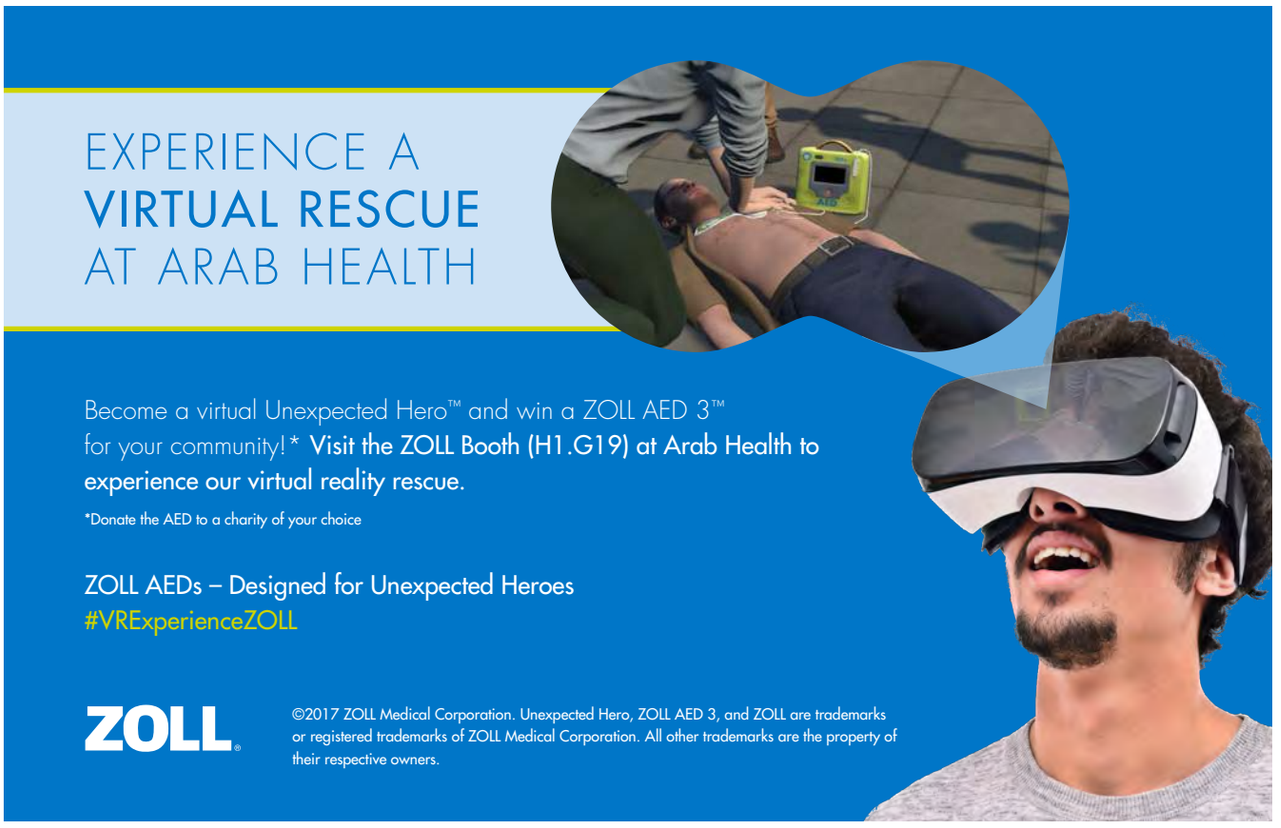
Performing CPR in Virtual Reality

ZOLL has developed a CPR training application in Virtual Reality – this allows users to experience the power of Real CPR Help with our new ZOLL AED 3 in an exciting, virtual world.

Stop by our booth in Hall H, stand G19 and become an "Unexpected Hero" in ZOLL's virtual rescue with our fully immersive VR experience at our booth. Or experience ZOLL's Real CPR Help through one of our VR telephone Apps which will be available for download at our booth.

Come and take the Virtual Rescue at Arab Health Exhibition held from 29 Jan -1 Feb 2018 at the Dubai International Convention and Exhibition Centre, UAE.

ZOLL Medical is located in Hall H1 Stand G19. For more information please visit www.zoll.com



IN THE KNOW

Dubai Health Authority Implements Masimo Patient SafetyNet™

Article provided by Masimo

Masimo has announced that the Dubai Health Authority (DHA), the government organization that oversees the healthcare systems of Dubai, is augmenting its current inventory of Masimo equipment and technology with the implementation of Masimo Patient SafetyNet™*, a supplemental remote monitoring and clinician notification system, at two hospitals in Dubai.

Masimo Patient SafetyNet enables information from bedside monitors, such as Masimo Root® with the Radical-7® or wearable Radius-7® Pulse CO-Oximeter®, to be accessible from a central viewing station. When changes occur in measured values, which may indicate deterioration in a patient's condition, Patient SafetyNet automatically sends wireless alerts directly to clinicians, wherever they may be. In addition, Patient SafetyNet can automate the transfer of patient data, including admission data, vital signs, early warning scores (EWS), and other physiological parameters, directly to hospital electronic medical record (EMR) systems, helping to improve clinician workflows and reduce the possibility of transcription errors.

Dr Andreas Taenzer and colleagues found in an 11-month study conducted at Dartmouth-Hitchcock Medical Center that using Patient SafetyNet and Masimo SET® pulse oximetry as part of a comprehensive alarm management strategy reduced rescue events by 65% and intensive care unit transfers by 48%, and as a result, reduced costs by $1,480,000.[1,2] In a subsequent article, they announced that after five years, Dartmouth-Hitchcock had had zero preventable deaths or instances of brain damage due to opioids since the installation of Patient SafetyNet.[2] In 2016, after ten years, they reported achieving a 50% reduction in unplanned ICU transfers and a 60% reduction in rescue events, despite increases in patient acuity and occupancy.[3]

The two Dubai Health Authority medical centers implementing Patient SafetyNet are Dubai Hospital (625 beds), which provides general medical and surgical care, and Latifa Hospital (367 beds), which specializes in maternal and child care. Dubai Hospital installed its first Patient SafetyNet in 2013. Latifa Hospital is in the process of installing four systems, with a further system planned for Dubai Hospital. "We are excited to deepen our partnership with Masimo," said Humaid Al Qatami, Chairman of the Board and Director General of Dubai Health Authority. "The Dubai Health Authority's mission is to develop an integrated and sustainable healthcare system that ensures our comprehensive services achieve the highest international standards, and we believe that Masimo's monitoring devices, now even more connected to hospital infrastructure through the power of Patient SafetyNet, will help us meet that goal."

"Patient SafetyNet, in conjunction with Masimo SET® pulse oximetry, enables continuous supplemental monitoring of active patients in post-surgical wards and can help save the lives of patients on opioids, among many other benefits," said Joe Kiani, Founder and CEO of Masimo. "We applaud the Dubai Health Authority, dedicated to providing no less than the best healthcare in the world, for recognizing the importance of implementing such a proven and powerful centralized monitoring and patient surveillance system."

*The use of the trademark Patient SafetyNet is under license from University HealthSystem Consortium.

References

1. Taenzer AH et al. Impact of Pulse Oximetry Surveillance on Rescue Events and Intensive Care Unit Transfers: A Before-and-After Concurrence Study. Anesthesiology. 2010 Feb;112(2):282-7.

2. Taenzer AH et al. Postoperative Monitoring - The Dartmouth Experience. Anesthesia Patient Safety Foundation Newsletter Spring-Summer 2012. Available online.

3. McGrath SP et al. Surveillance Monitoring Management for General Care Units: Strategy, Design, and Implementation. The Joint Commission Journal on Quality and Patient Safety. 2016 Jul;42(7):293-302.

ORi has not received FDA 510(k) clearance and is not available for sale in the United States.

For more information, please visit www.masimo.co.uk

IN THE KNOW

FUJIFILM
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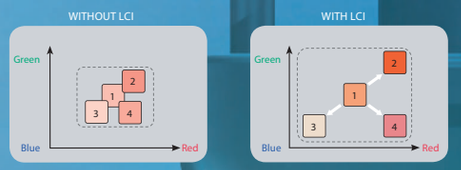
ELUXEO™

WITH 4-LED MULTI LIGHT™ TECHNOLOGY

NEW OBSERVATION MODE LINKED COLOUR IMAGING

LCI

OPTIMAL VISUALISATION FOR **DETECTION** OF LESIONS AND INFLAMMATION



NEW OBSERVATION MODE BLUE LIGHT IMAGING

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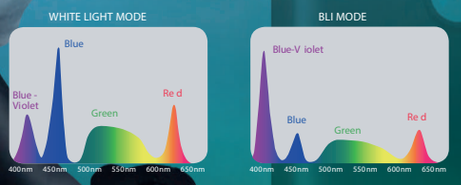
HIGH-INTENSITY CONTRAST IMAGING FOR ACCURATE **CHARACTERISATION**



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Multi Light™ technology

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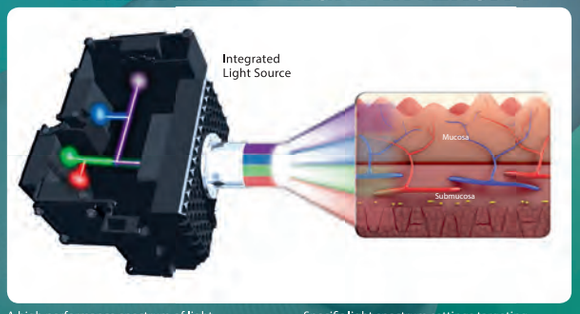
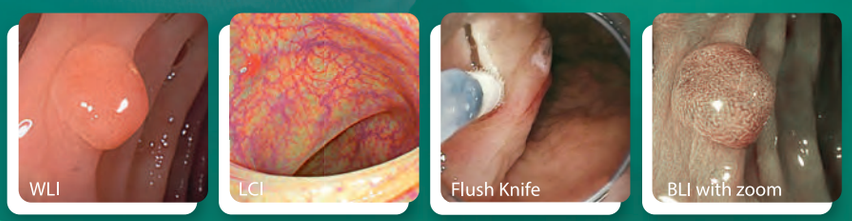


A high performance spectrum of light is generated from a powerful light source with four individual LED light bulbs.

Specific light spectrum settings targeting the mucosal layers result in improved contrast and higher definition of imaging.



This drawing is for illustration only and not a complete representation.

Trim: 274mm(h) x 220mm(w) Type maximum: 259mm(h) x 205mm(w) Bleed: 280mm(h) x 226mm(w)

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