FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter

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Wearables

L'Oréal launches wearable sun exposure monitor through Apple – November 19, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Patch + App)	**Therapeutic Areas**	Lifestyle driven health condition management
Applications	Environmental monitoring for health and wellness (e.g. solar ultraviolet radiation)	**Geographic Focus**	US / Global
Segment Focus	Clinical/Consumer Grade	**Topics (News type)**	Product Innovation
Companies	L'Oréal and Apple Inc.	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Last week, beauty giant L'Oréal has launched an NFC-enabled sun safety sensor called My Skin Track UV - the first battery-free wearable electronic that measures the wearers exposure to UV light and comes with a companion app that iPhone users can use to tap their sensor to get advice tailored to their skin tone and skin type.
- **Industry Needs:** As per the WHO, excessive exposure to ultraviolet radiation (UVR) from the sun is a well-known risk factor for human disease. For example, research by Canadian institution suggests that solar UV radiation is the second most prevalent carcinogen in Canada and is similarly important in other countries with large Caucasian populations. Public health policy on ultraviolet radiation therefore needs to aim at preventing the disease burden associated both with excessive and with insufficient UV exposure.

L'Oréal launches wearable sun exposure monitor through Apple – November 19, 2018 (2/2)

- **Value Proposition:** La Roche-Posay 'My Skin Track' UV measures both UVA and UVB rays, and provides instant status updates while storing up to three months of data. The battery-free sensor is activated by the sun and powered by the user's smartphone using near-field communication (NFC). My Skin Track UV relays stored data to its accompanying app through an easy single-touch function: users simply tap My Skin Track UV against their smartphone to update the app. The waterproof 'My Skin Track UV' sensor is exclusively available on the Apple.com website and at select US Apple stores at a cost of US$59.99.
- **How it works?** Users are instructed to place it on their thumbnail, as this is an area of the body that receives optimal sunlight. The battery-free 12mm by 6mm clip-on 'My Skin Track' UV measures both UVA and UVB rays. Once attached, the sensor get activated by the sun and powered by the user's smartphone app using Near Field Communication (NFC). The app then provides the user with information, from facts about sun safety, to warnings when they need to take shade. Records of a user's UV exposure are also stored in a profile (can store up to three months of data) – encouraging them to look back and track their time spent in the sun.
- Frost & Sullivan views the 'My Skin Track' UV as a testament to L'Oréal's continuous commitment to innovation and an commercial extension of their initial smartphone-connected UV patch called 'My UV Patch' during 2016. Frost & Sullivan recognizes L'Oréal's go-to-market strategy in collaboration with Apple's iPhone app as one that makes the sensors' data more actionable for meaningful health outcomes. For example, in addition to extensive UV data, the app—which seamlessly integrates with Apple HealthKit would also provide insights into humidity, pollen, and pollution levels. This makes the battery-free 'My Skin Track' UV sensor not only seamless to integrate into average consumer lives but also empowers them with personalized environmental data driven insights to make smart, sun-safe choices.
- 'My Skin Track' UV was the result of a partnership of L'Oréal in conjunction with academia and wearables OEMs such as MC10, Inc. and Wearifi. Given this Frost & Sullivan believes, as the value proposition between brand and technology blurs, innovative wearable OEMs will continue to find winning collaborations with large consumer brand names in the health, wellness, and fashion space to make the ultimate consumer experience more meaningful
- **Target End-User:** Average consumers, Wellness Clinics, Skin Health Clinics.

WEBLINK: https://bit.ly/2S3QhYV

Report: Apple Watch ECG will go live by year's end – November 29, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Device + App)
Applications	Remote patient monitoring - ECG
Segment Focus	Clinical Grade
Companies	Apple Inc.
Therapeutic Areas	Heart Health, Remote Cardiac Monitoring
Geographic Focus	US/ Global
Topics (News type)	Competitive Intelligence
Others	NA

ANALYST TAKE:

- **Synopsis:** According to leaked training documents, both the ECG and irregular heart rate detection will be part of Watch OS version 5.1.2., due out before the year's end.
- **Media Update on Apple Watch ECG Feature**: While the Watch itself has been on sale since September 21st, 2018, the ECG functionality was not quite ready to go at launch, nor were the irregular heart rate notifications that were also announced at the September event. According to MacRumors' reporting, the training document in question encourages Apple Store employees to stress the limits of the device's FDA clearance.
- Considering the latest publicly released update on watchOS 5.1.1 during early November, Frost & Sullivan anticipates, Apple may be ready to add ECG by the end of the year. However, Apple's watchOS 5.1.2 is still in testing with beta users. The company is currently trying to get its ECG feature approved in Canada, but other countries are likely to take longer. Apple has yet to offer any clarity on when the feature will be available in other markets, its differential value proposition is making Apple Watch a secondary screening tool for critical health vitals like ECG available on a mainstream smartwatch which may identify heart defects on millions faster than a normal diagnosis.

WEBLINK: https://bit.ly/2E6fyPl

Clinical trial will explore how Sensoria's smart socks can help Parkinson's patients – November 27, 2018 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Device)	**Therapeutic Areas**	Mental Health (Parkinson)
Applications	Remote patient monitoring	**Geographic Focus**	US/ Global
Segment Focus	Consumer Grade	**Topics (News type)**	Product Innovation/ Collaboration
Companies	Sensoria	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Smart sock maker Sensoria is teaming up with the Michael J. Fox Foundation and independent research group Neuroscience Research Australia to launch a 100-patient clinical trial looking at what smart textiles in socks can do for Parkinson's disease patients.

- **Industry Need**: Clinical trials are slow and an expensive processes. Frost & Sullivan observes that over the years, especially from 2016 onwards, the number of drugs approved through successful clinical trials has reduced significantly. For example, about 80% of pharmaceutical trials do not meet enrolment deadlines, resulting in an average loss of up to $1.3 million per day for a given candidate drug. These challenges are further heightened for CNS/mental health clinical trial settings. Integration of emerging wearable technologies will enable remote monitoring of clinical trial patients, providing a patient-centric trial design to increase patient recruitment/retention rates and facilitating faster and more cost-effective outcomes for the sponsor team.

Clinical trial will explore how Sensoria's smart socks can help Parkinson's patients – November 27, 2018 (2/2)

- **Value Proposition:** Despite an urgent need for new medications, clinical trials in Parkinson's have a relatively low rate of success. Among the operational challenges, poor recruitment is a chronic problem faced in clinical research leading to scientific challenges of underpowered studies and economic consequences of increased trial costs as the duration of a study is prolonged to meet enrolment targets. For example, under traditional physical site based clinical trial settings, most of the Parkinson's patients need to go to a clinic every two weeks to get gait assessments which create inconvenience and logistical challenges for patient/family members leading to high interim attrition rate.
- Entailing the above challenges, Frost & Sullivan views Sensoria's Smart sock-based real-time remote monitoring of Parkinson patient a timely solutions as the industry shift towards patient-centric remote/virtual trial models. As per the company, Sensoria's Smart sock features will also enable doctors with near-real-time alerts to take immediate action when a patient's condition is getting worse and allow the investigators to keep a tab on patient's medication adherence or possible adverse event due to medication.
- Additionally, given that Freezing of gait (FoG) and falls being a major risk for Parkinson's patients, where patients suddenly lose the ability to move their legs - the easy to use Sensoria smart socks create small vibrating motors that minimize the risk of FoG. This particular benefit of Sensoria has shown in small trials as per a company announcement.
- Smart sock company Sensoria, originally called Heapsylon, has been one of the earliest and most persistent players in the still-young smart clothing space. The company has had some success with fitness-focused offerings, but has also focused on health. It partnered with Genesis Rehab Services to spin off Sensoria Health last year, and the company has looked into the technology's potential for a number of health areas including diabetes and fall prevention.

- **Target End-User:** Clinical Trials, Aged Care

WEBLINK: https://bit.ly/2E46FFS

Duke to Use mHealth Wearables to Help Freshmen Improve Health – November 20, 2018

Applicable Product Categories: Wearables

Technologies	Wearable (Device)	**Therapeutic Areas**	Student Health and Lifestyle Monitoring
Applications	Remote Monitoring	**Geographic Focus**	US
Segment Focus	Consumer/Clinical Grade	**Topics (News type)**	Business Model Innovation
Companies	Duke University (Freshmen Program)	**Others**	Fitbit, Garmin, Apple and Polar

ANALYST TAKE:

- **Synopsis:** Duke University will be arming incoming freshmen with smartwatches next year in an mHealth program that aims to improve student health outcomes. The program, developed by professor Geoff Ginsburg, Susanne Haga, will use the wearables to track new students' sleep and activity.
- **Value Proposition:** Duke has long been at the forefront of mHealth and connected health innovation. More recently, the university's Clinical Research Institute teamed up with Cerner to develop an mHealth app designed to help clinicians determine whether their patients were at an increased risk of having a heart attack or stroke. Ginsburg and Haga are choosing from wearables developed by Fitbit, Garmin, Apple and Polar for the three-year program. During the first year, they'll be working on a companion mHealth app that would enable students to track their own health and answer surveys. Ginsburg and Haga plan to expand the program during the second year to include personalized health and wellness recommendations, such as advice for getting more sleep or resources for reducing stress.
- Frost & Sullivan view such student health management program a greenfield opportunity for innovative wearables OEMs in the overall expanding opportunity ecosystem for health and wellness wearables. We also anticipate in next 2-3 years time, leading academic institutions globally will find such initiatives a strategic fit as part of their holistic development of students programs and aligned research on population health management.

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

Mobile Phones/ mHealth

Medtronic to acquire nutrition AI firm Nutrino for its digital diabetes projects – November 29, 2018 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	mHealth App, Software Platform, AI	**Therapeutic Areas**	Diabetes Management
Applications	AI driven nutritional insights and predictive glycemic response	**Geographic Focus**	Global
Segment Focus	Clinical Grade	**Topics (News type)**	M&A/ Partnerships
Companies	Medtronic, Nutrino	**Others**	-

ANALYST TAKE:

Synopsis: Medtronic announced acquisition of its longtime partner Nutrino, an AI powered personalized nutrition platform.

Industry Need:

- Diabetes is among the top chronic disease areas witnessing high focus by companies to adopt data driven platforms to augment disease management through continuous monitoring of not just blood glucose data, but effective integration of meals, medications, physical activity, and moods related insights to provide a true holistic picture of the patient.
- Companies are looking at a holistic approach with insights on three distinct aspects — glucose monitoring through automated, miniaturized and smartphone enabled CGM; Smart Delivery Systems through Smart insulin pens, on body insulin delivery systems; and Data Analytics Support with automated data log of food; mood/ stress; physical activity; and medication.

Medtronic to acquire nutrition AI firm Nutrino for its digital diabetes projects – November 29, 2018 (2/2)

Value Proposition:

- As part of the deal, which is expected to close by January 2019, Medtronic will be integrating Nutrino's AI-driven personalized insights and food database. The acquisition is set to specifically boost Medtronic's offerings for people living with diabetes and offer the company's predictive glycemic response algorithm, which will be integrated with Medtronic's CGM system.
- The two companies have a long history of partnerships. In June 2018, the companies entered into a partnership to integrate Nutrino's FoodPrint Report technology, which lets users see how their bodies react to different foods and connection between meal and glucose variability, into Medtronic's iPro2 myLog app.
- Frost & Sullivan believes that while clinical grade continuous blood glucose monitoring has been the established norm in diabetes management, work still needs to be done in terms of effectively utilizing the glucose readings and other physiological data to offer a holistic solution aimed at effectively managing diabetes. Experts agree that healthy eating habits are essential to managing diabetes. Patients often have to manage food, calorie, and carbohydrate intake. The integration means that Medtronic will be able to offer its customers Nutrino's AI glycemic response algorithm, which helps predict how a users body will react to different meals. Medtronic will also be able to integrate Nutrino's FoodPrint technology, which helps people living with diabetes understand their own body and relationship to food. This, in addition to Medtronic's and IBM Watson's partnership for AI-powered nutritional guidance platform, Sugar.IQ will position the company as a leader in holistic diabetes management taking care of its three major aspects — continuous monitoring, smart delivery systems and data analytics support.
- Frost & Sullivan also views this as a progressive move by Medtronic to outpace increasing competition in the diabetes management solutions, especially for wearable style minimally-invasive auto insulin delivery devices. The new addition of Nutrino's AI-driven personalized food database insights will make Metronic's MiniMed and Harmony automated insulin delivery devices more intelligent solutions for evidence/ outcome based health benefits to demonstrate value to end-users.
- **Target End-User:** Hospitals; Primary Care Centers; Patients

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

Apple in discussions with VA to provide veterans access to medical records – November 21, 2018 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	mHealth Apps, EHR, Digital Health	**Therapeutic Areas**	All
Applications	Mobile EHR	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Care Delivery Innovation
Companies	Apple; Department of Veterans Affairs	**Others**	-

ANALYST TAKE:

Synopsis: As per reports, Apple is in talks with Department of Veterans Affairs to develop software functionality to enable around 9 million veterans enrolled in the VA, transfer their medical records to their iPhones. Apple is also expected to provide engineering support to VA for this.

Industry Need:

- Amidst increasing calls across quarters to enable greater interoperability and sharing of EHR data as well as data generated through connected medical devices, and mHealth apps, the move is a welcome one which offers patients easy access and ownership of their own health data.
- Additionally, it offers opportunities to enhance patient experience through better adherence as well as improve healthcare efficiency by reducing chances of missed appointments, easy accessibility and enhanced patient-provider engagement.
- The development is part of an earlier announcement by Apple of its intended testing of Health Records feature with around 39 participating healthcare systems, and the availability of the new capability to all iPhone users with the latest iOS 11.3 update.

Apple in discussions with VA to provide veterans access to medical records – November 21, 2018 (2/2)

Value Proposition:

- As per reports, Apple will be developing a new software that would let the VA patients enrolled in the system transfer their records to their iPhone — a functionality that would likely be achieved via a version of Apple's Health Records app.
- The VA, which has historically used its own self developed system called VistA, moved to Cerner's EHR system, called MHS GENESIS in 2017. Amidst this background, the report assumes significance, considering the fact that Cerner has been working with Apple to make personal health information accessible on a consumer platform. Both the companies are working with a range of partners and clients to achieve interoperability among various systems.
- Frost & Sullivan believes that interoperability among various EHR systems is a long standing issue in the US as well as globally. Amidst an emerging need for data standardization and consolidation for use by advanced technologies such as machine learning and AI, coupled with increasing emphasis on putting the patient at the center of care coordination pathways, Apple has created a niche for itself through its Apple Health Records feature, enabling standardized interoperability and putting more control in the hands of the patient. With enhanced interoperability of patient data, the company is very well positioned to work as an intermediary between medical researchers, developers as well as pharma and med-tech companies which require health data for specific actionable development of their respective solutions. Additionally, while its good for the patient to know all the aspects of his own health, it also means more data to be sifted through by the clinician. The next challenge for Apple is going to be its ability to make that data more intuitive and meaningful for the clinician.

- **Target End-User:** Hospitals; Primary Care Centers; Patients

WEBLINK: https://bit.ly/2FQMM6P

ClinMAPS app launched to help better assess and treat burn scars – November 21, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth App, Smartphone Camera	**Therapeutic Areas**	Wound care
Applications	Digital burn scar assessment	**Geographic Focus**	Global
Segment Focus	Clinical Grade	**Topics (News type)**	Business/ Monetization Model Innovation
Companies	ClinMAPS, Royal Adelaide Hospital (RAH)	**Others**	-

ANALYST TAKE:

- **Synopsis:** The first known digital burn scare assessment app developed by AusHealth, known as ClinMAPS PRO, is based on the reference book, Matching Assessment using Photographs with Scars (MAPS), which was developed in 2005 by Margot Masters and Margaret McMahon, therapists working with burns patients at the RAH.
- The app which uses photos of a patient's burns scar and compares it with photos of others, to give a score indicating healing of the scar, is available for download and purchase from Apple app store.
- Frost & Sullivan believes that digitization of chronic and burn wound management is a growing trend, in line with the global theme of increasing use of smartphones as a key enabler of improved health outcomes. The digital scar assessment tool, while easing care workflows, promises to improving scar assessment accuracy as compared to traditional scar rating tools which use both subjective and objective observations such as color, pliability, and thickness. However, there is still a lack of consensus with respect to the accuracy, reproducibility, and feasibility of these methods.

WEBLINK: https://bit.ly/2PaKv5X

CONTOUR®DIABETES app now able to integrate with Apple Health™ – November 21, 2018

Applicable Product Categories: Mobile Phones

Technologies	mHealth App; Apple Health Records	**Therapeutic Areas**	Diabetes
Applications	Connected diabetes monitoring platform	**Geographic Focus**	Global
Segment Focus	Clinical Grade	**Topics (News type)**	Care Delivery Innovation
Companies	Ascensia, Apple	**Others**	-

ANALYST TAKE:

- **Synopsis:** Ascensia Diabetes Care's Contour Diabetes app, a mobile tool to monitor trends in blood glucose levels that connects to the Contour Next One glucometer will now enable iPhone users to transfer blood glucose and carbohydrate data from their app to records kept within the Apple Health platform.
- The blood glucose data collected through Ascensia's app will automatically populate within the Blood Glucose area of the Apple Health app. Similarly, information captured through Apple's service can be brought into the Contour Cloud service, although Ascensia's app is not yet able to display these data.
- Frost & Sullivan research shows that Ascensia's connected diabetes monitoring platform has steadily seen regulatory and usability gains over the past couple of years, and in September enjoyed a strong endorsement from a triple-blinded, multisite, independent research study comparing commercially available and FDA-cleared blood glucose meters. The company's partnership and integration with Apple Health Records is in line with its own user reviews as well as general industry sentiment that being able to view the data in the Apple Health Kit enhances the value of the data in terms of a more holistic view of the patient's state of diabetes management.

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

Smart Home Devices & Appliances

Mood-enhancing Auri light packs Alexa smart home control – November 27, 2018

Applicable Product Categories: -

Technologies	IoT	**Therapeutic Areas**	All
Applications	Health & Wellness	**Geographic Focus**	US
Segment Focus	Consumer Grade	**Topics (News type)**	Care Delivery Innovation
Companies	Ling Technology	**Others**	Alexa (Amazon)

ANALYST TAKE:

- **Synopsis:** Ling Technology is aiming to crowdfund the smart light Auri to improve mental wellbeing using colored lighting as well as a sound (with a 36W speaker), but can also integrate with other connected devices including Amazon Alexa.

- Frost & Sullivan notes that mental health illnesses are expected to account for $6 trillion in costs by 2030, growing from $2.5 trillion in 2010. Depression alone, accounts for a third of the disabilities arising from mental illnesses. More importantly, clinical studies have proven a direct link between physical and mental health, expanding the definition of holistic care in effect. With that background, digital health solutions for mental health have ballooned in the recent past, including light and aroma therapy, but few may claim themselves to be integrated with other smart home devices. While an integration with a smart speaker may not make Auri a great tool, but future advances may consider ‘personalized care’, by understanding resident’s behavior, detecting emotions and playing music or using light therapy accordingly. Nevertheless, this is a first step in that direction.

WEBLINK: https://engt.co/2E63FbV

From tornado flushes to remote controls, modern toilets are flush with tech – November 19, 2018

Applicable Product Categories: -

Technologies	IoT & more	**Therapeutic Areas**	Diagnosis
Applications	Smart Toilets	**Geographic Focus**	Japan, US
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	Toto	**Others**	Kohler

ANALYST TAKE:

- **Synopsis:** Smart toilets, especially those with Toto (and some others which also have such features), have several features that are hygiene / infection control oriented. Other futuristic features may play a larger role in care delivery.

- Frost & Sullivan notes hygienic features such as automated lid opening, disability friendly features such as remote control use of washlets, infection-control features such as use of electrolyzed water for every wash and the use of UV light once a day to destroy bacterial buildup as ones that are gradually being adopted in the US as well, although these are associated with premium models. More importantly, the Intelligence-line (available in limited quantities in Japan alone), featured some of the health-oriented capabilities such as ability to measure metabolites, infections, sugar levels, intestinal microbiome and even some cancer precursors. Of course, this in the US would mean attracting regulatory approvals, and more importantly building partnerships to enable the correct use of this features (telehealth?). Yet, if adoption improves, such features can become standard (instead of premium) and therefore pave the way for more personalized care in the smart home.

WEBLINK: https://bit.ly/2FNJ0uU

Google Gets Patents for More Smart Home Devices to Track Users – November 26, 2018

Applicable Product Categories: -

Technologies	IoT & more	**Therapeutic Areas**	-
Applications	Personalization	**Geographic Focus**	US / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	Google	**Others**	-

ANALYST TAKE:

- **Synopsis:** In addition to tracking users' internet usage patterns and data, and recently the Google Home speaker that technically can listen to their conversations as well, Google's latest patent points to another device that can further track users in homes for improved personalization experiences.

- Frost & Sullivan notes that while this devices "will be able to scan and analyze items around the user, and recommend them content; product, movies or even music based on what it tracks", it is on the track of what a device could theoretically do for health as well. This patent is definitely stirring up the privacy controversy, similar to Facebook's camera device, but with Google's recent restructuring decision to move its health units in to the parent unit have the healthcare industry worried about Google breaking its commitment of never using health data. Any device that could use personalization for health intentions too could stir up a similar controversy, and with strict patient privacy regulations, it may be even more difficult to build such a device or solution for the mass market. Yet, smaller niche segments, such as aging-in-place will greatly benefit from such solutions, and in some forms, this concept is already being used commercially.

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

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
SC's first Senior SmartHOME caters to seniors who can't afford assisted living care	US	Nov. 16th, 2018	https://on.wltx.com/2KJaAZ9
Aging in place: Smart-home technology offers a way to extend seniors' independence	US	Nov. 23rd, 2018	https://bit.ly/2TZXNWI

Other Interesting Articles

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

News Title	Link	Remarks
Aviva takes majority stake in Munich Re-backed insurtech Neos	https://bit.ly/2QrEdDL	While Neos is a connected home insurer, we can imagine a similar trend in healthcare – after CVS & Aetna (and similar trends), a smart healthcare provider could be acquired by either an insurance company or even a provider of smart home services for extending their offering.
Men use Alexa and Google Home to control the smart home more than women	https://bit.ly/2zslkXB	A repeat US survey of 1,019 users reveals patterns that most users "stick to the basics" – points to a need for providing a service to help build complex rule-based automation to use smart home features to the fullest.
Xiaomi's smart speaker now has over 34 million monthly active users	https://bit.ly/2BJ64qA	China has a large and growing customer base for smart speakers – the 'empty nest' elderly and children in particular. There's potential to slowly build out healthcare services 'built-in' to an existing customer base for Xiaomi.
1.5 million UK households aim to run entire home using smart devices 'in next 5 years'	https://bit.ly/2zwMegK	According to a survey in the UK, the adoption of smart home tech is expected to rise over the next 5 years.