FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter
Issue 34
11th January, 2019

Table of Contents

FROST & SULLIVAN

Wearables

Apple patent shows woven electric fabric that could be used for healthcare – January 10, 2019 (1/2)

Applicable Product Categories: Wearables

Technologies — Wearable (Smart Textile)

Applications — Remote Monitoring and Self Health Management

Segment Focus — Consumer / Clinical Grade

Companies — Apple

Therapeutic Areas — Lifestyle Monitoring

Geographic Focus — US

**Topics (News type)** — Tech Innovation

Others — NA

ANALYST TAKE:

- **Synopsis:** Apple's IP work is accelerating for smart fabrics with a wide array of possible products on the table, especially over the past year. In the last 12 months Apple has been granted more than 6 patents relating to fabrics and smart fabrics and filed at least 6 new patents in the last 13 months on this internal R&D project.

- **Industry Needs:** Frost & Sullivan estimates the global clinical-grade wearables market at approximately $2 billion in 2015, growing at a compound annual growth rate of nearly 33% from 2015 to 2020. Despite the rapid adoption and proliferation of wearables, significant issues remain around form factors and data quality, with research indicating that between 33 to 50% of customers will stop using a purchased wearable within six months. User-friendly design and affordability are critical to market success. Additionally, devices often have a high degree of variability, leading to inconsistent biometric data capture and inaccuracy.

- **Value Proposition:** Apple is experimenting with the idea of weaving circuitry into fabrics (e.g. glove). This circuitry would be able to sense pressure and force, and would then be able to transmit that data back to a laptop, phone, or other wearable device. Without going into deep specifics, the circuits would be interwoven between the strands of fabric, and may include "stiffeners" that pop the fabric back into place after pressure has been released, preventing erroneous readings.
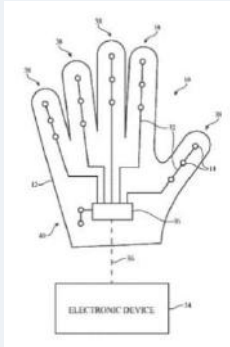
- Frost & Sullivan notes, that when it comes to wearables, seamlessness and convenience are two highly regarded attributes by average consumers. Given this, industry experts believe wearables in the form of day-today garments can drive stickiness and longer usage by wearers, a critical issue with consumer wearables. Frost & Sullivan views this as a rational expansion of Apple's wearable portfolio into more consumer-centric designs, and to be used for health purposes. Some of the leading smart-garment wearables companies with focused healthcare applications include OMSignal and Nanowear Inc. both targeting the cardiac monitoring space with clinical-grade smart-textile wearables. It will be interesting to track which use cases Apple would focus on and how it will complements its existing healthcare solutions.

- **Target End-User:** Average consumer

WEBLINK: https://bit.ly/2SNQgZP ; https://bit.ly/2swgmFv

L'ORÉAL Launches Wearable Sensor That Can Detect Skin pH Levels – January 7, 2019 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Smart Textile)	**Therapeutic Areas**	Lifestyle Monitoring
Applications	Remote Monitoring and Self Health Management	**Geographic Focus**	France / Global
Segment Focus	Consumer / Clinical Grade	**Topics (News type)**	Tech Innovation
Companies	L'ORÉAL	**Others**	NA

ANALYST TAKE:

- **Synopsis:** L'Oréal, the French multinational personal care company (reportedly the world's largest cosmetics company) recently at CES introduced its latest wearable prototype that is designed to detect skin pH levels.

- **Industry Needs:** Skin's pH plays an important role in skin condition. The acid mantle is key to skin's protective barrier. It neutralises alkaline-based aggressors (such as harsh surfactants), inhibits the growth of bacteria and restores and maintains the optimal acid environment in which skin's natural flora can thrive. If skin's pH rises into the alkaline range, its natural balance is disturbed. Essential epidermal lipids cannot be synthesised and skin loses water and dries out. In this condition, the outer layer of skin (or epidermis) is no longer able to work as a protective barrier. When skin's barrier function is compromised it is less resilient and more sensitive to environmental triggers. It can become dry, sensitive or hypersensitive, and is susceptible to infections, diseases such as Atopic Dermatitis and conditions such as Rosacea.

- **Value Proposition:** Wearers of the device can be empowered by the data provided by the device to learn what is best for their own skin. Apparently, unstable skin pH levels can cause inflammatory skin conditions such as dryness or eczema. The device comes with two dots that change color on the completion of the process of pH level detection. The wearer has to place the device on the inner arm for 5 to 15 minutes or till the dots change color. Next the My Skin Track pH app has to be launched on a smart phone and the pH level will be analyzed by the app through a picture taken of the dots. Sweat biomarkers such as glucose, chloride, lactate, pH, sweat rate and sweat loss are detected by the dots and the app is designed to process what it sees through the photo. It also measures how much the user is sweating and makes appropriate product recommendations.

- At present L'Oréal has not made it clear whether the wearable sensors will be reusable. According to an official statement by the company, such details will only be ascertained once My Skin Track pH moves beyond the prototype stage. No price for the device has yet been announced and My Skin Track pH would be officially made available to select dermatologists later in 2019. On further development, the device will be shipped directly to consumers.

- Frost & Sullivan view this as L'Oréal's continuous commitment to leverage wearables technologies to make its mainstream health and wellness segments more outcome-based to promote the differential value proposition against other competing products, luring tech-savvy millennial consumers. During Nov 2018, L'Oréal 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. Frost & Sullivan believes, as the value proposition between brand and technology blurs, innovative wearable OEMs will continue to find winning collaboration with large consumer brand names in the health, wellness, and fashion to make the ultimate consumer experience more meaningful.

- **Target End-User:** Average consumers, Wellness Clinics, Skin Health Clinics.

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

Mobile Phones/ mHealth

Philips Cares digitizes the aging and caregiving experience – January 7, 2019 (1/2)

Applicable Product Categories: Mobile Phones

Technologies mHealth App; Wearables, Predictive Analytics

Applications Integrated digital platform providing insights related to senior care at home

Segment Focus Clinical Grade

Companies Royal Philips

Therapeutic Areas Senior Care

Geographic Focus US

Topics (News type) Tech Innovation

Others -

ANALYST TAKE:

Synopsis: Philips unveiled a new app based digital platform, called Philips Cares, which integrates all of its senior care products such as GoSafe, HomeSafe and the Automated Medication Dispensing Service device into a single platform based ecosystem for caretakers, to offer an enriched insights driven care experience.

Industry Need

- Staggering statistics have been doing rounds over the past 3-5 years relating to the disproportionate rise in people requiring senior care in the next decade in the US, with some estimates pointing to a 3:1 ratio of number of seniors needing care to the number of people available to provide that care by 2020.

- Amidst the continuously understaffed senior care facilities, digital technologies and an ecosystem of smart devices is the most feasible answer towards the needs of senior care.

Value Proposition:

- The new app, Philips Cares, is a digital platform which offers a number of features such as reminders, scheduling tools and access to emergency services in order to effectively track and manage a senior's care at home by its caregiver.

- The app integrates data from all the senior care products from Philips, which include GoSafe — a pendant wearable enabling fall detection, location tracking, and two-way communication; the HomeSafe medical alert system and the in-home Automated Medication Dispensing Service device. Once the data is integrated, the platform, in addition to offering continuous updates on activities such as number of steps, location and medication adherence, leverages its inbuilt predictive analytics algorithm to offer holistic insights on the senior's current and expected future care needs to the family or professional caregiver.

- As per Jason Broad, head of marketing for aging and caregiving at Philips, the platform while being capable of predicting major events, like a senior requiring emergency transport as early as 30 days in advance, offers curated and targeted ways to the family member in terms of insights such as lack of medication adherence over the past week and the resultant risk of an imminent infection, so as to help them take necessary evasive actions.

- Frost & Sullivan believes that while the platform is a good starting point for Philips to begin on a holistic, data and insights driven senior care offering, the real value of such as concept would come from the platform's ability to be truly interoperable and acquire data sets from a host of other home based monitoring systems like a third party wearable device, an IoT enabled home based appliance or an in or on body sensor, not necessarily limited to Philips' set of product offerings. While this might sound like wishful thinking, there have been some baby steps taken towards attaining interoperability, at least in a symbolic manner when a set of tech giants issued a joint statement towards healthcare interoperability, and a growing interest from industry stakeholders towards achieving it. While, this still is a long-haul, Philips, in the short to mid term could look at entering into strategic data sharing partnerships with a host of smart home ecosystem players to continually enhance its offering.

- **Target End-User:** Seniors, caregivers

WEBLINK: https://prn.to/2TyG47o

23andMe to integrate genetic data into Lark Health's AI health coach – January 8, 2019

Applicable Product Categories: Mobile Phones

Technologies
mHealth App, Genetics, Artificial Intelligence

Therapeutic Areas
Diabetes, Obesity

Applications
AI enabled diabetes management platform

Geographic Focus
US

Segment Focus
Clinical Grade

Topics (News type)
M&A / Partnerships

Companies
23andMe, Lark Health

Others
-

ANALYST TAKE:
- **Synopsis:** 23andMe and Lark Health entered into a partnership to integrate 23andMe's genetic information into the latter's AI driven Wellness Program and Diabetes Prevention Program platform, with the aim of leveraging the user's genetic data to further personalize weight loss strategies.
- As per the parties, access to the patient's genetic information and further leverage of AI based algorithms would throw up useful insights and personalize a patient's weight loss and diabetes management regime.
- Frost & Sullivan believes that genomic companies like 23andMe, AncestryDNA, and Nebula Genomics, which have a wealth of patient genomic data up their sleeves, stand primed to leverage that data with pharma and biotech companies which spend billions in acquiring genomic information. However, to date, growth of the genomic data market has been hindered by small data quantities, data fragmentation, lack of data standardization and slow data acquisition, thereby hindering the growth prospects of such companies. Amidst such a scenario, innovative partnerships such as the one between 23andMe and Lark Health offer ample breathing space for such companies and enable newer growth opportunities.

WEBLINK: https://bit.ly/2Fhg39T

Humana's members will now have access to Fitbit Coach through the payer's Go365 wellness program – January 9, 2019

Applicable Product Categories: Mobile Phones

Technologies	mHealth App		**Therapeutic Areas**	General Wellness
Applications	Payor-Vendor Partnerships		**Geographic Focus**	US
Segment Focus	Consumer Grade		**Topics (News type)**	M&A / Partnerships
Companies	Humana, Fitbit		**Others**	DailyBurn, Noom and MindSciences

ANALYST TAKE:

- **Synopsis:** Humana announced a number of new additions for its members using Go365, the company's virtual wellness and rewards program. Notably, the program members will now get shared access to FitBit Coach, FitBit's personal training app which offers video based workout tutorials and audio based coaching services to achieve aimed fitness levels.
- In addition, the members will also have access to other apps like DailyBurn, Noom and MindSciences aimed at various mental and physical wellness needs such as obesity, anxiety, depression and smoking.
- Frost & Sullivan research finds that a number of payers have been entering into strategic partnerships with such digital health companies to offer holistic health and general wellness solutions to its members. The aim is to achieve proactive fitness and wellness levels among its members so as to prevent from falling sick, enabling greater value out of their programs. Amidst the variety of areas, the payers have focused on two major areas — obesity and mental health — due to a variety of health complications tied to ineffective management of these conditions as well as high prevalence rates of these chronic conditions in the US.

WEBLINK: https://huma.na/2VK76e9

Smart Home Devices & Appliances

'Smart homes' to help older and disabled people get digital skills and tackle loneliness in rural areas – January 06, 2019

Applicable Product Categories: Smart Home Devices

Technologies	IoT, Smart Devices		**Therapeutic Areas**	Aging in Place
Applications	Digital Skills Boosting in Elderly		**Geographic Focus**	UK
Segment Focus	Consumer Grade		**Topics (News type)**	Care Delivery Innovation
Companies	Department for Digital, Culture, Media & Sport (UK)		**Others**	-

ANALYST TAKE:

- **Synopsis:** "A number of 'smart homes' with digitally savvy older people demonstrating tech in their own homes are being created as part of an innovative scheme to boost the nation's digital skills. The homes, to be created in rural West Essex by a partnership led by Uttlesford Council for Voluntary Service, will see home owners become trained 'digital boomers' to help others improve their digital skills. They will receive a digital assessment, before having their homes 'kitted out' in tech." Objective: "make the most of smart technology to control household appliances, book GP appointments online, contact friends and family by video, and shop online." Also, "The fund will also see an app created by the Down's Syndrome Association to allow people with Down's Syndrome to monitor their weight and exercise levels from their smartphones to promote good health and wellbeing."

- Frost & Sullivan believes this is a great initiative to boost adoption of smart technologies among the elderly, to ultimately reap the benefits of these technologies. This will also set the stage for integration of telehealth and mHealth initiatives (which are a UK National Health Service priority in their current 5-year plan) with the smart home tech to fully leverage potential of technologies for aging-in-place.

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

Domalys Fall Prevention System at CES 2019 – January 09, 2019

Applicable Product Categories: Smart Home Devices

Technologies	Smart Devices, Sensors	
Applications	Fall Prevention	
Segment Focus	Consumer Grade	
Companies	Domalys	

Therapeutic Areas	Elder Care
Geographic Focus	France / Global
Topics (News type)	Care Delivery Innovation
Others	-

ANALYST TAKE:

Synopsis: "Aladin smart lamp monitors an elderly person while they're at home, detects abnormal patterns in activity, and aims to prevent falls and other common injuries. The device lights up at night if it detects activity to automatically illuminate a room, as poor lighting is one of the most common reasons for falls inside one's home. The device also recognizes that a person, for example, has begun taking frequent bathroom breaks at night and gives warnings to the individual and caretakers of such patterns. Finally, the device is actually able to detect falls and can send out alerts to family and caretakers, depending on the setup."

Frost & Sullivan notes that fall prevention and motion sensing to illuminate path at night are almost basic features, and a given when designing smart homes for seniors. However, the use of a smart lamp may be a little innovative, as it is not a wearable device that interferes with seniors' dignity (of not wanting to be identified as needing assistance), but doesn't really provide an advantage over fixed wall sensors and lights which can perform the same task. The ability to make note of frequent bathroom breaks at night, though, is a great healthcare tracking feature, and similar non-critcial tracking features can help doctors better understand and diagnose senior health conditions.

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

Cherry Home CEO: The Future Of Smart Homes And Independent Senior Living – January 09, 2019

Applicable Product Categories: Smart Homes

Technologies	Smart Devices, Sensors	
Applications	Remote senior monitoring	
Segment Focus	Consumer Grade	
Companies	Cherry Home	

Therapeutic Areas	Elder Care	
Geographic Focus	US / Global	
Topics (News type)	Tech Innovation	
Others	-	

ANALYST TAKE:

Synopsis: "Cherry Home device — a smart device equipped with computer-visioning technology, designed to monitor older users' in-home behavior. The tech sends notifications whenever normal patterns change, or if there's a dangerous event, such as a fall or significant stumble." It "watches seniors via its sensors, which are directed to keep track of certain behaviors that could signal when a senior might be in distress or have difficulty functioning: how often they eat or walk around, or their posture as they are walking. They are also on the lookout for certain changes (either over time or immediate changes like a fall to the ground). When sudden changes happen, the system is keyed to send notifications to caregivers, family members and other authorized receivers. Those images are "skeletal overlays of a human-based image."

Frost & Sullivan acknowledges the approach as a smarter one over any wearable device, as well as building on the potential outlined for healthcare on the previous slide. But other 'robots' (as covered on next slide) might be able to do something similar. Overall, the aging-in-place market is getting crowded with several solutions which overlap in their USPs and offerings, making differentiation difficult over the long run.

WEBLINK: https://bit.ly/2D32ybn

ElliQ Smart At-Home Assistant for Independent Elderly Folks (CES 2019) – January 09, 2019

Applicable Product Categories: Smart Home Devices

Technologies   Smart Devices, Sensors

Applications   Remote senior monitoring

Segment Focus   Consumer Grade

Companies   Intuition Robotics

Therapeutic Areas   Elder Care

Geographic Focus   US / Israel / Global

Topics (News type)   Tech Innovation

Others   -

ANALYST TAKE:

Synopsis: "ElliQ is a unique voice assistant from **Intuition Robotics**, an Israeli firm, that is designed specifically for elderly people living at home. It has a physical form that moves and lights up, as though it's alive, plus the voice that makes it pretty natural to communicate with. It also has a screen that can display a bunch of different kinds of information. The ElliQ can be asked to play music, read messages, set reminders, play games, share photos, and do all kinds of other things that are now common. It also has communication features thansk to built-in cameras, and can suggest personalized activities throughout the day to help stay active."

Frost & Sullivan has been tracking ElliQ and Mabu robot by Catalia Health for more than a year, and notes that (a) these are not true robots (as complete mobile units) though they have some movement features, and (b) are similar in some aspects to Cherry Home in tracking senior behavior, but (c) offer differentiators for socialization / reducing isolation. [Mabu Robot actually also has medication adherence features.]

WEBLINK: https://bit.ly/2VK6pBC

Builder KB Home To Offer 'Wellness' Software As Smart Home Race Heats Up – January 07, 2019

Applicable Product Categories: Smart Home Devices

Technologies	Smart Devices, Sensors	**Therapeutic Areas**	Elder Care
Applications	Remote senior monitoring	**Geographic Focus**	US
Segment Focus	Consumer Grade	**Topics (News type)**	Tech Innovation
Companies	KB Home, Delos	**Others**	-

ANALYST TAKE:

Synopsis: "KB Home today said it will begin offering home buyers technology to make their households healthier. Starting this spring the Los Angeles-based homebuilder will sell an add-on, known as Darwin, to buyers in California, with plans to eventually roll it out nationally. Darwin is designed by Delos, a New York-based technology startup that has raised over $200 million to develop what it calls wellness real estate."

Frost & Sullivan covered Delos in Issue 18, and subsequently, this is the company's first major builder partnership. As real estate (globally) becomes competitive, builders are looking at solutions for differentiation –smart home tech is a great choice. But KB Home is going a step ahead with wellness solutions. We believe in the coming two years, as the healthcare-smart home integration matures with technology, approvals and adoption, real estate will move beyond wellness to cover more healthcare centric features.

WEBLINK: https://bit.ly/2VK6pBC

CES 2019 (exclusive): AARP trialing virtual reality for remote healthcare – January 07, 2019

Applicable Product Categories: Smart Home Devices

Technologies	Virtual Reality	
Applications	Remote senior monitoring	
Segment Focus	Consumer Grade	
Companies	VRHealth, AARP Innovation Lab	

Therapeutic Areas	Elder Care
Geographic Focus	US / Global
Topics (News type)	Tech Innovation
Others	-

ANALYST TAKE:

Synopsis: VRHealth and AARP Innovation Lab collaboration is exploring the use of VR for remote monitoring of seniors. "The idea is to use sensors and VR technology to enable remote health monitoring. VRHealth's telehealth platform, available in the Oculus store, enables seniors to grant key participants in the medical process, like family members or physicians, access to healthcare data collected during VR therapy sessions. Caregivers are then able to make adjustments to treatment, potentially avoiding the need for a doctor's visit." Seniors can engage in "VR therapy around several different use cases, including brain health applications, memory span and cognitive skills, neck exercises, and pain management techniques."

Frost & Sullivan acknowledges the different approach taken by VRHealth versus some other virtual reality companies in building a telehealth platform to collect data around patient improvements while undergoing therapy (much like smart inhalers can provide caregivers information on inhaler use technique, and other statistics to understand medication effectiveness). This innovative approach could, theoretically be expanded in the future, in the smart home to use the same telehealth platform to provide more insights in to gait, falls, movements, diet, bathroom visits, and other sensor data to build complete health picture of the person's activity to provide better care.

WEBLINK: https://zd.net/2TD0Cfn

AI Detects Depression – January 04, 2019

Applicable Product Categories: Smart Voice Assistants

Technologies — AI

Therapeutic Areas — Depression

Applications — Diagnosis

Geographic Focus — US / Global

Segment Focus — Consumer Grade

Topics (News type) — Tech Innovation

Companies — Stanford University

Others — -

ANALYST TAKE:

Synopsis: "Researchers at Stanford University have published a paper describing a system that can automatically detect symptoms of depression simply through spoken language analysis and facial recognition. They applied a number of different artificial intelligence (AI) machine learning tools to the data recorded in patient interviews with a computer avatar."

6.7% of US adults have experienced at least one major depression episode per the National Institute of Mental Health; globally 300+ million suffer from the condition, per the World Health Organization.

Frost & Sullivan notes that while this is technology still being developed, it very well could be applied to smart virtual assistants, similar to Amazon having a patent to detect user sickness through voice (covered in Issue 23). With depression being one of the most prevalent mental health conditions, and one that has significant impact on physical health as well, mental health care is coming to the fore. Smart homes can have a significant role in diagnosing such conditions given that they can track resident movements, diet, speech and behavior, and therefore induce interventions, much before damage to physical health is done.

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

Other Interesting Articles

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

News Title	Link	Remarks
Synaptics launches new line of SoC audio sensors for smart home devices	https://bit.ly/2SJzNpD	"Synaptics has announced a new family of system-on-chip (SoC) audio sensor products featuring neural network acceleration, a proprietary wake word engine supporting custom wake words, and far-field voice processing the company says is highly-advanced." – this essentially brings intelligence to the edge (instead of on the cloud), and can make most appliances 'smart' by themselves (instead of reliance on the cloud). Implications? Amazon Echo outages resulting in smart lock owners being locked out could be avoided!
Some of the weirdest new products with Amazon Alexa built in — from pet feeders to toilets	https://cnb.cx/2D4k1QN	An insight into the strategies being employed by Google and Amazon to literally pervade homes with smart voice assistants –taking them to products which, in current view, don't really need a voice assistant. The idea is to get consumers hooked on to using voice for everything, while possibly collecting data on usage tor (a) advertising (Google), (b) supply (Amazon predictions) and probably much more.
Comcast debuts a subscription service to protect against threats to smart home devices	https://tcrn.ch/2RHVd9y	Comcast is leveraging AI for cybersecurity of smart homes, while providing the service as a subscription model. Not only is it addressing an unmet need, but is a great revenue stream going the subscription route. This could theoretically prevent, for example, smart appliances being enslaved for mining bitcoins.

F R O S T *&* S U L L I V A N

Other Interesting Articles (continued)

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

News Title	Link	Remarks
All the new Google Assistant products from CES 2019	https://cnet.co/2CTZQ87	Like Amazon, several smart products are now shipping with Google Home compatibility (some of which also have Amazon compatible versions – meaning those manufacturers would tap in to both consumer categories).
Whirlpool Brand Re-Imagines the Future of Care with Upgrades to Smart Kitchen Appliances	https://prn.to/2RJjWKr	If any area in the smart home has heated up (pun intended) in the build up to CES 2019, it has been the kitchen. With several appliance makers making moves in this area, we believe 2020 would see some diet / nutrition focus, signaling a move in to the health space.
Near Infrared Food Shelf Life Scanner	https://bit.ly/2D2pVC3	We have covered innovative food spoilage tracking products in the earlier issues, but this product is a portable scanner to detect freshness. Though work continues to improve its accuracy, we believe the other products covered (Ovie, Issue 3, WePlenish Issue 4) are better suited for the task.
Best Buy has quietly grown a home healthcare business: 4 things to know	https://bit.ly/2AEHGpg	A promotion to lead 'Best Buy Health', GreatCall (senior care company) acquisition, other healthcare leaders hired, and a declared shift to health and wellness for aging population – all point to Best Buy making moves in healthcare, the first of which was covered in Issue 4, around the Asssured Living Program for remotely monitoring elderly.

FROST & SULLIVAN

Other Interesting Articles (continued)

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

News Title	Link	Remarks
Universal Electronics to Debut Nevo Butler Smart Home Hub at CES	https://bit.ly/2Fr2hkj	Even the smart home hub space is seeing increasing competition, but with heavyweights Google and Amazon in play, it is not a level-playing field. This device is a managed, white-label service, targeted to businesses such as communication service providers (think Amazon Fire Stick with voice remote), but with Comcast also having voice capabilities, the consumer segment may not be the best target for them. The hospitality sector where customization beyond what Amazon / Google offer may be a better target.
Hospital at home tech: The 'quiet revolution' improving outcomes, cutting costs and building relationships	https://bit.ly/2H7dU2g	A must read article that provides insights in to how healthcare moving to the home is great a move – reduced costs, improved recovery and also more involved caregivers.

FROST & SULLIVAN