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DAY 01 MONDAY 28 JANUARY 2019

arab health

DAILY DOSE

THE **OFFICIAL DAILY NEWSPAPER** OF THE ARAB HEALTH EXHIBITION

At the Forefront of  
Healthcare Advancements

Welcome to the 44<sup>th</sup> edition of Arab Health Exhibition & Congress

By Daily Dose Staff

Arab Health Exhibition and Congress, one of the largest healthcare events in the world, is bringing the international healthcare industry to the Middle East. Organised by Informa Exhibitions, this edition of the event is expected to be attended by more than 84,500 healthcare and trade professionals and is offering an important platform for the MENA healthcare industry to build relationships with international stakeholders. Enabling companies to showcase progress and achievements in the sector, the show facilitates the exploration of new business opportunities in the global healthcare field.

The event is hosting more than 4,150 exhibiting companies from over 66 countries across the globe. Additionally, with dedicated country pavilions, the exhibition gives a truly international representation of hospital equipment, medical devices and medical technology on display. Moreover, visitors and delegates will be attending the event from more than 160 countries, proving that Arab Health is truly where the healthcare world comes to do business.

From the latest imaging equipment to the most cost-effective disposables; developments in surgery to advances in prosthetics, Arab Health continues to be at the heart of healthcare in the Middle East. As the largest collection of healthcare product manufacturers and service providers under



one roof, the exhibition is a one-stop shop for all healthcare sourcing and procurement needs.

For professionals who are tasked with purchasing and procurement responsibilities for healthcare facilities, educational providers and medical speciality associations, Arab Health is (pg 2) ►

Leaders Felicitated at the First Global  
Health Pioneer Awards in Dubai

The first ever Global Health Pioneer Awards were held yesterday evening under the patronage and presence of His Excellency Sheikh Nahyan bin Mubarak Al Nahyan, Cabinet Member and Minister of State for Tolerance UAE and President of UAE Genetic Diseases Association. The event, which took place at Etihad Museum, Dubai, was promoted by Gruppo Ospedaliero San Donato (GSD) in partnership with UAE Genetics Disease Association and Arab Health.

The awards were founded under the joint advocacy and vision of Paolo Rotelli, President, of GSD and Kamel Ghribi, Chairman of GSD Healthcare Middle East.


GSD is Italy's leading private hospital group and among the largest in Europe. Its model is centred around the patient and combines clinical, academic and research excellence to provide the very best tailor-made (pg 2) ►



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the ideal platform to get ahead of the upcoming year’s product needs.

What continues to attract medical practitioners to the show are the incredible insights it offers into the advancements of the healthcare industry through the exhibition, and the dedicated CME-accredited conferences and hands-on-training

workshops that provide the opportunity for growth in multiple fields and disciplines.

Plus, with 11 conferences, Arab Health Congress is one of the largest CME accredited multi-track medical conferences in the world. More than 4,500 delegates and 250 plus international and regional speakers will be welcomed over the four days of



the congress. The speakers and moderators at the conferences cover the most up-to-date insights into cutting-edge procedures, techniques and skills, making these a must-attend.

This year the Total Radiology Conference and the Obs-Gyne Conference will be held at the Conrad Dubai, directly opposite the main exhibition venue during the show. The other conferences will continue to take place at the Dubai World Trade Centre.

There will also be a host of training and workshop programmes at the show that will be hosted by leaders in the healthcare industry. These sessions will focus on advanced techniques of the latest state-of-the-art equipment across different modalities.

Furthermore, with 39 dedicated country pavilions, international representation at the show remains robust with a number of pavilions increasing in size. One example is that of the Polish country pavilion, which has seen its national participation grow from 39 exhibitors in 2018 to 50 exhibitors in 2019, signifying the growing interest in the UAE as a key market for the healthcare industry.

Fostering Innovation

A new feature of the show this year is the Innovation Hub – a dedicated area for attendees to immerse themselves in the latest healthcare innovations. It is being held in association with government entities such as UAE Ministry of Health and Prevention, Dubai Health Authority, Department of Health Abu Dhabi and SEHA.

The Innovation Hub will feature the Innovation Showcase allowing visitors to explore cutting-

edge healthcare technology including AI, disease management and home care devices, mobile device accessories, telemedicine platforms, to name a few.

According to Ross Williams, Exhibition Director of Arab Health, “The market is ripe for new healthcare start-ups and entrepreneurs looking to make their mark on the industry. Over the years, we have seen growing interest in new products and innovations that will contribute to shaping the future of healthcare. Hospitals, medical device manufacturers and service providers across the globe are facing increasing pressure to innovate in order to become competitive.”

The Innovation Hub will also be the platform for the inaugural Innov8 Talks. As well as daily free-to-attend talks with discussions led by keynote speakers, the Innov8 Talks will host a series of ‘Pitch’ sessions for creative healthcare start-ups and SMEs to demonstrate their ideas to an esteemed panel of judges.

Stay Connected

In order to get the most out of your visit, download the Arab Health mobile app from [www.arabhealthonline.com/mobileapp](http://www.arabhealthonline.com/mobileapp) or use one of the many Supplier Finder kiosks situated at the entrances of most of the exhibition halls.

Furthermore, exhibitors looking to expand their reach beyond the horizons of the four days of the exhibition can take advantage of Omnia’s user-centric digital platform and connect with people and products in one simple click. By logging on to [www.omniagmd.com](http://www.omniagmd.com), Arab Health stays live, year-round, and allows you to stay connected with the market place throughout the year.

and innovative care to everyone.

“The UAE aims to become in the next decade one of the top countries worldwide for quality of life. By organising the first Global Health Pioneers Award, we would like to draw the attention to this great path, wherein populations’ health and innovation are among the key drivers.

“According to the Bloomberg 2017 ranking, Italy is the world’s healthiest country. When it comes to the UAE, which ranks tenth thanks to its strong leadership in healthcare, we can see how it is fast growing every year to secure the best quality and most equitable healthcare. This growth has been and will continue to be fueled by the continuous collaboration and share of worldwide best practices. The 2019 commitment to Tolerance strengthens the notion that healthcare innovation should be accessible by everyone and everywhere, for the empowerment of tomorrow’s healthy generation,” said Paolo Rotelli.

As a leading organisation in healthcare, GSD, with GSD Healthcare, the UAE arm, is committed to creating opportunities that support the national healthcare strategies of the countries it is present in.

The Global Health Pioneer Award has therefore been established to celebrate the dedication, innovation and commitment of healthcare leaders of the country first, to recognise the vital link between the UAE and Italy, and to play an essential role in supporting the UAE national agenda for healthcare. The award is meant to recognise pioneers worldwide, strengthening the value of Dubai as a worldwide platform that is able to reach

out and generate fruitful exchanges from a global uptake of the innovations and humanitarian approaches, that fuel the search for improving quality and equity in healthcare systems.

GSD opened its first office in Dubai Healthcare City in 2017. Rotelli shared that the reason Dubai was chosen as the place to launch GSD’s first international office was because the city is at the centre of the world.

“Dubai can be reached in three hours by plane by almost the one-third of the world population, and in seven hours by two-thirds. Basically, it is easier to bring the world to Dubai than to bring it to Milan. We decided that this was the market through which we want to take our know-how to developing markets such as China and Africa, as it is easier for them to travel to Dubai,” he said.

Fostering Tolerance

The event was held under the patronage of Sheikh Nahyan bin Mubarak Al Nahyan, the Minister of State for Tolerance UAE, who was also in attendance, and one of the key focus areas of the evening was to commend the declaration of 2019 as the Year of Tolerance.

The UAE, with its wise leadership and people from diverse cultural backgrounds, is a combination of tolerance, harmony, respect and acceptance of the other. The idea of tolerance is rooted in society, and the Year of Tolerance is geared towards strengthening these values and creating frameworks that support its continuity. In the same vein, the aim of the Awards was

to promote the values of tolerance, enhance interaction and highlight the equal opportunities presented in the country for all.

Honouring the Best

The 2019 edition of the awards were dedicated to the field of Genetics and recognised the outstanding efforts of individuals and organisations working

towards innovation and advancements in the field of genetics and to what extent such innovations can boost the future of more equitable and accessible healthcare systems. Genetics research and innovations in fact are concretely bringing healthcare systems towards a new system thinking, moving from health to wellness and wellbeing.

**Winners**

- Pioneer with most outstanding contribution towards care and preventive health service towards children and families living with Genetic Disorders  
**Dr. Tawfik Ahmed Muthaffer Khoja (KSA)**
- Pioneer in healthcare transformation  
**Prof George Joji Hara (Japan)**  
**Maryam Al Jalahma (Bahrain)**  
**Anders Lonnberg (Sweden)**
- Pioneer woman scientist or physician  
**Dr. Maha Ahmed Ali Al Mozaini (KSA)**  
**Ismahane El Ouafi (UAE)**  
**Prof Silvia Cirri (Italy)**
- Pioneer researcher or physician  
**Prof Luigi Naldini (Italy)**  
**Prof Alawi Alsheikh-Ali (UAE)**  
**Dr. Naif Ahmad Almontashiri (KSA)**
- Pioneer nurse  
**Tiziana Fiorini (Italy)**  
**Dr. Sumaya Al Bloushi (UAE)**
- Pioneer NGO/ personality contributing toward improving the quality of life  
**Association Bambini – Cardiopatici Nel Mondo,**  
**Prof Alessandro Frigiola (Italy)**

**Purple – Mike Adams (UK)**  
**Advancement Initiative for Medicine and Science – Alireza Haghighi (USA)**

- Pioneer innovative research Institution  
**Arabian Gulf University, H.E Dr. Khalid Abdulrahman N. Al Ohaly (Bahrain)**  
**DEFTA partner (USA)**
- Pioneer community project in promoting a healthy lifestyle for future generation  
**Tobacco Control Program - MOH**  
**Lifestyle Clinic - DHA**  
**Weqaya Program - HAAD**
- Pioneer personality/organization demonstrating leadership and commitment towards health needs or assistance of refugees or migrants  
**Medecins Sans Frontieres - Clara Nordon**
- Pioneer media program or personality  
**Sustainable Health – Assiha Al Mostadama-Sonitta Nader (France)**  
**Haykal Media - popular Science (UAE)**  
**Dr. Mohammad Nabeel Eissa Alsafi (Kuwait)**
- Special Prize  
**George Stephen Hayes (USA)**



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# TODAY AT A GLANCE

## ARAB HEALTH 2019 CONGRESS

Conference	ROOM	Location	Start	Finish
Total Radiology	Level 2	Conrad Dubai	08:50	18:30
Obs & Gyne	Level 4	Conrad Dubai	09:00	18:00
Orthopaedics	Abu Dhabi B	1 <sup>st</sup> floor above Rashid Hall, DWTC	09:20	17:20
Surgery	Umm Al Qwain	2 <sup>nd</sup> floor above Rashid Hall, DWTC	09:30	17:30
Paediatrics	Ajman D and Fujairah A	Above Hall 7, DWTC	09:00	18:00
Diabetes	Dubai C & Dubai D	Above Sheikh Maktoum Hall, DWTC	08:50	17:45
Gastroenterology	Ras Al Khaimah	2 <sup>nd</sup> floor above Rashid Hall, DWTC	09:20	18:00

### ARAB HEALTH DAILY DOSE

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# Your Guide to Innovation Hub

Working alongside government entities such as the UAE Ministry of Health and Prevention, Dubai Health Authority, Department of Health Abu Dhabi and SEHA, Arab Health 2019 is hosting the Innovation Hub, a dedicated area to immerse yourself in the latest healthcare innovations. It comprises of two key sections: Innovation Showcase and Innov8 Talks.

The Innovation Hub is providing an opportunity for companies to display and demonstrate new products and innovations to the region's healthcare decision makers and future shapers. Working together with key influential stakeholders, the hub is providing a dedicated showcase area for start-ups, SMEs, and innovators to participate at the Innovation showcase. The areas covered include Artificial Intelligence, Disease Management, Health Monitors, Healthcare Start-ups, Smart Devices and Telemedicine Platforms.



# Innov8 talks.

### The Innov8 Talks

**Today's theme:** Future of Care and Treatment  
**Location:** Plaza Hall, DWTC

**Moderator:** Robert Nieves, Vice President Health Informatics, Clinical Solutions, Elsevier

**12:00 Keynote: The future of genomics in personalised care**  
Summer Nasief, Director of Healthcare, Middle East & Africa, Microsoft

**15:00 Changes in the healthcare industry to enhance patient care and delivery**  
Dr. Gareth Goodier, Group Chief Executive, SEHA, Abu Dhabi, UAE

**15:30 Emerging innovations and achieving the quadruple aim of quality, access, cost and patient experience**  
Manish Kolhi, Chair, Global Board of Directors of Health Information and Management Systems Society (HIMSS)

**16:00 Health tech hub: How Abu Dhabi is becoming the center of healthcare innovation**  
Dr. Asma Al Mannaei, Director of Healthcare Quality, DOH, Abu Dhabi, UAE

### THE PITCHES

**12:30 – 14:30: This will feature 8 talks, for 8 minutes**

**3D Life Prints:** Provides medical 3D printing, manufacturing and service capabilities for key UK NHS hospitals and academic institutions

**Aetrex:** Bringing 3D Printing and AI for real time foot analysis and treatment

**CELLINK:** The leading 3D bioprinter provider that focuses on the development and commercialisation of bioprinting technologies.

**FibriCheck:** Developed an app to detect atrial fibrillation and other heart arrhythmias

**Now You See:** A smart navigation system to help the blind

**Qure.AI:** Using AI to transform radiology

**Tissue Guard:** Develops biomaterial to support artificial tissue growth

**WSP:** Enhancing the future of children's hospitals

### THE JURY

■ Dr. Mohammad Al Redha, Director, The Executive Office for Organizational Transformation, Dubai Health Authority

■ Mohamed Hamdy, Head of Venture Capital, Dubai Future Foundation

■ Saqr AlHemeiri, Chief Innovation Officer, Ministry of Health and Prevention

■ Mubarka Ibrahim, Director of IT Department, Ministry of Health and Prevention

■ Marwan Abdulaziz, Executive Director, Dubai Science Park

■ Daniel Amir Raduan, Head of Digital Health, Etisalat

■ Akbar Moideen Thumbay, VP – Healthcare Division, Thumbay Group



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# Highlighting French Healthcare

Article provided by Business France

The French pavilion is hosting 110 companies, of which 30 will be in Dubai for the first time. For the 2019 edition of the French pavilion, Business France, the agency supporting the international development of the French economy, is launching the French Healthcare brand, an innovative initiative aimed at bringing together French companies, researchers, and healthcare professionals to jointly promote their activities internationally.

On display across 1,400 square metres, French expertise will embrace a wide range of fields: from orthopaedics to rehabilitation, sterilisation, waste treatment, remote medicine solutions, furniture and equipment for hospitals, implantable medical devices, and medical measuring instruments, among others.

The collective brand French Healthcare has the ambition to build momentum through a joint approach so as to boost the influence of French health expertise and technologies. The players of the French health ecosystem wishing to join this approach can join the French Healthcare organisation through <https://frenchhealthcare.fr/en/join-us/>.

In 2017, the French medical devices market posted €28 billion, earned by more than 1,300 companies, of which 92 per cent are SMEs. The industrial sector generates 85,000 jobs in France. Growth in the sector is fuelled in large part by export, an area in which turnover is growing by five per cent per year.

France offers tremendous potential for innovation in the medical devices sector thanks to recognised industrial, scientific and medical expertise. The medical devices sector stands out for its three-pronged growth model: "reasoned innovation/ internationalisation / external growth", with exports as the main driver, in light of the obstacles on the domestic market. In this respect, innovation remains of central importance to these companies. It is illustrated by a desire to develop solutions that integrate new functionalities, in particular developed from e-health technologies.

With the support of Sanofi, FedEx and regional partners from France such as Bretagne

Commerce International, DEV'UP, Lille Eurasanté and Medicalps, the French Pavilion will give centre stage to the latest innovations at the show. Their technical nature meets the expectations of the very demanding and rapidly-developing local market.

Jean-Paul Scheuer, Country Chair & General Manager, Sanofi Gulf commented: "Delivering innovation in healthcare that will truly benefit patients and improve care is one of the main commitments at Sanofi. I believe that partnerships are vital to realising this, and the Arab Health conference is a great platform to meet like-minded organisations to exchange insights and experiences and explore potential collaborations. We are always pleased to work with partners who share the same values."

Taarek Hinedi, Vice President Operations, FedEx Express Middle East and Northern Africa added: "Driven by emerging economies, longer life expectancy and technological advancements, the Global Healthcare market is set to cross US\$ 1.85 trillion this year. FedEx is supporting the complex needs of the industry like temperature-control of sensitive samples and products by providing leading solutions in healthcare logistics. FedEx innovations such as SenseAware track the entire journey of vital healthcare products, delivering new levels of visibility, security and control from start to finish. This is a transformative time for FedEx, and we are continuously working to innovate across entire healthcare supply chains."

Some of the represented sectors on the French Pavilion are:

- **Hospital equipment and furniture:** Medical beds, trolleys, wheelchairs, operating lamps, ergonomic chairs, gynecological examination chairs.
- **Prevention and risk management in hospitals/ hospital hygiene:** Equipment sterilization and disinfection, air treatment and purification, hospital waste management, ventilation system, effluent decontamination.
- **Diagnostics:** Ultrasound diagnostic equipment, sonography equipment, Doppler, endoscopes, radiography units.
- **Telemedicine solution:** Patient monitoring, transmission of medical information.



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# DHA Receives Fifth Consecutive Silver Award from American Heart Association

Article provided by Dubai Health Authority (DHA)

The International Training Centre (ITC) at Dubai Health Authority (DHA) has received the Silver Award for the fifth consecutive year by American Heart Association (AHA) in recognition of the exemplary First Aid, CPR and Advanced Cardiovascular Care Life Saving training programmes provided.

The DHA's ITC is affiliated to AHA and is recognised as the International Training Centre in the MENA region with highest number of regional faculty, training centre faculty and instructor pool. Since 2008, the centre has provided 3,226 life support-training courses for more than 50,000 trainees.

CPR – or Cardiopulmonary Resuscitation – is an emergency lifesaving procedure performed when the heart stops beating. Immediate CPR can double or triple chances of survival after cardiac arrest.

Amena Al Suwaidi, Acting Director of Medical Education and Research Department at the DHA said, "Since the centre's affiliation to AHA in 2008, we have been providing training to thousands of healthcare professionals within DHA and in the private sector. In 2012, the AHA certified DHA's ITC as a reference centre and we are proud to be among the top five centres in the MENA region that provide the highest number of CPR training."

Dr. Gheneya Sultan Al Shamsi, Head of Training at DHA's Medical Education and Research Department, said, "Apart from the above, DHA ITC also provides awareness campaigns every year to educate public on how to handle situations during an emergency and cardiac arrest. Every year, training is provided to thousands of the public to raise awareness on hands-only CPR. In 2018, 2,600 participants were trained through this programme."

The DHA Life Support office is located at Medical Training Section, Medical Education and Research Department. For more information, about CPR training courses, contact +971 4 219 1905.

# UK Displays Transformative Digital Health Technologies

Article provided by Association of British HealthTech Industries (ABHI)

An award-winning online platform and smartphone app for people with diabetes and a software that turns physical and cognitive exercises into video games are two of the UK digital health technologies being showcased at the show.

This year the UK Pavilion – organised by the Association of British HealthTech Industries (ABHI) – is highlighting a range of UK digital health technologies, reflecting the digital revolution taking place across Britain.

Exhibitors include MIRA Rehab whose medical software turns physical and cognitive exercises into video-games, making therapy easier to follow and increasing patient compliance. The technology aims to motivate people to get better in a faster, easy and fun way. As performance is tracked, the tool is ideal for therapists, allowing them to personalise MIRA to fit their patients' conditions.

Another technology on display is, My Diabetes My Way, an online self-management platform. It gives people with diabetes



The UK Pavilion will be located in Hall 7

secure access to their own medical records and home recorded data together with tailored information, advice and multimedia



My Diabetes My Way is an online platform and smartphone app for people with diabetes

education resource access. The product has been developed with input from UK clinicians, technicians, data experts and patients and has undergone extensive user testing and evaluation to demonstrate its clinical impact.

Paul Benton, Managing Director, International, said: "There is no doubt a digital revolution is taking place in the UK. We have some of the world's most innovative digital health technologies being developed and we are delighted to host many of them on our UK Pavilion at Arab Health."

The global market for digital health was estimated to be worth £70bn in 2016 and is expected to almost double to £150bn by 2020. In the UK, digital health employs over 10,000 people, generating £1.2bn in turnover. Over the last year alone there has been an extra 1,100 jobs created – an increase of 11 per cent.



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## Business Partner Presentation Zone Schedule\*

Session Timings	JAN 28 DAY 1	JAN 29 DAY 2	JAN 30 DAY 3	JAN 31 DAY 4
10:30 - 11:00 am	DHCC Brief	<b>Laser Eye Care &amp; Research Center Presentation + Q&amp;A</b>  Dr Anwar Hamdan Sajwani, one of the 'first' Emirati ophthalmologists sharing his experience	<b>Clinart Presentation + Q&amp;A</b>  An overview about the cycle of clinical research from concept development to publication	<b>Revitalife Compounding Pharmacy Presentation + Q&amp;A</b>  Presenting Bioidentical Hormone Replacement Therapy and Revitalife Drip Multivitamins, Minerals and Amino Acids Intravenous Therapy
11:10 - 11:40 am	<b>DHCC: The Hub for Kidney Transplants in Dubai Presentation + Q&amp;A</b>  Showcasing how the free zone has built expertise and capacity in kidney transplantation	DHCC Brief	<b>VAT Awareness Session with tax advisory firm WTS Dhruva</b>	To mark Dubai Healthcare City's (DHCC) 15th year of participation at Arab Health, we are celebrating business partners who have completed 15 years with us
11:50 - 12:20 pm	<b>Imperial Healthcare Institute Presentation + Q&amp;A</b>  Supra Lasik Treatment, the latest generation of laser eye vision correction	<b>Memorandum of Understanding signing</b>  Visiting Doctor's License	<b>VAT Awareness Session with tax advisory firm WTS Dhruva (continued)</b>	<b>Al Jalila Children's Speciality Hospital Presentation + Q&amp;A</b>  Showcasing the mental health day care program
12:30 - 01:00 pm	Dubai Dental Hospital Launch	<b>DHCC Telehealth Launch + Memorandum of Understanding signing with Getbee</b>	<b>Patient Safety Pledge launch + Memorandum of Understanding signing</b>	<b>Dubai Healthcare City - Medical Presentation + Q&amp;A</b>  Showcasing the Automated External Defibrillator (AED) installation across the free zone
01:10 - 01:40 pm	<b>American Spine Center Presentation + Q&amp;A</b>  Successful non-invasive treatment for acute disc herniation cases	<b>DHCC Telehealth Launch + Memorandum of Understanding signing with Getbee (continued)</b>	<b>CryoSave Arabia Presentation + Q&amp;A</b>  The region's largest stem cell laboratory offering a unique program designed to give access to stem cell banking for families in need.	<b>Merrimac Dialysis Center Presentation + Q&amp;A</b>  A CSR initiative to provide dialysis for people in need.
01:50 - 02:20 pm	<b>Cochlear Middle East Interactive Session</b>  Nucleus® 7 cochlear implants that can now be connected to your smart phone	<b>Bioscience Clinic Presentation + Live Stream</b>  The only UAE Ministry of Health and Prevention approved certified cells factory	<b>Igenomix Presentation + Q&amp;A</b>  A leading company in reproductive genetics, showcasing Endometrial Receptivity Analysis, and NACE prenatal testing (non-invasive)	<b>Okadoc Presentation + Q&amp;A</b>  Insights into patients' preference for healthcare technology
02:30 - 03:00 pm	<b>DHCC - Okadoc</b>  Live Appointment System introduction + Memorandum of Understanding signing	<b>Emirates Specialty Hospital and Hasan Surgery Discussion</b>  Our partners talk about the use of stem cells in their treatment plans	<b>American Academy of Cosmetic Surgery Hospital Presentation + Q&amp;A</b>  Showcasing newly-introduced biological treatments	<b>DHCC: The Hub for Kidney Transplants in Dubai (Repeat session) Presentation + Q&amp;A</b>  Showcasing how the free zone has built expertise and capacity in kidney transplantation
03:10 - 03:40 pm	<b>Moorfields Eye Hospital Dubai Presentation + Q&amp;A</b>  Showcase of Opmi Lumera microscope and Optical Coherence Tomography (OCT)	<b>Mediclinic City Hospital Presentation + Q&amp;A</b>  Showcasing the Comprehensive Cancer Centre (CCC), an advanced facility for the diagnosis and treatment of cancer	<b>Dr Sulaiman Al Habib Hospital</b>  Epilepsy Monitoring Unit	<b>BR Medical Suites Presentation + Q&amp;A</b>  Patient success stories with sinus surgery using a navigation system
03:50 - 04:20 pm	<b>American Heart Association: Adult and Child CPR Interactive Session*</b>  Learn the core skills of Cardiopulmonary Resuscitation (CPR) in just 20 minutes * Anytime Personal Learning Kit included	<b>DHCC: The Hub for Kidney Transplants in Dubai (Repeat session) Presentation + Q&amp;A</b>  Showcasing how the free zone has built expertise and capacity in kidney transplantation	<b>London Sleep Center Presentation + Q&amp;A</b>  Only center in Dubai providing Integrated Dental Sleep Medicine services	<b>Emirates Specialty Hospital Presentation + Q&amp;A</b>  Esophageal Resections and Replacement
04:30 - 05:00 pm	<b>Emirates Specialty Hospital Presentation + Q&amp;A</b>  DTRAX- the first minimal invasive intervention for permanent treatment of chronic neck pain and cervical disc in Dubai	<b>American Heart Association Presentation + Q&amp;A</b>  Showcasing the Resuscitation Quality Improvement Program (RQI)®	<b>Mohammed Bin Rashid University of Medicine and Health Sciences Student Research Presentation + Q&amp;A</b>  Showcasing biomedical, clinical, public health, and medical education student research	DHCC Brief

\*Subject to change



# Inspiring Innovation in the Spotlight

Arab Health 2019’s Innovation Hub, located in the central Plaza Hall, allows you to discover the latest technology advancements shaping the future of healthcare

By Deepa Narwani, Editor

A new feature being launched at the show this year is the Innovation Hub, located within the central Plaza Hall, that will prominently focus on technologies transforming healthcare. Working alongside government entities such as the UAE Ministry of Health and Prevention, Dubai Health Authority, Department of Health Abu Dhabi and SEHA, the Innovation Hub is a dedicated area for visitors to immerse themselves in the latest healthcare innovations and discover trending start-ups and SMEs creating an impact in the healthcare arena. Plus, a dedicated seminar theatre will be a key feature in the Innovation Hub for the inaugural Innov8 Talks that will host 8 pitches, each 8-minute-long. Here you can listen to start-ups and entrepreneurs present their healthcare innovations to a panel of industry experts and potential investors.

Below is a deeper dive into some of the companies that are a part of the Innovation Hub and looking at how their innovations are shaping the future of healthcare.

### Improving Paediatric Care with AI

**At the Innov8 talks today,** Nolan Rome, engineer and healthcare design director for WSP in the U.S. and co-chair of WSP’s Global Healthcare initiative, will be showcasing a paediatric care innovation that the company has been working on to determine how Artificial Intelligence (AI) can help deliver a better experience for patients and staff.

He shares: “We’re discovering whether using AI to interpret temperature, lighting controls, etc., is effective to achieving better wellness environments and reduce the procedural information the clinicians need direct from patients. The approach we are taking is to empower the children and give them the ability to control their environment, then using this data to provide the clinicians with unspoken cues as to what the patients level of wellness is. We believe this would reduce anxiety and stress on the patient, potentially helping them to recover more quickly, and allow the clinicians to have less scripted interactions with patients.”

### Access to Everyone Everywhere

Participating at Arab Health for the second consecutive year is Okadoc, which is based in Dubai Health Care City and is a first of its kind platform in the region that connects healthcare providers and doctors instantly with their patients, bringing a way to quickly make confirmed booking appointments.

Fodhil Benturquia, CEO and Founder of Okadoc highlights: “We are making our official international debut at the show, showcasing our unique proprietary digital platform designed to provide instant and interactive healthcare access to everyone everywhere.

“The platform shows real-time doctors’ calendar availability, which allows hospitals, clinics and practitioners to take online appointments by patients who can search and select the doctor they need according to specialty, experience, education, location, insurance, language spoken and availability.”

Okadoc’s aim is to help the healthcare sector introduce significant efficiencies while reducing cost and maximising revenues and profitability. For example, hospitals and clinics connected to it can reduce no-shows by 75 per cent. From a patient experience standpoint, its user-friendly and device-agnostic platform drastically improve patient satisfaction giving them the functionality to find their preferred doctor who matches their precise requirements, book a confirmed appointment in less than 40 seconds, reschedule in 10 seconds and cancel in just five seconds; and all that without any human intervention. In fact, artificial intelligence enables Okadoc’s platform reduce toxic calls



CELLINK is showcasing its latest 3D Bioprinter, BIO X

hospitals and clinics receive by 30 per cent.

When asked about future plans, Benturquia shares: “Okadoc’s high-adoption platform and highly scalable business model are at the core of the digital transformation of the UAE’s healthcare market, which is expected to be worth US\$20 billion by 2020. Looking across the region, this year we have concrete plans to launch our presence in key regional markets across the GCC, a market expected to be worth a total US\$71.3 billion by 2020.”

### Effectively Managing Diabetes

Nicolas Babin is the co-founder of MirambeauAppCare and co-founded the company in France in 2017 with his associate Benoit Mirambeau. The company manages diabetes protocol for patients and at the show they are showcasing DiabiLive, their flagship product, an EU class 2b medical device application.

Babin explains: “DiabiLive allows insulin management and tele-consultation for patients and doctors. Everything is based on the doctor’s protocol. This application is unique as it is the only technology on the market that can calculate the precise amount of insulin the patient needs to inject by integrating their glycaemic level with medical protocol, food intake and physical activity.”

According to Babin, innovation in healthcare today means having the patient at the centre of everything. Furthermore, the use of AI and smart algorithms allow patients to feel safe and doctors to

manage them efficiently on-site or at a distance.

When asked about future plans, he shares: “We are currently focused on our diabetes protocol management application using all new technology. Our next step is to apply our technology to other illnesses that require strict and challenging protocols. Also, we are looking forward to starting our business in the UAE shortly.”

**DiabiLive will be pitching at the Innov8 talks on Tuesday, January 28.**

Its innovative and patent pending bioinks are biomaterial innovations that enable human cells to grow and thrive such as they would in the natural human body environment.

The company’s disruptive technology platform is being used in over 600 labs to print tissues such as cartilage, skin, and even fully functional cancer tumours that can then be used to develop new cancer treatments. At the show, CELLINK is showcasing its latest 3D Bioprinter, BIO X.

Johan Berthag, Head of Global Sales, CELLINK says, “At CELLINK we take great pride in being one of the companies that are driving the future of medicine. To be able to be a part of and collaborating with some of the world’s best scientists doing ground-breaking research that will totally change how we develop new pharmaceuticals or patient-specific treatments, that is truly exciting.

“One of the big goals is of course to be able to bioprint a full-size organ and transplant this into a patient!”

### Tapping into Telemedicine

TruDoc24x7 has been operating since 2011 and is one of the UAE’s leading 24x7 Population Health Management Delivery System that combines next-



TruDoc24x7’s on-site Virtual Clinic Booth that is on display at the show

### Machine Learning to the Rescue

Brainscan.ai is showcasing a software that uses machine learning to analyse computed tomography images of the head to detect and evaluate brain changes. Thanks to this solution, the Radiologist is able to give an opinion on a case faster, more accurately and with easy access to similar cases, in order to make a more informed decision. It hopes to generate savings for the hospitals and lower the queues for radiological interpretation.

Dariusz Wiśniewski, International Relationship Manager, Brainscan.ai says: “As software is not prone to be tired, it’s a tool that can actively help to lower the risk of misdiagnosis, which is a major problem.”

Brainscan.ai is continuing to further develop the software by improving its accuracy and by polishing functionalities. “Our team of developers is working to ensure that the final version of the software is available on the market in October 2019. When we have an established presence on the market, we want to get into MRI scans,” Wiśniewski adds.

### Driving the Future of Medicine

One of the world’s first bioink companies and leading 3D bioprinter provider, CELLINK, is present at the show and will be pitching **at the Innov8 talks today.** The company focuses on the development and commercialisation of bioprinting technologies.

generation telemedicine, telemonitoring and home health to provide patients with immediate access to highly trained, DHA licensed doctors and wellness experts for healthy, acute and chronic condition management and advice via voice/video calls.

The one-of-a-kind solution consists of a 24x7 Call Centre, Integrated and Interactive Mobile Application, 24x7 On-site Virtual Clinic Booth, On Site Clinics, Disease Management Programs and Hospital at Home Program, which is licensed by Johns Hopkins University.

Raouf Khalil, Founder & CEO, TruDoc24x7 highlights: “Our full-time, non-incentivized doctors will tell you the truth about what you need, not what you can afford. As a trusted partner to over 5.1 million paid subscribers, we provide consumers with a true concierge service based on 24x7 Population Health Management and a guaranteed savings model for payers through the practice of true evidence-based medicine.”

At Arab Health, the company will be showcasing its new 24x7 On-site Virtual Clinic Booth. Through the innovative technology included within the clinic, patients are able to take their readings using easy-to-use, integrated smart devices, which relay the readings directly to the call centre where TruDoc’s doctors are available 24x7 to assess the readings and provide advice back to the patient.



WSP provided Building Services and Fire Protection to Dell Children’s Medical Center of Central Texas, one of the top sustainable children’s hospitals globally. Photo credit: John Durant.



# THE CANCER THERAPIES OF TOMORROW

Our mission at Children's Hospital of Philadelphia: introducing and perfecting the most innovative pediatric cancer cell therapies.

Using CAR-T cell therapy, our program treated the first pediatric patient, and now has treated more patients than any other pediatric institution in the world.

The global trial led by our physician-scientists has shown an **82 percent remission rate** for children with especially tough leukemia — who once had about a **10 percent chance of surviving**.

And our pursuit of the next breakthrough is unrivaled. We're studying combination therapies that could save even more children's lives.

Because at Children's Hospital of Philadelphia, innovation is in our DNA.

[chop.edu/global](https://chop.edu/global)

*Our cell therapy patient KaShaun, 8*

# Partner for Innovation and Networking in Pharma

By Deepa Narwani, Editor

Over the years, CPhI Middle East & Africa has established itself as one of the region's most comprehensive pharma gathering that brings together a wide range of exhibitors from all across the pharma supply chain. Together, with its co-located events iCSE, P-MEC, InnoPack, and FDF, it hosts over 4,900 key visiting pharma suppliers and buyers. Whether you are looking for sourcing new business or getting the latest market insight, with its co-located events, the exhibition is a one-stop-shop pharmaceutical platform in the Middle East & Africa region. The next edition will take place between September 16 to 18.

In an interview with *Daily Dose*, Cara Turner, Brand Director, CPhI Middle East & Africa, discusses the impact innovation is driving in the healthcare arena, especially technology that is transforming the pharma industry, and sheds light on the agenda for the upcoming event. Excerpts.

## Innovation in healthcare is the theme of Arab Health this year. What would you say is the impact innovation is having on the delivery of healthcare?

Innovation has become crucial to the delivery of healthcare. Already we've seen the incredible impact technologies such as Artificial Intelligence (AI), Virtual Reality (VR), wearable technologies, 3D printing, and drones have had on the transformation of the healthcare landscape. The wearable medical device market is worth billions of dollars annually and this is expected to continue to increase year-on-year according to the latest research. It's not only the wearables market either; across-the-board strong growth is predicted with healthy lifestyle apps, telehealth, and, greater patient engagement



Cara Turner

through technology resulting in cost saving and quality improvement.

## What according to you is the potential of Blockchain and Artificial Intelligence in improving patient care?

If we look at the healthcare sector over the last few years, there have been several buzzwords dominating the discussion. However, it appears Artificial Intelligence (AI) could be the one that will have the most impact on the sector as we move forward. Computer-assisted robotic technology or AI one day superseding medical professionals are just a couple of examples being looked at and discussed. As we move into 2019, these will become even more pertinent, as the industry prepares to implement the technology.



iCSE

P-mec

InnoPack

FDF

AI might be a relatively new term, but this is something that a lot of businesses, particularly those involved in the healthcare sphere, have been exploring for a long time.

## What are your thoughts on the UAE's healthcare industry? According to you, what are some of the current healthcare trends being seen in the GCC region and what do you see as the growth areas going forward?

Innovation is driving the healthcare industry forward and advances in technologies are creating vast new possibilities and opportunities for the UAE healthcare sector. Healthcare facilities, medical device manufacturers and service providers across the globe are constantly innovating to remain competitive and offer new and improved treatments to patients.

There will be a wealth of opportunities for healthcare start-ups, thanks to an increase in interest in new products and innovations – it will be the manufacturers and service providers who are able to innovate and remain competitive who will experience the greatest growth.

## Could you tell us about CPhI's upcoming events? What is the agenda for these?

CPhI Middle East & Africa focuses exclusively on pharma manufacturing across the region and is this specific community's regional partner for innovation and networking, across the entire pharma supply chain. As such, our content this September will be shaped around encouraging government to industry initiatives, exploration of the latest trends within manufacturing, but more importantly, taking a closer look at innovation; where it's coming from and what it means to the pharma manufacturing across the region.

## What according to you are the opportunities available to healthcare and trade professionals who attend CPhI events?

CPhI is all about making connections that propel businesses within pharma manufacturing forward. At our events, we work hard to ensure a mix of trending content, high-level exhibitor interactions, and multi-level networking opportunities; from pre-arranged mutually beneficial meetings to informal networking events. If your business is within any aspect of the pharma manufacturing supply chain, then CPhI events are a must-attend!

For more information visit CPhI's stand 05.12 or [www.cphi.com/mea](http://www.cphi.com/mea).

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# Ireland, the home of High-Tech Healthcare Innovations

Ranked as one of the top five MedTech hubs globally, Ireland's unique ecosystem has all the essential elements required to deliver innovative solutions around the world.



## Who we are

Enterprise Ireland is the government organization responsible for the development and growth of Irish enterprises in world markets. We work in partnership with Irish enterprises to help them start, grow, innovate and win export sales in global markets. We have a national network of nine regional offices throughout Ireland and over 30 international locations, facilitating access to more than 60 countries worldwide. Among these include our branches in Riyadh, Dubai, Abu Dhabi and Doha covering the Arab World.

## Ireland as a source of MedTech innovation

Ireland is one of the top MedTech innovation hubs internationally. We pride ourselves on being recognised as one of the most collaborative, integrated and globalised economies worldwide. With annual exports of €22.7bn to over 100 countries globally, our world class Irish companies have positioned Ireland as the second largest exporter of Medical Technologies in Europe. The formula for this success has been integrating innovation in our companies' DNA. As a result, Innovation and research & development are at the core of Ireland's MedTech solutions.

## The Irish MedTech ecosystem

18 of the world's top 25 MedTech companies are located in Ireland. Among these are Boston Scientific, Abbott and Johnson & Johnson. Furthermore, Enterprise Ireland's 14 Technology Centres and 15 Technology Gateways focus on cutting-edge areas such as pharmaceuticals, medical devices, nanotechnology, and smart technologies. At each of these centres and gateways, scientists and engineers are working in partnership across academia and industry to address crucial research questions. The Irish MedTech ecosystem is marked by a cluster of over 300 Irish companies operating across four key areas: Medical Sub-supply, Finished Medical Devices, Diagnostics and Digital Health. These companies are globalised, forward-looking, ambitious and their innovative products and services enable international partners to achieve their unique business needs.

## Enterprise Ireland at Arab Health 2019

2019 marks Enterprise Ireland's 10th year exhibiting at Arab Health. This event offers a unique opportunity to co-exhibit with innovative and ambitious Irish partners and for them to showcase their world-class solutions. This year Enterprise Ireland will host 12 Irish companies

on the Ireland Pavilion. Visit stand H3.A10 to meet these innovative companies specialising in the areas of:

- Medical Consumables
- Airborne Infection Control Units
- Medical and Aesthetic Laser Solutions
- Specialized Healthcare Lavatories
- Healthcare Education for Non-native English Speakers.
- Clinical Intelligence Systems
- Medical Contract Manufacturing
- Healthcare Engagement Platforms
- Over the Counter Pharma Products
- Aerosol Drug Delivery
- Radiation/X-Ray Protection Products and Systems

Along with these promising companies, Irish Minister for Mental Health and Older People, Mr. Jim Daly T.D. along with Ambassador of Ireland to the U.A.E., H.E. Mr. Aidan Cronin will be in attendance to celebrate yet another successful year of Arab Health.

To find out more contact:

[Imed.abnoun@enterprise-ireland.com](mailto:Imed.abnoun@enterprise-ireland.com)



# Ospedale San Raffaele

One of the best University and Research hospital in Europe



**Ospedale San Raffaele** is a clinical-research university hospital which provides international-level specialized care for the most complex and difficult health conditions. It has over 50 clinical specialties and more than 1300 beds.

Its main areas of excellence are: Cardiac and vascular surgery, Clinical transplantation, Diabetes and diabetes research, Gastroenterology and Gastrointestinal endoscopy, Gynecology & Obstetrics and Reproductive Medicine, Hematology and Bone Marrow Transplantation, Intensive care, Neurosurgery and Gamma Knife, Nuclear medicine, Oncology, Ophthalmology, Otorhinolaryngology, Pancreatic surgery, Pediatric Immuno-hematology and Transplantation, Radiology, Radiotherapy and Tomotherapy, Thoracic surgery, Urology.

Ospedale San Raffaele is also one of the main research institutes in Italy, both for volume and profile of scientific output. In 2014 alone we produced 1179 scientific publications (total impact factor: 6726.056) and we were granted 245 patents worldwide.

Here our main objectives:

- promote research aimed at dissecting the molecular pathways responsible for a variety of important human diseases;
- identify new targets and new therapeutic strategies for such diseases;
- create the best environment for young scientists and physicians.

Thanks to the commitment and enthusiasm of scientists, physicians, students and all those working at San Raffaele, our in-house research has already brought to the clinic new and important therapeutic approaches against life threatening diseases.

## Highlights

### - Gamma Knife

The Gamma Knife utilizes a technique called stereotactic radiosurgery, which uses multiple beams of radiation converging in three dimensions to focus precisely on brain tumors or defects, permitting intense doses of radiation to be delivered to that volume safely. It enables physicians to locate and irradiate relatively small targets in the head (mostly inside the brain) with extremely high precision while sparing the surrounding tissues.

### - Tomotherapy

Ospedale San Raffaele is one of the few European institutes which offers tomotherapy treatment. Tomotherapy combines CT imaging with a radiation treatment delivery system and allows to apply highly conformal, individualized dose distributions to any target volume, at its true location, during each treatment fraction.

### - Diabetes Research Institute (DRI)

Diabetes Research Institute (DRI) is an international center of excellence for the study and treatment of diabetes. Its main objective is to prevent and cure type 1 diabetes (T1D) and its complications.



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# THE LEADING ITALIAN HOSPITAL GROUP

## DIABETES

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

## GENE THERAPY - STRIMVELIS

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

## CARDIOVASCULAR

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

## ONCOLOGY

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

## ORTHOPAEDICS

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



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# Replicating the Womb

## A new system may revolutionise care for extremely premature babies

Article provided by Children's Hospital of Philadelphia

Infants born near the limit of viability – at 22 to 26 weeks gestation, or about four months early – weigh as much as a bottle of water and are so small they fit in a mother's hand.

Fewer than half survive. Of those who do, 90 per cent suffer sickness and disability, such as lung disease, cerebral palsy, blindness and brain damage.

Surgeons and neonatologists at Children's Hospital of Philadelphia (CHOP) witness the effects of prematurity every day. And now a team of them has innovated a breakthrough: a device that has great promise to lessen the terrible effects of premature birth.

Premature babies are not ready to breathe. From birth, they are placed on mechanical ventilators. Necessary to save them, ventilators also hurt them, exposing the lungs to levels of oxygen that arrest normal development. This causes a cascade of severe health effects.

The system invented at CHOP – which is in an experimental stage using animal models – represents a radically different approach: It replicates the womb. Foetuses remain immersed in fluid and their lungs are kept at rest.

Researchers have been attempting to build such a device for more than 50 years. Previously, success at sustaining life was measured in hours.

The new system is strikingly better: It has supported animal foetuses for as long as 28 days, and they grow normally, with no damage to lungs or brain.

The results, published in *Nature Communications* in 2017, show great promise. The research team, led by surgeon Alan Flake, MD, Director of the Center for Fetal Research at CHOP, is currently working to scale down the system for use in human infants, who are much smaller than infant lambs.

"If this is as successful as we think it can be, ultimately the majority of pregnancies predicted at-risk for extreme prematurity would be delivered into a system that keeps them immersed, rather than being delivered and put on a ventilator," says Flake. "With that we would have normal physiologic development and avoid essentially all of the major risks of prematurity – and that would translate into a huge impact on paediatric health and society."

### Creating a Bridge

In the U.S., 30,000 babies are born every year at 26 weeks gestation or less. This extreme prematurity is the nation's leading cause of infant mortality (death) and morbidity (sickness). The annual cost of hospital care for these babies is estimated at more than \$40 billion.

The new system is not intended to carry extremely premature babies to full term (40 weeks gestation). Rather, it would serve as a bridge to the equivalent of 28 weeks gestation, when morbidity and mortality rates greatly improve.

In addition, the new system is not intended to push viability lower than its current limit of approximately 23 weeks gestation. Foetuses younger than that have limitations of size and development that this system cannot address.

### The Beauty of It

When they started five years ago, the researchers pored through publications about previous attempts. They also consulted another source: nature.

"Every obstacle that we've encountered, we've been able to overcome by turning to Mother Nature's normal physiology, and that's the beauty of this system," says Flake.

In the womb, the lungs rest and grow. The foetus gets oxygen from the mother's blood, which travels through the umbilical cord into the foetus' bloodstream.

The new system is built to replicate this. The foetus rests in a plastic bag filled with lab-made amniotic fluid. The bag has an opening for the umbilical cord. During C-section delivery, surgeons keep the cord as long as possible and insert tubes called cannulas into the blood vessels at the cut end.

The circuit works like this: Blood flows out of the umbilical cord, through the tubes, to an oxygenator. This device (developed for heart bypass surgery) extracts carbon dioxide and adds oxygen. Then the blood flows back to the foetus. The foetus is fed fluid nutrition from an IV bag connected to the circuit.

### Imagination and Teamwork

The spark for this breakthrough came from Emily Partridge, MD, a surgeon who is a fellow in Flake's research lab.

She was convinced building a womb-like device was possible and believed the key would be avoiding artificial pumps to drive the blood through the system, which had been used in most previous attempts. In the new system, the foetal heart is the only pump. The system is different in other key ways. Use of a closed container nearly eliminated the infection issues that contributed to previous failures. And while earlier attempts relied on blood vessels in the neck, the team at CHOP figured out how to quickly and successfully insert tubes (cannulas) into the notoriously touchy umbilical vessels.

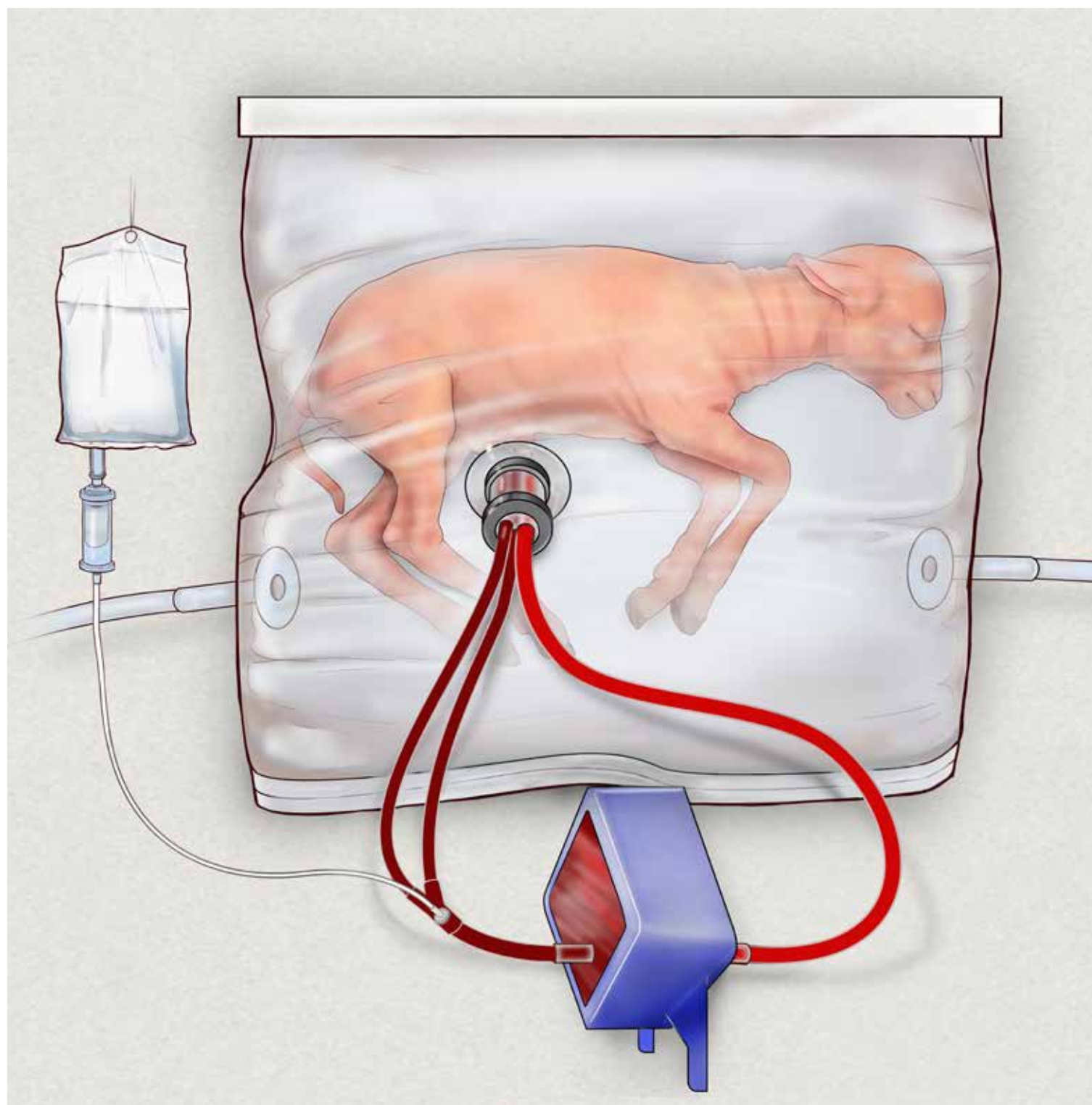
At first, the team had difficulty finding funding, as the idea seemed far-fetched. So, they improvised, building prototypes with parts and equipment intended for other uses.

"Thomas Edison said that to be an inventor, all you need is imagination and a pile of junk, and essentially, that is the story of how our team created this new system," says Marcus Davey, PhD, a fetal physiologist who designed – and redesigned and redesigned – the device. "We had to be very resourceful."

Four prototypes were developed, each more effective than the last. Funding increased. And a growing team at CHOP – neonatologists, experts in heart-lung bypass and others – helped, believing this new invention would someday benefit children.

"The dedication that it takes to pull off an effort like this is tremendous," Partridge says. "It would be impossible to tally the hours. But it has been nothing but a privilege to do this work because of the potential it represents. These infants are desperate for solutions and for innovation."

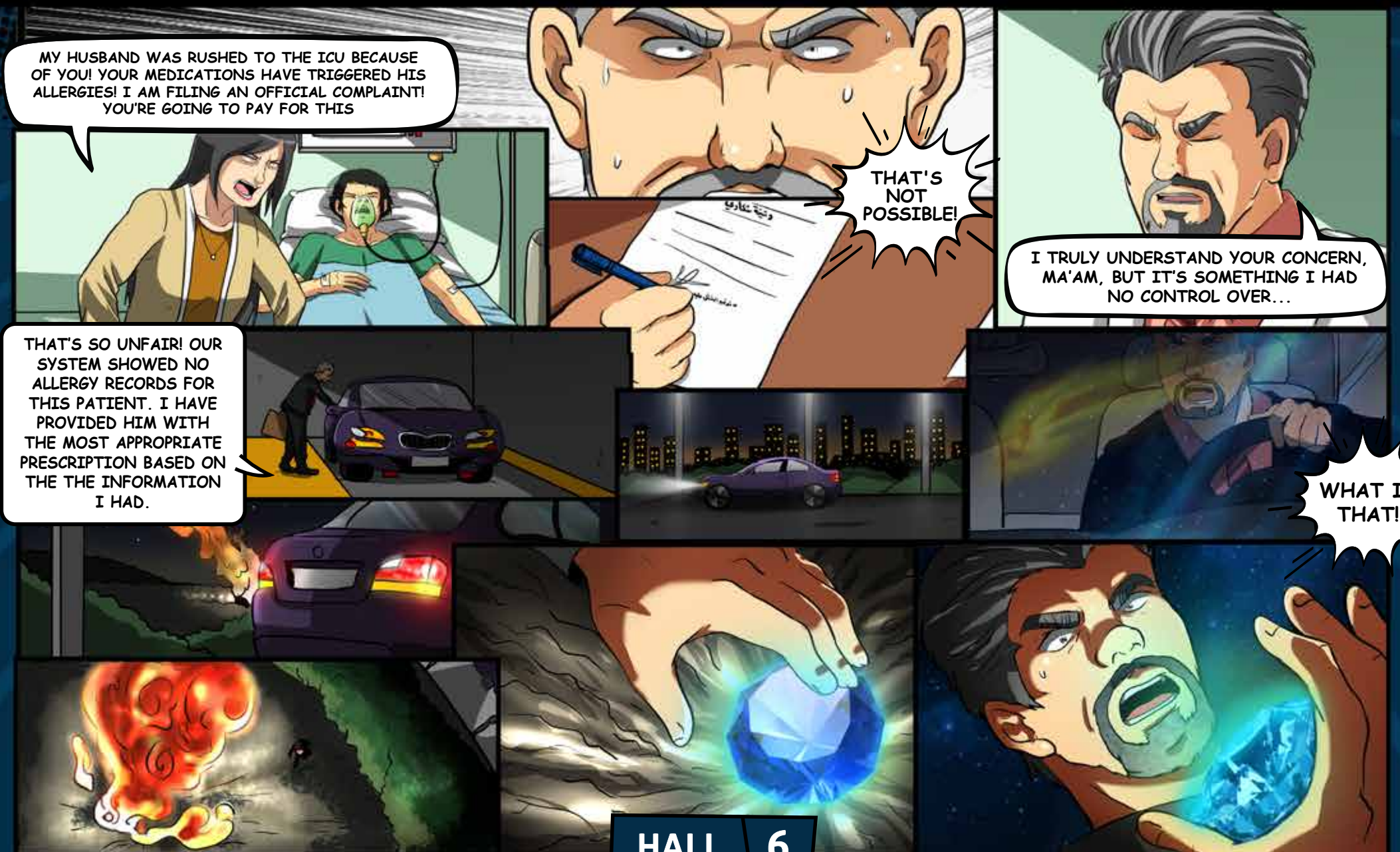
**For more info, visit [www.chop.edu/global](http://www.chop.edu/global). Meet Marcus Davey at the Ministry of Health and Prevention's conference booth.**







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# 3D Breast Imaging: Improving Accuracy in Daily Practice

**D**r. Nehad Kazim Albastaki, Specialist Breast Radiologist, Head of Breast Imaging, Mediclinic, Abu Dhabi, UAE, describes how impactful 3D imaging has become to breast cancer screening.

She says: "When you do the 2-D mammogram, breast density can hide something underneath. But when you do the 3-D mammogram you can more carefully analyse what's inside the density, slice by slice. And at that time, you may notice finding a true cancer."

"I first experienced 3-D mammography in 2016 with Siemens MAMMOMAT and over the years, 3-D has quickly becoming the standard of care."

What 3-D offers, she says, is the ability to see certain anomalies that just aren't apparent on 2-D screens. Further, sometimes a 2-D image will show something suspicious, but when looking at the image in 3-D it ends up being an overlap of tissue and not a cause for concern.

"A situation like that, creates a lot of anxiety for a woman who is called back for additional testing," she explains. "She's assuming it's cancer, but it might be a non-cancerous or benign finding. Using 3-D technology dramatically reduces the number of false alarms."

Dr. Albastaki added that standard 2-D digital images are provided even when 3-D is used, giving physicians a complete picture of the breast architecture.

"3D definitely has a clinical advantage," she highlights. "The 3-D scan is an additional sweep that takes 1-millimeter slice pictures through the breast. It opens the structure of the breast, allowing us to see more cancers."

In her experience, Dr. Albastaki shares that the 3-D scan typically adds just one to two minutes more to the screening.

Furthermore, research has also shown that cancer detection rates have improved by 40 per cent when 3-D imaging is used in addition to 2-D. That's because breast cancer outcomes notably improve, the earlier the cancer is detected.

The downsides to 3-D breast imaging are minimal. The doctor pointed out that 3-D scans do come with a greater radiation exposure than 2-D scans, about the same as a film X-ray. The only time she doesn't do 3-D scans is because of patient preference or fatty parenchyma.

"The benefits definitely outweigh the downsides of it," Dr. Albastaki said. "3-D is the newest technology available in mammography. It's a huge clinical benefit and we have it readily available right here in Mediclinic Airport Road. It improves accuracy and overall visualisation for the physicians, and provides greater peace of mind and reduced anxiety for patients."

A recent study titled "Effectiveness of Digital Breast Tomosynthesis Compared with Digital Mammography: Outcomes Analysis From 3 Years of Breast Cancer Screening," saw researchers analyse 44,468 screening mammograms of 23,958 women

who had never been diagnosed with breast cancer. From September 2010 to August 2011, all the women were screened with digital 2-D mammograms only. For the next 3 years, the women were screened with 3-D mammograms.

The researchers compared differences in screening outcomes between each 3-D mammogram year and the 2-D digital mammogram year. They also compared the differences in outcomes between women who had one, two, or three 3-D mammograms.

The rates of women who had to come back for more testing increased slightly each year for women who had 3-D mammograms:

- year one recall rate: 88 per 1,000 women screened
- year two recall rate: 90 per 1,000 women screened
- year three recall rate: 92 per 1,000 women screened

Still, these rates were much lower than the recall rate of 104 per 1,000 women screened for 2-D mammograms. This difference was statistically significant, which means that it was likely because of the difference in screening technique rather than just due to chance.

The rate of cancers found in women who were called back for more testing went up in women who had 3-D mammograms compared to women who had 2-D mammograms – meaning that 3-D mammograms found more cancers than 2-D mammograms. Rates of cancer detection in women who were called back for more testing were:

- 4.4 per cent in women who had 2-D mammograms
- 6.2 per cent in year one of 3-D mammograms
- 6.5 per cent in year two of 3-D mammograms
- 6.7 per cent in year three of 3-D mammograms

When the researchers compared recall rates between women who had one, two, or three 3-D mammograms, they found that these rates went down as women had more 3-D mammograms. Recall rates were:

- 130 per 1,000 women screened for women who had one 3-D mammogram
- 78 per 1,000 women screened for women who had two 3-D mammograms
- 59 per 1,000 women screened for women who had three 3-D mammograms

Interval cancers are cancers that are found within 12 months after a normal mammogram. Rates of interval cancers went down slightly from 0.7 per 1,000 women screened with 2-D mammograms to 0.5 per 1,000 women screened with 3-D mammograms.

"These results and further studies with exciting outcomes along with my personal experience show that 3-D mammography has become an essential part of routine breast cancer screening," Dr. Albastaki concludes.

**Dr. Albastaki will be speaking on 'The role of digital breast tomosynthesis in clinical practice' as part of the Total Radiology conference, at 14:35.**





# New Study Investigates Impact of General Ward Clinical Monitoring Using Masimo Root®, Radius-7®, and Patient SafetyNet™ on Clinical Workflow and Patient Care

Article provided by Masimo

A recent study published by researchers at Dartmouth-Hitchcock Medical Center investigated the impact of an integrated clinical monitoring system, using various Masimo technologies and devices, on clinical workflow and patient care in the general ward. The researchers sought to “demonstrate the application of systems-level design and analysis to measure the impact of clinical monitoring on key workflow and system characteristics that contribute to early detection of patient deterioration.”<sup>1</sup>

To evaluate workflow impact through use of the enhanced monitoring system, Dr. McGrath and colleagues collected data in a study unit consisting of 2 general wards with 71 beds total for five months prior to and five months after implementation. They also collected the same data for the full 10 months in a control unit consisting of 2 general wards with 61 beds total, which did not have any system changes. In both the study and control units, prior to implementation, the baseline monitoring system consisted primarily of Masimo Rad-87® Pulse CO-Oximeters®, for continuous and spot-check (vital signs) measurements using Masimo SET® pulse oximetry, and Masimo Patient SafetyNet™, a supplemental remote monitoring and clinician notification system, used for data processing and archiving.

The enhanced monitoring system, implemented in the study unit, added Masimo Root® with Radius-7® wearable Pulse CO-Oximeters. Root is a patient monitoring and connectivity platform that includes features such as built-in blood pressure and temperature measurements, a barcode reader and integration with the hospital's admission-discharge-transfer (ADT) system, and integration with Patient SafetyNet and the hospital's electronic medical record (EMR) system for automated

capture of patient monitoring and vital signs data, including from connected third-party devices. Radius-7 is a tetherless, wearable monitor that allows patients to be mobile while still being continuously monitored, with data sent wirelessly via Bluetooth® or WiFi to Root, eliminating the need for nurses to manually place bedside monitors in standby mode and disconnect sensors each time a patient leaves the bed.

Key points of comparison and results included:

**Monitoring system utilization:** The researchers noted a significant increase in the number of hours patients were continuously monitored after implementation. Monitored hours per patient day increased from mean 17.26 hours to 19.57 hours ( $p < 0.0001$ ) and monitored hours per month from mean 15,931.25 hours to 19,053.3 hours ( $p < 0.0001$ ).

**Vital signs documentation:** With the implementation of Root and its ability to automatically upload patient data, including pulse oximetry and blood pressure and temperature measurements, to Patient SafetyNet and the EMR, researchers noted a significant decrease in the time required to obtain and record vital signs: mean assessment time dropped from 178.8 seconds to 128.9 seconds ( $p < 0.0001$ ), representing an average time savings of 3 hours per day in a 36-bed unit.

**Patient information:** The researchers measured the rate at which certain patient data fields were filled out in the EMR for one month before and after implementation. Patient last name presence increased from 98.92% to 100% presence ( $p = 0.0083$ ). Patient first name and room and bed presence increased from 33.75% and 57.27%, respectively, to 100% ( $p < 0.0001$ ).

**Clinical staff satisfaction:** Three months after implementation, hospital staff feedback was solicited in a 16-question survey which had a 65%



response rate and overall “very high” satisfaction with the enhanced monitoring system.

**Alarms:** The researchers found that there was a significant increase in the number of clinical alarms per patient day (rate ratio 1.46,  $p = 0.0263$ ) but not per monitored hour (rate ratio 1.34,  $p = 0.1090$ ), which they believe is “logical when considering [the] additional time each patient [was] monitored.”

The researchers concluded, “The enhanced monitoring system received high staff satisfaction ratings and significantly improved key clinical elements related to early recognition of changes in patient state, including reducing average vital signs data collection time by 28%, increasing patient monitoring time (rate ratio 1.22), and availability and accuracy of patient information. Impact on clinical alarms was mixed, with no significant increase in clinical alarms per monitored hour.”

In previous studies conducted at Dartmouth-Hitchcock, researchers found that continuous

monitoring of adult post-surgical patients using Masimo SET®, in conjunction with Masimo Patient SafetyNet, resulted in a 65% reduction in rapid response team activations and a 48% reduction in transfers back to the ICU.<sup>2</sup> Over five years, they achieved their goal of zero preventable deaths or brain damage due to opioids,<sup>3</sup> and over ten years, they maintained a 50% reduction in unplanned transfers and a 60% reduction in rescue events, despite increase in patient acuity and occupancy.<sup>4</sup>

Joe Kiani, Founder and CEO of Masimo, said, “We are incredibly grateful to Dartmouth-Hitchcock for their continued long-term research into the utility of continuous patient monitoring on the general floor and the benefits that holistic, integrated monitoring systems can provide. Continuous monitoring of all patients on opioids is clearly the path forward, with the potential to make significant improvements in patient safety and quality of care. We look forward to continuing to learn from Dartmouth-Hitchcock's data and to improving our technologies and integrated solutions.”

*The use of the trademark Patient SafetyNet is under license from University HealthSystem Consortium.*

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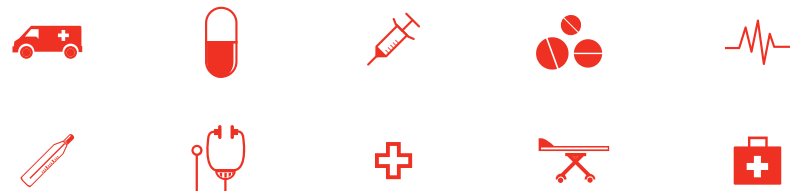
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# Single Port VATS Lobectomy – An Innovative Surgical Approach

Article provided by Royal Brompton & Harefield Hospitals Specialist Care



Simon Jordan

With such alarming statistics, patients often look to explore their treatment options following diagnosis.

Inevitably, more and more patients are looking for innovative and less invasive procedures to ensure a faster recovery time and a lower risk of complications. These days, patients with tumours in the lung have the option to be treated using less invasive surgical approaches. In recent years, there has been a shift towards offering patients keyhole surgery and smaller incisions with no rib spreading. This approach is known as video-assisted thoracoscopic surgery (VATS) lobectomy.

The single port VATS lung resection technique allows for an even faster recovery and minimises complications, compared to conventional surgical approaches.

## Single Port Approach Versus Traditional Thoracotomy

Compared to 10 years ago, the conventional posterolateral thoracotomy has been significantly modified. With the minimally invasive single port approach, the length of the incision is much smaller and rib spreading is completely avoided. Both single port and multiport approaches generally heal very well with smaller, neat scars.

Simon Jordan, consultant thoracic surgeon at Royal Brompton & Harefield Hospitals Specialist Care, explains: "We have found the use of single port minimally invasive surgery reduces the amount of post-operative pain and speeds up the recovery process. It also allows the patient to have a more rapid return home.



"Since this is a relatively new technique, the long-term benefits are still being investigated. However, this surgical approach is just as good as the conventional open chest surgery and probably confers benefit and allows more rapid recovery. If the tumour is very big, then a thoracotomy would be the best approach, but most tumours are amenable to the minimally invasive single port technique."

The risk of having a major complication is typically less than one per cent. Although this is a major surgery, most patients are up and about the next day.

## Successful Outcomes

A recent review examining all UK centres performing lung cancer surgery concluded that Royal Brompton and Harefield Hospitals have one of the highest lung cancer resection rates, treating the highest risk cases. The results included the single port VATS lobectomy approach, as well as multiple VATS and thoracotomy surgery.

Despite treating such high-risk cases, the two hospitals have achieved the best outcomes post-operatively and one year later. And when other patient risk factors and co-morbidities were taken into consideration, such as heart disease and heavy smoking history, then Royal Brompton and Harefield hospitals achieved one of the best one-year patient survival rates in the UK.

## Early Detection

Increasingly, organised screening programmes or scans are picking up cancers, often at an earlier stage. Screening can allow for diagnosis of cancers when they are most treatable, and surgery has a chance to be more curative.

Most people are aware that there is association between smoking and lung cancer, and anyone who has smoked for a long period of time will worry about lung diseases at some stage, particularly lung cancer. Tobacco use has been reported as one of the single most important risk factors for causing 71 per cent of global lung cancer deaths.

Jordan explains, "Historically we have recognised that only 10 to 20 per cent of lung cancers are surgically treatable or curable at diagnosis; this is typically following the development of symptoms.

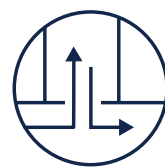
"The earlier lung cancer is detected, the greater the chances of successful treatment. The knowledge and expertise of our specialists and their teams are available to anyone with concerns about the risk of lung cancer." **Visit them at Hall 7 #H7.E30**

**References available on request.**



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# Mediclinic Parkview Hospital – Now Open in Dubai

Article provided by Mediclinic Middle East

Part of Mediclinic Middle East, one of the UAE's largest and most respected private healthcare operators, Mediclinic Parkview Hospital joins Mediclinic City Hospital and Mediclinic Welcare Hospital as the group's third hospital in Dubai and seventh in the UAE.

Mediclinic Middle East is part of Mediclinic International plc, a London Listed private healthcare service provider founded in 1983 that today has three operating divisions in Southern Africa (South Africa and Namibia), Switzerland and the UAE. Mediclinic International also has a 29.9% shareholding in Spire Healthcare plc, a UK-based healthcare group with 38 hospitals.

Mediclinic Parkview Hospital is the largest ever greenfield construction project undertaken by Mediclinic International across its entire portfolio of healthcare businesses on three continents. It took two-and-a-half years to build and opened in September 2018, ahead of schedule. The new hospital delivers the same international standard healthcare services and treatments that patients have come to expect from Mediclinic's existing hospitals. Located in the rapidly growing "New Dubai" area on Umm Suqeim Road, close to the intersection with Sheikh Mohammed Bin Zayed Road, the hospital provides services to a currently estimated population of 800,000 UAE nationals and expatriates living in a 10km radius.

With a team of 150 doctors, the 182-bed hospital Mediclinic Parkview Hospital provides a comprehensive selection of consultant-led clinical services in more than 35 specialities. Given its location amongst a large number of family

residential areas, Mediclinic Parkview Hospital has a special emphasis on family medicine, obstetrics and gynaecology and paediatrics, offering a full complement of female consultant obstetricians.

Highlights of services include:

- Same day appointments for children
- 24/7 emergency unit with dedicated paediatric services and ambulance services
- Comprehensive obstetrics and gynaecology services with 24/7 on site anaesthesia cover, with foetal medicine support
- Dedicated paediatric surgeon with same day services for newborns
- Weight reduction programme managed by a highly experienced multidisciplinary team with a range of services including dietary and lifestyle management, medical management and surgical management where appropriate
- Paediatric subspecialties including paediatric gastroenterology
- Cancer unit integrated with overall Mediclinic Middle East cancer programme
- Dedicated breast unit with female breast surgeon and female breast radiologists
- Dedicated varicose vein, hernia, proctology and gastrointestinal clinics
- Ophthalmic services with dedicated vitreo-retinal capabilities
- Digestive disease, hepatology and interventional endoscopy
- Cosmetic services from a plastic surgeon, dermatologists, dentists and vascular specialists for varicose veins
- Sports medicine specialists

- ICU / NICU (level III) with 24/7 coverage by intensive care specialists/consultants
- Dedicated dialysis unit
- The latest technology including a 3T MRI, 256-slice CT, floor-mounted Cath lab, neuro microscope and integrated digitalised operating theatre
- Six VIP suites and one Royal suite offering the highest level of luxury, complemented by a standard of VIP care and service surpassing anything currently in Dubai's private healthcare market

Barry Bedford, Hospital Director of

Mediclinic Parkview Hospital, said: "Our team of internationally-trained doctors has been carefully selected to meet the requirements of the area's unique demographic profile. The expertise of our doctors is supported by state-of-the-art technology and equipment including a 3T MRI, 264 slice CT and Cath lab. Over the last few months we have enjoyed welcoming our first patients to Mediclinic Parkview Hospital and demonstrating to them the Mediclinic philosophy of 'Expertise you can Trust'."

For more info call 800 1 999 or visit [www.mediclinic.ae](http://www.mediclinic.ae)



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- Weight reduction programme managed by a comprehensive multidisciplinary team
- Dedicated Breast unit with female breast surgeon and female breast interventional radiologists
- Cosmetic services

For a full list of services and doctors, and more information about Mediclinic Parkview Hospital, please visit [www.mediclinic.ae](http://www.mediclinic.ae). Alternatively, call us for an appointment today on **800 1999**.

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# Ensuring Access for All

Article provided by Direct Access

People of Determination can find it difficult to access their local hospitals and health centres – inaccessible medical equipment, poor signage, narrow doorways, internal steps, inadequate bathroom facilities, and inaccessible parking areas create challenges for Health Estate Managers to overcome in creating accessible facilities for all. An independent Universal Design audit can be the solution, suggests Steven Mifsud, Director of Dubai-based Direct Access.

Disability is extremely diverse. While some health conditions associated with disability result in poor health and extensive healthcare needs, others do not. However, all People of Determination have the same general healthcare needs as everyone else, and therefore need access to mainstream

stature to interact with receptionists. Waiting rooms that have announcement systems need to incorporate both visual and audible technologies to enable patients to know when it is their turn. A hearing enhancement system (loop) can improve understanding for a hearing aid user and quiet spaces for autistic people help with sensory overload.

All new buildings are required to ensure that they comply with accessibility Codes. An established building or service is required to develop an action plan on how they will adapt to meet Codes. This may be at the next refurbishment or be something as simple as introducing a management procedure.

To better understand the level of access for People of Determination, an access and adaptations



healthcare services. At the same time, health promotion and prevention activities seldom target People of Determination. People with intellectual impairments and diabetes are less likely to have their weight checked. Adolescents and adults with disabilities are more likely to be excluded from diet and nutrition education programmes.

Women with mobility difficulties are often unable to access breast and cervical cancer screening because examination tables are not height-adjustable and mammography equipment only accommodates women who are able to stand. Children of Determination, when compared to non-disabled children, have 30 per cent more untreated dental decay. They also have more extractions and less preventive work, such as fissure sealants. Adults of Determination typically have more missing teeth, need more dental treatment and are 20 per cent more likely to have no teeth at all, if they are over 55, when compared with non-disabled adults.

All healthcare facilities have obligations under UAE Federal Laws and Building Codes in individual Emirates (such as the Dubai Universal Design Code) to remove barriers to access. Reference can be made to various international guides such British Standards BS 8300 and the various accessible Health Building Notes produced by the UK's Department for Health for additional advice. It is crucial that the most appropriate and up to date guidance is used, which in most cases will be the Dubai Universal Design Code.

Of particular relevance to hospitals is the design of waiting rooms and reception areas from the introduction of low-level reception desks for wheelchair users and people of short

audit has to be carried out and findings recorded. It should identify features and services that may affect or impose physical, sensory, psychological and intellectual barriers, including on staff, volunteers, patients and their families.

While a check list can be found online as a starting point, a specialist Access Consultant who understands healthcare settings would be able to select the most appropriate guide or standard to use – what may be relevant for an Accident and Emergency department may not for example be suitable for a dental practice. The Consultant would be able to undertake detailed measurements, generate a report and action list to meet compliance.

The process of completing an access audit is generally taken in two stages.

The first stage is a walkthrough inspection of the site using the surveyor's knowledge. During this stage the surveyor would look at a number of different details including external and internal ramps, entrances, reception areas, platform lifts, lighting, acoustics, means of escape and much more in order to identify any issues or barriers.

The second stage suggests any possible improvements, which can be made to the site, from small adjustments to major structural alterations. The audit would also give an idea of priorities, but most importantly how to start addressing issues identified. This would be in the form of an action plan, which demonstrates to stakeholders an understanding of existing barriers and a planned route to resolving these.

*Direct Access is part of a delegation from the UK called the Northern Powerhouse exhibiting in Hall 7. For more info Whatsapp +44 7786 547700 or email sdering@accessaudits.com.*

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# Diagnosing and Treating Latent Autoimmune Diabetes in Adults

By Ernesto Maddaloni and Silvia Peralice, Department of Medicine, Unit of Endocrinology and Diabetes, Campus Bio-Medico University of Rome, Italy

**A**utoimmune diabetes is a heterogeneous disorder due to an autoimmune process against the insulin-producing cells of the pancreas ( $\beta$ -cells) leading to insulin deficiency. Differently from type 2 diabetes (T2D), all forms of autoimmune diabetes are characterised by the presence of specific autoantibodies directed against pancreatic  $\beta$ -cells islets such as islet cell-related autoantibodies (ICA), glutamic acid decarboxylase (GAD) autoantibodies.

Classically, when this form occurs in children or young adults, insulin therapy is needed right up, due to the impairment of  $\beta$ -cell function, defining the well-known type 1 diabetes (T1D). However, the clinical onset of autoimmune diabetes is extremely heterogeneous, and it can develop at any age. Epidemiological studies have demonstrated that approximately 30 per cent of cases of T1D occur after 30 years of age, showing that adult-onset T1D is less rare than previously deemed. On the other hand, it has been estimated that among people with a clinical diagnosis of T2D, the occurrence of the same diabetes autoantibodies vary between 3 per cent and 12 per cent. Some of these subjects may experience a progressive loss of insulin-secreting  $\beta$ -cells due to the reactivity of activated T-cells, developing insulin-dependent diabetes.

In this regard, these subjects are wrongly diagnosed with T2D and are actually affected by "latent autoimmune diabetes in adults" (LADA), a slowly progressive insulin-dependent diabetes, characterised by initially non-insulin requiring, slower course through  $\beta$ -cells failure and, in most cases, a subclinical onset. Nonetheless, established guidelines for diagnosis of LADA are currently unavailable due to the great heterogeneity that is inside the definition of LADA itself and the lack of well-designed randomised controlled trials. Therefore, a great effort has been made in order to well-characterise these individuals. The overlap for genetic, immunological features between LADA and classical T1D as well as the lack of pathogenetic studies that are exclusive for this form of diabetes, make it difficult to draw a clear dividing line between them.

According to the Immunology of Diabetes Society (IDS), subjects affected by LADA are diagnosed with diabetes after the age of 30 years old and are insulin independent for at least six months after diagnosis, despite the presence of T1D-related circulating autoantibodies. Therefore, any adult who does not require insulin and who is positive for at least one diabetes-associated autoantibody, regardless of number, could be diagnosed as having LADA. This definition reveals the heterogeneity of LADA. For instance, not all subjects found to be positive for circulating autoantibodies develop the need for insulin therapy.

Thus, LADA remains often unnoticed in clinical setting and a high misdiagnosis rate (5-10 per cent)



still occurs among people with T2D, leading to inappropriate therapies that could worsen diabetes control and could accelerate the loss of insulin producing capability by  $\beta$ -cells.

As a consequence, one of the main issue concerns is how to identify LADA patients at an early stage, before insulin therapy is needed. LADA should be suspected in adults newly-diagnosed with insulin-independent diabetes, who have few signs of metabolic syndrome (such as obesity, high blood pressure and cholesterol levels), uncontrolled hyperglycaemia despite using oral agents and familiar and/or personal history of autoimmunity. Testing islet autoantibodies, glutamic acid decarboxylase autoantibodies (GADA) especially, in these patients should be advised in order to ensure a closer monitoring of those with autoantibody positivity. However, it is important to clarify that a state of insulin resistance, which is typical of T2D, does not exclude LADA.

In fact, patients affected by LADA encompass a broad spectrum of phenotypes from prevalent insulin deficiency to variable degrees of insulin resistance, sharing features of both T1D and T2D and make it difficult to correctly identify LADA, just on the basis of metabolic phenotype. Consequentially, islet-cell antibodies measurement remains essential to diagnose LADA and routine GADA screening have been previously proposed. Nonetheless, testing for

LADA with a full autoantibody panel in all patients with newly diagnosed T2D, irrespective to the clinical suspicion, is not recommended because of high costs, low test specificity and difficulties in interpreting the results. Risk scores based on clinical parameters should be considered before requiring islet-cell autoantibodies tests in patients with recent evidence of diabetes in order to increase the efficiency of a screening programme for LADA.

Once LADA is diagnosed, another critical issue is how to recognise subjects who have a higher risk of progression to insulin treatment. In this regard, authors suggest that insulin requirement in LADA may be linked to the degree of autoimmunity, explaining the heterogeneity observed in LADA. On that note, recent studies investigated this heterogeneity by comparing phenotypes of LADA with high-titre GADA versus those with low-titre GADA, finding that individuals with high-titre GADA are clinically more similar to those affected by T1D, being younger, thinner and showing faster progression towards insulin treatment. By contrast, low-titre GADA subjects show more pronounced traits of insulin resistance and slower rate of  $\beta$ -cells destruction as compared with high-titre GADA. Furthermore, even the type of antibody positivity seems to influence clinical features of LADA. The Non Insulin Requiring Autoimmune Diabetes (NIRAD) group demonstrated that IA-2A, that are less frequent than GADA, increase in frequency with increasing BMI in a population affected by T2DM, becoming the most prevalent antibody in patients with BMI > 30 kg/m<sup>2</sup>. In the Arab population, it was observed that the number of positive autoantibodies is also associated with the risk of developing insulin-dependence. These findings support the hypothesis that pathogenesis of LADA should be linked with both immunological factors, which may act as the principal trigger in subjects with normal BMI and high-titre GADA, and chronic inflammation, which could lead to the development of less severe islet autoimmunity in people with obesity and with increased risk of T2D, as testified by the presence of IA-2A. Testing for C-peptide may also

be helpful to identify LADA subjects at higher risk of developing insulin-dependency.

Another outstanding question concerns treatment strategy. In fact, due to the wide heterogeneity among patients with LADA it is difficult to establish a priori algorithm for treatment and a tailor-made therapeutic approach is needed to improve glycaemic control and insulin sensitivity, taking into account clinical and biochemical features of each patient. Considering the autoimmune pathogenesis of LADA, evidence shows that patients with LADA should be treated with insulin at an earlier stage. On the contrary, data on sulfonylureas discourage their use in patients with LADA, because these agents might stimulate  $\beta$ -cell and enhance the antigen expression of  $\beta$ -cells, exacerbating the autoimmune process. However, there is a wider window of other therapeutic interventions that may be of some clinical benefits when added to insulin treatment.

Insulin sensitizers have been shown to be helpful in subjects with autoimmune diabetes who share more pronounced insulin-resistant traits. Moreover, as LADA subjects generally show some degree of residual  $\beta$ -cell function, treatment should aim at both protecting and stimulating  $\beta$ -cell regeneration. Thus, combined therapies to target different pathways could be a proper strategy. Based on the newest evidences, DPP-4 inhibitors and GLP-1 receptor agonists might be tested in LADA as an add-on therapy to insulin to sustain residual  $\beta$ -cell function, slow down  $\beta$ -cell loss and improve glycemic control in autoimmune diabetes, especially in patients with a relative maintenance of C-peptide secretion. Therapeutic strategy in LADA should focus on the preservation of residual  $\beta$ -cell function as long as possible since its preservation is associated with reduction of long-term diabetic complications. Further studies in this field of interest are strongly encouraged.

**References available on request.**

**Dr. Maddaloni will be speaking on 'Latent autoimmune diabetes of the adulthood' as part of the Diabetes conference, at 11:30am.**







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# Acute Cholecystectomy: Better than the Alternatives

By Dr. Shaw Somers BSc (Hons) MD FRCS, Consultant Upper GI and Bariatric Surgeon, BMI Hospitals, London, Portsmouth Hospitals NHS Trust, UK

Acute gallstone disease remains one of the most common general surgical emergencies worldwide. As such, the condition requires the utilisation of considerable surgical resource. In addition, with the increase in obesity rates and diabetes, the problems associated with gallstones and their complications is steadily increasing.

The burden on emergency surgical services is significant. This has driven the need for more defined surgical pathways to be developed in order to deal effectively with acute patients. This need has been recognised by many centres around the world, but uptake of acute cholecystectomy has been unequal. This is especially relevant in an age of increasing subspecialisation, where the necessary skill-set for safe operative intervention in the acute setting might not be available.

Over the last 25 years we have seen a move away from open cholecystectomy and conservative treatment for acute gallstone disease. Traditionally, patients presenting with acute cholecystitis are managed by the general surgery emergency service. Resuscitation, management of sepsis and analgesia remain the mainstays of initial treatment. Clearly, these can be managed by non-specialist surgeons.

However, controversy exists around the best time for intervention to remove the gallbladder containing the troublesome stones. In the past, surgical teaching was to allow the inflammatory process to 'settle' for 6-8 weeks, then proceed with elective (or 'cold') cholecystectomy.

Increasingly, this approach is being shown to be both inefficient and potentially dangerous for patients at risk of further complications of their gallstones.

Since the advent of specialised upper gastrointestinal services, the development of acute cholecystectomy for the 'hot gallbladder' has matured into a realistic option for the majority of

patients presenting acutely. Data from around the world have started to define the standard of care that would be applicable for the majority of acutely presenting patients.

Guidelines from the World Society of Emergency Surgery (WSES) recommend that early laparoscopic cholecystectomy should be performed as soon as possible but can be performed up to 10 days from symptom onset. In the United Kingdom, the National Institute for Health and Care Excellence (NICE) recommend that patients with acute cholecystitis should receive cholecystectomy within seven days of diagnosis.

### Evidence Base

A recent observational study comparing the practice of acute cholecystectomy in the U.S. and UK has given some interesting insights. National hospital data for a 14 year period (1998-2012) was analysed for the diagnosis of acute cholecystitis. In the U.S., 1,191,331 patients were admitted, in England 288,907 patient. Emergency cholecystectomy was performed in 53 per cent of U.S. patients, but only 16 per cent of UK patients. The rate of emergency cholecystectomy increased over the time period in the U.S. (50 to 55 per cent) but remained relatively static in the UK (14 to 16 per cent). The rate of laparoscopic procedures was 89 per cent in the U.S., but only 38 per cent in the UK. The incidence of bile duct injury reduced over the time period in both subsets to 0.4 per cent at the study end.

The low proportion of acute cholecystectomy in the UK permitted an analysis of delayed cholecystectomy surgery in this patient group. Within the first year of index admission, 40 per cent of the delayed surgery group were readmitted as emergencies with a further attack of acute cholecystitis, in addition to gallbladder colic (9.4 per cent), biliary obstruction (3.2 per cent), pancreatitis

(1.3 per cent) and ascending cholangitis (0.6 per cent). A mean of 2.7 emergency re-admissions was recorded in the first year for this group. After the first year, more than half this group had not received definitive cholecystectomy. The main reason for the delayed management in the UK group was lack of healthcare resource provision. Many patients were subsequently lost to follow-up. This study clearly demonstrates the unnecessary burden of a 'delayed cholecystectomy' policy, which imposes increased costs in the healthcare system and the patient.

Further sub analysis of the UK patient group undergoing index cholecystectomy showed that in high-volume centres undertaking cholecystectomy within three days of presentation, patients had reduced complications, incidence of conversion to laparotomy and hospital stay. Larger hospitals with specialist upper GI units had better outcomes.

The Cochrane review of seven randomised trials of acute vs delayed cholecystectomy found that early cholecystectomy reduced hospital stay, and the risk of later emergency surgery for unresolved cholecystitis or complications. No increased complications or surgical conversions were seen in the early surgery group.

The London-based CholeS study group, in which my Unit participates, has identified further insights into the UK population series admitted to hospital with acute cholecystitis. High volume centres (>300 total cholecystectomy procedures per annum) performed more procedures within three days and less after eight days than low volume centres (< 170 total cholecystectomy procedures per annum). Patients with delayed cholecystectomy tended to be older and more co-morbid, perhaps pointing to a clinical reason for delay. Multi-variate analysis showed that bile duct injury was associated with age >70yrs, high comorbidity index and delay

in surgery to eight days (HR 2.76). High volume centres had lower bile duct injury rates.

Our specialised Upper GI centre performs approximately 850 cholecystectomy procedures per annum. We have the benefit of laparoscopic nurse practitioners who can mediate the emergency cholecystectomy pathway and navigate patients swiftly through to discharge. Of those presenting as an emergency (appx 30 per cent), 70 per cent are treated with cholecystectomy within three days, and 50 per cent are discharged within 24hrs of the procedure.

### Recommendations

The Royal College of Surgeons of England is completing a national quality improvement project via the Cholecystectomy Quality Improvement Collaborative (Chole-QulC). This aims to develop and disseminate a viable model for the provision of emergency cholecystectomy services within the National Health Service. Healthcare systems with a financial incentive to early treatment have been identified as having a higher provision of early treatment services.

Patients presenting with acute gallstone disease should be able to access urgent laparoscopic cholecystectomy to resolve the cause of the acute episode and prevent the occurrence of further complications and emergency presentation. This makes good clinical sense and is cost effective.

Increasingly, patients will seek out those services which provide one-stop care for their acute presentation with gallstone disease.

**References available on request.**

**Dr. Somers will be speaking on 'Acute cholecystectomy - better than the alternatives?' as part of the Surgery conference, at 11:30am.**

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# Developing a Continuum of Care

## A Necessity for Child and Adolescent Mental Health Treatment

By Dr. Jennifer Katzenstein, Director of Psychology & Neuropsychology, Johns Hopkins Children's Hospital, St Petersburg, Florida, U.S.

Children around the world increasingly are being diagnosed with mental health disorders. Depression is the single leading cause of disability worldwide, according to the World Health Organization (WHO), and data from the Centers for Disease Control and Prevention (CDC) suggest that one in five children in the U.S. between the ages of three and 16 have a diagnosable mental, emotional or behavioural health disorder. Suicide is the 10<sup>th</sup> leading cause of death in the U.S. at an annual cost of \$69 billion, and rates are on the rise. The increase in suicide is observed worldwide, with a global rate of 10.7 per 100,000 in 2015. Despite recognition of increases in mental healthcare needs, in the U.S., only approximately 20 per cent of children and adolescents will be diagnosed and receive care. With suicide rates higher than ever before, it is our responsibility, as healthcare providers and healthcare systems, to develop mental health programmes for our communities.

In 2013, the WHO enacted a comprehensive mental health action plan, with primary objectives including strengthening leadership and governance for mental health, providing a comprehensive, integrated and responsive mental healthcare system across settings, implementing strategies for promotion and prevention, and strengthening evidence and research focused on mental health. This action plan is aspirational, even in 2019, with continuing barriers to mental healthcare limiting progress.

A lack of well-trained providers across the continuum who understand evidence-based practices limits mental health services for children

and adolescents in need. Continued evidence shows cognitive behavioural therapy treatments and psychotropic medications, in combination, are the most effective treatment for many mental health diagnoses. Daily barriers, including reduced reimbursement for services, few resources, and limited time and space, leave practitioners few opportunities to focus on a comprehensive approach to services that includes prevention, early intervention and specialised care.

To expand access and develop prevention programmes, primary care providers have taken on a greater role in mental healthcare. However, primary care providers continue to be undertrained in mental health diagnosis and treatment. Residency curriculum and primary care mental health programmes are increasing attention on mental health, which results in increased empowerment of primary care providers to work to prevent mental health concerns.

However, schools and educators play a large role in prevention as well, with an additional need for mental health focused curriculum needed for educators, administrators and school nurses. Schools are increasingly focusing on positive behavioural, emotional and social support, and these programmes are necessary for establishing pro-social behaviours.

### Identifying Risks

Early intervention and screening have the opportunity to reduce costs by avoiding more specialised treatments in the future and educate children and parents on warning signs that will



allow for earlier diagnosis. Maternal mental health and general health plays a large role, as this early relationship sets the stage for future self-regulation and emotional development. Identification of those most at risk, such as those who have experienced childhood maltreatment (including exposure to violence and other traumatic events), discrimination, bullying, malnutrition and other stressful events, allows for appropriate early intervention and the potential for improvements in mental wellbeing. Early identification of children and families at risk for mental health diagnosis is likely to significantly reduce the number of children diagnosed later.

Hospital systems find themselves underprepared for increasing rates of mental health concerns. Children and adolescents are presenting more frequently to emergency centres with mental health and psychiatric concerns, and the emergency centre physicians and care teams often have very limited training in mental health and limited resources to address these concerns. Children's hospitals in the U.S. are beginning to open psychiatric emergency centres, with an opportunity to address concerns rapidly and urgently. Yet, these sites remain limited, and necessitate the full continuum of mental healthcare, including inpatient, residential, intensive day treatment and outpatient services, which have limited access. Evidence-based intervention by highly trained and qualified specialists remains a key barrier and, at the same time, a necessity for access to appropriate mental health services for children and adolescents.

Despite increasing focus on mental health diagnosis and treatment worldwide, the full continuum of mental health interventions remains limited. A well-trained, specialised and fairly compensated mental health provider workforce remains a primary barrier. Specialised treatment modalities, including psychotherapy, psychological testing, medication management and family education are key to providing an appropriate continuum of care. As interventions intensify, high quality residential treatment facilities are key, as well as therapeutic homes for more severe mental health concerns. While most children and adolescents will not require this level of care, worldwide systems remain underprepared for the increasing complexity of mental health presentations in children and adolescents. With an ever-increasing need for mental health services,

and an ongoing need for an appropriately trained and specialised workforce, in high acuity health care settings, we remain underprepared worldwide to meet these needs.

More than ever before, individuals are sharing their mental health diagnoses and stories. This reduction in stigma assists with parents and adolescents seeking care when needed; however, additional education on early signs, symptoms, and appropriate treatment is necessary to improve overall outcomes and improve quality of life. Capacity to identify and treat those in need necessitates collaboration across multiple systems and individuals. Healthcare providers, both primary care and specialist, must be prepared to work with systems that are typically separate, including schools, government agencies and communities. For healthcare systems, this may mean cross-system communication, sharing of information, and multi-tier treatment systems that cross-cut multiple systems and environments for each child's daily life. This comprehensive level of care may be what it takes to address, and in turn, decrease, mental health diagnoses in children and adolescents.

Early identification and appropriate treatment for child and adolescent mental health concerns is necessary to prevent later adult mental health disorders. Approximately one-half of all adult mental health disorders are diagnosed before age 14, and early diagnosis and treatment is necessary for prevention of life-long mental health conditions that can result in disability, under-education and unemployment.

Long-term, systematic change will require intensive time and training. Future goals for development of mental health treatment programmes must include a family-focused approach, by a well-trained workforce that spans the treatment continuum, close to the family's home. Healthcare providers and hospital systems must take initiative in development of innovative strategies for prevention, early intervention and specialised care. Increased focus worldwide on mental health must be a primary objective for the future in order to ensure the overall health and wellbeing of future generations.

**Dr. Katzenstein will be speaking on 'Mental disorders in adolescents' as part of the Paediatrics Conference, at 17:30.**

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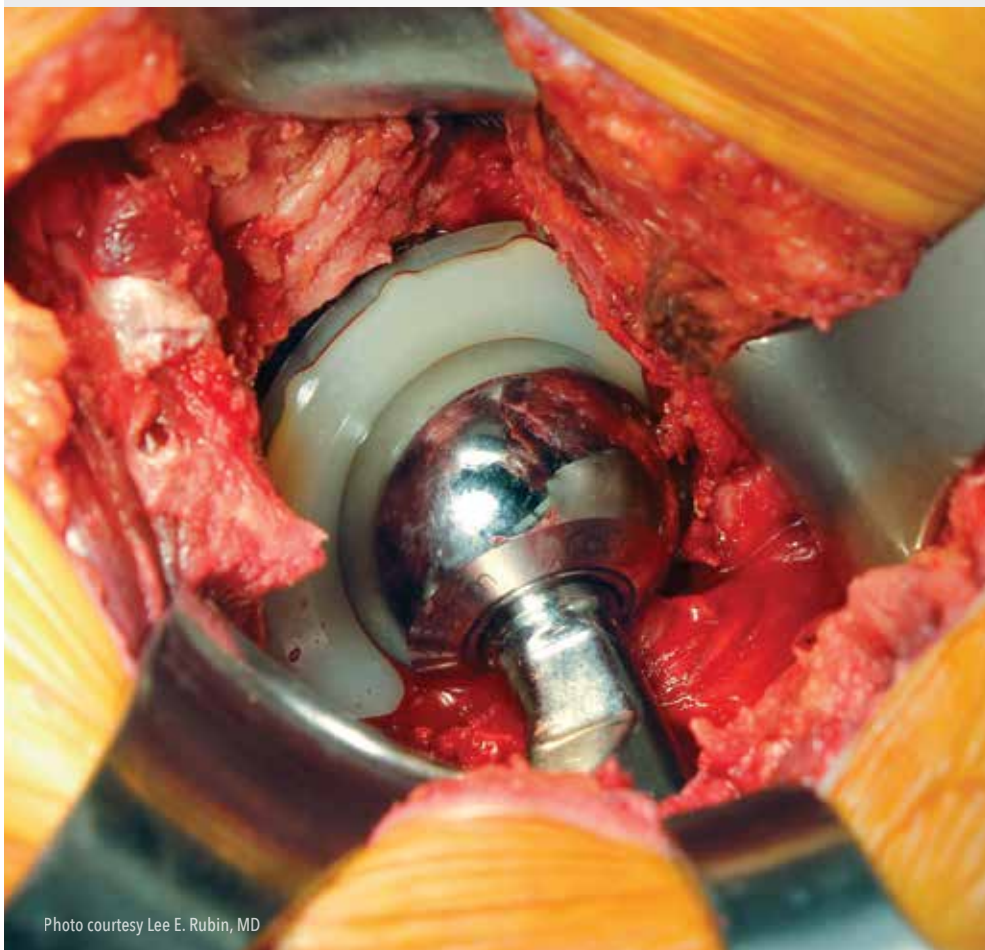
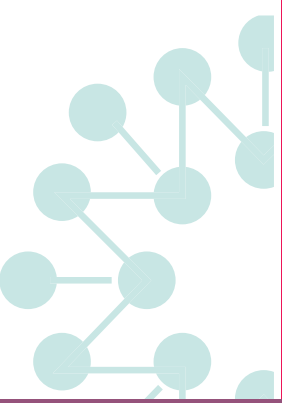


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# Building a Better Cancer Fighter

## Turning Immune Cells into CAR T-Cells

By Edwin Alyea III, MD, Director of Clinical Strategy for Hematologic Malignancies and the Associate Chief of the Stem Cell Transplant Program, Dana-Farber Cancer Institute

The excitement around CAR T-cell therapies for cancer has been growing for quite some time now. After numerous studies and clinical trials, these therapies, made from genetically modified immune cells, have been generating promising results. Specifically, more than 80 percent of patients with acute lymphoblastic leukemia (ALL) and nearly half of patients with B-cell non-Hodgkin lymphoma (NHL) have achieved remission thanks to CAR T-cell therapy.

These advancements have led the U.S. Food and Drug Administration (FDA) to recently approve one CAR T-cell therapy as standard treatment for children and young adults with relapsed ALL and a second for adults with advanced B-cell lymphomas. Approvals for other blood cancers are expected in the next two years. Furthermore, trials of genetically modified T-cells for patients with some solid tumours are beginning to open.

Amid such progress, it is easy to overlook the significant technical complexity of making CAR T-cell therapies. Manufactured by collecting millions of disease-fighting T-cells from a patient's bloodstream, these "living drugs" provide new genes that better track down and destroy cancer cells and infuse the upgraded cells back into the same patient. A combination of gene therapy, immunotherapy, and personalised therapy, CAR T-cell therapy is unlike virtually anything else in medicine.

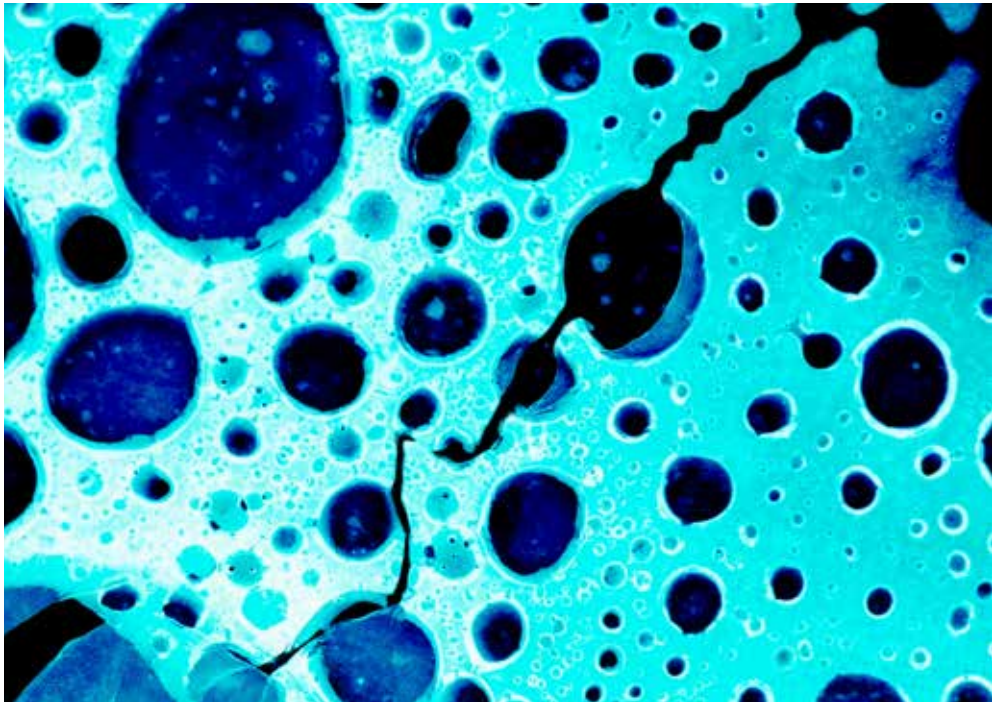
Only a select few laboratories and biotechnology companies have the expertise and capacity to produce high-quality CAR T-cells in quantities necessary for a clinical trial or standard patient treatment. Many of these manufacturers are commercial biotechnology or pharmaceutical firms, but Dana-Farber's Connell and O'Reilly Families Cell Manipulation Core Facility (CMCF) is a hub of production for cell-based therapies and has made CAR T-cell therapies for several clinical trials.

At the CMCF, the CAR T-cell production process is meticulously supervised and documented. For each CAR T-cell therapy produced, there are 100 pages of documentation, with signoffs required for every step of the way. Daily worksheets with checklists are used for each phase of production, verifiers oversee each technician's work and quality assurance specialists are onsite at key stages of the process with the authority to halt production if problems are detected.

Below is an overview on how CAR-T cells were produced at the CMCF for the trial for patients with acute myeloid leukemia (AML) and multiple myeloma.

### 1. Collection

CAR T-cell production begins at the Kraft Family Blood Donor Center at Dana-Farber and Brigham and Women's Hospital, where a patient's T-cells are collected through a process known as leukapheresis. Blood from the patient's arm is channelled to an



apheresis machine, which separates T-cells and other cells. Upon completion, the collection bag holds 10-20 billion cells, about half of which are T-cells.

### 2. Purification and Growth

Next, a courier hand-delivers the sample to the CMCF, where it is placed in an enclosed, ventilated workspace inside a closely monitored clean room. Flow cytometry equipment counts and categorises the cells in the sample. Technicians then test the product for sterility and cull out excess red blood cells and platelets if necessary. The T-cells are placed in a device containing nutrients and antibodies to keep the cells alive and stimulate growth.

### 3. Viral Invasion

A few days later, the T-cells are ready to receive their new genetic instructions. A CMCF technician retrieves a vector – a solution of commercially produced viruses – to insert harmless viruses containing three key genes that carry cellular instructions to the cell culture.

### 4. Maturation

The viruses enter the T-cells and download their genetic material, including the three specially installed genes, into the cells' DNA. The trio of genes order the cells to produce a three-part protein structure – known as a chimeric antigen receptor, or CAR – on the cells' surface. The CARs will help the T-cells recognise the patient's cancer cells and destroy them.

### 5. Multiplication

The cells remain in their nutrient bath for 7-10 days, until they become fully fledged CAR T-cells and reach a sufficient quantity. During this time, technicians periodically remove used-up growth

media – the mixture cells feed on – and replenish it with new media.

### 6. Quality Control

A technician "harvests" the CAR T-cells, drawing them into a syringe and placing them in a bag or tubes. A centrifuge spins them at high speed to remove the culture media. The cells then undergo a variety of quality control checks. These checks help ensure there are enough cells, that they're the right type and function properly, that the product is sterile, that the CAR cells have acquired the proper number of genes, and that the vector viruses have been fully removed. While it takes just 10-14 days to manufacture CAR T-cells, quality-control testing may consume up to two additional weeks. If any of these quality checks fail, the cells will not be used.

### 7. Re-Infusion

Upon approval from the CMCF medical director, the CAR T-cells are ready to be re-infused with the patient. CAR T-cells can be infused fresh but are typically frozen to be available when the patient is ready. Close coordination between the facility's staff and infusion nurses ensures they're released at precisely the right time. The cells make their final trip to the bedside, where they're infused into the patient from whom their forebearers were taken weeks earlier. Back in their "home" body, they immediately join the battle against the patient's cancer cells.

CAR T-cells have delivered dramatic clinical benefits to some patients, but there are many opportunities to fine-tune our genetic and cell-manufacturing approaches to achieve better safety and effectiveness and target additional cancer types in the future. We are looking forward to the challenge.

### CAR T-cell Treatment Provides Patient Benefits Outside Clinical Trials

New research from Dana-Farber Cancer Institute indicates that outcomes in non-Hodgkin lymphoma patients treated with the CAR T-cell product Yescarta in the "real world" are similar to results seen in the more limited clinical trial setting.

The scientists, led by Caron Jacobson, MD, Medical Director of the Immune Effector Cell Therapy Program at Dana-Farber, performed a multicentre retrospective study of Yescarta used to treat relapsed or refractory large B-cell lymphoma and compared the results with those in the ZUMA-1 trial, the first multicenter phase II trial evaluating CAR T-cells in this disease.

In the ZUMA-1 trial, treatment with Yescarta achieved durable responses in 40 per cent of relapsed or refractory lymphoma patients. The 76 patients in the "real world" setting studied by Jacobson and colleagues were sicker and had poorer performance status than those treated in the clinical trial.

According to Jacobson, over 60 per cent of her team's patients would not have been eligible for ZUMA-1, making the similarity of results between the broader real world and more limited clinical trial settings quite encouraging.

While the overall response rate and the rate of complete responses was a bit lower than what was seen in ZUMA-1, the durability of responses is nearly identical. Based on this research, Yescarta seems to provide durable benefit in the same proportion of patients in the 'real world' as it did in the clinical trials.

The results, which were recently presented at the American Society of Hematology Annual Meeting on December 1, 2018, also showed that patients who had biomarkers indicating a low level of inflammation on the day of treatment had better outcomes. These results suggest that strategies to decrease levels of peak inflammation may improve the safety of this therapy while improving clinical outcomes.

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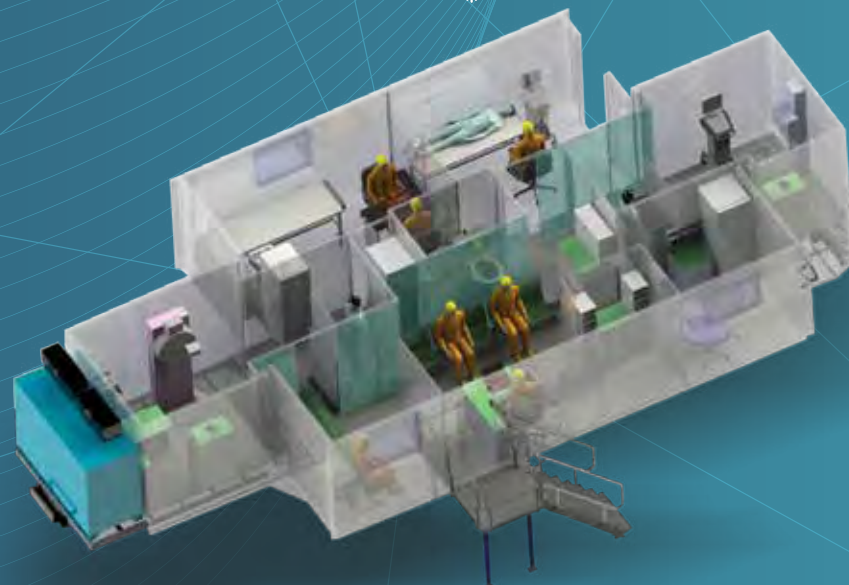
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