FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter

Issue 27

9th November, 2018

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Wearables

CarePassport announces Boston Hospital will use its digital health platform for clinical trials – November 6, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device + Platform)	**Therapeutic Areas**	Remote and virtual healthcare research
Applications	Patient monitoring and engagement platform for research studies	**Geographic Focus**	US
Segment Focus	Clinical/Consumer Grade	**Topics (News type)**	Business Model Innovation
Companies	CarePassport	**Others**	NA

ANALYST TAKE:

- **Synopsis:** CarePassport, a Boston-based patient engagement solutions developer, announced that Massachusetts General Hospital (MGH), a founding hospital of Partners HealthCare, will begin using CarePassport's digital health platform for patient monitoring and engagement in research studies.
- **Industry Needs:** Clinical trials are slow and an expensive processes. For example, about 80% of pharmaceutical trials do not meet enrolment deadlines, resulting an average loss up to $1.3 million per day for a given candidate drug. Additionally, about 37% of research sites fail to meet their enrolment targets, and 10% fail to recruit a single patient for the study. Pharmaceutical companies are seeking to leverage wearables mHealth solutions to improving patient engagement, preventing trial failures, and, overall, improving drug development profitability. Frost & Sullivan research suggests that early application and integration of wearable devices' and smartphone apps' data demonstrates compelling benefits around reducing trial costs, streamlining trial processes and demonstrating real-world efficacy.

CarePassport announces Boston Hospital will use its digital health platform for clinical trials – November 6, 2018 (2/2)

- **Value Proposition:** The Boston hospital, one of the founding members of the Partners HealthCare network, will be using a connected health platform developed by Newton, Mass.-based startup CarePassort for remote patient monitoring and patient engagement. MGH will use the CarePassport platform to conduct a research study to identify individuals with undiagnosed atrial fibrillation, seeking to prevent strokes by enabling early treatments.
- **How it works?** The app connects with wearable and home-based monitoring devices, helping to gather and transfer patients' medical data including imaging, medications, vitals, etc. CarePassport also enables healthcare facilities to send surveys, educational material and discharge summaries to patients regularly to follow up during research studies or after medical visits.
- CarePassport interfaces with a hospital's electronic health records (EHR) system using the Fast Healthcare Interoperability Resources (FHIR) or HL7 standard for information exchange. The CarePassport platform is designed to enable Mass General care providers to personalize wearable and mHealth apps for target populations.

- Frost & Sullivan believes that in next 1-2 years, 15%-20% of the clinical trials globally will adopt some form of remote or virtualization patient monitoring solutions leveraging wearables and mHealth solutions. Considering this, Frost & Sullivan views this collaboration as a latest example of hospitals and health systems turning to remote patient monitoring to connect with patients at home. The technology’s reach gives care providers and researchers new opportunities to collaborate with patients and collect data that they wouldn’t get inside the hospital or doctor’s office.
- However, Frost & Sullivan also believes, apart from technological readiness, academic research institutions, clinical trial sponsors, CROs, and regulators need to play a critical role in validating new types of endpoints with ongoing trials and research to ensure scalability of mHealth solutions.

- **Target End-User:** Academic research institutions, Pharma clinical trial sponsors, CROs

WEBLINK: https://prn.to/2Qw8jCR

Blue Spark gets CE mark for TempTraq wearable temperature monitoring patch – November 5, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Patch)	**Therapeutic Areas**	All requiring body temperature measurements
Applications	Temperature monitoring	**Geographic Focus**	EU
Segment Focus	Clinical Grade	**Topics (News type)**	Product Innovation
Companies	Blue Spark	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Thin film batteries producer Blue Spark Technologies has secured CE mark for its TempTraq Bluetooth wearable temperature monitor, which the company clams will set a new standard of care for hospitals in Europe.
- **Value Proposition:** The TempTraq system is a disposable, wearable continuous temperature monitoring patch that wirelessly delivers temperature readings, the Cleveland-based company said. The system includes the ability to set alerts, which are sent to mobile devices, when patients reach user-set temperatures. As per the company, TempTraq Connect is a HIPAA-compliant service which allows the TempTraq system to be integrated directly into hospital central monitoring systems and electronic health records for storing patient data. The approval allows TempTraq wearable temperature monitoring and disposable patch to be marketed to European consumers and hospital systems.
- Body temperature is a common vital parameter and a regular screening test for most health conditions. However, innovation around temperature monitoring has been limited in past few decades. Given this, Frost & Sullivan views TempTraq's remote temperature monitoring feature as a simple yet a timely innovation, leveraging the wearable tech concept, as the healthcare industry transition towards preventive and homecare practices.
- **End-users:** Average consumers, Homecare, Aged Care

WEBLINK: https://bit.ly/2zDs97X

Jabil And Recovery Force Advance Blood-Clot Prevention With New E-Textile Technology – November 8, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Smart textile)	**Therapeutic Areas**	Lifestyle and chronic condition management
Applications	Remote patient monitoring	**Geographic Focus**	US
Segment Focus	Consumer Grade	**Topics (News type)**	Product Innovation
Companies	Jabil and Recovery Force	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Recently, Jabil unveiled a collaboration with Recovery Force to advance next-generation wearable medical technology. Praised as “a marvel of engineering” by the National Institutes of Health (NIH), Recovery Force’s patented technology delivers ground-breaking mobile compression to enhance circulation. The technology addresses a host of therapeutic conditions, including the prevention of blood clots (DVT) and reduction of post-operative pain as well as alleviating joint pain and sore muscles.
- **Value Proposition:** Jabil collaborated with Recovery Force to develop a innovative smart textile platform technology, which embeds shape-changing memory fibers into various garments and footwear to produce therapeutic compressions. While this achievement on its own is a great clinical advancement, Recovery Force accomplishes this in a comfortable, lightweight and mobile form factor without requiring bladders, pumps, cords or electrical stimulation. Recovery Force’s first product will include a compression back device to enhance blood circulation, and targeted for release in the first half of 2019, followed by a calf device later in the year.
- As the lines between retail, textile, and healthcare IT blur, Frost & Sullivan foresees a potential opportunity for smart textiles to become mainstream in the health and wellness space. For example, seamlessness of smart textile based wearables make them an ideal choice for average consumer and patients for applications such as; post surgery monitoring, sports performances, and activities monitoring without compromising quality of life.

WEBLINK: https://bit.ly/2AVM5EN

Announcing Verum: a platform to reshape healthcare delivery – November 6, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Device) + AI/ML	**Therapeutic Areas**	Lifestyle and chronic condition management (e.g. Stress and neurological disorders)
Applications	Remote patient monitoring	**Geographic Focus**	US/UK
Segment Focus	Consumer Grade	**Topics (News type)**	Product Innovation
Companies	Cambridge Consultants	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Verum remotely monitors patients and provides AI-powered predictions around medical conditions. Verum can unlock efficiencies in clinical trials by eliminating the effect of stress.
- **Value Proposition:** UK-based research and development (R&D) firm Cambridge Consultants has developed a new digital platform, called Verum, to enhance healthcare delivery. As per the company, Verum system comprises sensors integrated into a wearable, a data collection app and a widget for healthcare dashboards that augments existing data with patient-specific predictions and alerts, for unprecedented clinical insight. Verum's initial test application focuses on clinical trials for efficiently monitoring patient stress on trial outcomes. Other potential applications include the diagnosis of neurological conditions, the post market surveillance of drugs, the development of closed loop therapeutics, rehabilitation and remote patient monitoring.
- Frost & Sullivan views the Verum system as a true amalgamation of best of breed technologies such as AI/ML, wearables, and platform technologies to empower care providers (clinicians, nurses and trial co-ordinators) to access biometric and behavioural data from continuously monitored patients, gaining valuable context around a specific condition. If the company translates the Verum PoC into commercialization, it has potential across applications such as precision medicine, post-market surveillance and drug development (clinical trials and RWE).

WEBLINK: https://bit.ly/2RMUEHU

Mobile Phones/ mHealth

USDA report finds rural residents less likely to use telehealth services than urban counterparts – November 7, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth app; Telehealth	**Therapeutic Areas**	All
Applications	Adoption of telehealth	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Market Trends
Companies	US Department of Agriculture (USDA)	**Others**	NA

ANALYST TAKE:

- **Value Proposition:** As per the USDA report "Rural Individuals' Telehealth Practices: An Overview", adoption of telehealth in rural areas is lesser as compared to urban areas in the US, indicating telehealth's adoption maybe driven more by convenience than necessity. While usage of telemedicine varied across demographics, education, access to technology and household income were found to be positively correlated with adoption. Surprisingly, internet access wasn't found to be a significant contributor to level of adoption of telehealth in the US.
- Frost & Sullivan believes that study findings, although based on relatively old datasets (2015), throws some interesting insights on the actual drivers of telehealth in developed countries such as the US and busts some myths such as rural need should be the ideal driver for telehealth services. While the findings offer some interesting parameters such as income levels while evaluating telehealth adoption, they somewhat contradict the inherent value proposition of telehealth for rural areas. Its also important to consider them while taking these services to other countries with relatively lower penetration.

WEBLINK: https://bit.ly/2PhS5kg

Wound Care Advantage taps Tissue Analytics for AI, smartphone offering – November 5, 2018 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	3D Imaging, Artificial Intelligence, Machine Learning	**Therapeutic Areas**	Wound Care
Applications	Wound imaging and diagnostics	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Business/ Monetization Model Innovation
Companies	Tissue Analytics; Wound Care Advantage (WCA)	**Others**	NA

ANALYST TAKE:

Synopsis: Wound Care Advantage, a manager of outpatient wound treatment centers, has partnered with Tissue Analytics to use the startup's AI and 3D imaging technology to measure wounds and develop improved treatment protocols.

Industry Need:

- Wounds, especially chronic wounds, represent a serious public health issue compounded by rising incidences of hospital-acquired infections, diabetes, and the increasingly complex problems associated with an aging population.
- Even to this date, wound care nurses and clinicians, rely on conventional methods of diagnosis based on physical examination and subsequent wound sampling and laboratory tests to ascertain the severity of the wound, its underlying tissue damage and bacterial or fungal infections, if any.

Wound Care Advantage taps Tissue Analytics for AI, smartphone offering – November 5, 2018 (2/2)

Value Proposition:

- The 3D wound imaging solution from Tissue Analytics, launched at the 2018 Cerner Health Conference, uses an android or iOS smartphone camera to take a short 5 second video of the wound. The system's underlying software uses machine learning and computer vision algorithms to generate a relevant and accurate 3D rendering of the wound to provide clinicians with volume and depth measurements at a claimed sub-millimeter resolution. The resultant data can be automatically shared to the hospital's EMR owing to the company's effective interoperability and documentation workflows through its partnerships with key vendors such as Cerner, Epic, athenahealth and Allscripts.
- The partnership between WCA and Tissue Analytics allows for WCA to leverage its clinical expertise and 17 years of clinical data with Tissue Analytics' imaging and AI to improve the accuracy of measurement during wound assessments and provide better insights into the efficacy of wound treatments to improve patient outcomes and reduce costs.
- Frost & Sullivan studies found that in the United States alone, chronic wounds affect 6.5 million patients annually, with a healthcare cost burden of more than $25 billion. In the European Union, they affect between 1.5 and 2.1 million people. Approximately, 9.7 million venous ulcers, and 10.0 million diabetic ulcers in the world required treatment in 2015. The care of chronic wounds has been reported to account for 2% to 3% of the healthcare budgets in developed countries such as the UK, France and Germany. Appropriate and timely assessment of a wound as an ulcer, is imperative for its effective treatment. However, lack of reliable and easy-to-use diagnostic tools limits early wound assessment, complicating and delaying the healing process. In response to this, several digital wound assessment and management tools such as those from Moleculight:iX, WoundVision, Parable, WoundRounds and Bruin Biometrics have come up in recent years to augment the wound assessment process so as to enable appropriate care interventions. However, their adoption remains limited due to lack of effective commercialization models, inefficient data sharing, interoperability and storage standards as well as lack of clinician buy in. Amidst such a backdrop, it is commendable on the part of Tissue Analytics to enter into such innovative partnerships with wound care provider managers which enables outreach and also improves outcomes through effective usage of WCA's existing rich clinical data set of wounds.
- **Target End-User:** Hospitals; Primary Care Centers; Patients

WEBLINK: https://bit.ly/2RIaMdp

This smartphone app could detect infectious diseases – November 6, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth App; Sensors	**Therapeutic Areas**	Infectious Disease Diagnostics
Applications	Smartphone camera driven app to diagnose infectious disease	**Geographic Focus**	US
Segment Focus	Consumer/ Clinical Grade	**Topics (News type)**	Care Delivery Innovation
Companies	University of California Santa Barbara	**Others**	-

ANALYST TAKE:

- **Synopsis:** Researchers at the University of California Santa Barbara have developed a smartphone app that can identify bacteria from patients remotely, thereby helping prompt diagnosis and prescription of antibiotics within an hour of an office visit. The app uses smartphone's camera to measure a chemical reaction and determine a diagnosis within an hour. The test has shown success in achieving rapid diagnosis of urinary tract infections.

- Frost & Sullivan believes that Point of Care Testing (POCT) has been evolving as a preferred diagnostic mode for a variety of disease areas with high focus on infectious diseases, owing to increasing miniaturization, consumerization, and a surge in retail clinics and physician laboratories. Low cost and immediate diagnosis of infectious disease and epidemics becomes all the more important in rural or lower-resource regions. Enhancing smartphone penetrations in such regions further enhance the market potential of such rapid tests. While the technology is not commercialized yet, this developmental solution is an ideal in-licensing or collaboration target for companies.

WEBLINK: https://bit.ly/2OyoYUt

Smart Home Devices & Appliances

Kintell is an all-in-one smart home health system for elderly people – November 05, 2018

Applicable Product Categories: Smart Home Devices

Technologies	IoT, AI, Voice	**Therapeutic Areas**	Elderly Care
Applications	Elderly Support	**Geographic Focus**	UK
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	Kintelll	**Others**	-

ANALYST TAKE:

- **Synopsis:** A startup launching on Kickstarter for crowdfunding, Kintell will provide a bundle of three devices for £199. Features include “a voice assistant that requires a button press, an in-home intercom, medication and prescription reminders, a downward facing nightlight to illuminate trip hazards, a smart alarm and a customisable 'healthy habits' program that seems to include drinking water. There are also motion and temperature sensors that carers and families can use to check in.”

- Several approaches to elderly care using IoT / smart devices exist, but Frost & Sullivan notes that this one is among the very few that takes an integrated approach to elderly care. The closest other products are the Mabu and ElliQ robots (similar to devices rather than robots). Perhaps, an integration with other sensor and smart devices within the ecosystem will make this product even more appealing. The “own and loan” approach makes most sense instead of outright purchase only models – allowing the equipment to be returned when no longer required.

WEBLINK: https://bit.ly/2RIAxuo

Innit Partners With Tyson To Bring Packaged Food Giant Into The Smart Kitchen – November 02, 2018

Applicable Product Categories: Smart Home Appliances

Technologies	IoT, Voice	**Therapeutic Areas**	NA
Applications	Recipe / Food support	**Geographic Focus**	US
Segment Focus	Consumer Grade	**Topics (News type)**	Business Model Innovation
Companies	Innit, Tyson	**Others**	-

ANALYST TAKE:

- **Synopsis:** Smart kitchen platform Innit has tied up with one of the largest meat suppliers, Tyson Foods**.** A planned demo will begin **"**with a QR code on a package of Tyson protein, connecting via Google Assistant to Innit, and sending an expert cook program to a GE oven (that is) tailored to that SKU."

- Frost & Sullivan views the smart kitchen space as one that can allow for excellent fine-tuning and personalization around dietary needs for people with chronic conditions and even obesity, and also for those with allergies and other special dietary requirements. With nutrition and food being an integral part of the wellness equation, smart kitchen platforms like Innit are well positioned to serve these needs. Innit may well be laying the foundation for such a vision, by partnering with major appliances like GE, LG and Electrolux, and now with packaged food brands.

WEBLINK: https://bit.ly/2PBhN2x

Aging-In-Place News

Several 'Smart Homes for Aging-in-Place' initiatives are coming up across Europe and the US, and have been covered in previous newsletters. Since the theme remains the same, additional articles have been added here:

News Title	Region	Date	Link
How Smart Devices are Changing Lives for Seniors (Company: K4Connect)	US / Global	Nov 01, 2018	https://bit.ly/2DnyRmL
Start-up aiming to boost independence for elderly seeks funds (Startup: TL Tech)	UK	Nov 05, 2018	https://bit.ly/2Db3ElT
Using AI to Make Homes Safer for Seniors, Part 1 (Company: Zanthion)	US	Nov 01, 2018	https://bit.ly/2OBErmC

Other Interesting Articles

When available, other interesting articles will be covered here in short.

News Title	Link	Remarks
Vodafone Ireland teams with architect to explore smart home	https://bit.ly/2RN5MED	Entry points in to the smart home market – communication service providers and also architects / home builders / designers. This approach brings both together for mutual gain, but also provides an opportunity for other vendors to piggy back.
T-Mobile Austria launches Smart Home platform	https://bit.ly/2AVl2cN	Deutsche Telekom has had smart home products (some white labeled) for a while – so no surprises here.
Amazon, home builder partner for Alexa home installations	https://bit.ly/2AVHYZv	This time the partnership is with TRI Pointe Group, third after Lennar and Plant Prefab.
Spearheading digital health initiatives in Thailand with the Khon Kaen Smart Health project	https://bit.ly/2Dxa9Rd	A project that borders on the smart city for health concept more than smart homes, but is an interesting development that can interact with smart homes for even more use cases in health and wellbeing.
NAU electrical engineers to lead development, commercialization of next-gen cybersecurity solutions for Internet of Things	https://bit.ly/2yV8d0P	Northern Arizona University researchers are pioneering a hardware+software approach for securing IoT devices, instead of the prevalent 'software only' approach.
The Kenmore Brand Integrates Amazon Dash Replenishment into Smart Refrigerators to Simplify Kitchen Maintenance	https://prn.to/2Qrh8xO	While the auto-reordering feature is limited to water and air filters, we can envision the same service being applied to a larger number of products in the wellbeing space.