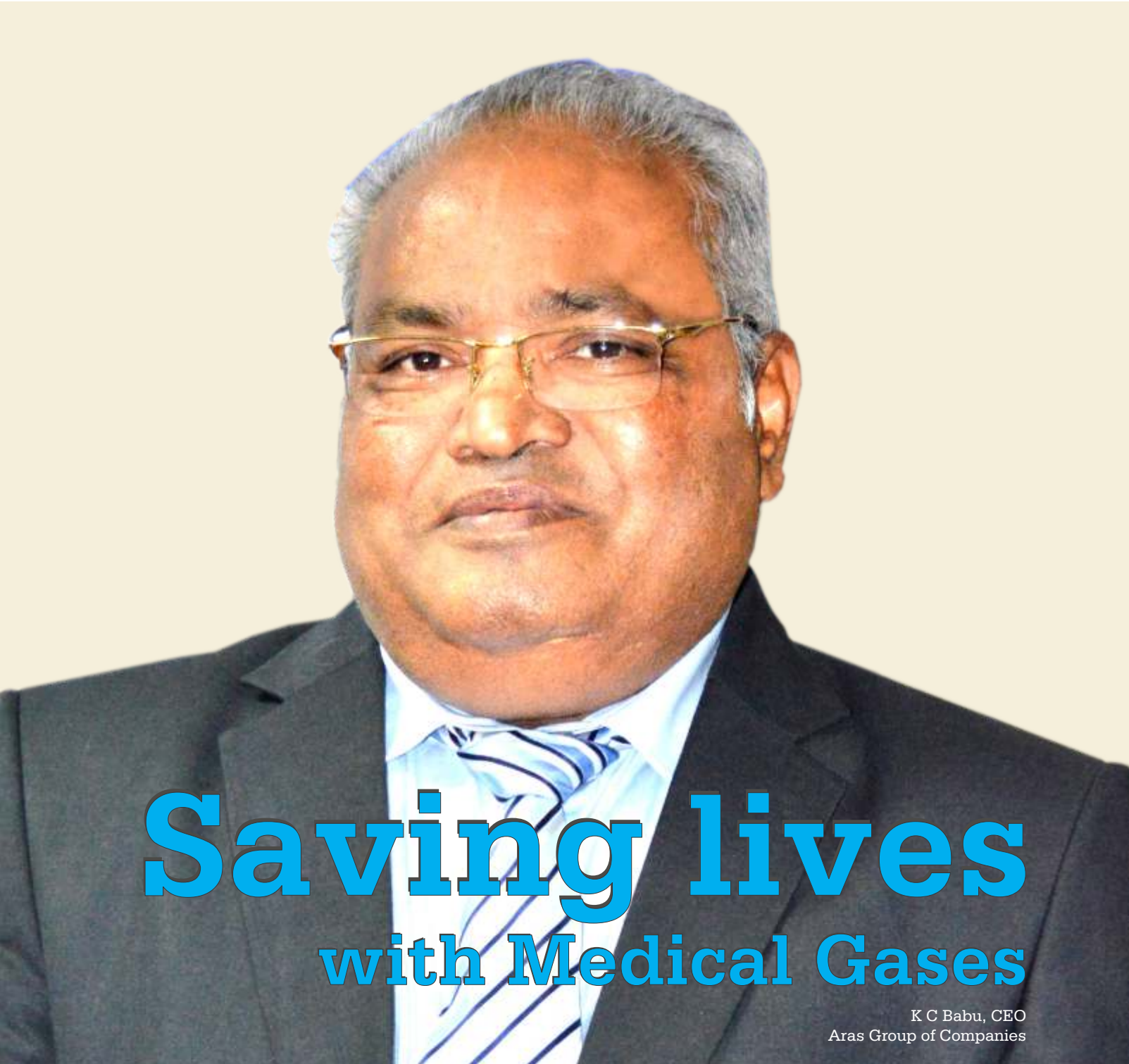




Vol. 01 Issue 02 March-April 2017

# MEDIWORLD

Middle East



## Saving lives with Medical Gases

K C Babu, CEO  
Aras Group of Companies

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Transforming the way we  
look at healthcare

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Kidney surgery using  
3D printing performed first  
time in MENA

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Arab Health  
The region's largest healthcare  
trade show

- Design • Supply • Supervision • Installation • Training
- Third Party Inspection • Testing & Commissioning
- Operation & Maintenance



# Aras Group

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- Authorized person MGPS design installation & maint. (HTM-02)
- Authorized person General New Hospital Engineers & Supervisors
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Middle East, Africa and Asia & Beyond

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## Editor's Note

### 'Arab Health' brings top industry professionals under one roof

The region's largest gathering of healthcare and trade professionals, the Arab Health Exhibition & Congress, recently took place in Dubai. Just like in previous years but of course on a bigger scale, the event unmistakably offered business development, training and learning opportunities for those in the sector working both in the region and beyond. MediWorld ME team was also on the ground talking to local and international company executives to find out more about the latest developments, innovations, new product launches and more and share the latest updates with our readers.

According to the organizers, the 42nd edition featured an additional 400 exhibitors, with 4,400 companies showcasing their latest innovations to over 100,000 attendees from over 70 countries. In addition, the new Hands-on-Training (HoT) sessions were introduced, which allowed over 900 physicians, surgeons and technicians to learn and practice new techniques. The participants were given a chance to learn more about state-of-the-art equipment for specialized treatments in areas such as cardiology, neurology, surgery, gastroenterology, urology, oncology and radiology.

As we bring more news on Arab Health in this edition including MEDLAB Exhibition & Congress, which spanned over six exhibition halls as a standalone event, and accommodated more than 700 international exhibitors, we also feature interesting topics such as robotics and its role in healthcare sector. Furthermore, medical technology is under focus with an insightful article by Philips. Our health & wellness destination this edition is Singapore. This small island nation is at the forefront of providing the best of medical services to both its citizens and residents as well as international patients. And finally, but as the first story, our cover story explores the world of medical gases that we normally do not pay much attention in a healthcare facility but which actually requires a lot of background planning, design and work by experienced professionals.

In line with the vision of the leaders, Dubai aims to be central to all future projects including those in healthcare, and we will continue to cover the the latest news and developments in the sector and invite you to join us in our journey in creating the ultimate industry platform.

Sincerely,

**Editor, MediWorld ME**

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Saving lives with Medical Gases



**10-Feature**  
Robotics-  
Transforming the way we look  
at healthcare

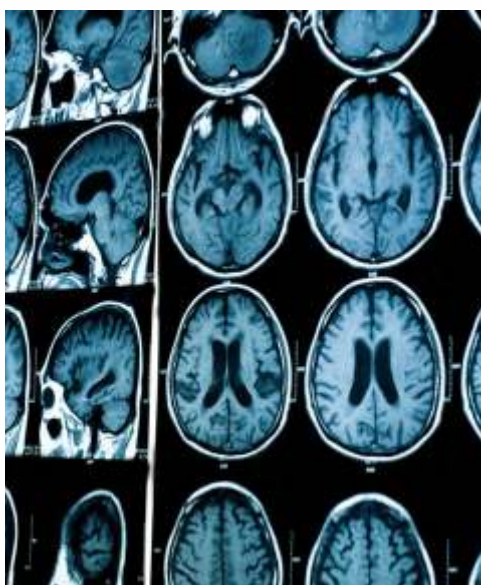
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# Saving lives with Medical Gases



Incorrectly installed medical gas systems that fail to comply with local and international standards could result in loss of lives and that is where the utmost importance of correct installation of medical gas systems in healthcare facilities come to the fore. MediWorld ME has met with Aras Group of Companies - one of the leaders involved in the design, supply, supervision, installation, testing & commissioning of as well as training in medical gas systems.

#### What is a medical gas?

A medical gas can be defined as any gaseous substance that meets medical purity standards and has application in a medical environment such as oxygen, nitrous oxide, nitrogen, medical air, surgical air and carbon dioxide. As an example, oxygen and respiratory therapy gases help patients breathe. But, there is more to tackle in the application of medical gases in a complex health environment.

In the past, the US media reported about two women who died during diagnostic procedures because of a medical gas cross connection - the patients received lethal doses of nitrous oxide instead of oxygen. In Australia, a baby boy died and a newborn girl suffered brain damage at a hospital just because they were also administered nitrous oxide instead of oxygen even though the medical gas systems may have been installed by well-reputed or qualified technicians.

**K C Babu**  
CEO, Aras Group of Companies



The tragedies took place due to lack of training or inspection by qualified third parties, which may sometimes be neglected. However, such tragedies are likely to happen at any healthcare facility in any country but incidents like these that may result in loss of lives can actually be prevented.

#### Design & installation of gas systems

Being an innovative company backed by a highly experienced medical gas systems team, Aras Group of Companies continues to offer best-in-class medical gas system education and services. The group's services include Design, Supply, Supervision, Installation, Testing & Commissioning, Operation & Maintenance of medical gas systems and turning the products over to their clients with warranty. Also handling operation, maintenance and training in medical gas systems, the group has been serving the medical gas needs of many healthcare facilities throughout the UAE, the United States and India for over three decades.

MediWorld ME has recently met with Mr K C Babu, CEO of the group to find out more about the services they offer with regards to the group's expertise in medical gas systems. Mr Babu's team has successfully completed many government and private sector projects in medical gas engineering systems, air and vacuum plant, laboratory gas engineering systems along with the supply of complete range of biomedical equipment from Europe, UK and the USA.

"Established back in 1976, we used to focus on the supply of oxygen, which has many applications across a variety of sectors. In time, we shifted our focus to the medical sector and added other main types of medical gases such as helium, nitrous oxide, carbon dioxide, etc. to our portfolio. Naturally, we provide the services of design, installation and maintenance of these medical gas systems in healthcare facilities," Mr Babu explained who is specialized in industrial LNG (Liquid Natural Gas), medical & laboratory gas engineering with 41 years of experience in oil & gas projects, hospitals, universities and QC laboratories.

"Precision is a key word in medical gases," the CEO remarked. "We need to be very careful with the selection of the brand and quality of the medical equipment because the patient's life is at risk. The precise air flow measurement, purity levels of the gases, required air pressure in that specific situation, volume remaining in the cylinders, and possible contamination in the pipelines, etc are all major concerns for those handling medical gas systems in a healthcare facility. Thus, all these variables should be under our control."

There are different standards in different parts of the world when it comes to medical gas systems. The USA follows its own standards as Europe dictates its own rules. In the Middle East, there is no single set of standards and Mr Babu underlined that the manufacturers of the medical gas systems and other



#### DO YOU KNOW?

- Installing the correct gas piping system can cut the costs by 40 per cent
- Vacuum pumps and compressors have over 70 applications in about 97 industries
- Good medical equipment can last up to 100 years

#### Medical-grade gases are used as or in:

- A therapy, in which the gas is prescribed as an anaesthetic, drug delivery agent, or remedy for an occurring illness
- An atmosphere in environments in which air composition must be regulated
- A pneumatic power source for surgical and dental tool
- An analytical agent, to calibrate medical devices or to diagnose a patient by exposing cultures or a biopsy to the gas and examining the reaction
- Production of pharmaceutical merchandise and medicines
- Pipelines serve as a convenient and economical method for the distribution of medical gases throughout a healthcare facility by reducing the number of gas cylinders required. Medical gas pipelines:
  - help maintain the cleanliness of the facility;
  - Simplify gas delivery;
  - Decrease the cost of the gas;
  - Help reduce personnel injuries due to the movement of heavy gas tanks

related equipment such as compressors have not taken the hot and humid climate of the region into consideration.

"When I talk to the experts in the USA, UK or other parts of Europe, they find it hard to believe that temperatures here can reach above 50 degrees in the height of summer. The equipment are generally suitable for use in the climates of their own respective countries and may not function as desired in the extreme climatic conditions here considering the heat, dust and moisture in the air."

#### Issue of contamination

Talking on the importance of selecting the right personnel to handle the installation of medical gas systems in healthcare facilities, the CEO explained how careful they need to be with the wellbeing as well as medical history of their employees.

"When someone applies for a resident visa in any



Medical gas supply systems in hospitals, and most other healthcare facilities, are essential for supplying piped oxygen, nitrous oxide, nitrogen/surgical air, carbon dioxide, oxygen/nitrous oxide 50/50, medical vacuum, anaesthetic gas scavenge/waste anesthetic gas disposal and medical air to various parts of the facility. Source equipment systems are monitored by central/source alarm systems.



country, he or she is required to take a medical test to prove that he or she is free from communicable diseases. This is for the welfare of everyone in that place. How about the employee who is handling the pipes and installing them at a hospital for patients that are most vulnerable to all types of infections? For example, if the technician is suffering from flu at that time, the disease can easily be transported to the patients via the pipelines. In my investigation and experience in the field throughout the years, there is no set standard to check the wellbeing of the technicians and this has to be tackled on a priority basis."

Carbon monoxide deposits and impurities in the pipelines could also be counted as other types of contamination in medical gas systems. This contamination can easily lead to infections with patients who are actually in the hospital for treatment and not to be infected with another disease.

"In addition, proper installation of pipes throughout the healthcare facility is of utmost importance. There is no tolerance for any amount leakage at any joint and the whole piping system should be regularly checked by trained personnel for any signs of leakage. Any possible leakage is not only a health concern for all the people in that facility but also a danger to the health of the patient," Mr Babu added.

#### **Best of training courses**

Aras Group of Companies is also into medical gas training, which is in great demand in the UAE and beyond. To be able to provide the best of training courses right here in the UAE, a long-lasting partnership with a UK-based company, Eastwood Park, has been established. Thus, Aras Eastwood Park was set up as a gas safety training company delivering specialist medical gas training. This formally marked the partnership that has been developed over several years, combining the skills and knowledge of two world leading experts, both well-established and highly

regarded within medical equipment supply and education and training, imparting quality engineers training courses.

New medical gas training courses are being delivered in Dubai, UAE, at the company's extensively equipped medical gas training facility, developed by medical gas portfolio manager and trainer Michael Ell. The full portfolio of healthcare support services training:

- Decontamination & Infection Control
- Dental Equipment
- Medical Gases
- Medical Equipment
- Lift Safety & Servicing
- Heating, Ventilation, Air Conditioning & Steam
- Water Hygiene
- Fire Safety
- Health & Safety
- Electrical
- Estates & Facilities Management

In the UK, Eastwood Park Training is the leading technical training provider for healthcare engineering, decontamination and estates and facilities management. Among its large and varied training portfolio are medical gas courses to suit a variety of healthcare roles that come into contact with medical gases: Competent and Authorized Persons, Quality Controllers, Nurses, Porters and Designated Nursing Officers. These courses include a mix of theory and practical elements applicable to specific roles.

"We offer the best of technical training in our facilities here as safety is of utmost importance especially with different types of gases found in a healthcare facility. Starting with the design, layout and installation of gas pipes, we teach how to safely handle and administer various types of medical gases. This includes even the handling and transportation of gas cylinders as they are highly pressurised and any mishandling of the cylinders may lead to undesirable consequences," Mr Babu said.

#### **Sound project management**

To cater to the growing needs of the market, The company operates other divisions although the medical engineering division is the core of their business with a sound project management infrastructure. With over three decades of experience, Aras Medical Devices & Equipments Co LLC offers a complete engineering solution for Medical/Laboratory Gas Engineering Pipeline System (MGPS/LGPS) in the UAE and beyond.

According to the CEO, approved by the UAE Ministry of Interior, Ministry of Health & Ministry of Public Works, ARAS Medical Devices and Equipments Co is an ISO 9001:2015 and ISO 13485: 2003 registered company supplying Central Piped Medical & Laboratory Gas Systems adhering to NFPA, HTM, EN, BCGA, other local and international standards.

And finally, the Industrial Engineering Division supplies with industrial products like vacuum pumps and systems, compressors, compressed air products, gear motors, frequency converters, electronic sensors, proximity switches, pneumatic systems, pneumatic valves, solenoid valves and controls, compressor replacement parts, vacuum pumps and blowers. The division is also the exclusive agents for Stenhoj compressors (Denmark) Worthington compressors (Belgium), GSR Ventiltechnik GmbH (Germany) for process control valves, Walker Filtration Ltd. (UK) for compressed air filtration products.





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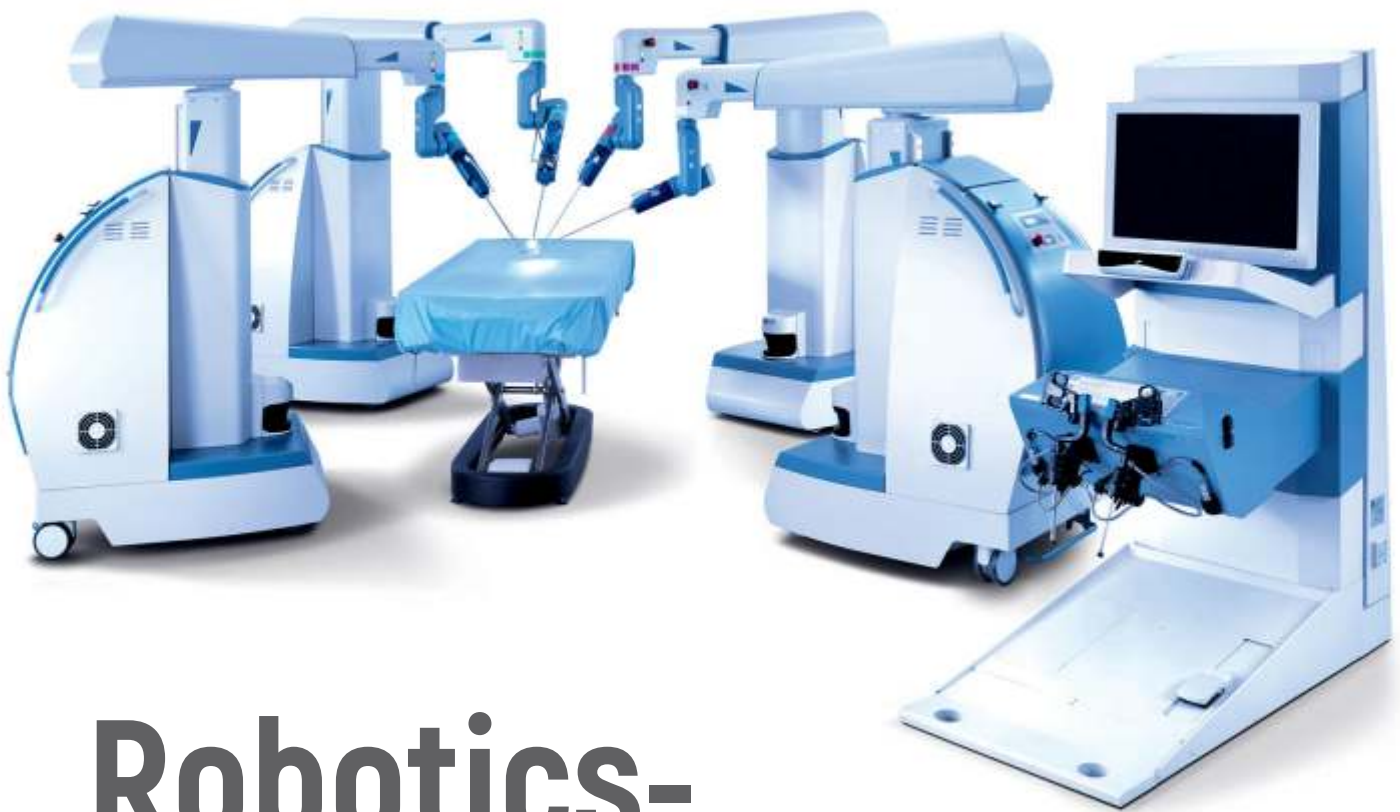
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# Robotics-

## Transforming the way we look at healthcare

Robotic surgery is an advanced form of minimally invasive or laparoscopic surgery where surgeons use a computer-controlled robot to assist them in certain surgical procedures. Arabian Millennium Medical Trading (AMMT) discusses more about 'Senhance Surgical Robotic System'.

**T**he topic of Robotics is actually nothing new to the healthcare industry. In fact, they have come a long way since. Due to this we are now experiencing and witnessing the effects of healthcare digitization in the industry. Medical robots can perform various medical tasks that has the potential to relieve strain on many healthcare systems by automating tasks and freeing up healthcare staff. They can also be used as a stand-ins for doctors and nurses for various types of medical care.

The usage of robotics in the healthcare is rapidly growing and the global medical robots market is expected to reach \$11.4 billion by 2020 at a CAGR of 22.2 per cent, experts remark. The sources also forecast that The Gynaecology Robotic Surgery Market is expected to rise at 10.07 per cent CAGR during the period of 2016-2020.

### Healthcare Transformation

During Arab Health 2017, recently held on January 29th and February 1st, MediWorld Middle East caught up with Mr Muwafaq Matari, CEO of Arabian Millennium Medical Trading (AMMT) to discuss

about Senhance Surgical Robotic System which the company presented during the event.

"Robots are about precision. In surgery, the human hand is limited as to the amount of precision possible, the use of robots greatly improves the surgeon's precision by reducing normal tremor and providing a stable platform to operate with," Mr Matari explained.

According to the CEO of AMMT, the Robotics have transformed the way we look at the healthcare

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“Robots are about precision. In surgery, the human hand is limited as to the amount of precision possible, the use of robots greatly improves the surgeon's precision by reducing normal tremor and providing a stable platform to operate with.” - Muwafaq Matari, CEO of Arabian Millennium Medical Trading (AMMT)

system offers the precision and ergonomics of robotics with the added benefits of sensing a surgeon's vision to seamlessly control the camera. The multi-port robotic system brings the benefits of robotic surgery to patients while enabling surgeons with innovative technology such as haptic feedback and eye sensing camera control. Senhance Robotics is broadly used in general surgery, gynaecology, urology and thoracic surgery.

“The Senhance Robot is the first in the world to provide the surgeon with tactile feedback, so that the surgeon can actually feel inside the patient. The system also allows the surgeon, to control the camera inside the patient with his eyes. This is important for safety and enhances surgical outcome.

“Moreover the cost of Senhance surgery is similar to regular laparoscopic surgery and thus makes the benefits of Robotic Surgery accessible to all patients,” Mr Matari added.

#### **Ergonomics of robotic surgery**

The interest in the ergonomics of robotic surgery has become more important following the introduction of minimal access surgical instruments and systems. Factors affecting efficiency of surgery include access, vision, manoeuvrability and the ease of using instruments.

Robotic surgery is an advanced form of minimally



invasive or laparoscopic surgery where surgeons use a computer-controlled robot to assist them in certain surgical procedures, allowing surgeons to perform complex surgical tasks through tiny incisions using robotic technology. Surgical robots are self-powered, computer-controlled devices that can be programmed to aid in the positioning and manipulation of surgical instruments, thus, providing surgeons with better accuracy, flexibility and control.

industry and the near future will only witness an increased usage of robotics in this sector.

“In line with the UAE vision 2021 to achieve world-class healthcare and the vision of our wise leadership to ensure happiness for all. AMMT is committed to bring the latest advanced technology in the Middle East to ensure the best of healthcare services”.

AMMT recently unveiled a first of its kind surgical robotic system, aimed to transform healthcare. The

invasive or laparoscopic surgery where surgeons use a computer-controlled robot to assist them in certain surgical procedures, allowing surgeons to perform complex surgical tasks through tiny incisions using robotic technology. Surgical robots are self-powered, computer-controlled devices that can be programmed to aid in the positioning and manipulation of surgical instruments, thus, providing surgeons with better accuracy, flexibility and control.

Another important advantage is the restoration of proper hand-eye coordination and an ergonomic position. These robotic systems eliminate the fulcrum effect, making instrument manipulation more intuitive. With the surgeon sitting at a remote, ergonomically designed workstation, current systems also eliminate the need to twist and turn in awkward positions to move the instruments and visualize the monitor.

"In a lot of surgeries, the surgeon is standing in an uncomfortable and tiring position for many hours. In

The Robotics have transformed the way we look at the healthcare industry and the near future will only witness an increased usage of robotics in this ever growing sector

"During a normal surgery, the surgeon has to rely on someone else to control the camera, which can cause miscommunication, instability of the picture on the



Senhance Robotic Surgery, the surgeon is sitting down in a very comfortable and ergonomic position, which reduces fatigue, and enhances surgical precision,

Robotic surgery is an advanced form of minimally invasive or laparoscopic surgery where surgeons use a computer-controlled robot to assist them in certain surgical procedures, allowing surgeons to perform complex surgical tasks through tiny incisions using robotic technology.

patient safety, and ultimately surgical outcome. The surgeon is seated comfortably in a correct ergonomic position, with relaxed shoulders, straight back, with hands in a comfortable position".

#### **Seamless camera controlling**

The enhanced vision with 3-dimensional view with depth perception is a marked improvement over the conventional laparoscopic camera views. Also to one's advantage is the surgeon's ability to directly control a stable visual field with increased magnification and maneuverability. All of this creates images with increased resolution that, combined with the increased degrees of freedom and enhanced dexterity, greatly enhances the surgeon's ability to identify and dissect anatomic structures as well as to construct microanastomoses.

screen and extend the time needed for surgery. The Senhance Robotic system is the only system in the World which allows the surgeon to control the instruments and the camera at the same time by using an eye sensing technology, where the camera follows the surgeon's eyes."

#### **Less pain and scarring**

The robotic 'hands' have a high degree of dexterity, allowing surgeons the ability to operate in very tight spaces in the body that would otherwise only be accessible through open (long incision) surgery. Compared to open surgery (traditional surgery with incisions), robotic and minimally invasive surgery results in smaller incisions resulting in less pain and scarring.

Furthermore, technological innovation in health care is an important driver of cost growth. Doctors and patients often embrace new modes of treatment before their merits and weaknesses are fully understood. These technologies can lead to revenue growth, either because they are simply more expensive than previous treatments or because their introduction leads to an expansion in the types and numbers of patients treated.

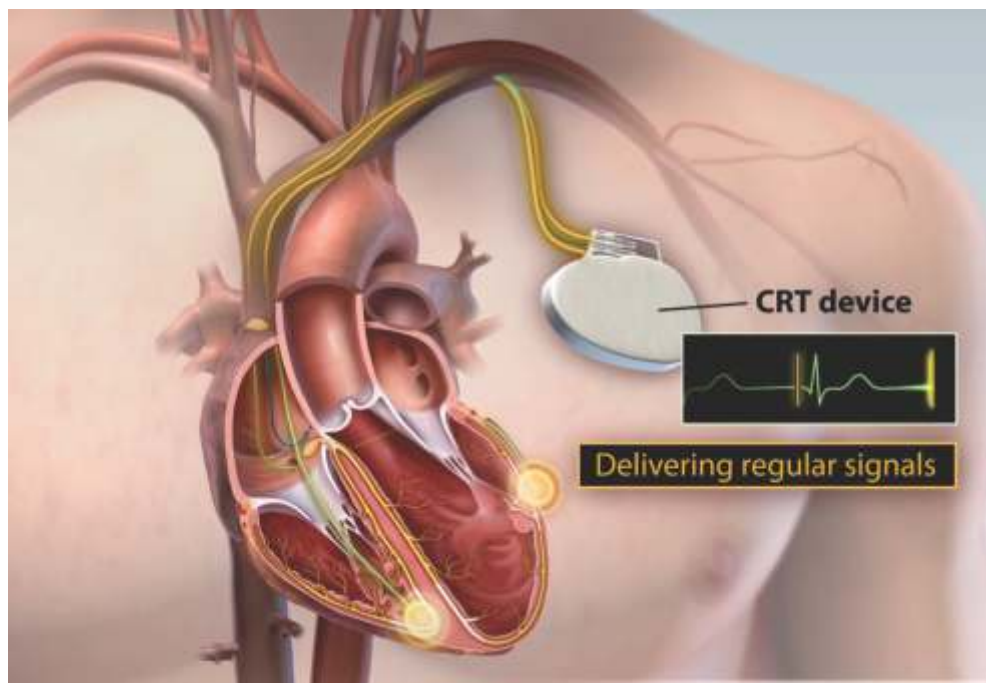
"Senhance Robotics provide responsible economics to the hospital by reducing the actual cost of the robotic surgery to the same level as today's current costs, while providing all the advantages of Robotic Surgery. An Improved 3D HD vision enhances the surgeon's visibility during surgery, and potentially improves the patient's outcome," concluded Mr Matari.





# New analysis of reverse trial shows Medtronic CRT devices cost-effective

CRT is an established treatment for indicated patients with heart failure that has been demonstrated to improve survival and quality of life, and reduce hospitalizations. However, despite significant clinical evidence and guideline recommendations in support of CRT, studies have shown the therapy to be underutilized in eligible patients.



Medtronic plc announced an economic analysis of five-year data showing that patients with mild heart failure who get cardiac resynchronization therapy (CRT) devices early in their treatment live longer and that implanting these devices is cost-effective, compared to optimal medical therapy. Results from the REVERSE (REsynchronization reVERses Remodeling in Systolic left vEntricular dysfunction) trial were published in the Journal of the American College of Cardiology: Heart Failure.

CRT is an established treatment for indicated patients with heart failure that has been demonstrated to improve survival and quality of life, and reduce hospitalizations. However, despite significant clinical evidence and guideline recommendations in support of CRT, studies have shown the therapy to be underutilized in eligible patients.

REVERSE is the largest study to assess the long-term clinical impact and survival benefit of devices combining CRT with a defibrillator compared with CRT pacemakers. It is also the first study to show the cost-effectiveness of CRT when implanted earlier in the disease state.

"These new data expand upon the current evidence and guidelines for the treatment of heart failure, by showing that CRT in patients with mildly symptomatic heart failure is beneficial, both from a clinical perspective, as well as from a financial perspective," said Michael R. Gold, M.D., Ph.D., chief of cardiology, Michael E Assey Professor of Medicine at the Medical University of South Carolina. "REVERSE confirms that implanting CRT earlier slows the progression of heart failure, reduces heart failure-related hospitalizations and deaths, and prolongs life, all while being very cost-effective."

REVERSE was a prospective, randomized, double-blind study of 610 patients with mild heart failure (those designated New York Heart Association Class I/II) from North America and Europe. All patients were implanted with a CRT-pacemaker (CRT-P) or -defibrillator (CRT-D) and randomly assigned (2:1) to either CRT-ON or CRT-OFF.

Previously published REVERSE findings

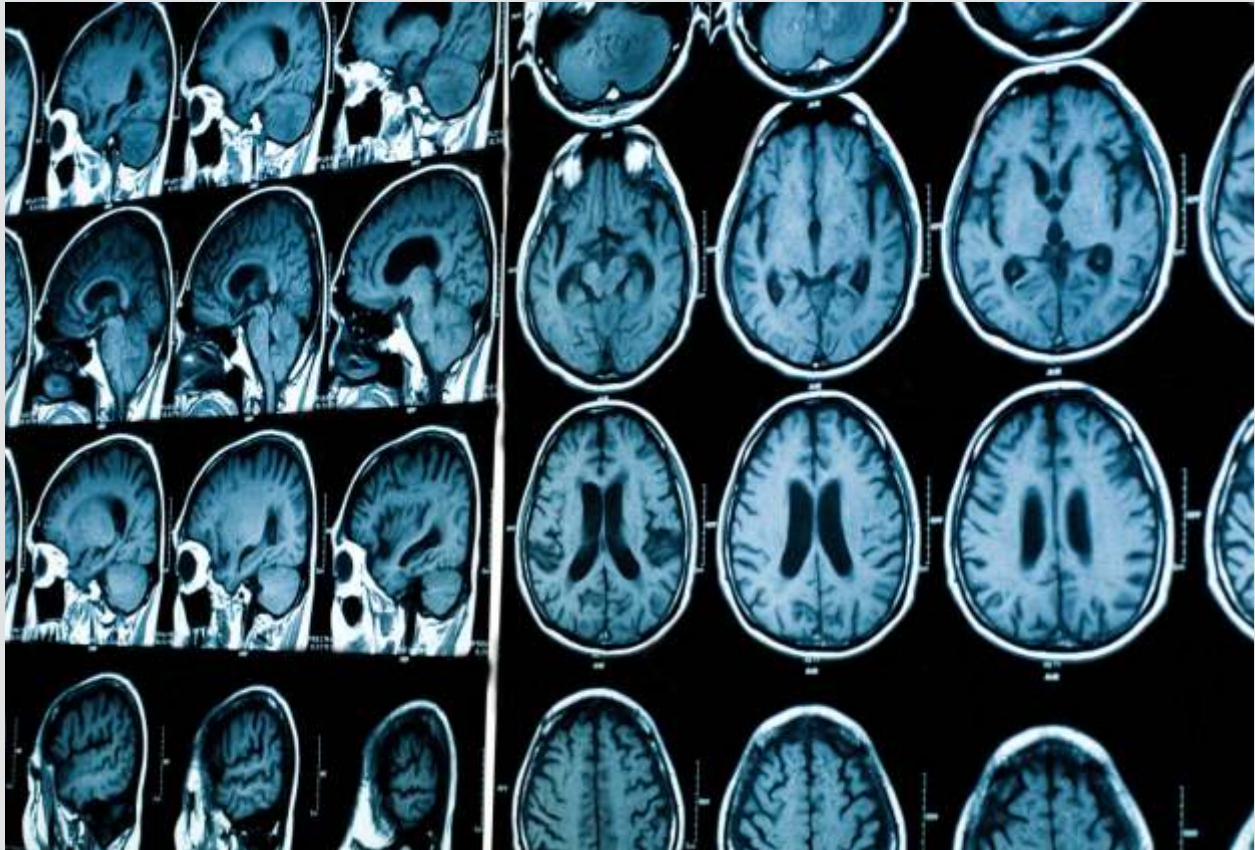
showed a trend that CRT-ON increased survival by nearly 23 percent (52.5 percent vs. 29.7 percent,  $p=0.21$ ), leading to an expected survival rate of 9.76 years for CRT-ON versus 7.5 years for CRT-OFF<sup>2</sup>.

Based on these findings, the new analysis shows - for the first time under the Medicare setting - that CRT is a cost-effective option for patients with mild heart failure: CRT-ON yields an incremental cost effectiveness ratio (ICER) of \$8,840 per Quality-Adjusted Life Year (QALY) gained over a patient's lifetime, compared to CRT-OFF. (ICER is a statistic that summarizes the cost-effectiveness of a healthcare intervention, and QALY is a measure of the quantity and quality of life.)

Additionally, REVERSE has shown that CRT-D provides a significant improvement in survival - 2.77 additional years of life - compared to CRT-P devices. This benefit results in a first-of-its-kind finding that CRT-D is a cost-effective alternative to CRT-P, yielding an ICER of \$43,678/QALY gained over the patient's lifetime, lower than the benchmark for therapy cost effectiveness of other serious chronic conditions that cost at least \$50,000 per QALY gained. Thus, while CRT-D costs more than CRT-P, the added 2.77 years of life justify the additional cost over a patient's lifetime.

Finally, these analyses show CRT delays disease progression, which means that initially implanting a CRT-D is essentially cost-neutral compared to implanting an ICD and implanting a CRT-D later, when the disease worsens. With early CRT-D implantation slowing disease progress and increasing survival, and without any discounting of future benefits and cost applied, early CRT-D led to 1.24 years of additional survival, resulting in an ICER of \$1,829 per year of life gained.





# Philips' MR-based technology explores new territories in neurology

The new suite of neuro-diagnostic applications provides physicians with a comprehensive portfolio of tools delivering visibility into neurological anatomies and multi-dimensional data to enable diagnostic decision support

**T**he technology and the market impact of emerging and existing MRI systems have a huge growth potential in medical imaging for several years to come. Closed MRI systems lead the market due to its high clinical value delivered by the systems.

The MRI global market for systems reached \$5.8 billion in 2015. The market should reach nearly \$6.1 billion and \$8.0 billion in 2016 and 2021 respectively, rising at a compound annual growth rate (CAGR) OF 5.7 per cent from 2016 to 2021, according to Research and Markets' Medical Magnetic Resonance Imaging (MRI):

Technologies and Global Market report.

MediWorld ME spoke with Eric Jean, SVP and GM, MRI at Philips regarding their new launch of advanced MR-based software applications for assessment of neurological disorders.

According to the World Health Organization, neurological disorders are the leading global burden of disease (economic and health impact), and as an aging population grows, the identification and treatment of these disorders becomes a critical priority in population health management.



Eric Jean, SVP and GM, MRI, Philips

“The suite of neuro-diagnostic applications will be available on the full Philips' family of MRI systems, starting with our Ingenia systems, utilizing Philips' dStream digital broadband architecture technology to provide high quality images at remarkable speed. The suite of neuro-diagnostic applications will also be seamlessly integrated into the latest version of the Philips IntelliSpace Portal.” - Eric Jean, SVP and GM, MRI at Philips

#### (MR)-based software applications

Last year Philips introduced a suite of magnetic resonance (MR)-based software applications dedicated to neurology – providing radiologists with the necessary tools to resolve complex health questions and explore new territories in neurology.

“The suite of neuro-diagnostic applications will be available on the full Philips' family of MRI systems, starting with our Ingenia systems, utilizing Philips' dStream digital broadband architecture technology to provide high quality images at remarkable speed. The suite of neuro-diagnostic applications will also be seamlessly integrated into the latest version of the Philips IntelliSpace Portal,” remarked Mr Jean.

#### Next-generation technology

Advanced diagnostics are a critical part of the treatment protocol for neurological disorders. With its 3D imaging of soft tissue, Magnetic Resonance Imaging (MRI) can produce a wealth of structural and physiological information of the brain. It has therefore become a standard in neuroimaging, with 65 per cent of neurologists leveraging MR technology over alternative methods. However, 70 per cent of physicians often face challenges with their existing neuro-diagnostic tools, which lack effective imaging and visualization techniques.

Philips' new suite of neuro-diagnostic applications provides physicians with a comprehensive portfolio of tools designed with the patient in mind, delivering visibility into neurological anatomies and multi-dimensional data to enable diagnostic decision support.

“Next-generation imaging technologies need to provide physicians with a comprehensive portfolio of modalities and applications designed with the patient in mind. The goal is to deliver visibility into all relevant anatomies and multi-dimensional data to enable diagnostic decision support, using the most appropriate modality or set of modalities, helping to improve the patient care experience and ultimately, outcome,” the SVP and GM, MRI at Philips added.

“Major innovations in the field of neuro-imaging center around access to the right tools, enabling radiologists to assess the complex nuances in each case while offering the patient personalized, efficient care with a more comfortable experience”.

#### Unique features

- **Black Blood Imaging** – Boosts diagnostic confidence for radiologists by providing a high resolution 3D brain image with reduction of the blood signal, resulting in higher image quality and giving radiologists deeper insights.
- **4D-TRANCE** – Provides contrast-free dynamic (4D) imaging of the brain vascular anatomy. 4D TRANCE is a non-contrast technique promoting patient comfort and enabling radiologists to evaluate both the vascular anatomy and blood flow dynamics.
- **MultiBand SENSE** – Allows simultaneous acquisition of multiple slices in the brain, enabling accelerated neuro-functional scans (BOLD fMRI or diffusion) at high speed and high resolution. This feature provides radiologists the option to increase coverage or resolution without increasing scan time.

#### 'Future ready' platform

Digital MRI not only greatly improves the speed and quality of images produced, but is also the 'future ready' platform where speed and quantitative multi-parametric data will become increasingly important.

According to Mr Jean, “MR is an imaging standard and by incorporating the digital benefits with the soft



tissue imaging capabilities of an MRI system, provides a clearer view to the radiologist, helping them identify and characterize the issue. The digital architecture, with its unique channel independent benefit, also provides a future proof platform that allows our customers to remain on the latest technology at greatly reduced costs, compared to analogue systems”.

#### Exploring new territories

The new suite of Neuro applications provides improved tools to help resolve complex Neuro questions. Where possible, the suite also provides patient-friendly contrast-free solutions. And finally, the suite opens up new territories in neuro, enabling easier and faster exploration of brain connectivity why is required to address complex diseases such as mental disorder.

MRI is the modality of choice for Brain and Spine imaging, because of its exquisite soft-tissue contrast, allowing for instance grey and white matter differentiation, but also detection of soft tissue tumors or vascular anomalies and perfusion defects.

“MRI can deliver 3D sub-millimetric resolution, only takes a few minutes of scan time and can probe into macro-cellular phenome thanks to a MR unique diffusion contrast capability. The Philips Neuro suite builds on these strengths to enable a new nerve specific contrast, more specific soft tissue contrast by making blood fully black, or by speeding up diffusion acquisition by up to a factor four,” he underlined.

#### Personalized care

Several of the techniques included in the neuro suite rely on an industry unique technology: e.g. the black blood technology, the nerve specific contrast, or the ability to review easily follows up studies from multi-parametric data.

Mr Jean added, “This suite of applications is designed specifically for the needs of neuro-radiologists, providing them with tools and analytics to support the growing amount of people with neurological disorders. Designed with the patient experience in mind, the applications enable physicians to conduct fast scans to provide personalized care. This suite includes tools that will open up new territories in neurology, by accelerating neuro-functional MRI to new levels, enabling exploration of complex conditions such as mental disorders”.

The new Neuro suite delivers the richest set of Neuro clinical applications in the industry. The combination allows robust, fast, and advanced diagnostic capabilities for high diagnostic accuracy.

“Patients experience is also a key focus of Philips MR. We introduced new capabilities to our In-Bore solutions reducing the patient anxiety throughout the exam, while actively engaging the patients in their exam, leading to improved compliance”.

The MRI global market for systems reached \$5.8 billion in 2015. The market should reach nearly \$6.1 billion and \$8.0 billion in 2016 and 2021 respectively, rising at a compound annual growth rate (CAGR) OF 5.7 per cent from 2016 to 2021, according to Research and Markets' report.

#### Adoption in the UAE

Neuro MRI represents 65-70 percent of MR procedures overall, and advanced MRI is expected to have a growing impact in neuro imaging in the coming five years.

“We believe that radiologists will need to embrace this transformation in order to remain competitive in an ever fast moving healthcare environment, and Philips is committed to help customers around the world, specifically in UAE, to be successful moving forward,” Mr Jean concluded.

The overarching imaging technology requirement is to 'do more with less' through a 'first time right' approach that enables an efficient and definitive decision making process. Today, radiologists are moving from the traditional transactional role in disease detection, localization, staging, planning and treatment assessment, to becoming a part of each longitudinal patient journey.

Based on insight from global customers, Philips believes the follow areas will be priorities for the future of imaging technology:

- Leveraging Actionable Information from Data-Driven Insights
- Enhances and Transforms Workflow
- Imaging's Role in Precision Medicine



# Delivering a Lifetime of Wellness

The dedicated team of Universal Hospital firmly believes in 'compassionate care' for all patients



Cardiac Disease, Trauma and Cancer are the three leading causes of death in the UAE says Dr. Shabbeer Nellikode, DM (Neurology), DCN, MD, Managing Director, Universal Hospitals in conversation with *MediWorld ME*.

**Universal Hospital has traversed a long way from starting 2013 to one of the most reputed Multi-Specialty Medical Centre in the region can you throw some light on this illustrious journey?**

Dr. Shabbeer Nellikode after finishing his DM neurology in India was fortunate to train in UK's largest Neurology Hospital in England after which he started Universal Hospital in 2013. This flagship 17 storey tower hospital has now 35 stories of pure healthcare. With 6 State of the art operating theaters, A full floor of advanced Radio diagnostic Equipment including a 1.5 Tesla MRI, A 126 Slice CT Scanner, Digital Mammogram, DEXA Machine, an advanced Clinical and Microbiology Lab, we run 70 outpatient clinics seeing an average of 2000 patients a day. The 20 Bed ICU, 14 bed NICU and 10 bed PICU further improve our reach on seeing complicated and seriously ill patients.

Our core strength has been recruiting physicians with good clinical skills and ability to work harder than the average lot. They are dedicated towards their patients and our hospital alike. This creates a lot of synergies, cross references and hence very few missed diagnosis and slipped treatments.





The whole physician body is actively engaged in teaching nurses and staff alike on the latest principles of healthcare. This also strengthens the staff medical knowledge. All of this is supported by a team of active Guest and Public Relation personnel who take care of the patients as a part of the family.

**How did Standard Operating Procedures in the UAE change over the years? What can you say on the evolution of healthcare sector in the country?**

The UAE healthcare sector is a 95 percent Insurance governed market where providing Healthcare comes under strict outcome and revenue review. This has made the market tough for average providers. It has made it good for us because we stand out in the competition because of our clinical results and transparent business practices. The Operating Procedures of our hospital are controlled by strict JCIA accredited policies and fall within the framework of worldwide best practices.

**What sets you apart from other Multi-Specialty Medical Centre providers in UAE?**

What sets us apart from most Muti-Speciality providers is the commitment, sincerity and compliance of the physicians, the reliability of our clinical evidence based practices and the satisfaction score of our patients.

The equipment at our hospital is not only latest but of the best standard. As a JCIA and SKEA certified hospital the results and Clinical Outcomes define us.

**What all services does your center provide? What are some of the peculiar ailments in this region and how equipped are you to treat them?**

Cardiac Disease, Trauma and Cancer are the three

leading causes of death in the UAE. Our hospital is geared up to provide care in each one of them. We have a 24X7 Emergency staffed with a dedicated Trauma OT. Our Cardiothoracic Department has four Interventional Cardiologists backed up with a Cardiovascular Surgery Team. Our Surgical specialties range from Onco-Surgery, Pediatric Surgery, ENT Surgery all the way to Advanced Ophthalmic Surgeries. We have one of the city's Largest Obstetric Department with Ten



Obstetricians and deliver complicated deliveries with a stand by ten bed Level III NICU. Our Dermatology Department has the most advanced laser and skin resurfacing equipment where we do everything from Medical to Advanced Cosmetic Dermatology.

**Can you throw some light on your expansion plans?**

The plans are afoot to set step in each of the Emirates with both feeder clinics and Tertiary Hospitals. Growth by Acquisition, Growth through green field projects are both on the roll. Our recent acquisition of Al Ain Cromwell Hospital (a Primarily Maternity Hospital) into Universal Hospital brand basket is just an example. We are not only adding more specialized departments to the facility but we are expanding its bed capacity too.



# SINGAPORE

## A natural 'gateway' to healthcare in Asia

Ranking among the best in healthcare services, the 'Lion City' boasts an established & strong track record in scientific and clinical excellence leveraging its base of public-sector research institutes and global industry partners

**K**nown as the 'Lion City', Singapore ranks at the 4th position in best healthcare infrastructure (World Competitiveness Yearbook 2010, MD) and is the world's 3rd lowest in infant mortality and 7th highest in life expectancy (WEF Global Competitiveness Report 2009-2010), while spending less than 4 per cent of GDP on healthcare and providing universal coverage with multiple layers of care. The standard of medical practice ranks among the best in the world. The Joint Commission International (JCI) has accredited 11 hospitals and three medical centres in Singapore.

### Healthcare system

Singapore's healthcare system is split into six regional healthcare systems, anchored by a regional hospital working with a variety of Primary, Intermediate and Long-term care sector and support services to deliver patient-centric care.

The healthcare clusters - Alexandra Health Pte Ltd (anchored by Khoo Teck Puat Hospital in the North), Eastern Health Alliance (anchored by Changi General Hospital in the East), National Healthcare Group





(anchored by Tan Tock Seng Hospital in the central region), National University Health System (anchored by National University Hospital), Jurong Health (anchored by the upcoming Jurong General Hospital in the west) and SingHealth (anchored by the Singapore General Hospital) – have also been set up to drive the movement towards integrated care.

The Agency for Integrated Care (AIC) was set up to smooth the transition of patients from one care setting to another at the national level. This is also supported by the effort by the Ministry of Health to develop a nation-wide electronic medical records system, National Electronic Health Records.

#### **Asian proximity**

With its favourable business environment, proximity to Asia, strong talent base and vibrant biomedical sciences ecosystem, Singapore has become the natural 'gateway' for companies to understand the fragmented healthcare markets in Asia and to grow in Asia.

Singapore has an established strong track record in scientific and clinical excellence. Leveraging its base of public-sector research institutes and global industry partners, Singapore offers strategic partnership opportunities for healthcare service providers to develop and test-bed innovative healthcare solutions and systems.

The sovereign city-state is also committed to driving innovation that addresses the rising costs and inefficiencies in healthcare systems worldwide. As the city-state adopts an integrated-care approach to sustain its objective of providing good and affordable healthcare and to find ways to tackle the challenges of an ageing population, Singapore seeks to promote innovation within the healthcare system that can achieve improved

clinical outcomes and enable greater cost and operational efficiencies in the healthcare system.

#### **Medical technology hub**

Singapore is a trusted base for companies to manufacture complex and high quality instruments and medical devices for global markets. It is known to be Asia's leading location for medical technology, accommodating over 30 medical technology companies which have set up commercial-scale plants to produce medical devices for the regional and global markets. In addition, all of the top 10 medical technology companies have their regional headquarters in Singapore, from which to drive business expansion in Asia. Global leaders that have set up manufacturing, R&D and headquarter functions in Singapore.

Singapore offers key engineering capabilities that enable medical technology companies to engage in product reengineering and scale up their manufacturing operations. The strong base of high-quality, ISO13485-certified suppliers in Singapore's medical technology sector has extensive experience in working with medical technology MNCs, adhering to strict standards of IP protection and regulatory requirements stipulated by US FDA and European EMEA. Their capabilities include electronic product conception, manufacturing and supply chain management; plastic components moulding; metal forming and casting; ceramics; surface treatment; as well as cleansing, packaging and sterilisation.

To facilitate and enhance partnerships between original equipment manufacturers (OEMs) and suppliers, Singapore has established several platforms to ensure that suppliers' capabilities evolve to meet the needs of the industry.

To date, Singapore's medical technology manufacturing sector employs more than 12,000 workers in high-value

The strong base of high-quality, ISO13485-certified suppliers in Singapore's medical technology sector has extensive experience in working with medical technology MNCs, adhering to strict standards of IP protection and regulatory requirements stipulated by US FDA and European EMEA.

and complex roles, and this number is set to grow with more than 20,000 science and engineering graduates entering the workforce from Singapore's tertiary institutions each year. Companies can also access a strong base of more than 230,000 employees in adjacent sectors (e.g. pharmaceutical, electronics, engineering). At the same time, government agencies such as the Singapore Workforce Development Agency (WDA) and the Employment and Employability Institute (e2i) continue to work closely with industry partners in enhancing manpower capabilities through customised training programmes and skills upgrading schemes.

#### Asia microcosm

As a microcosm of Asia, Singapore provides an ideal base for companies to develop new technologies and product innovations, test-bed new solutions and systems for the regional and global market, as well as to nurture the growth of R&D and commercialisation activities.

One example in Singapore's encouragement in innovative medical technology is the development of the world's thinnest one-day disposable contact lens by Japanese company Menicon. Called 'Magic', the innovation was developed in Singapore, at the corporation's first R&D and manufacturing facility outside Japan, with total investments of S\$123 million. In collaboration with software giant Hewlett Packard, Singapore-based company Healthstats also produced a wireless monitoring device to facilitate the monitoring of blood pressure by patients and doctors.

The Singapore government remains committed to growing the medical technology industry by investing in further research. In 2015, it announced that S\$4 billion would be invested in biomedical sciences research for the period 2015 to 2020, demonstrating that biomedical sciences R&D remains a priority in Singapore's long-term strategy to boost its economic competitiveness, achieve sustained growth and establish the country as Asia's innovation capital.

#### Pharmaceuticals and Biotechnology

Singapore is reputed for its clinical research and clinical trials management activities in Asia. As the secretariat for the APEC Coordinating Centre for Good Clinical Practice (GCP), Singapore plays a strategic role in developing GCP in Asia, steering initiatives such as the training of clinical research personnel and developing a conducive environment for multi-site clinical trials in the region.

These factors have attracted many global pharmaceutical brands to set up their regional clinical trial centres in Singapore. Several Contract Research



Organisations (CROs) have also established operations in Singapore to support the pharmaceutical firms' growing outsourcing needs. These include global CROs Covance, Quintiles and ICON which manage regional clinical trials from the city-state. These international CROs offer a wide range of services, ranging from Phase I to pharmacovigilance studies. Some are also setting up innovative biomarker discovery and validation services to support their clients.

Singapore's integrated research ecosystem enables companies to access multidisciplinary capabilities in a single location, improving R&D decision-making and accelerating drug discovery and development. More than 30 of the world's leading biomedical sciences companies are leveraging Singapore as a key home base to drive innovation, growing the nation's biotechnology and pharmaceutical industry by more than 30 percent in 2011.

#### Biomedical science

According to Singapore's Economic Development Board, Singapore's Biomedical Science (BMS) industry has grown substantially since 2002. The industry as a whole employs an estimate of over 25,000 people across manufacturing, R&D and commercial activities today. Singapore is home to more than 50 BMS manufacturing plants, with a combined manufacturing output of more than \$26B in 2014 and employing more than 18,000 employees in the same year.

Singapore also features as a strong base for companies to access the fast-growing Asia Pacific markets, with more than 30 leading regional headquarters from top BMS companies located in Singapore.

Since 2002, business expenditure in R&D (BERD) in Biomedical & Related Sciences and Biomedical Engineering has increased more than four times from around S\$140 million to more than S\$630 million in 2014. Employment of researchers has also grown more than three times from around 500 to 1500 in the same period.

#### QUICK FACTS - SINGAPORE

**Population:** 5.5 million

**GDP (PPP):**

\* \$471.9 billion

\* 2.0% growth

\* 4.0% 5-year compound annual growth

\* \$85,253 per capita

**Unemployment:** 3.3%

**Inflation (CPI):** -0.5%

**FDI Inflow:** \$65.3 billion

(Source: heritage.org)



# Global medical costs to increase despite lower rates of inflation

Aon's report reflects the medical trend expectations of employer-sponsored medical plans in more than 90 countries based on reported data from Aon professionals, clients and carriers represented in the portfolio of Aon medical plan business in each country.

According to Aon, projected medical trend rates are expected to vary significantly by region. For example, countries in Latin America and the Middle East should expect to see a sizeable jump in average medical premium rate increases from 2016 to 2017, while Asia Pacific and Europe are projected to see lower rates of increase for 2017. Despite variations in regional trend rates, all regions are expected to exceed average regional inflation levels by at least 4 percentage points.

"Medical cost trend rates continue to increase due to many factors, including global population aging, poor lifestyle habits in emerging countries, cost shifting from social programs and the increased prevalence and utilization of employer-sponsored health plans in many countries," said Wil Gaitan, senior vice president and global consulting actuary at Aon.

"Today's multinational employers are experiencing the increased costs and complexities across their organizations with lowered productivity levels due to the aforementioned factors."

While global inflation rates appear to be mitigating, average cost increases for employer-sponsored medical plans globally are continuing to rise, according to a new report from Aon. Average cost increases are projected to be 8.2 percent in 2017, up slightly from 8.1 percent in 2016. However, the average inflation rate in 2017 is projected to be 2.8 percent, down slightly from 2.9 percent in 2016.

## Employer strategies

Aon's report found cost sharing, managing provider networks and making plan design changes were the top strategies for controlling costs globally, though strategies vary slightly based on region. For example, while cost sharing is the most prevalent strategy in Asia Pacific and Middle East/Africa, managing provider networks is the preferred strategy for employers in Europe and Latin America.

## Average Medical Trend Rates by Region

Region	2016		2017	
	Medical Trend Rate	Annual General Inflation Rate	Medical Trend Rate	Annual General Rate
Asia Pacific	9.4%	3.2%	8.9%	2.9%
Europe	5.9%	1.6%	5.7%	1.6%
Latin America & Caribbean	13.6%	6.4%	14.2%	6.0%
Middle East & Africa	11.6%	6.3%	14.3%	6.7%
North America	6.0%	1.5%	6.3%	1.6%
Global	8.1%	2.9%	8.2%	2.8%

## Poor health habits

Aon's report revealed that cardiovascular, cancer and respiratory conditions were the most prevalent health conditions driving health care claims around the world. The global risk factors expected to drive future claims—and contribute to the adverse experience driving high medical cost increases—continue to be primarily non-communicable diseases: high blood pressure, high cholesterol, and physical inactivity.

"Many of the factors driving the upward momentum for higher medical costs are ones that individuals can change when the appropriate support and programs are available," noted Tim Nimmer, chief health care actuary at Aon. "Employers can play a key role by motivating individuals and their families to take a more active role in managing their health, including participating in health and wellness activities and better managing chronic conditions that frequently drive higher costs for treatments."

"Many of these approaches will not be as effective in the future, and employers will need to adopt more innovative strategies to mitigate costs and influence the health and wellbeing of their employee population," said Francois Choquette, leader of Aon's Global Benefits practice.



## Kidney surgery using 3D printing performed first time in MENA

Doctors at Dubai Hospital performed a kidney surgery using 3D technology, making the hospital the first in the MENA region to use this technology for kidney surgery. Dr Yaser Al Saeedi, Consultant Urologist at Dubai Hospital and main surgeon for this surgery performed the procedure on a 42-year-old Palestinian expatriate who had a tumour in her kidney.

She visited Dubai Hospital for a second opinion after other healthcare providers told her that she would have to undergo radical surgery to remove her kidney. Her tumour was deep within the kidney and was located in the posterior part of the kidney near the blood vessels and ureter and thus there were reduced chances of saving the kidney and removing only the tumour without 3D technology.

His Excellency Humaid Al Oatami, Chairman of the Board and Director-General of the DHA, said: "The DHA spares no effort in incorporating the latest technology to better patient outcomes. 3D technology allows doctors to better plan their surgery and perform minimally invasive procedures. Using 3D technology for surgeries and other medical purposes is the future and we are currently working on developing regulations for 3D printing for patients and the medical sector in Dubai. We are also looking at training doctors and healthcare professionals on the use of this technology."

Dr Yaser Al Saeedi, Consultant Urologist at Dubai Hospital and main surgeon for this surgery said that he requested a 3D kidney model to assist him in preparing for a complex kidney tumor surgery because the aim was to only remove the tumour and not the kidney. Medativ



created a 3D printed replica of the kidney, featuring the tumor, ureter and the vasculature.

Dr Al Saeedi said: "In this case it was very important because medical imaging did not adequately portray the location of the tumor and its spatial relationship to other structures. The 3D replica of the kidney allowed us to better assess our surgical approach and ultimately facilitated a safe partial nephrectomy (removal of mass), instead of total nephrectomy (removing the entire kidney). The complete dissection of the tumor was made easier as a result of using the model, ultimately resulting in a shorter and safer procedure."

He added that normally the procedure takes about 5 hours but in this case due to pre-operative planning using a 3D model the procedure took only 3 hours, of which the complete removal of the tumour took only 28 minutes.

## DHA receives ISO certification for business continuity

The Dubai Health Authority (DHA) announced that it has received ISO certification 2012/22301 for business continuity, proving once again that its hospitals and centers provide a high quality of health services.

The DHA received the accreditation after the capabilities of its facilities have proved that they can operate under any circumstances, including emergencies that need immediate response. The certification reflects the level of medical services and technologies that DHA facilities offer. It is also a testimonial to the highly skilled doctors, nurses and staff who are internationally trained to deal with any emergency they may face.

This latest ISO certification is the fourth certification that the authority has received in general and the seventh certification that DHA's primary health care centers received.

His Excellency Humaid Al Oatami, Chairman of the Board and Director General of the DHA said customer satisfaction remains the main priority that drives the authority to continue on striving to develop its services.

Al Oatami added that the authority has received a notable number of ISO accreditation in a short period of time, making it now one of the biggest international accredited

medical networks. The DHA received reaccreditation for the third and fourth time in 2016.

The authority also received many other international accreditations that include 10 primary health-care centres that received international accreditation from the Joint Commission International (JCI).

JCI is an organisation which works to improve patient safety and quality of health care in the international community by offering education, publications, advisory services, and international accreditation and certification.

Other DHA facilities that received international accreditation include the Dubai Gynecology & Fertility Centre, which received accreditation from the Canadian Authority for Accrediting Fertility Centres, making it the first specialized laboratory of its kind to receive the certification in the Middle East.

The Dubai Blood Donation Center received international accreditation from the American Association of Blood Banks, while Latifa and Hatta Hospitals received a Baby Friendly Hospital status—to name a few.

Furthermore, Dubai's Public Healthcare Centres (PHC) became the first in the region to receive International Organisation for Standardisation (ISO) certifications.



## Tosoh and DiaSys join forces to offer high quality solution for laboratory testing



Tosoh and DiaSys recently announced a collaboration for clinical laboratory testing with the combination of Tosoh's new generation analysers (AIA-CL1200 for immunoassay and G11 for HbA1c) and DiaSys' BioMajesty® JCA-BM6010/C. Instruments are linked through Evoline and Evoline Manager, Tosoh's open laboratory automation and middleware solution. The collaboration takes place to address current requirements regarding clinical testing.

Tosoh has a significant experience with the development of high-specific and high-sensitive immunoassays. The company is also a pioneer in the field of automated HPLC-analysis for the measurement of HbA1c. During Medlab Middle East, Tosoh showcased the AIA-CL1200, the newest generation of midsize chemiluminescence immunoanalysers, as well as the G11, the latest model of HbA1c analysers. Both instruments excel in sensitivity, stability and speed (1 minute per HbA1c analysis).

Like all other Tosoh automated immunoassay analysers, the AIA-CL1200 utilizes the unique CL-AIA Pack twin cup format. The AIA-CL1200 is an easy-to-use, very fast, high sensitive and precise instrument. First results are available within 15 minutes, with an equivalent of up to 120 tests per hour. The principle of "one cup – twice the immunoassay power" ensures time and money saving (1 cup = 1 test).

The BioMajesty® JCA-BM6010/C is designed to increase the performance of medium-sized laboratories. It is also the ideal system for speciality laboratories. The throughput of up to 1,200 tests/hour, 43 reagent and 84 sample positions are a guarantee for flexibility in everyday use. It handles a full menu of photometric and immunoturbidimetric assays as well as Na, K, Cl determinations by indirect ISE methods.

Special emphasis has been spent on the software to

combine highest user friendliness with optimally secured results. A special feature is the integrated on-board hemolysis function for optimized HbA1c determination. Dynamic range extension avoids additional dilutions and a dedicated STAT port allows for immediate STAT processing. Clot detection and liquid level sensor technology ensures confidence in results.

The analyzer works with very small sample volumes, making it the perfect instrument in pediatric and geriatric settings. The BioMajesty® JCA-BM6010/C is the system with the smallest footprint in its class hence saving precious laboratory space. DiaSys supplies ready-to-use reagents well known for their excellent on-board stability with the instrument. The result in conjunction with extremely low reagent consumption is cost efficiency on the highest order.

The integration of a Tosoh and DiaSys analyser into the automation implementation of a clinical laboratory offers significant benefits to the working processes and is intended to achieve the following goals:

- Integration of multi competence technologies;
- Improvement of laboratory turnaround time with consistent throughput over time;
- Simultaneous management of routine and emergency workloads;
- Automation of repetitive manual procedures;
- Elimination of the need for the pre-sorting of specimens;
- Qualification of operators' work, taking them off tasks associated with pre-analysis;
- Simple connection and a sophisticated data transmission system ensure analytical quality with minimal maintenance.

## New Merivaara Q-Flow surgical light aims to reduce risk of hospital infections



Merivaara Corp., a Finnish provider of hospital furniture and operating room systems, is launching a new surgical light, Merivaara Q-Flow™. Q-Flow surgical light improves the working environment in operating rooms as well as offers a new way to reduce the risk of infections. Designed and manufactured in Finland, Q-Flow was developed to fulfil the needs of the modern surgical team. It offers improvements on many standard features in the industry as well as radical innovations.

“I believe this is one of the very best operating theatre lights in the whole world,” said CEO Markku Aherto. “We are very excited about this excellent product.”

The light gives superb colour rendering, particularly in red and skin shades, which make the product perfect for a variety of surgeries such as internal or plastic surgery. The Q-Flow gives a very deep column of light and dynamic obstacle compensation, so if the surgeon bends over her patient sensors brighten other LEDs to reduce shadows.

Moreover, the light has sterile intuitive controls. The

Q-Flow displays simple user instructions onto the operating table so the surgeon does not have to look up.

One of the most ground-breaking features is the way it improves hygienic conditions in the operating theatre. Standard operating room lights create turbulence intensity, acting like an aircraft wing to pull particulates in the air right over the patient. Merivaara's designers shaped the Q-Flow as a series of concentric circles with open spaces in between. This improves laminar air flow so sterile conditions are maintained and the risk of infection is reduced. According to the DIN 1946-4:2008 standard the turbulence intensity should be below 37.5% but the Q-Flow boasts 15.9%.

The Q-Flow is a part of the Merivaara Fluent™ concept, which enhances the usability of operating rooms. This includes an intuitive user interface which works across a variety of devices, such as Q-Flow, operating tables and an integrated operating system.

The new Q-Flow surgical light was showcased on the Merivaara stand during Arab Health 2017 in Dubai, UAE



## Philips introduces new digital solutions and services to advance pathology



Royal Philips recently announced upcoming additions to its portfolio of pathology solutions as part of its presence at the 2017 United States and Canadian Academy of Pathology (USCAP) Annual Meeting.

Pathology plays a critical role in the detection and diagnosis of a wide variety of diseases, including cancer. Increasing cancer incidence, an aging population and efforts to improve patient outcomes have put cancer diagnostics and pathology services under considerable pressure. Digitization of the tissue slide that the pathologist normally views using a microscope could help increase operational efficiencies. As part of this year's USCAP, Philips unveiled these new technologies that showcased expansion plans for open pathology solutions.

Philips IntelliSite Collaboration Suite is a new software as a service being developed on Philips HealthSuite digital platform that will connect pathologists worldwide. This case sharing platform aims to allow pathologists to have easy access to expertise and consultation services to speed turnaround times and enable cost savings for consultation.

Philips Digital Pathology Solutions portfolio is being expanded to support computational pathology offerings from Philips as well as partners. First, clinically validated image analysis applications that aim to assist the pathologist in routine case review, which could help to standardize and facilitate first time right decisions. In partnership with Visiopharm, the company will offer applications for semi-quantification of breast IHC markers.

Second, Philips' research application TissueMark that helps in automatic identification of tumor region and subsequent quantification for macro dissection. Third, Philips' research application Xplore2 that enables image and study data management, and biomarker discovery with additional tools that help streamline research and biomarker discovery.

Philips IntelliSite Pathology Solution will add new capabilities in its open research platform allowing support of additional image file formats to its image management system, including DICOM.

## Baxter and ScinoPharm announce partnership for generic oncology injectables

Baxter International Inc. and ScinoPharm Taiwan, Ltd. announced a strategic partnership to develop, manufacture and commercialize five injectable drugs used in a range of cancer treatments, including lung cancer, multiple myeloma and breast cancer, as well as medication to treat nausea and vomiting, common side effects of chemotherapy. The arrangement also provides Baxter the option to partner with ScinoPharm—one of the world's leading active pharmaceutical ingredient (API) manufacturers—on as many as 15 additional injectable molecules.

Under the terms of the partnership, Baxter and ScinoPharm will collaborate on product development and manufacturing. Baxter will hold commercialization rights, with products included in the arrangement expected to launch beginning in 2020.

"Combining Baxter's differentiated manufacturing expertise and global commercialization capabilities with ScinoPharm's recognized API experience enables Baxter to increase patient access to difficult-to-manufacture, high-quality oncolytic medicines," said Robert Felicelli, president, Pharmaceuticals, Baxter. "The ScinoPharm collaboration will further expand Baxter's presence in generic injectables, which will continue to be enhanced through our recently executed agreement to acquire Claris Injectables Limited."



Current branded sales of the initial five products included in this partnership total more than \$4 billion annually. These products will join Baxter's existing portfolio of generic injectable medications, which includes difficult-to-manufacture oncology drugs and a broad portfolio of standard-dose, ready-to-use premixed injectable products such as anti-infectives, analgesics and critical care medicines.

ScinoPharm has a 17-year history of manufacturing APIs for the global pharmaceutical industry with a high level of quality and safety. Under the arrangement, ScinoPharm will provide APIs for the initial five generic injectables, and Baxter and ScinoPharm will share manufacturing responsibilities, with the majority of the molecules to be manufactured at Baxter's state-of-the-art facility in Halle, Germany, one of the most advanced facilities in the world for manufacturing oncology drugs.

# ARAB HEALTH

**the region's largest healthcare trade show, brings industry professionals under one roof**

With a growing number of healthcare infrastructure projects in the pipeline for the GCC, innovation and technology remains the focus for the region's healthcare industry







The 42nd edition of Arab Health Exhibition & Congress, the region's largest gathering of healthcare and trade professionals, was officially inaugurated by His Highness Sheikh Hamdan Bin Rashid Al Maktoum, Deputy Ruler of Dubai, UAE Minister of Finance and the President of the Dubai Health Authority. The event, that took place from 30 January-2 February 2017 in Dubai, offered business development, training and learning opportunity for healthcare trade professionals from across the world.

This year's Arab Health featured an additional 400 exhibitors, with 4,400 companies showcasing their latest innovations to over 100,000 attendees from over 70 countries. The event saw the introduction of the new Hands-on-Training (HoT) sessions, which allow more than 900 physicians, surgeons and technicians from the region to learn and practice new techniques using state-of-the-art equipment for specialised treatments in areas such as cardiology, neurology, surgery, gastroenterology, urology, oncology and radiology.

His Excellency, Humaid Al Qatami, Chairman of the Board of Directors and Director-General of the Dubai

Health Authority (DHA) said: "Dubai has become one of the world's most attractive destinations to gather international experts and major institutions for conferences and forums. The city provides a promising platform for economic trade and business exchange, and fostering future relationships. This is in line with the vision of His Highness Sheikh Mohammed Bin Rashid Al Maktoum, UAE Vice President and Prime Minister and Ruler of Dubai, for Dubai to be central to all future projects including those in healthcare."

"The Arab Health Exhibition & Congress is an important opportunity for international health institutions to exchange knowledge, access the latest in medical technology, and review what has been achieved within healthcare and emerging fields of healthcare such as smart health technology. The DHA is always keen to embrace unique medical solutions that help deliver better health outcomes and such congresses provide us a platform to network with experts in the field from the region and abroad," His Excellency concluded.

Khalid Ahmed Al Sheikh Al Shamsi, CEO, Dubai Healthcare City Authority, said, "We have witnessed

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positive changes in the health sector whereby patients nowadays demand for higher degrees of efficiency and flexibility from the healthcare system. In this context, we at DHCA are proud to support a platform such as Arab Health Exhibition & Congress which provides a great insight into the latest developments within the healthcare industry."

### Latest technologies on show

Running for the second year and following its success in 2016, the 3D Medical Printing Zone has expanded for this edition of Arab Health, reflecting the growing use of 3D printing technology in healthcare, estimated to grow by 18.3 per cent annually until 2020. Items on show include 3D-printed bionic limbs and real life models of 3D-printed organ models among others.

"Our vision for 3D printing to become the standard of care is becoming a reality, based on forward thinking groups and leaders such as Dr. Mohammad Al Redha in the Department of Organisational Transformation in the Dubai Health Authority and the adoption of 3D printing across its hospitals," said Scott Rader, GM Medical Solutions at Stratasys.

Arab Health's multi-track congress offered the program

of Continuing Medical Education (CME) to over 8,500 attending medical professionals in the region. A total of 14 conferences were held over the four days including Workforce Empowerment, Big Data, Healthcare Business Forum, Quality Management, Emergency Medicine, Gastroenterology, and the Leaders in Healthcare conference.

### MEDLAB-world's largest laboratory exhibition and congress

The first standalone edition of MEDLAB Exhibition & Congress was officially inaugurated by His Excellency Humaid Mohammed Obaid Al Qatami, Chairman of the Board and Director General of the Dubai Health Authority. Following 15 years of success alongside the region's flagship healthcare event, Arab Health, the laboratory show is a standalone event and took place from 6 - 9 February 2017 in Dubai, UAE.

Spanning over six exhibition halls, the show accommodated more than 700 international exhibitors, over 400 ground breaking medical laboratory products and services, 11 CME-accredited conferences and welcomed over 30,000 laboratory and trade professionals.



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With MEDLAB looking at bridging the gap between the laboratory and clinical settings, the congress focused on two key topics - laboratory management and cardiac markers (measurement of heart functions), with healthcare leaders addressing topics varying from the



risks of the use of social media in healthcare, to how to improve cardiac testing.

The day also saw the start of the 5th Middle East Diabetes Conference, led by Dr Nader Lessan, Consultant Endocrinologist, Imperial College London, Diabetes Centre, who gave regional insights into diabetes care. The conference, which is normally held at Arab Health, is now part of MEDLAB to improve the relationship between the laboratory and clinicians when diagnosing and treating diabetes.

During the four-day congress, MEDLAB unveiled the industry's latest updates on laboratory testing and developments in clinical diagnostics. Within its new



scientific programme, comprising 11 multi-disciplinary conferences, the congress introduced three new tracks including blood transfusion medicine, laboratory informatics, and clinical diagnostics of cardiology and diabetes, in addition to the more established laboratory management, microbiology, immunology and clinical chemistry tracks.

Offering delegates the chance to earn up to 28.0 credits of Continuing Medical Education (CME), the conferences were spearheaded by regional and global industry leaders, who presented the latest research, innovations, and drive discussions on best practice in laboratory medicine.

Simon Page, Managing Director of Informa Life Sciences Exhibitions, the organisers of MEDLAB, explained how important the show is in bringing healthcare professionals together to improve the provision of healthcare in the region.

“MEDLAB provides access to hundreds of laboratory innovations and insights into medical breakthroughs that will help improve healthcare, both in the Middle East and globally. The congress has been designed to foster collaboration and encourage the sharing of knowledge and skills between two pillars of healthcare – the laboratory and clinicians - to ultimately improve patient care outcomes, particularly in this part of the world,” he said.

“The Arab Health Exhibition & Congress is an important opportunity for international health institutions to exchange knowledge, access the latest in medical technology, and review what has been achieved within healthcare and emerging fields of healthcare such as smart health technology. The DHA is always keen to embrace unique medical solutions that help deliver better health outcomes and such congresses provide us a platform to network with experts in the field from the region and abroad,” His Excellency concluded.

Khalid Ahmed Al Sheikh Al Shamsi, CEO, Dubai Healthcare City Authority, said, “We have witnessed positive changes in the health sector whereby patients nowadays demand for higher degrees of efficiency and flexibility from the healthcare system. In this context, we at DHCA are proud to support a platform such as Arab Health Exhibition & Congress which provides a great insight into the latest developments within the healthcare industry.”

# UAE praised for its leading role in blood transfusion services

A leading expert in blood transfusion services praised Dubai for being a backbone in the creation of services set up to improve blood transfusion safety globally.

Speaking at the MEDLAB Exhibition and Congress in Dubai, Dr Jean-Claude Faber, President of the Luxembourg Haemophilia Association in Luxembourg City, said the UAE can be considered the "capital" in haemovigilance globally, which is the procedure of reporting undesirable effects of transfusion to ensure the safety, efficiency and efficacy of blood transfusion.

Dr Faber explained that the UAE has been home to many "important events" relating to haemovigilance, and key outcomes from the WHO Global Consultation on Haemovigilance, held in Dubai in 2012, include the establishment of a global agreement to establish national haemovigilance systems.

According to Dr. Faber, haemovigilance is "a must" when ensuring high quality patient care, and lauded the UAE's efforts in establishing an effective system to reduce risks and ensure top safety standards in

blood transfusion services.

Led by Dr May Yassin Raouf, Head and Medical Director, Dubai Blood Donation Centre, the Blood Transfusion Medicine conference, which is held for the first time in the region saw a number of leading international industry figures discuss a host of pertinent topics in blood transfusion.

Dr Faber emphasized the importance of blood donation, stating that, while globally, "there are still challenges and risks when it comes to blood transfusion practices", the "real risk for patients is a lack of blood".

During the congress, a spotlight has been put on a number of topical issues such as the use of cardiac markers - biomarkers measured to evaluate heart function - in acute coronary syndrome, chronic heart failure and non-cardiac conditions. With three in 10 deaths in the UAE attributed to heart disease, having access to the latest research in the field of cardiac care will help assist the authorities in creating future strategies and plan effective initiatives to non-communicable health issues such as this.

## ATM to focus on \$8.3 billion MENA wellness tourism sector

A Wellness Symposium, which will throw the spotlight on the \$8.3 billion industry in the Middle East/North Africa (MENA), will be launched at Arabian Travel Market (ATM), which takes place in Dubai from 24-27 April 2017.

A partnership between the World Travel Market (WTM) portfolio of events and the Global Wellness Institute (GWI), the symposium has been organized as part of a schedule of events in ATM's Wellness Lounge. It will also analyse MENA's thriving domestic (4 million trips) and inbound (4.5 million trips) wellness tourism markets – as well as trends in outbound wellness tourism from the Middle East.

"Wellness travel is not only growing twice as fast as tourism overall, it's evolving in bold new directions, both globally and across the Middle East. Our ongoing mission will be to bring together the top experts and latest research and trends in this travel space to ATM and WTM's tens of thousands of attendees," said Susie Ellis, chairman and CEO of the GWI.

The UAE leads the Middle Eastern wellness tourism market. With an average of 1.7 million wellness trips generating \$2.7 billion annually, it accounts for 14 per cent of the MENA spa market, according to research from Colliers Experiential Travel Series.

"The UAE is followed by Morocco (1.66 million trips), Tunisia (0.76 million trips) and Jordan (0.62 million trips). However, the growth in wellness tourism in MENA compared with overall tourism over the past five years is truly remarkable.

"For example, wellness trips in the UAE have grown by 17.9 per cent during this period, while overall tourism has grown 8.1 per cent. It's a similar story with Morocco (14.7pc versus 6.6pc), Tunisia (9.4pc versus 4.5pc) and Jordan (12.8pc versus 5.9pc)."

Having already identified the demand for wellness, ATM

launched a dedicated Wellness and Spa Lounge in 2016, connecting Middle East wellness and spa buyers with international suppliers. Designed as a hub for wellness and spa professionals, the lounge returns to this year's event and will host two days of up to 35 pre-scheduled appointments with high calibre Middle Eastern buyers and up to 35 international wellness suppliers.

After ATM, the partnership continues at WTM London – the leading global event for the travel industry (6-8 November 2017) – with a focus on the global wellness industry, which has grown to \$3.72 trillion. WTM London, which was responsible for £2.8 billion in agreed industry deals last year, will also host a dedicated Wellness Lounge facilitating deals in the wellness travel and tourism sector.



**Susie Ellis**  
Chairman & CEO of GWI



# National Reference Laboratory (NRL) puts education in the spotlight

National Reference Laboratory (NRL), part of Mubadala's network of world-class healthcare providers and managed by LabCorp®, a world leading life sciences company, providing comprehensive clinical laboratory services, are demonstrating their commitment to continuing medical education for laboratory and other healthcare professionals by their participation in a number of leading healthcare events in the first half of 2017, including two of the largest healthcare events in the world, Arab Health and MEDLAB.

Approximately 70 percent of medical decisions are influenced by laboratory tests, ordered to diagnose, treat, manage, and monitor a patient's condition, requiring high levels of education and knowledge in order to ensure high quality of services, improved patients outcomes and reducing the unnecessary costs in the industry.

"In a region that faces unique healthcare challenges and where laboratory testing is a crucial plank of healthcare outcomes, the continuing education of current and future healthcare professionals in the science of laboratory medicine is a core theme of our company's mission", said Abdul Hamid Oubeisi, CEO of NRL.

"The continuing innovation and advancements in

laboratory testing and technology are remarkable and it is our mission and duty to educate the laboratory professionals, physicians and patients about these exciting changes. These advancements will only serve to facilitate faster diagnostic and more precise treatment decisions, which should ultimately increase the quality of care for our patients. As a partner of LabCorp, the world's leading healthcare diagnostics company, and having one of the largest teams of locally-present laboratory experts, NRL is in the best position to assume its role as a thought leader in the region", said Dr. Basel Altrabulsi, Chief Medical Officer of NRL.

During MEDLAB, in cooperation with their partner LabCorp from the USA, NRL hosted a workshop of Coagulation Reference Testing, led by Michael Taylor, M.S., Associate Vice President of Laboratory Corporation of America - Colorado Coagulation. Special Coagulation is one of NRL's Centers of Excellence that the company is working to establish during 2017.

Dr. Basel Altrabulsi, NRL's Chief Medical Officer, also presented at the MEDLAB Conference, giving a lecture on 'Managing the anatomic pathology laboratory' and 'Update on molecular tests and their value in evaluating challenging lesions of thyroid FNAs.

## "Pharma can learn from other sectors" - TEAM-UP

Speaking recently at the 15th IQPC Coldchain Logistics Summit in Toronto, Canada, Alan Kennedy from TEAM-UP stressed the need for the pharmaceuticals sector to embrace some of the supply chain concepts that have proved so profoundly transformational in other industries.

Introducing the new TEAM-UP pharma-logistics collaboration initiative, Kennedy pressed his proposition by describing some of the inspired approaches to logistics that are the business signatures of leading companies such as Amazon, Apple and Inditex. "The common denominator in all these ground-breaking supply chain platforms is collaboration," he attested. "By taking a lead and driving supply chain integration, pharma companies can position themselves to better assimilate technology, drive efficiency, facilitate transparency and, ultimately, deliver improved, safer, outcomes for patients."

Asserting that "the sector lacks a common platform to underpin collaborative working and enable supply chain integration", Kennedy went on to describe how the TEAM-UP pharma-logistics collaboration program has been designed to fill this need. Based around the "3 TEAM-UP Pillars" of Community, Resources and Accreditation, TEAM-UP has been conceived as a not-for-profit body fostering win-win collaboration and



integration between all stakeholders in the pharma-logistics supply chain.

Co-presenting with Kennedy at the IQPC event was Andy Akrouche, MD of the Institute of Collaborative Working in Canada. Akrouche acquainted the audience with the new ISO 44001 international standard for collaborative working which is scheduled for global launch at the end of March. "The TEAM-UP program is aligned with the new ISO standard and provides pharma companies and their logistics partners with a structured route to its operational execution."

TEAM-UP has been conceived as a hands-on, interactive community with all corporate participants committed to following agreed collaborative principles, all committed to a programme of continuous collaborative improvement and all having access to a shared repository of collaborative tools, templates and advice.

# New LC-MS workflow provides higher quality data for clinical research samples



Attendees at MEDLAB 2017 had the opportunity to see a powerful fully-integrated liquid chromatography-mass spectrometry (LC-MS) workflow designed to offer accurate and consistent analysis of the most challenging and complex sample matrices for clinical researchers.

This workflow is part of a research collaboration with Amerispec Diagnostics, a Dubai-based reference laboratory focused on offering cutting-edge technologies based on mass spectrometry to the United Arab Emirates (UAE), the Gulf Cooperation Council (GCC) and the Middle East. The LC-MS workflow is designed to provide a comprehensive solution for clinical research laboratories evaluating how to improve separation, low-limit detection and quantification of molecules in biological matrices such as steroids, vitamin D and its metabolites, immunosuppressants, anti-epileptics and amino acids. In addition, the workflow is designed to facilitate drug monitoring research of prescribed and illicit drugs, while addressing the analytical needs of clinical translational researchers working on transitioning new protein biomarkers toward clinical laboratories.

"We understand the need for established processes designed to offer robust, sensitive and reliable research methods that can lead to high-quality, reproducible data," said Lisa Thomas, senior director, clinical and forensic markets, chromatography and mass spectrometry, Thermo Fisher. "The collaboration

with Amerispec will enhance our customers' capabilities in these regions – ultimately accelerating their research and enabling them to make meaningful clinical discoveries."

"We aim to provide scientists and academic research institutions in the UAE and the region access to novel technologies, which will lead to further advancements in clinical research," said Yasser Ismail, founder and president of Amerispec Diagnostics. "We will be improving patient outcomes by localizing critical assays that are currently sent to the US and Europe – resulting in a drastic reduction in time to result. With adjacency to many prominent global scientific organizations, and the support of the Dubai Creative Cluster Authorities and the Dubai Science Park, we are able to further support our mission."

Comprised of hardware, software, training application and service support, the new workflow aims to standardize the future analysis of samples and better leverage the strengths of modern, high-throughput systems. Utilizing the sensitivity and speed of a system such as the Thermo Scientific Endura mass spectrometer combined with a multichannel UHPLC system incorporating online sample preparation with turboflow technology for cost-effective sample analysis such as the Thermo Scientific Prelude SPLC, together with advanced software, enables clinical research scientists to obtain the quantitative accuracy of LC-MS with confidence.





**2nd International Dermatology & Cosmetology Congress**

15 – 18 March  
Istanbul, Turkey  
[www.indercos.org](http://www.indercos.org)

**Dubai International Humanitarian Aid & Development Conference & Exhibition**

21 – 23 March  
Dubai, UAE  
[www.ihad.org](http://www.ihad.org)

**International Emergency Catastrophe Management Exhibition**

21 – 23 March  
Dubai, UAE  
[www.emergency.ae](http://www.emergency.ae)

**4th Evolving Practice of Ophthalmology ME Conference**

23 – 25 March  
Dubai, UAE  
[www.epomec.ae](http://www.epomec.ae)

**MSK MRI Workstation Workshop**

31 March – 1 April  
Dubai, UAE  
[www.mskmridubai.eventbrite.sg](http://www.mskmridubai.eventbrite.sg)

**13th Emirates Critical Care Conference**

6 – 8 April  
Dubai, UAE  
[www.eccc-dubai.com](http://www.eccc-dubai.com)

**6th International Conference and Expo on Cosmetology, Trichology & Aesthetic Practices**

10 – 11 April  
Dubai, UAE  
[www.cosmetology-trichology.conferenceseries.com](http://www.cosmetology-trichology.conferenceseries.com)

**Cardiovascular Pharmacology and Cardiac Medications**

13 – 14 April  
Dubai, UAE

<http://cardiac.pharmaceuticalconferences.com/>

**Cosmetology, Trichology & Aesthetic Practices**

13 – 14 April  
Dubai, UAE  
<http://cosmetology-trichology.conferenceseries.com/>

**6th Global Experts Meeting on Cardiovascular Pharmacology and Cardiac Medications**

13 – 14 April  
Dubai, UAE  
[www.cardiac.pharmaceuticalconferences.com](http://www.cardiac.pharmaceuticalconferences.com)

**8th World Congress on Toxicology and Pharmacology**

April 13-15  
Dubai, UAE  
<http://toxicology-pharmacology.conferenceseries.com>

**3rd Annual Congress & Medicare Expo on Primary Healthcare**

17 – 19 April  
Dubai, UAE  
[www.primaryhealthcare.conferenceseries.com](http://www.primaryhealthcare.conferenceseries.com)

**Clinical and Medical Case Reports**

17-19 April  
Dubai, UAE  
<http://clinicalcasereports.conferenceseries.com/>

**Medicare Expo on Primary Healthcare**

17-19 April  
Dubai, UAE  
<http://primaryhealthcare.conferenceseries.com/>

**24th International Conference on Dentistry & Oral Care**

17 – 19 April  
Dubai, UAE

<http://dentistry.conferenceseries.com>

**2nd International Conference on Neuro Oncology & Neurosurgery**

24 – 25 April  
Dubai, UAE  
<http://neurooncology.conferenceseries.com/>

**16th Global Annual Oncologists Meeting**

24 – 25 April  
Dubai, UAE  
<http://annualmeeting.conferenceseries.com/oncologists/>

**Conference on Pharmaceutical Development and Technology**

24 – 26 April  
Dubai, UAE  
<http://pharmatech.pharmaceuticalconferences.com/>

**3rd International Conference on Neurological Disorders and Stroke**

24 – 26 April  
Dubai, UAE  
[www.stroke.global-summit.com](http://www.stroke.global-summit.com)

**4th GCC Healthcare Innovation Congress**

25 – 26 April  
Dubai, UAE  
[www.gcchealthcareinnovation.com](http://www.gcchealthcareinnovation.com)

**4th International Conference on Hepatology**

27 – 28 April  
Dubai, UAE  
[www.hepatology.conferenceseries.com](http://www.hepatology.conferenceseries.com)

**2nd Annual MENA Ophthalmology Congress**

27 – 29 April  
Doha, Qatar  
[www.menaophthalmologycongress.com](http://www.menaophthalmologycongress.com)



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**King Abdul Aziz University Hospital**  
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**Ajman Police**

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**Fujairah Police**

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**Ras Al Khaimah Police**

Tel: 07-235 6666

**Umm Al Quwain Police**

Tel: 06-765 6677

**Directory Enquiry Services**

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Du - 199

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Section/Stream/Class: \_\_\_\_\_

Address: \_\_\_\_\_

Mobile No: \_\_\_\_\_ Email: \_\_\_\_\_

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