



Vol. 05, Issue 06, No. 30, November-December 2021

# MEDIWORLD

## Middle East



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### Feature

*External Counter Pulsation - 'Bypass without Bypass'*

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*UAE health authorities celebrate World Diabetes Day*

### Healthcare destination

*FRANCE: The Next Health Technology Nation*

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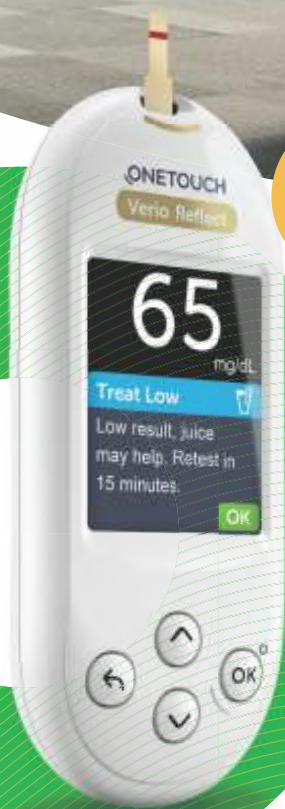
*US researchers develop new bioprinting technique based on voxels*

# SmartTrack's

## FIGHT AGAINST COUNTERFEIT DRUGS



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## Editorial

### A new chapter in the Covid-19 pandemic

This November, about 23 months later, since the first reported case of Covid-19 and after a global estimated 260 million cases and 5.2 million deaths, a new SARS-CoV-2 variant of concern (VoC), omicron, was reported. Omicron emerged in a COVID-19-weary world in which anger and frustration with the pandemic are rife amid widespread negative impacts on social, mental and economic wellbeing. Although previous VoCs emerged in a world in which natural immunity from COVID-19 infections was common, this fifth VoC has emerged at a time when vaccine immunity is increasing in the world.

The emergence of the alpha, beta and delta SARS-CoV-2 VoCs were associated with new waves of infections, sometimes across the entire world. The current knowledge about Omicron is still unknown and Researchers in South Africa and around the world are conducting studies to better understand many aspects of Omicron and will continue to share the findings of these studies as they become available.

With sales ranging from \$163 billion to \$217 billion per year, according to industry estimates, counterfeit pharmaceuticals are the most lucrative sector of the global trade in illegally copied goods. Fraudulent drugs harm or kill millions around the world and inflict serious damage on the brand names and bottom lines of major pharmaceutical manufacturers. Although less developed markets have long been their stronghold, pharma counterfeiters are now using digital channels to penetrate developed countries, where traditional physical drug distribution networks are well protected. Companies have plowed billions of dollars into defensive measures, but their efforts have not slowed counterfeiters. Common anti-counterfeiting tactics block about half of the fake drugs, at most. New regulatory initiatives, meanwhile, leave large gaps for criminals to exploit.

EVOTEQ's SmartTrack digital solution is revolutionary in terms of building trust and reliability in the supply chain. The platform uses serialization and advanced cloud platforms to 'track and trace' the complete journey of products by providing an end-to-end monitoring and analysis. SmartTrack increases visibility and trust across various industries, especially healthcare, pharmaceuticals, food and beverage, raw materials, etc. We speak in great length about this with CEO of EVOTEQ Jihad Tayara in our cover story.

Coronary heart disease is often caused by the buildup of plaque, a waxy substance, inside the lining of larger coronary arteries. This buildup can partially or totally block blood flow in the large arteries of the heart. Some types of this condition may be caused by disease or injury affecting how the arteries work in the heart. Coronary microvascular disease is another type of coronary heart disease. It occurs when the heart's tiny blood vessels do not work normally. It is also known to a catch-phrase for a variety of conditions that affect the heart's structure and function. Dr. Annie Varghese, CEO Advanced Cardio Vascular Center in Texas explains to us the benefits of the ECP Therapy and how it can help prevent Coronary Artery Diseases.

France has a high quality healthcare system that offers universal coverage for all citizens, regardless of age or economic situation. It consists of an integrated network of public and private services including doctors, hospitals, and specialist providers.

The country is ranked 11th on the 2018 Euro Health Consumer Index and has been praised for its efficiency and outcomes. We explore La France in our medical destination section.

If you would like to be featured in our magazine, you can get in touch with me at ayesha@mediworldme.com. Don't forget to LIKE and SUBSCRIBE to all our social media channels to stay updated with what's happening in the medical industry.

Happy New Year in advance to our all readers, we wish that 2022 brings in lots of joy, happiness, good health and indeed wealth to all of us.

Have a rocking year!

Sincerely,

**Ayesha Rashid**  
**Chief Editor, MediWorld ME**

# HI-CARE PROTECTION Feels Good



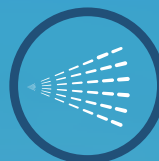
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**Warning :** For external use only. Flammable. Keep away from heat or flame.

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On open skin wounds. When using this product keep out of eyes, ears and mouth.

**In case of** contact with eyes, rinse eyes thoroughly with water. Stop use and ask a doctor if irritation or rash occurs. These may be signs of a serious condition.

Keep out of reach of children. If swallowed, get medical help.

**Directions :** Place enough product on hands to cover all surfaces.

Rub hands together until dry. Supervise children under 6 years of age when using this product to avoid swallowing.

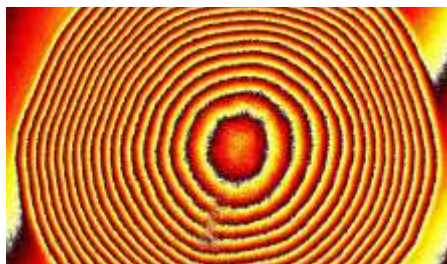
**Other information :** Do not store above 30°C

Avoid freezing and excessive heat above 40°C.

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1. Data on file – Hi-Care Alcohol Antiseptic 80% Topical Solution Composition Formula.
2. World Health Organization - Guide to Local Production: WHO-recommended Handrub Formulations. April 2010.
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# SmartTrack's fight against counterfeit drugs

EVOTEQ's SmartTrack digital solution is revolutionary in terms of building trust and reliability in the supply chain. The platform uses serialization and advanced cloud platforms to 'track and trace' the complete journey of products by providing an end-to-end monitoring and analysis. SmartTrack increases visibility and trust across various industries, especially healthcare, pharmaceuticals, food and beverage, raw materials, etc.





*Jihad Tayara, CEO, EVOTEQ*

**T**rack and trace technology is known to be the next logical step in a consumer-led supply chain with its industry-wide implementation. Logistics companies want to know where their fleet is at any given time, and consumers want to be able to follow the journey their goods take. Today, that technology covers RFID, GPS and EPOS, all of which aim to increase the efficiency of the supply chain throughout the life cycle.

Track and trace technology is known to be the next logical step in a consumer-led supply chain with its industry-wide implementation. Logistics companies want to know where their fleet is at any given time, and consumers want to be able to follow the journey their goods take. Today, that technology covers RFID, GPS and EPOS, all of which aim to increase the efficiency of the supply chain throughout the life cycle.

Track and trace technologies enable a product's status to be captured through the value chain, and to retrospectively identify and verify its path. Solutions typically include elements for: (1) associating products or materials with unique identifiers (UIDs); (2) capturing events at various points in the supply chain; and (3) performing analytics and reporting on the information. Some solutions include messaging to share information with regulatory agencies or trading partners, and some also support capabilities for product authentication.

The implementation of track and trace solutions and technologies is an important strategy adopted by many manufacturing companies and regulatory bodies in recent years. The global track and trace solutions market is projected to reach \$7.3 billion by 2026 from \$4.1 billion in 2021, at a CAGR of 12.1% during the forecast period (markets and markets).

Growth in the market is largely driven by stringent regulations & standards for the implementation of serialization, increasing focus of manufacturers on brand protection, growth in the number of packaging-related product recalls, high growth in the generic and OTC markets, and growth in the medical device industry.

On the other hand, the high costs and long implementation timeframe associated with serialization and aggregation and the huge setup costs are expected to limit market growth to a certain extent.

## SmartTrack Platform

**EVOTEQ built the SmartTrack platform, an advanced serialization and tracing system that has linked and developed new generation technology to track and trace serialized products from the point of production to the consumer. The platform is a GS1 compliant solution to ensure global supply chain integrity and can be readily deployed across many verticals. The platform is capable of integrating use cases across industry verticals including the automotive industry, for validating genuine spare parts; halal food verification; taxation of FMCG products, such as soft drinks and tobacco products; identifying luxury goods imitations, and counterfeit drugs detection to name just a few. As a result, every critical point throughout the supply chain is documented and the final item can be traced to its origins – ensuring transparency and eliminating counterfeit products. To get an idea of the platform's scalability in counterfeit detection, we spoke in depth with the CEO of EVOTEQ, Jihad Tayara.**

### ***Tell us in detail about your 'track and trace' technology SmartTrack?***

EVOTEQ's SmartTrack digital solution is revolutionary in terms of building trust and reliability in the supply chain. The platform uses serialization and advanced cloud platforms to 'track and trace' the complete journey of products by providing an end-to-end monitoring and analysis. SmartTrack increases visibility and trust across various industries, especially healthcare, pharmaceuticals, food and beverage, raw materials, etc.

EVOTEQ is currently working with the UAE's Ministry of Health and Prevention (MoHAP) to utilize this technology and ensure healthcare supply chains are secure and tracked in the country. SmartTrack acts as a crucial method to ensure product safety by providing authenticity validation and enabling counterfeit prevention. Apart from uniting all stakeholders against fraud or shortages, SmartTrack also aims to empower consumers to enable them to validate and verify products across the global supply chain.

### ***How can it be used in the healthcare sector?***

As our SmartTrack solution aims to ensure product integrity by tracking serialized tangible products, it is certainly fit for the healthcare industry. The solution can track any medical item from the point of production through hospitals and pharmacies all the way to the patients. The process seeks to increase transparency and trust in the healthcare industry. SmartTrack will aim to reduce factors which lead to medicine shortages and fraud, expedite recalls and prevent the sale of expired medicines.

The front-end mobile solution for consumers and a separate portal for manufacturers and distributors will offer end-to-end traceability of medical supplies for all supply chain participants. The tracking system is based on the GS1 global serialization standards, which will facilitate the day-to-day operations for pharmaceutical and medical equipment manufacturers and all supply chain stakeholders who supply to the UAE healthcare system. SmartTrack is built with the latest state-of-the-art technology and includes SAP software and Microsoft Azure.

### ***How can SmartTrack overcome the challenge of serializing healthcare?***

Counterfeit and sub-standard drugs in the pharmaceutical sector pose a global public health risk. These drugs are not only ineffective but may also put the lives of patients in danger, causing adverse reactions or even death. Counterfeiting, adulteration, theft and even diversion of drugs have led governments and regulatory agencies to develop regulations to ensure patient safety and supply chain security.

SmartTrack ensures that pharmaceutical supply chains are as secure as possible by providing information about the origin and locations of certain products. Transparency is necessary when it comes to tackling the menace of counterfeit goods, which now stands at 3.3 per cent of the global trade, according to the Organization for Economic Co-operation and Development (OECD). The World Health Organization (WHO) estimates that one in 10 medicinal products sold globally is counterfeit and is a cause of more than a million deaths each year.

To combat this crisis, especially during the pandemic, serializing the medical products will help reduce counterfeiting, diversion, and theft by making supply chain operations more transparent. Therefore, assigning a unique 2D Matrix barcode to products and tracking them throughout the supply chain becomes important. However, the process comes with its own challenges as the execution goes far beyond printing barcodes on a package.

One of the main hurdles is the ability to couple physical movement of products with the transfer of electronic data. The process requires a robust IT infrastructure which can generate, store, capture, and transmit the serialized data to trading partners within the pharmaceutical supply chain through secure channels.

To that end, EVOTEQ's SmartTrack platform, which was

developed in compliance with not-for-profit organization GS1, tracks and traces pharmaceutical products by serializing each product. SmartTrack assigns a unique identification code, which is a serial number or an electronic product code (EPC) to all the products once manufactured. The serial number should be applied to each unit in GS1 standard in the form of a 2D DataMatrix barcode format and human-readable formats. The units can be tracked through its entire supply chain, from production through the supply chain partners to final dispensation to the patient.

***How is SmartTrack known to be an advanced platform to ensure global supply chain integrity?***

**In order to combat counterfeit issue, many countries have their own traceability requirements to protect prescription medicines. For instance, traceability through barcoding can help ensure product quality and safety management to identify expired products and assist in inventory management.**

Apart from benefiting manufacturers and supply chain providers, traceability in healthcare will ensure that correct and authentic products reach patients when they need it. With SmartTrack, products can be traced by attaching a unique identification of the items which offers the opportunity to leverage visibility for every stakeholder about the movement and delivery of the inventory.

***How does SmartTrack track and trace serialized products from the point of production to the consumer?***

When a manufacturer makes a product, they will affix a GS1 2D Matrix barcode to it and digitally upload that information into SmartTrack. From there onwards, the code is the mark of authenticity and shipping conditions for those products. This will make it easy for logistics providers to ensure the timely supply of products to the right customers. All they need to do is scan the barcode to get the information.

By checking the barcode, authorities can verify and check the details on the number of drugs being imported, drug type, manufacturing details, expiry dates, approvals for release of shipment in the UAE, and data repository updates.

Once the product receives its serial shipping container code, it is then shipped by International providers to the UAE or applied by the local producer for the local market. When international supplies enter the UAE, customs officials can get detailed information about the products including the origin, validity, shipping conditions as well as the expiration date and its

destination. The same process follows when inventory reaches warehouses and subsequently to hospitals and clinics through distributors.

Most importantly, SmartTrack puts the power of verification into the hands of every customer. The platform also offers a Mobile App which allows patients to confirm the authenticity of the medicine they buy. If a product is flagged as unsafe, patients can return the flawed product to any pharmacy or government center.

***Describe its counterfeit detection process?***

Smart Track has the ability to understand where a product should be in the supply chain. If a product has a barcode, which is not recorded in the system, it will notify the relevant authority that it is not authorized. Equally if a barcode is copied and appears in the supply chain again, the system knows where the barcode (product) should be in the supply chain and notifies the authority that it is an unauthorized product. SmartTrack has advanced analytics that enables the system to detect illicit product for many reasons, including expired and unauthorized products.

***In an effort to support track and trace for pharma, how is serialization used to help identify a drug's authenticity prior to sale, dispensing, return or recall?***

SmartTrack acts with files of data with 2D matrix barcode, which has unique information for that box supplied by the Ministry of Health's authorized manufacturers and is used to identify each box of medicines through its journey to the patient.

Applying a global location number to all supply chain participants, we can track the progress of that medicines to individual location, including the manufacturing site, the logistics provider, distributor, and a hospital, clinic or pharmacy that receives the medicine. Additionally, if we need to recall the medicine, we can do so quickly, as we know the location of each box. Every outlet dispensing or storing drugs are digitally connected to the system, enabling it to be notified in seconds in case of a recall.

***What happens if track and trace is not implemented?***

With rapid innovation in product manufacturing comes the need to identify the engineering, design, production, and distribution of resources. It is only possible with an end-to-end visibility process across production and supply, including real-time production monitoring systems, advanced planning and scheduling manufacturing tools as well as the track-and-trace method along the supply chain.

SmartTrack connects the company with its suppliers, customers, and partners to enable a real-time flow of information and transactions to create flexibility and robustness in logistics. It is beneficial in a way that it improves life expectancy in terms of quality medicinal drugs and minimizing monetary loss due to counterfeits. Some of the benefits are:

- Improving efficiency and minimizing waste



- **Enhancing collaboration in the supply chain to resolve inter-enterprise problems better and faster**
- **Boosting resilience and agility to help predict shortages and secure the supply when facing a crisis**

In the absence of such a platform, it would be very difficult to regulate medical supplies being transported around the world in such high volumes due to increased demand for healthcare with rising population.

### ***Describe SmartTrack's verification process?***

SmartTrack uses the GS1-approved 2D matrix barcode and the global location number of all supply chain partners. It verifies every movement by using the matrix of these codes to verify where the product should be and that it moves as it should through the supply chain. Any anomalies in either the codes, the location or the movement of the product from one place to another are notified as a non-compliant event to the system immediately.

### ***How does it increase visibility and trust across different industries including healthcare and pharma?***

Real-time visibility enables companies to improve efficiency and gain higher customer satisfaction. With access to real-time environmental data combined with insights into transit times and predictive estimated times of delivery, companies can now create a more accurate, timely, and complete picture of the supply chain than ever before.

### ***Describe its end-to-end monitoring and analysis?***

SmartTrack uses advanced algorithms, analytics, and machine learning to follow the unique identifiers on a product. It follows the product through the supply chain, from its starting point to its end point, ensuring that it is where it should be. SmartTrack continually learns to help clients predict demand, the behavior of products in their portfolios, and the efficiency of their supply chain for better planning, reduced cost, and increased sales.

### ***In this Covid-19 era, why is it even more important to opt for SmartTrack?***

The ripples of the coronavirus pandemic were felt across all sectors globally, but the healthcare system was forced to immediately adapt to the sudden changes. The COVID-19 pandemic has put pressure on the pharmaceutical supply chains to ensure a steady inflow of medicines, which can be challenging to manage. But on the positive side the pandemic has demonstrated the speed with which companies can adapt.

When a country unexpectedly needs to import huge quantities of hand sanitizers, medicines, and masks from as many sources as possible, it is imperative to ensure the products are genuine given the investments made and the number of lives that are at stake. This is where the SmartTrack platform becomes invaluable.

Such a platform can trace the flow of goods from the point of



manufacture to point of sale and the end-users. This streamlines the supply chain process and enhances operational efficiency.

As the pandemic raced around the world, healthcare facilities were left facing rising case and supply shortages. As the data was migrated online, it was imperative to trace it in order to make real-time decisions. The pandemic accelerated the digitization process to adopt the traceability methods for supply chain risk monitoring and management to achieve operational resilience.

### ***How has these current times highlighted the need for a seamless functioning healthcare system, addressing the needs of hospitals, pharmacies and consumers to ultimately enhance the quality of life?***

We have seen the need for seamless supply chains to enable exceptional patient care. SmartTrack can work with Hospital Information Systems to forecast demand and react quickly to the needs of the hospitals or clinics and the patients. By allowing supply chain visibility, it also enables governments and hospital systems to move drugs and equipment to where they are needed.

SmartTrack is proud to work with some of the major players in the pharmaceutical industry in providing transparency until the last mile delivery. Digital technologies such as artificial intelligence and blockchain improve security and visibility across the supply chain. Such methods create a dynamic, interoperable system where transactions can be transparent and traceable.

Disruptions within specific parts of the supply chain can have subsequent impact on the steps that follow, creating a cascade of inefficiencies that is very complicated to trace. However, end-to-end traceability across the interconnected supply chain allows data to be safely extracted in real-time using artificial intelligence tools, which generates actionable insights and, consequently, improving decision-making across the process. This further helps companies to mitigate disruptions and become more agile, efficient, and responsive.

**16-18 Dec 2021 | Sofitel Dubai The Obelisk  
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The Emirates Pathology Society (EPS) is  
pleased to invite you to join the Emirates Surgical Pathology  
Conference to **be held LIVE AND IN PERSON from 16<sup>th</sup>-18<sup>th</sup> December  
2021**, in Sofitel Dubai The Obelisk Hotel, Dubai, United Arab Emirates

### IMPORTANT DATES:

✓ 15 <sup>th</sup>	September 2021	Abstracts Notification
✓ 01 <sup>st</sup>	October 2021	Abstracts Presenters Registration Deadline
✓ 14 <sup>th</sup>	September 2021	Early Bird Registration Deadline

### CONFERENCE SESSIONS 17-18 DEC 2021

- Breast pathology
- Neuropathology
- Genitourinary (GU) Pathology
- Cytopathology
- Gynecologic Pathology
- Keynote Lectures
- Abstracts Presentations

### PRE-CONFERENCE WORKSHOPS

**16 DEC 2021**

- Molecular Pathology
- GI and Digital Pathology

### WHO SHOULD ATTEND

- Pathologists
- Cytopathologists
- Molecular Pathologists
- Gastroenterologists
- Oncologists
- Surgeons
- Haematologists
- ENT Surgeons
- Neurosurgeons
- Gynaecologists
- Laboratory Managers  
And Directors
- Pathologists in Training
- General Practitioners
- Laboratory Professionals
- Healthcare Professionals
- Medical Students

# External Counter Pulsation - 'Bypass without Bypass'

The market for technologies and products in the treatment of coronary heart disease is forecast to grow from \$12.2 billion in 2014 to \$22.5 billion in 2021, (Smithers)

**Dr. Annie Varghese**  
CEO, Advanced Cardio Vascular Center  
Houston Texas





## Coronary heart disease (CHD) or coronary artery

**disease occurs when a coronary artery clogs and narrows because of plaque buildup.**

Plaque is made of fat, cholesterol and other materials. This plaque builds up inside artery walls and can cause the arteries to narrow and stiffen, reducing the blood flow and vital oxygen to your heart muscle. The process of atherosclerosis, the buildup of plaque in the wall of the arteries, happens overtime.

Without enough blood supply, the heart is starved of the oxygen it needs to work properly, causing chest pain called angina. If the artery wall tears and plaque leaks into the bloodstream, it can cause a blood clot to form, blocking the blood vessel. If the blood flow to the heart muscle is stopped, or the heart does not get enough blood flow, a heart attack (injury to the heart muscle) can occur.

The market for technologies and products in the treatment of coronary heart disease is forecast to grow from \$12.2 billion in 2014 to \$22.5 billion in 2021, according to a new study from Smithers.

External Counter Pulsation (ECP) is a non-invasive procedure believed to help stimulate the growth of new blood vessels in the heart and, in some cases, improves the flow of existing blood vessels. Often, ECP is used when physicians have exhausted other therapies. ECP also may be used in addition to bypass surgery and angioplasty to enhance the benefits of these two procedures.

No preparation is necessary for ECP. In most cases, the procedure is done on an outpatient basis. It is suggested that patients wear clothes that are tight-fitting and elastic to prevent irritation from the cuffs and follow

medication and exercise instructions as directed by their physician.

An ECP treatment usually takes about one hour. Treatment is daily and may extend from five to twelve weeks or more. Patients are placed on a comfortable table and pneumatic stockings or cuffs are fitted to the calf and lower and upper thighs on each leg. These cuffs are hooked-up to a monitor which enables the physician to make adjustments to the pressure as necessary.

The cuffs are choreographed to inflate and deflate based on the results of an electrocardiogram (EKG), which measures heart rhythm. First, the calf cuffs inflate, followed by the lower thigh cuffs, ending with the upper thigh cuffs. The cuffs deflate as the heart starts another beat. Because ECP increases the pressure on the blood flowing through the aorta while the heart is at rest, the heart receives extra oxygen enriched blood.

Dr. Annie Varghese, CEO, Advanced Cardio Vascular Center, Houston Texas, is a cardiologist, trained to provide comprehensive care for the heart and cardiovascular system in patients. She was on a short visit to Dubai and took some time out to speak with Ayesha Rashid of Mediworldme on the benefits of the ECP Therapy and how it can help prevent Coronary artery diseases.

### ***Why Coronary artery disease is so prevalent these days and what can be done to prevent it?***

Coronary artery diseases is a number one killer in both men and women worldwide. There are a lot of things which can be done to prevent coronary artery diseases so if we have to look at the ideology we have to look at the lining of the arteries and this is where the answer is with regard to the inflammatory changes in the cholesterol such as the triglycerides and LDL (low-density lipoprotein) and the remnant particles which are very bad particles for the lining of the artery and when these things become oxidized, the oxidative stress takes over in the blood, causing triglycerides and LDL and the remnant particles to become toxic for the lining of the artery as well as the sub-lining, so these things enter the lining of the artery and they become deteriorated and start to attract white blood cells which later becomes macrophages. Then macrophages eat the bad cholesterol particles.

Years of research has shown that the reduction of LDL and triglycerides does decrease the morbidity and mortality in multiple clinical trials throughout the last thirty years. With regards to Coronary artery diseases prevention we can definitely evaluate the patient by doing blood testing that looks at the lining of the arteries and then we can focus on the problem areas and then decreases the inflammatory process in those areas.

### ***You mentioned that 6.2 million people in the USA are suffering from coronary artery diseases what is your suggestion in bringing down this number?***

With regard to lifestyle modification, CAD patients need to be taught about lowering cholesterol intake or fat intake which are the things which leads towards high cholesterol levels, lowering carbohydrates such as refined sugars, like cakes, cookies, pastas and potato, rice bread are all loved by the people, but are not good for our bodies and many people are very sensitive to these things and develop insulin resistance and subsequently diabetes. Diabetes leads to vascular plaque



formation, so we can say that diabetes is equivalent to coronary artery diseases so if you can prevent diabetes you can prevent coronary artery diseases. Prevention is the key beyond the cholesterol and the sugars we talk about oxidative stress in the blood and we can check for it early in the patients who are coming for evaluation whether they have the family history of Coronary artery diseases and they want to be checked early or if they have hypertension or diabetes. We can do blood test that we bring from the USA, called the pulse cardiac test, which is a simple blood test with nine different marks of information which are consistent with endothelium and correlated to the coronary arteries and cerebrovascular diseases so this test can predict the heart attack or stroke for the next five years and the patients can understand it with regards to their symptoms and post that they can work towards lowering their risk with the treatment plans that we implement and in treatment, we focus on decreasing the inflammatory changes in the blood and the endothelium level.

### ***Over 1.2 million patients per year undergo heart procedures, can ECP treatment cut down this number?***

ECP treatment has been shown to be beneficial to improve the coronary flow, and multiple clinical trials show improvement in the ST Segment depression or low blood flow of the heart because ECP therapy is growing new coronary arteries so that is why it's called 'by pass without bypass' because collateral flow is created in the areas that were not getting enough blood due blockages or small arteries or diffused diseases, can now be improved in the functioning of the heart muscle because blood flow has improved as well. Patients may come up with heart attack and need to be intervened on acutely but in the long term analysis, patients do benefit significantly with regards to the coronary flow as well as improving Systolic function with ECP Therapy and we are actually evaluating the diastolic functions with the ECP patients.

### ***Tell us about your ECP therapy?***

ECP is well studied and has over 50 years of data. It requires patient to lay on a specialized bed that has cuffs attached to it which are placed on the legs in a sequential fashion as well as to the bottom area of the body, and the machine does the sequential compressions times to the cardiac cycle and squeezes the legs in the what we call a dyastallic phase of the cardiac cycle thereby helping the coronary artery flow to increase and improve blood flow to the heart. This is safe, recommended as an Adjuvant therapy for the patients with

cardiovascular diseases in medicare guidelines covering it for the chest pain not amenable to intervention.

### ***How many hours of treatment do you recommend?***

The length of the treatment is 35 days but its benefits can actually be seen after two weeks of treatment one hour a day on the bed for 35 days is the standard time.

### ***Can you shed some light on your expansion plans in the UAE?***

We want to educate people in the United Arab Emirates regarding ECP therapy. The plan is to educate both doctors as well as patients with webinars and seminars, being available in a forum of clinical care in hospitals as well as in the setting of wellness care in outpatient clinics as well as in cardiac rehab centers. Merlin ECP Centers will be especially interested in seeing patients for cardiac rehab as well as sports rehab as they have been pioneers in the field of ECP use in the research settings of their centers in Sharjah as well as in Dubai. I want the people of the UAE and this entire region which sweeps from Africa to Europe to Asia (as Dubai is such a global hub and leader in medical care in this region) to be informed about excellent advances in medical science, one of which comes in the form of ECP therapy. I want to reach Vision 2021 and to be hand in hand with Sheikh Mohammed's Dream for a better today and a brighter tomorrow for his people and all those of the United Arab Emirates.



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# World Diabetes Day

The global diabetes devices market size was valued at \$25.9 billion in 2020 and is expected to expand at a CAGR of 6.6% from 2021 to 2028. The market is primarily driven by factors such as an increase in technological advancements and rise in the incidence of obesity. Moreover, the increasing adoption of insulin delivery devices and the rising prevalence of diabetes are driving market growth (Grand view research)



**D**iabetes is a disease that occurs when your blood glucose, also called blood sugar, is too high. Blood glucose is your main source of energy and comes from the food you eat. Insulin, a hormone made by the pancreas, helps glucose from food get into your cells to be used for energy. Sometimes your body does not make enough—or any—insulin or does not use insulin well. Glucose then stays in your blood and does not reach your cells.

Over time, having too much glucose in your blood can cause health problems. Although diabetes has no cure, you can take steps to manage your diabetes and stay healthy.

The global diabetes devices market size was valued at \$25.9 billion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 6.6% from 2021 to 2028. The market is primarily driven by factors such as an increase in technological advancements and rise in the incidence of obesity. Moreover, the increasing adoption of insulin delivery devices and the rising prevalence of diabetes are driving market growth (Grand view research).

### **World Diabetes Day**

The health authorities in the United Arab Emirates have joined the world in celebrating World Diabetes Day, with a ceremony organized by the leading global healthcare company Novo Nordisk in cooperation with the Embassy of Denmark.



Held at Burj Plaza in Downtown Dubai, the event helped highlight the UAE's achievements made to enhance the level of healthcare services provided to people with diabetes and shed light on future initiatives and technologies that would advance the treatment and prevention methods of diabetes in the country and improve the results of the National Diabetes Index.

During the gathering, local health authorities and strategic partners reviewed ways to strengthen their cooperation, enhance the public awareness of diabetes and develop prevention plans and initiatives.

It has also been a great time to call on all stakeholders to step up their efforts to limit the spread of this disease, improve the quality of life of the community and discuss national and international policies and strategies to better manage diabetes, innovate new treatment methods and bring about a real change by reducing the prevalence of diabetes in the region.

Speaking on the occasion, Mads Bo Larsen, Vice President and UAE General Manager at Novo Nordisk, said that all parties taking part in the event share one clear goal. It is to strengthen cooperation to combat diabetes, bring about a positive change, improve people's access to health care services and enhance the quality of their lives.

### **Milestones**

Larsen lauded the distinguished milestones made by the UAE in the fight against diabetes, which as he said, would not have been possible had it not been for the country's integrated and sustained efforts, launching innovative initiatives and projects, providing world-class health and treatment services.

Stressing the importance of the event, Franz-Michael Skjold Mellbin, Ambassador of Denmark to the UAE, urged all stakeholders to step up their efforts to fight diabetes, which is one of most serious non-communicable diseases and affects more than 500 million people around the world.

The ambassador said that the health authorities in Denmark and the UAE are doing their best and moving in the right direction towards fighting diabetes by developing innovative treatments and introducing new healthcare strategies to save the lives of diabetics and improve their access to various healthcare services.

Mellbin expressed his pleasure at taking part in the event, which coincides with the 100th anniversary of the discovery of insulin, and highlighted the need to constantly conduct research and go the extra mile to come up with new treatment solutions that can help in the fight against this chronic disease.

He also underlined the importance of public private partnerships and working closely together with patients and their families to ensure compliance and successful treatment.



For his part, Dr. Hussein Abdul Rahman Al Rand, Assistant Under-Secretary for the Public Health Sector, stressed that the Ministry of Health and Prevention will spare no effort to provide the best healthcare and treatment services to people with diabetes and reduce the health risks of diabetes by continuously conducting related research and scientific studies, adding: "Diabetes is being given a top priority within the ministry's initiatives and programs."

### ***Developing innovative health services***

"The UAE is racing against time to develop innovative health services and is constantly updating the National Non-Communicable Disease Control Policy. This comes in line with the country's forward-looking vision, the Principles of the 50 and is in implementation of the wise directives of the UAE leadership," Al Rand said.

Dr. Amin Hussein Al Amiri, Assistant Undersecretary for the Health Regulatory Sector, stressed the importance of the event, which brought together eminent speakers and a great audience with a common objective: bringing a real impact on reducing the prevalence of diabetes in the UAE community and improving the quality of life of people living with diabetes.

Al Amiri stressed that the local health authorities are making every effort to develop the country's preventive systems to safeguard the health of the UAE people and provide comprehensive and distinguished health services. Thanks to all their

efforts, the prevalence of diabetes in the UAE has declined from 18.9% in 2010 to 11.8% in 2018.

He went on to say that the UAE has been one of the first countries to attract and launch innovations including medicines and devices. Such products that entered the UAE market granted individuals with diabetes the opportunity to better manage their condition and improve their quality of life.

Dr. Yousef Mohammed Al Serkal, Director-General of the Emirates Health Services (EHS), affirmed that UAE's health system stands out for its unique efficiency and flexibility in providing innovative healthcare and treatment services and introducing smart digital solutions that perfectly meet the growing needs of diabetic patients.

He said, "Today and as we join the world in celebrating World Diabetes Day, we have become more mindful than ever before that the chronic disease, which affects humans of all ages, represents health, social and economic burden. We affirm our full support for multilateral efforts being made to improve the health of all individuals, promote healthy lifestyles and provide accessible preventive, curative and promotional services and hence we also renew our commitment to taking all necessary measures and measures to confront it."

### ***Importance of adopting healthy lifestyle***

**Highlighting the importance of adopting a healthy lifestyle in fighting diabetes, Director General, Abu Dhabi Public Health Centre, Matar Saeed Rashed Al Nuaimi said the ADPHC is playing its full part in supporting the ongoing efforts being made to combat diabetes.**

**"Today, we stand together to promote awareness and direct attention towards the importance of collaboration and uniting efforts among all stakeholders to save lives, address the plague of diabetes and reduce its complications," Al Nuaimi said.**

**Dr. Younis Mohammed Amin Kazim, CEO of Dubai Healthcare Corporation, said, "DHA has developed a multi-faceted robust strategy that covers all aspects from prevention to the use of AI technology and telemedicine to manage as well as prevent type 2 diabetes due to obesity, unhealthy diet and physical inactivity.**

**"We have implemented, over the years, policies and created health-supporting environments to reduce risk. All our primary healthcare centers act as gatekeepers to ensure prevention as well as early treatment, specialist referrals and timely care. We also have endocrinology and paediatric endocrinology units at Dubai hospital and we have a dedicated Dubai Diabetes Centre that provides the highest quality of multidisciplinary diabetes care," Kazim added.**

**He emphasized that DHA aims to provide the highest quality of diabetic care while focusing on prevention and healthy lifestyles to ensure a healthier and happier community.**



## Beat Diabetes

Considering the often unmet and unique needs of people with diabetes in getting regular follow-up and monitoring, Howard Gough, Chairman of Advisory Committee at TruDoc Healthcare, highlighted the unique hybrid model of care that TruDoc provides. He also emphasized on the importance of working collaboratively across the healthcare ecosystem involving the leaders among pharmaceutical companies and the medical profession with the aim to support patients optimally at their convenience. Renuka Jagtiani, Chairwoman & CEO, Landmark Group, said, "At Landmark Group, driving diabetes awareness is very close to our hearts. We started driving this cause passionately since 2009, with our flagship CSR initiative, Beat Diabetes.

The discovery of insulin transformed the way this chronic disease is managed. Our strategic partnership with Novo Nordisk in commemorating 100 years of insulin discovery demonstrates our shared objective of raising awareness and contributing towards diabetes research and treatment".

Ashish Koshy, CEO at G42 Healthcare, stressed the G42 Healthcare's commitment to developing sustainable solutions for chronic disease management, by innovating and deploying holistic and scalable AI offerings that unlock the potential of personalized and preventive care.



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# FRANCE

## The Next Health Technology Nation

The medical device market in France had an estimated turnover of €31.2 billion for the year 2019. The market turnover for medical devices exported from France is estimated at €8.9 billion, which is 26% of the total market. The market is expected to see an annual growth of about 2% for the next several years (trade.gov)

**F**rance is a transcontinental country spanning Western Europe and overseas regions and territories in the Americas and the Atlantic, Pacific and Indian Oceans. Including all of its territories, France has twelve time zones, the most of any country. Its metropolitan area extends from the Rhine to the Atlantic Ocean and from the Mediterranean Sea to the English Channel and the North Sea; overseas territories include French Guiana in South America, Saint Pierre and Miquelon in the North Atlantic, the French West Indies, and several islands in Oceania and the Indian Ocean. Due to its several coastal territories, France has the largest exclusive economic zone in the world. France borders Belgium, Luxembourg, Germany, Switzerland, Monaco, Italy, Andorra and Spain in Europe, as well as the Netherlands, Suriname and Brazil in the Americas. Its eighteen integral regions (five of which are overseas) span a combined area of 643,801 km<sup>2</sup> (248,573 sq mi) and over 67 million people (as of May 2021). France is a unitary semi-presidential republic with its capital in Paris, the country's largest city and main cultural and commercial center; other major urban areas include Lyon, Marseille, Toulouse, Bordeaux, Lille and Nice.



France retains its centuries-long status as a global center of art, science and philosophy. It hosts the fifth-largest number of UNESCO World Heritage Sites and is the world's leading tourist destination, receiving over 89 million foreign visitors in 2018. France is a developed country with the world's seventh-largest economy by nominal GDP and ninth-largest by PPP; in terms of aggregate household wealth, it ranks fourth in the world. France performs well in international rankings of education, health care, life expectancy and human development. It remains a great power in global affairs, being one of the five permanent members of the United Nations Security Council and an official nuclear-weapon state. France is a founding and leading member of the European Union and the Eurozone, as well as a key member of the Group of Seven, North Atlantic Treaty Organization (NATO), Organization for Economic Co-operation and Development (OECD) and La Francophonie.

### ***French healthcare sector***

Like other European Welfare States, France has a system of universal health care. This is largely financed by the government through a system of national health insurance. However, there are some major differences in the structure of the French healthcare system and in its financing, versus its EU peers. Most crucially, France spends over 11 percent of GDP on health care, much higher than the EU average.

The French government sets the national health strategy and allocates budgeted expenditures to regional health agencies, which are responsible for planning and service delivery. Enrollment in France's statutory health insurance system is mandatory. The system covers most costs for hospital, physician, and long-term care, as well as prescription drugs; patients are responsible for coinsurance, copayments, and balance bills for physician charges that exceed covered fees. The insurance system is funded primarily by payroll taxes (paid by employers and employees), a national income tax, and tax levies on certain industries and products. Ninety-five percent of citizens have supplemental insurance to help with these out-of-pocket costs, as well as dental, hearing and vision care.

The French hospital sector accounts for almost half total healthcare spending. Of this, just under half is directed at existing infrastructure, with 30 percent going to upgrades and renewal, and 20 percent to new projects. Overall, French hospitals have long been associated with a lack of transparency, along with little incentives for efficiency at individual facilities. Equally important is a sharp deterioration in the quality of buildings and other infrastructure. This is partly due to dwindling outlays on maintenance – ironically, a direct result of reforms in 1996. In the mid-2000s, for example, no fewer than six of 10 university hospitals were reported to have inadequate safety standards in as much as 25-75 percent of their surface area.

Physician density in France has been stable in recent years, at about 3.3 per 1,000 inhabitants in the period 2000-2009. This is more or less in line with the EU average.

Nurse numbers have however risen sharply, in line with other major EU countries





such as Germany and Italy (but unlike the Netherlands). One reason for this is the decrease in average hospital stay and a considerable increase in emphasis on ambulatory interventions. Nurse density has risen - from 6.7 per 1,000 inhabitants in 2000, to 7.6 in 2005 and an estimated 8 in 2008. This corresponds to a satisfactory ratio of 2.5 per physician. However, France has still some way to go. Nurse density per 1,000 inhabitants in 2008 in Germany was 11.6.

### **Medical devices**

The medical device market in France had an estimated turnover of €31.2 billion for the year 2019. The market turnover for medical devices exported from France is estimated at €8.9 billion, which is 26% of the total market. The market is expected to see an annual growth of about 2% for the next several years (trade.gov).

There are over 1,300 medical device firms in France. One-third of these firms are of foreign origin. Although they only account for one-third of the number of enterprises, foreign enterprises bring in two-thirds of the total turnover. American enterprises alone account for 22% of the total market.

Unlike other medical sectors such as pharmaceuticals where large multi-national corporations often dominate the market, the medical device industry is mainly composed of niche-market producers. Out of the 1,300 enterprises in France, 92% are SMEs, of which 88% exclusively produce medical devices. The medical device sector employs approximately 85,000 people.

The best prospects for medical equipment can be found in newly developing sectors such as non-invasive surgery, orthopedics, and disposable medical equipment. Healthcare professionals in France are highly optimistic about the success of new medical technology. One example of such technology is telemedicine, which is expected to have a major impact on medical care institutions in the coming years.

There has been a steady growth of innovative medical procedures in France, such as same-day surgery. This growth is expected to benefit American medical equipment manufacturers who produce highly innovative devices, as well as those who offer products and services focused on reducing healthcare costs.

### **Technology-intensive expertise**

France is home to historical medical industries, especially in the pharmaceutical field, such as Sanofi or Ipsen. This sector represents more than €28.7 billion of exports every year.

French companies in the healthcare sector have a technology-intensive expertise and a strong capacity for innovation, which gives the country a sustainable competitive advantage.

Moreover, France is known worldwide for its excellent scientific and clinical research, thanks to strong institutions like the National Institute for Health and Medical Research (Inserm) or the National Center for Scientific Research (CNRS). According to World's Most Innovative Research Institutions, a 2017 ranking by Reuters, four French institutions are amongst the 25 best public research institutions in the world, and circa 500 clinical trials were realized on the French territory between 2014 and 2015. An additional French specificity: its network of University Hospital Centers (CHU), which places clinical research at the heart of the medical profession.

France owns another strong asset to massively boost innovation: the National Health Data System (SNDS), which is one of the world's most important medico-administrative databases. However, much remains to be done for the country to be able to fully take advantage of this lever and facilitate the access to such databases.

France has recently implemented innovative tools to support health innovation. For instance, the French Investment Bank created the "French Tech Acceleration", a €200 million fund entirely dedicated to the support of healthcare startups. The research tax credit (C.I.R.) also plays an important role: it provides companies with the partial funding of their R&D strategy and encourages them to hire postgraduates or researchers, by including their salaries and associated social costs in the C.I.R. Thanks to the C.I.R., more than a thousand of PhD students are hired every year in French companies.





**Dr. Abdul Jabbar**

Consultant Internal Medicine, Al Safa – Medcare Hospital

**Dr. Abdul Jabbar  
is a Consultant  
Internal Medicine  
and Endocrinologist,**

**who has qualified as a fellow of the  
Royal College of Physicians  
London (FRCP), and Fellow,  
American College of  
Endocrinology (FACE). He has  
undergone training in  
endocrinology at  
St. Bartholomew's Hospital in  
London.**

Dr. Jabbar has more than 30 years of experience in Diabetes, Obesity and Endocrinology and is a visiting Professor at the Aga Khan University. He held the post of Head of Diabetes and Endocrine Section there and has been the President of Pakistan Endocrine Society and an examiner for FCPS (endocrinology) by CPSP. He is an adjunct faculty at the Mohammed bin Rashid University of Health Sciences, Dubai.

Dr. Jabbar works mainly in the management of

diabetes and other endocrine disorders. He helps patients to manage type 1 and type 2 diabetes in adolescents and adults including uncontrolled complex cases with or without complications (diabetic kidney disease, diabetic neuropathy and foot ulcers, diabetic retinopathy, diabetes and cardiovascular complications). He guides on diabetes and pregnancy/preconception management: gestational diabetes and pre-existing type 1 and type 2 diabetes in pregnancy. He also advises on hypoglycaemia, including hypoglycaemic unawareness management.

Dr. Jabbar treats a wide variety of endocrine disorders. These include obesity management, including evaluation for bariatric surgery. Treating thyroid disorders, including hypo and hyperthyroidism, thyroid lumps and cancers. All types of pituitary disorders including evaluation of pituitary function using dynamic tests multiple endocrine neoplasia (men1 and men2 a/b). He treats parathyroid gland disorders: primary, secondary and tertiary hyperparathyroidism, polycystic ovarian syndrome leading to acne, excessive hair growth, irregular menstruation, or insulin resistance. He also treats adrenal disorders, adrenal incidentalomas, congenital adrenal hyperplasia, primary hyperaldosteronism, pheochromocytoma, cushing's syndrome, and Addison's disease. He is an expert on male reproductive and hormonal disorders, delayed puberty and related disorders, pregnancy and endocrine disorders management. He advises patients with neuroendocrine conditions such as carcinoid syndrome, insulinomas, pheochromocytomas/ paragangliomas, hypertension, lipid disorders, osteoporosis, calcium, and sodium balance disorders, unexplained fatigue and dizziness or postural dizziness.



**Dr. Abdul Karim Almohamed**

Head of Anesthesiology Specialist, Anesthesiology  
Danat Al Emarat Hospital

**Dr. Abdul Karim  
Almohamed is the  
Head of**

**Anesthesiology and  
Anesthesiology Specialist at Danat  
Al Emarat Hospital. With more  
than 25 years of experience,**

**Dr. Abdul Karim worked in many leading  
medical organizations UAE, France, Poland  
and Syria. He specializes in cardiac  
anesthesiology and bariatric surgery  
anesthesiology.**

Dr. Abdul Karim earned his Medical Degree from Damascus University, Syria, 1999. He then earned a Master Degree in Anesthesiology and ICU from the same university in 1999. He is a Member of European Society of Anesthesiology since 2005.



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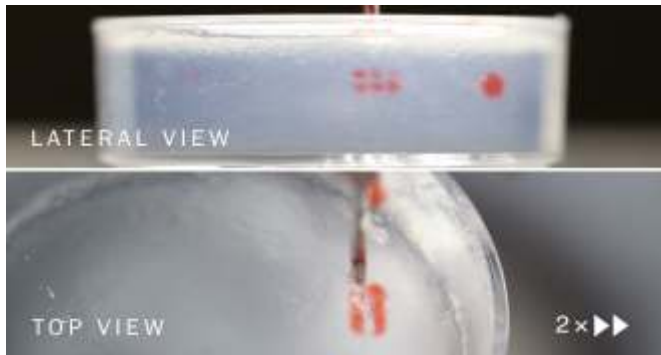
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## US researchers develop new bioprinting technique based on voxels

At the University of Virginia researchers developed a new bioprinting technique based on voxels. Voxels are 3D cubes that form basic building blocks in computer graphics, similar to what pixels are for 2D, and have been popularized by games such as Minecraft. The new technique involves printing discrete spherical blobs of bioink (as the voxels) within a supportive matrix that then swell to merge together, forming a porous structure. Sticky bioinks can be difficult to handle and print predictably, but this new technique helps to address this issue.

Bioprinting holds enormous promise as a method to 3D print new tissues or even organs. However, there are many practical and technical hurdles to be overcome before we reach that point. Typically, the existing process involves printing a sticky bioink consisting of a biomaterial matrix with encapsulated cells suspended within. This is frequently achieved by printing the bioink as a filament that emerges from the printer nozzle and then stacking the filaments layer-by-layer to form a structure.

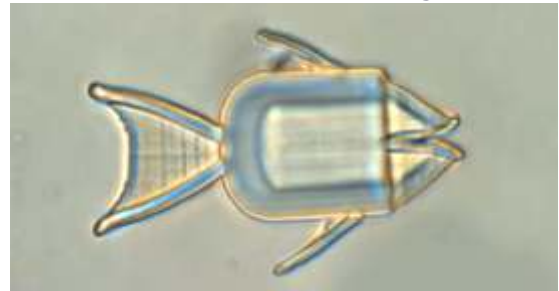
One of the issues is that these sticky filaments are not easy to handle, and it can be difficult to create a desired structure using this method. "It is very challenging to print bio-ink particles because they are very sticky," said Liheng Cai, a researcher involved in the study, in a press release. "Because the bio-inks have the consistency of honey, it is hard to control when and how they detach from a printer nozzle. This becomes even more challenging when the bio-ink particles are as small as the diameter of a strand of human hair. A second challenge is to manipulate each particle into place to build a 3D structure."

To address this, these researchers used the 3D pixels present in computer games as inspiration for constructing a bioprinted structure. Their technique, called Digital Assembly of Spherical Viscoelastic Bio-ink Particles (DASP), involves depositing a droplet of bioink in a slurry of gelatin microparticles. The supportive matrix allows the researchers to place the 'voxels' in precise locations, to build a desired structure.

"You need to make particles that maintain a round shape as they detach from the printer nozzle," said Jinchang Zhu, another researcher involved in the study. "If the particles are too elastic, they will be deformed into a long thin strand instead of being a ball."

So far, the researchers have used the technique to encapsulate pancreatic islets and showed that the highly porous nature of the resulting printed construct allows the islets to react quickly to glucose and rapidly release insulin. "We cannot yet precisely define the properties of each particle as Minecraft does for each voxel," said Cai. "But this technology is the first step toward 3D printing tissue with the complexity and organization needed for biomedical engineering, drug screening and disease modeling."

## Chinese researchers design shape-shifting microrobots to treat tumor in the body



Researchers from the University of Science and Technology of China, working with outside collaborators, have developed shape-shifting microrobots that are designed to be guided to a target area in the body using magnets, and then release a drug cargo in response to the local environment. The application that the researchers have pursued involves guiding the microrobots to a solid tumor using magnets outside the body, and then the tumor's naturally acidic microenvironment stimulates a shape change, resulting in the local release of a chemotherapy drug.

Researchers are devising a variety of cunning ways to deliver drugs at precise locations in the body, and this latest technology is no exception. The microrobots consist of a 3D-printed hydrogel that is pH-responsive. The researchers tweaked the printing density at specific locations so that the small structures would change shape in predictable and useful ways in low pH conditions. This capability adds an additional 'dimension,' and has led the Chinese team to describe the process as 4D printing.

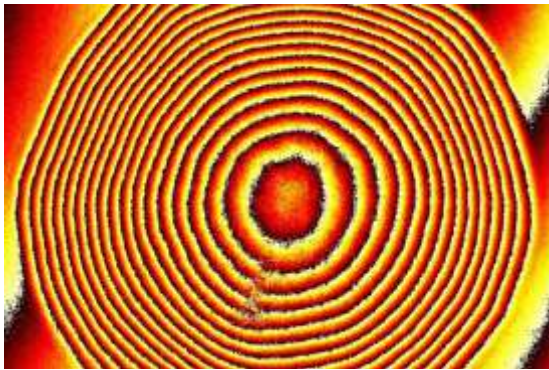
For instance, one design consists of a fish-shaped microrobot that opens its mouth in an acidic environment, releasing a drug contained within its belly. Another is a crab that can hold something in its claw and then release it when required, and a third design is a butterfly that can move its wings.

Another challenge involves maneuvering the microrobots to the area they are required, such as the site of a solid tumor. To address this, the researchers turned to magnets. They magnetized the tiny microrobots by soaking them in a suspension of iron oxide nanoparticles, allowing them to use magnets to move the tiny devices. In theory, this may mean that the microrobots can be controlled remotely and minimally invasively when they are in the body, by applying magnets or magnetic fields externally.

So far, the team tested the microrobots in artificial blood vessels in a petri dish that also contained cancer cells. They successfully maneuvered the microrobots through the blood vessels and towards the cancer cells, where they reduced the pH to mimic the naturally acidic microenvironment of a tumor. The robots changed shape and released their drug payload, killing the cells.

In future, the researchers will need to make the structures smaller so that they can traverse real blood vessels, but the technology certainly looks promising for targeted drug delivery.

## Highly sensitive imaging sensor to rapidly and accurately monitor bacterial growth in the body



Researchers at the University of Connecticut have developed a highly sensitive imaging sensor that can rapidly and accurately monitor bacterial growth. The technique involves shining laser light through a bacterial sample and taking images at multiple orientations, before reconstructing the diffracted light patterns, to produce a 3D image of the bacterial colony. These 3D images provide significant detail about the growth and characteristics of bacteria, and could be very helpful in rapidly identifying which antibiotics are most effective at killing them.

Determining antibiotic susceptibility is a laborious

process. A bacterial sample that has been isolated from a patient will typically be cultured on a nutrient medium, such as agar. Once there are enough bacteria present, which may take several days, lab technicians will then start exposing them to different antibiotics. Only then can they assess whether the bacteria are susceptible to certain drugs.

This can be too long to wait for someone with a dangerous infection. As such, developing more rapid antibiotic susceptibility tests is an active area of research. This latest technique relies on imaging the bacteria in 3D to provide more information than conventional 2D images. For instance, if a bacterial colony was growing upwards, but not outwards, conventional imaging techniques would not readily reveal this, meaning that lab technicians would assume that the colony was not growing at all.

Conversely, this new technique will reveal such growth, providing a more accurate overview of bacterial viability and proliferation. "For the 3D model it's an accurate measure of how fast the bacteria grow," said Guoan Zheng, one of the developers of the new technology, in a University of Connecticut press release. "If you just use the 2D model, it simply just doesn't give you the accurate measure to quantify that growth."

His team's system consists of a laser to illuminate the bacterial sample, a sensor coated with microbeads that scatter the light, and a temperature-control component that allows the researchers to keep the bacteria at the perfect temperature for culturing. The entire system should fit within a conventional incubator.

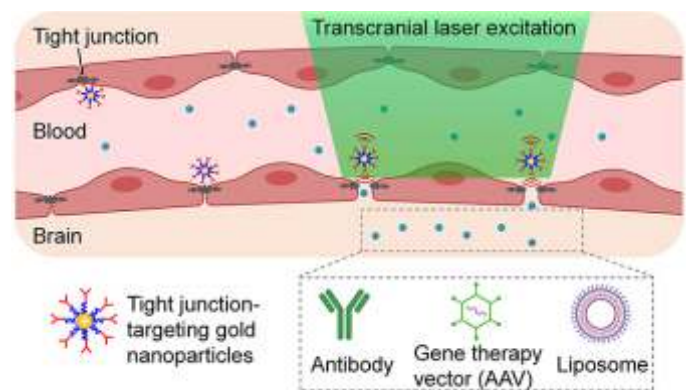
After imaging the sample at different positions, the researchers reconstruct the resulting diffracted light patterns using an imaging technique called ptychography. This results in 3D images that are more informative for the researchers in terms of bacterial growth. The technique is also rapid, allowing the University of Connecticut team to image the bacteria over a 15-second period, essentially tracking their growth in real time.

## Therapeutics usage to potentially allow new treatments for brain tumors & other conditions affecting the brain

Delivering drugs to the brain remains a challenge due to the blood-brain barrier, a specialized endothelial layer that is highly selective in what it permits into the neural tissue beyond. At the University of Texas at Dallas, researchers have developed a technique that allows therapeutics to cross the blood-brain barrier, potentially allowing for new treatments for brain tumors and other conditions affecting the brain.

The method involves administering gold nanoparticles into the blood stream and then activating them using transcranial laser illumination to cause temporary openings in the tight junctions between endothelial cells that line the cerebral blood vessels. Once the nanoparticles are in place near the tight junctions, the researchers use a very rapid burst of laser light, which can penetrate the skull non-invasively, to 'activate' them, causing a small mechanical force to act on the tight junctions. This means that the barrier becomes permeable for a while, allowing the researchers to deliver different types of therapeutic into the brain.

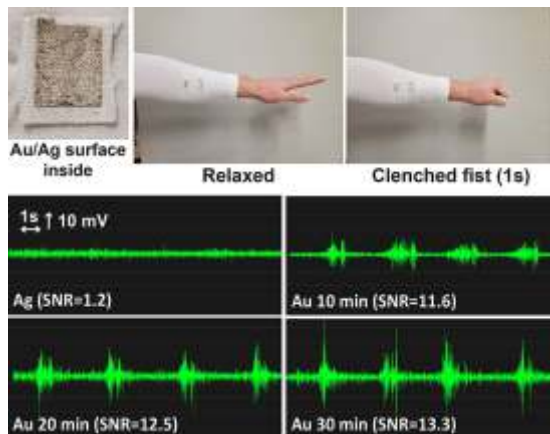
So far, the UT Dallas team tested the system in its ability to deliver various therapeutics, including antibodies, gene therapies, and liposomes, suggesting that the technique is highly versatile.



"Approaches to increase blood-brain barrier [BBB] permeability are essential to advance therapeutics for central nervous system diseases," said Xiaqing Li, a researcher involved in the study, via a press release. "The action produces a tiny mechanical force that temporarily breaks the barrier open so a drug can enter the blood flow into the brain,"

So far, the UT Dallas team has shown that the technique does not appear to be harmful, and it allows them to deliver a variety of therapeutics. More studies will be necessary, but the novel technique may prove out to be very important in making new therapies available for brain conditions.

"We demonstrated that the BBB permeability can be modulated without significant disruption to the spontaneous vasomotion or the structure of the neurovascular unit," said Dr. Qi Cai, another researcher involved in the study.



Researchers at the University of Utah engineered a wearable fabric that can function as a biosensor, measuring electrical activity of muscles. The technology could be useful for physical rehabilitation, allowing clinicians and physical therapists to monitor patients' progress.

The fabric contains a network of silver flakes and gold nanoparticles that provide conductivity, allowing electrical signals to be measured in high fidelity using a portable electromyography (EMG) device.

Physical rehabilitation is a cornerstone of recovery from a variety of illnesses and injuries, but obtaining hard EMG data on muscle activity typically requires attaching wires and patches to the skin. These patches can be uncomfortable and expensive, the wires inconvenient, and such systems only provide data from small areas of the body at any one time.

Imagine if our clothes could make such measurements

## Wearable fabric to function as biosensor for measuring muscles electrical activity

instead. Granted, such clothing would need to make contact with the skin, and therefore be skintight, but many garments that people use for exercise or rehabilitation would fit that description already. This latest technology brings such clothing a little closer to reality.

"This new method can enable clinicians to collect a muscle's long-term electrical signals with more precision," said Huanan Zhang, a researcher involved in the study, in a University of Utah announcement. "And we can get a better understanding of a patient's progress and therefore their therapeutic outcomes over time."

The system consists of ordinary fabric (a cotton/polyester blend) onto which the researchers deposit silver flakes using a screen-printing method. The flakes are placed onto areas of the clothing that are intended to touch the muscles being assessed. However, silver can be toxic and can irritate the skin, and so to address this, the researchers covered the silver with a layer of gold nanoparticles using an electrochemical deposition method.

The gold helps to improve the biocompatibility of the material and also enhances the electrical signal that can be recorded. "The silver layer provides a baseline conductivity, but the gold on top improves the signal and the biocompatibility, and it helps reduce the cost of manufacturing pure gold devices," said Zhang.

The material has proven to be very robust, and the University of Utah researchers report that they put the clothing through 15 washes and it still maintained its ability to measure muscle electrical activity. The team hopes to upgrade the system in the future, and allow its integration with a smartwatch or smartphone to provide a convenient way to display the data coming from the clothes.

## Exosuit to measure muscle activity via ultrasound

At Harvard University a team of scientists and engineers developed an exosuit that uses ultrasound to measure muscle activity. The capability allows for rapid calibration of the suit for users' needs. The soft wearable device continuously assists when walking or running, reducing the energy required to perform these tasks, which could be very useful for patients with neurological issues or muscular dystrophy. By directly measuring muscle dynamics, the suit provides activity- and user-specific assistance, bringing such wearable technologies a step closer to fruition.

Wearable 'exosuits' have significant potential in assisting those with mobility issues by providing supplemental power when a wearer is walking or running.

Currently, it is typical that hours of fine tuning are required before an exosuit is ready for the needs of a particular user performing a specific task. This is laborious and impractical, and a barrier to the wider adoption of such technology. In response to this, the Harvard researchers designed an exosuit that can directly measure the muscle activity of its wearer as they perform a specific task and then enable rapid customization of the suit so that it fulfills the needs of the user.

"We used ultrasound to look under the skin and directly measured what the user's muscles were doing during several walking tasks," said Richard Nuckols, one of the developers of the new exosuit technology, in a Harvard press release. "Our muscles and tendons have compliance which means there is not necessarily a direct mapping between the movement of the limbs and that of the underlying muscles driving their motion."

The new system consists of a portable ultrasound system that is strapped to the leg of a user, which images the underlying muscle activity. "From these pre-



recorded images, we estimated the assistive force to be applied in parallel with the calf muscles to offset the additional work they need to perform during the push off phase of the walking cycle," said Krithika Swaminathan, another researcher involved in the study.

After just a couple of seconds of walking, the suit can accurately assess the muscle activity. "By measuring the muscle directly, we can work more intuitively with the person using the exosuit," said Sangjun Lee, another researcher involved creating the device. "With this approach, the exosuit isn't overpowering the wearer, it's working cooperatively with them."



## DHCC pays tribute to 1st Emirati Doctor



Dubai Healthcare City (DHCC), the emirate's healthcare enabling freezone, has paid tribute to Dr. Ahmed Kazim, the first Emirati Doctor, naming a building after the esteemed, prominent doctor.

Dr. Kazim was recognized in 2014 by the UAE Pioneers Award as the first Emirati Doctor. The Award is given to UAE pioneers in diverse fields in honor of their service to the nation and their pioneering spirit and for being the first in their respective fields.

Dr. Kazim graduated from medical school in 1950

and started his career in 1955. He went on to devote his life to the care of patients in the UAE and beyond for more than 60 years. Dr. Kazim died recently at the age of 89.

In honor of Dr Kazim's pioneering efforts towards the medical profession in the UAE, DHCC has renamed one of the key buildings in its community, building No. 33 after him to ensure his legacy lives on.

The tribute comes as part of the DHCC's approach of recognizing prominent names throughout the region's medical history, including of polymaths, physicians and scientists. DHCC's Ibn Sina Medical Complex is named after Ibn Sina, a polymath who is regarded as one of the most significant physicians, astronomers, thinkers and writers of the Islamic Golden Age, and the father of early modern medicine.

**"Dr. Ahmed Kazim was a truly inspirational figure, both as person and as a medical professional. Without the dedicated service of selfless individuals such as Dr Kazim we wouldn't be where we are today as a regional destination for healthcare excellence," said Mr. Jamal Abdulsalam, CEO, Dubai Healthcare City Authority, the regulator of Dubai Healthcare City free zone.**

"Renaming one of the buildings in our community after Dr Kazim will insure his legacy lives among all of us, from our business partners and stakeholders to patients and visitors. This initiative acknowledges Dr. Kazim great work, immortalizes his name among the most influential figures of the region's medical history."

## New telehealth app brings digital healthcare to rural communities in Africa

A new telehealth app from Remote Doctors 4 Africa will not only bring digital healthcare to rural communities in Africa but has the additional benefit of allowing doctors to capture critical data at a village clinic level, providing stakeholders with invaluable insight into the prioritization of much-needed resources.

While hospitals might have networks and connectivity in place, the rural village clinics do not have this. They often rely on dongles to connect to the internet.

"Most doctors in rural village clinics and communities do everything on a piece of paper which gets filed somewhere," says Ernest Mhlongo, CEO of Remote Doctors 4 Africa, a start-up focused on the digital healthcare ecosystem.

"If a patient visits another physician, there is no medical history to fall back on.

"By pushing for all this information to be stored in the cloud, we are making sophisticated analytics possible that can help healthcare providers and governments identify where best to allocate resources," he explains.

For Remote Doctors 4 Africa, it is about connecting the unconnected and using technology to bridge the gap in healthcare.

"We are using technology built in Africa for Africans," says Mhlongo.

"We understand the challenges of infrastructure and healthcare on the continent, and we have developed a platform that is language-agnostic, biometrics enabled, to address the need to deliver hospital-grade healthcare to rural communities," he adds

The app can be used on all mobile devices whether a smartphone or a more basic feature phone, like a standard Nokia for example.

"Even though telemedicine (the remote diagnosis and treatment of patients through technology) has been getting significant attention on the continent, not much is said about telehealth," says Mhlongo.

This is where hospital-grade diagnostic equipment is brought closer to the patient.

"Effectively, this sees a nurse operating the equipment at the location and a doctor doing the consultation remotely, enabled through various technology platforms.

"There are companies that specialize in either of these approaches, but we provide a value proposition that integrates both with local knowledge and skills," explains Mhlongo.

Covid-19, and its subsequential onslaught to communities across the continent, highlighted the dire situation, not only in South Africa but across Africa, where rural communities lack access to education, healthcare, and infrastructure.

It is these forgotten citizens that Remote Doctors 4 Africa want to assist through a range of telemedicine, telehealth, and connectivity solutions.

Through the Remote Doctors 4 Africa app (RD4A), citizens in the remote corners of South Africa, Botswana, Ethiopia, and Zimbabwe, will have access to digital telehealth services, and healthcare professionals will have access to critical data.

## Cleveland Clinic Abu Dhabi expands cancer treatments with new female gynecologic oncologist



Abdominal bloating, pelvic pain, early satiety/feelings of fullness while eating, and spotting after menopause can be some early signs of gynecologic cancers but are often ignored as minor inconveniences until they advance, says the newly appointed female gynecologic oncologist at Cleveland Clinic Abu Dhabi, an integral part of Mubadala Health.

**Dr Stephanie Ricci, who treated cancer patients for six years at the US-based Cleveland Clinic, has joined the oncology team at Cleveland Clinic Abu Dhabi as its first female and US Board Certified gynecologic oncologist. Her experience and expertise focus on diagnosing and treating cancers of the female reproductive system, including uterine, ovarian, vaginal, cervical and vulvar cancers.**

"Awareness of gynecologic cancers in the UAE is similarly low to what I saw among women in the United States. Women take some of the warning signs of cancers quite lightly and do not schedule regular appointments with their gynecologist. Most of these cancers are more likely to be cured if they are discovered early," says Dr. Ricci.

She says women must pay attention to even the slightest change in their body or any irregularities and visit a doctor for a thorough investigation. Common gynecologic cancer signs include pelvic pain or pressure, vaginal bleeding or discharge, itching or burning of the genitals,

increased urination, constipation or diarrhea, and bleeding or spotting after menopause.

Cervical cancer is the fourth most common cancer<sup>1</sup>, while uterine cancer is the sixth<sup>2</sup> and ovarian the eighth<sup>3</sup> most common cancer in women worldwide. Family history, age and obesity are important risk factors for gynecologic cancers.

Dr. Ricci says that she has been seeing a lot of patients with advanced disease at Cleveland Clinic Abu Dhabi.

"Women are not being diagnosed early enough because they are referred to different physicians for their symptoms, which delays treatment. There are very few female gynecologic oncologists in the UAE and such cancers can go undetected without the right multidisciplinary expertise. Another important factor contributing to such advanced disease here is that women often stop seeing their gynecologist after they have had children."

"For women who have reached menopause, it is very important that they see a doctor if they are bleeding again. Patients believe that a little spotting post menopause is not concerning, but this is never normal and can be a sign of endometrial cancer, which begins in the inner lining of the uterus. This cancer is curable if found at an early stage. Once metastatic, the recovery rate drops significantly."

Dr. Ricci says annual exams with pap smears, investigating issues of pelvic pain, abdominal bloating and abnormal menstruation, and scheduling a mammogram and colonoscopy based on health history and age can help reduce the risk of gynecologic cancers.

"Your doctor can order further tests, including genetic testing, and recommend a treatment plan with the right diet and lifestyle changes to reduce the risk of cancer or prevent it altogether."

The expert says that treatment for gynecologic cancer has made significant strides in the last decade with most procedures to remove tumors done with minimally invasive techniques.

"Advancements in not only treating but also diagnosing these cancers means that patients have better outcomes and a faster recovery. For example, for patients with endometrial cancer, we can do a minimally invasive laparoscopic hysterectomy, and a sentinel lymph node mapping to determine whether the cancer has spread, and they can go home the same day. The incisions are small and the surgery is completed in less than two hours. Immunotherapy, where we take advantage of a person's own immune system to help kill cancer cells, is also emerging as a viable treatment option for patients with ovarian, cervical, and endometrial cancer," Dr. Ricci concludes.



## Aster brings together one-doctor clinic inside retail pharmacy with Aster Xpress

Aster DM Healthcare, has announced the launch of Aster Xpress, a novel concept which brings together a one-doctor clinic inside a retail pharmacy which will help patients with general ailments and primary health needs seek instant medical care and receive the medication within the least possible time. Introduced specially for the residents of The Expo 2020 Village, Aster Xpress would provide first aid, effective triaging and basic diagnostics for general medical needs as well as cater to health & wellness requirement of Expo visitors and residents of Expo Village. Patients can be referred to larger facilities with specialized doctors as required. With new communities merging across Dubai which are fast becoming popular as a preferred location for UAE residents and visitors, Aster Xpress is all set to tackle the need for easily accessible and affordable quality healthcare in new neighborhoods and far areas where healthcare providers are not yet available.

Commenting on the launch of Aster Xpress, Dr. Sherbaz Bichu, Chief Executive Officer, Aster Hospitals & Clinics said, "The introduction of Aster Xpress is in alignment with our Group objective to make quality primary care services easily available at the doorsteps of people and address the challenges of access to quality care for residents in the far-flung areas of UAE. We have

often noticed that due to the inconvenience of traveling long distance to avail medical services, people often delay seeking care for minor ailments till it gets aggravated, causing much suffering, which can easily be avoided if proper medical care is sought in the early stages, this challenge also induces financial burden on individuals and insurance coverage providers. Aster Xpress aims to curtail such issues and is indeed a paradigm shift from illness to wellness"

Speaking at the launch of Aster Xpress, Mr. N S Balasubramanian, Chief Executive Officer, Aster Pharmacy said, "We have strived to make the concept seamless by creating a virtual check-in and appointment booking, consultation and dispensing medication in 3 easy steps. One can even seek teleconsultation with the doctor to report their symptoms and the prescription medicines can be delivered at their doorsteps. Similarly, if your child sprains his or her ankle or you need relief from an itchy throat or a nagging cough, you can just walk into any Aster Xpress and get the medical care you need for minor general ailments like cough & cold, sore throat, bodyache etc."

Aster Xpress brings together pharmacy and clinic services into a single format under which a patient can quickly consult a doctor to seek help with routine health issues or even seek advice on nutrition and wellness, before purchasing the required medication and wellness products at the pharmacy. In addition to medication, the pharmacy section will stock wellness products like Nutritional supplements, skincare, haircare, medical devices, baby products, weight management products and many more. Aster Xpress will follow extended working hours thus enabling patients to get convenient treatment for routine issues and minor emergencies. In case, a more advanced consultation is required, a referral can easily be created to the large range of specialists available within the wide network of Aster Clinics and Hospitals across the UAE.



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# UPCOMING EVENTS



**Global Pharmaceutical  
and Clinical Research  
Conference  
(Pharmaceutical  
Science)**

06-07 December

**Dubai**



**2nd International  
Conference on  
Nursing & Health  
Care (Online)**

09-10 December

**Dubai**



**Evolving Practice  
of Ophthalmology  
Middle East  
Conference**

09-11 December

**Dubai**



**Global Conference  
on Primary  
Healthcare and  
Medicare (PHC)**

12-14 December

**Dubai**



**Int'l Conference on  
Medical,  
Pharmaceutical  
& Health Sciences  
(ICMPH)**

13-14 December

**Dubai**



**Arab Health  
2022**

24-27 January

**Dubai**



**Building  
Healthcare  
Middle East**

01 February

**Dubai**



**MEDLAB  
Middle East**

08 February

**Dubai**







## Not all Round Breast Implants are the Same

PROVEN

### Performance

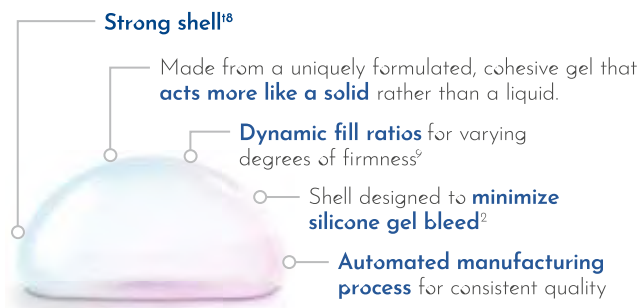
MENTOR® MemoryGel® Breast Implant 10 Year Core Study data demonstrates safety, efficacy, and high patient satisfaction.

### Design

Each profile in the MENTOR® MemoryGel® and MemoryGel® Xtra Breast Implant family contains proprietary and dynamic fill ratios developed from surgeon feedback.

### Peace of Mind

As one of the world's leading maker of high quality breast implants for over 30 years, our experience results in quality products that you can rely on and are backed by a comprehensive warranty.



#1 GLOBAL BRAND³

USED OVER 115+ COUNTRIES

7 MILLION+ women have MENTOR® Silicone Gel Breast Implants⁵

Successfully used and trusted for more than

30 YEARS⁶

## Proven Performance

Mentor® MemoryGel® Breast Implants in Primary Augmentation Patients  
What does The Mentor® Level 2 Core Study Say at 10 years?

97%  
Satisfied  
WOMEN⁴

1%  
Rotation  
RATE⁴

0%  
Double  
CAPSULES⁴

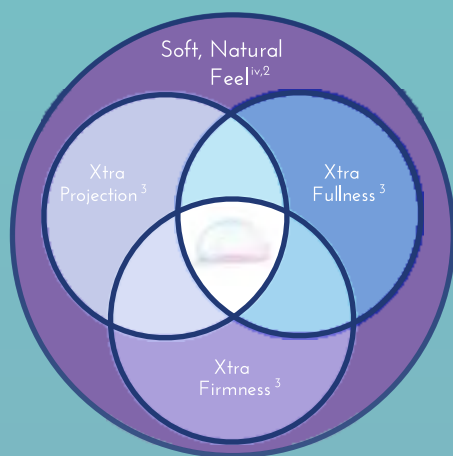
1.3%  
Wrinkling  
RATE⁴

LOW  
Capsular  
CONTRACTURE  
RATE⁴

⁴⁴ Based on patient survey at 10 years in the Mentor® MemoryGel™ Breast Implant 10-Year Core Gel Clinical Study Final Report.

⁴ Head-to-head testing according to industry standard ASTM D412 test method for rubber properties in tension (v. Q9Q1) between MemoryGel® (n=19) and Natrelle Inspira (n=19)

# Why MemoryGel™ Xtra Breast Implants?¹



iv. Mentor Consumer Preference Market Research Report July 2017.

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