

IA in a world of connected health

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ConnectedHealth

C H A N G E

C

~~G~~

A word puzzle diagram on a dark blue background. The word 'CHANGE' is written in a row of six light pink rounded squares with yellow-green borders. Above the 'G' square is another identical square containing the letter 'C'. A red diagonal slash is drawn over the 'G' square in the main row.

L'administration représente 34% des frais de santé des Américains

MediQuality Medscape 10-02-2020



C'est ce qu'affirme Abigail Abrams, la célèbre éditorialiste de *Time Magazine*, en réaction à la publication récente dans les *Annals of Internal Medicine* d'une étude calculant quel pourcentage des frais de santé des Américains sont engloutis par l'administration ; la dernière analyse de ce type remontait à 1999 déjà. Précisons pour être tout à fait complets que le calcul n'a pas pris en compte les frais de santé et administratifs afférents aux prestations des dentistes et pharmaciens.

Qu'en est-il de la situation belge? Malheureusement, force est de constater **qu'il n'existe pas pour notre pays de chiffres fiables**, tant la complexité du système de santé et du calcul complique la réalisation de recherches de qualité.

Et si 60% du budget de l'INAMI était consacré aux frais de fonctionnement ?

MediQuality Medscape 14 février 2020

Le calcul de la part des frais administratifs dans le budget total de la santé ne semble toutefois pas être une priorité politique.



SPIRIT OF CHANGE



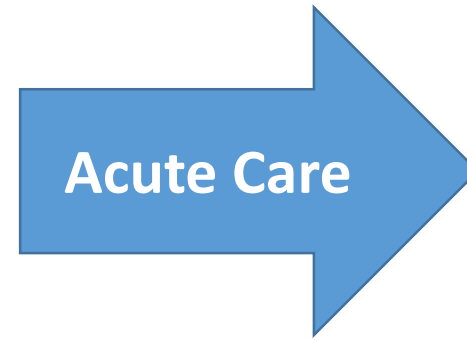
Building a new ecosystem:

- IoMT
- Big Data
- Artificial Intelligence
- Cloud
- Blockchain



Care Anywhere

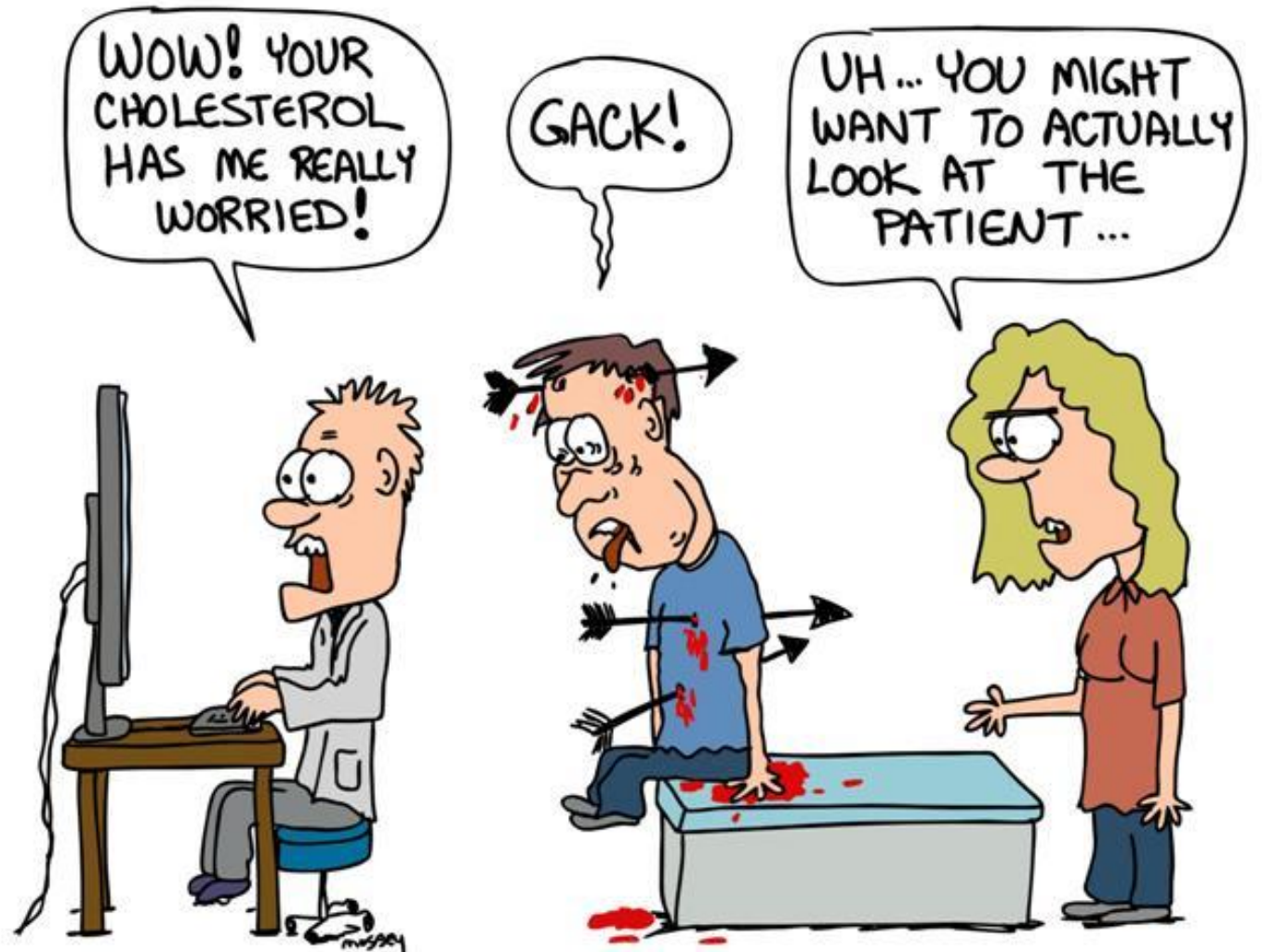
Jupiter Medical Center Care Anywhere is a convenient and cost-effective way to get immediate world-class medical care anywhere – from home, office or anywhere you choose – using your smartphone, tablet or computer



Decline of the Physical Exam: Clinical Tragedy or Good Riddance?

www.Medscape.com August 22nd 2017

- At the same time, we grossly **overestimated** the **average clinician's ability** to do an extremely good physical exam and to make all of the relevant physical findings.
- It has been documented over and over again that the average person's ability to use a stethoscope and document a murmur accurately **is a coin flip**.
- **To take care of huge numbers of patients and to do it efficiently**, we're going to need to use the new tools and give up some stuff.



Tyto Care Brings the Doctor's Visit to Home: Interview with Ophir Lotan

FEBRUARY 6TH, 2019
WWW.MEDGADGET.COM



Tyto Care is an on-demand telehealth provider based in Israel that hopes to bring all aspects of a doctor's visit to the home. Beyond the limits of traditional telemedicine, the platform also allows patients to conduct their own physical exam using a device that combines a camera, stethoscope, otoscope, thermometer, and tongue depressor.

Tyto Care takes telehealth retail

The Israeli maker of FDA-cleared medical devices announced it has expanded its partnership with Best Buy such that its connected device kit - TytoHome - is sold in the retailer's U.S. locations.

By [JOSH BAXT](#) Nov 13, 2019 MedCityNews

On Wednesday Israel-based Tyto Care announced it has expanded its [partnership](#) with consumer electronics retailer Best Buy, which will be selling TytoHome at **300 stores** across the U.S. for **\$299**. Individual **tele-visits will cost \$59**.

Smartphone App Uses Phone Microphone to Hear Ear Infections

MAY 17TH, 2019 WWW.MEDGADGET.COM

Researchers at the University of Washington have developed a smartphone app that can detect ear infections.

The app emits a sound through the phone's speaker, and the microphone picks up the noise that is reflected back from inside the ear. By analyzing the reflected sound, the app can predict the likelihood that there is a buildup of fluid behind the eardrum, a sign of infection.

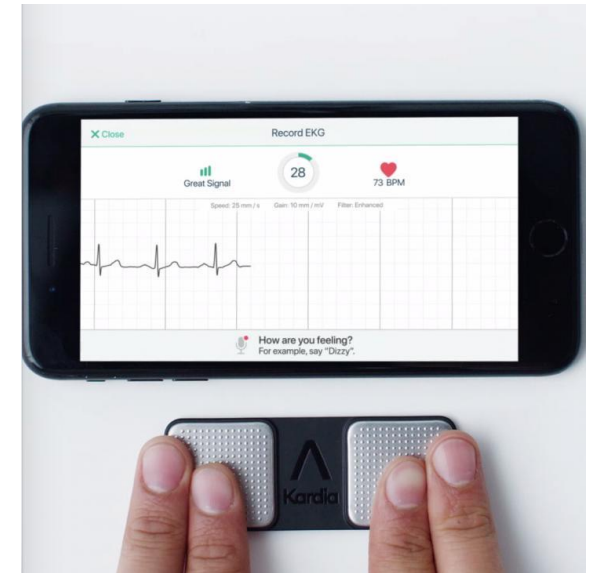


International study puts AliveCor's smartphone ECG on par with 12-lead system

The investigation compared tests from 204 STEMI patients presenting in five different settings.

By [Dave Muoio](#) November 12, 2018 www.mobihealthnews.com

New data from an international study of AliveCor's smartphone app and accompanying two-wire ECG found the mobile tool to **be on par with a standard 12-lead ECG** among patients presenting with **ST-segment elevation myocardial infarction** (STEMI).



FDA clears AliveCor's six-lead smartphone ECG

The KardiaMobile 6L builds upon its predecessor with a third electrode placed on its back side, allowing cardiologists better insight into device owners' arrhythmias.

By [Dave Muoio](#) May 13, 2019 www.mobihealthnews.com



The KardiaMobile 6L generally resembles the standard KardiaMobile and uses a similar app-driven interface. However, in addition to placing their thumbs on the device's front electrodes, a third node on the back is pressed against the user's knee or ankle. By creating this so-called **"Einthoven Triangle"** (named after the ECG's inventor), the device is able to provide cardiologists with **six different perspectives** on the heart's electrical activity, helping them better identify arrhythmias and diagnose heart conditions.

World's First Blood Pressure Smart Watch from Omron

DECEMBER 20TH, 2018 WWW.MEDGAGGET.COM



It also monitors the wearer's **heart rate** and **sleep quality** throughout the night, but can't be programmed to take BP readings while sleeping.

The device just received **FDA clearance** and will soon be made available to the public for purchase.

Omron Blood Pressure Measuring Watch at CES 2019

JANUARY 8TH, 2019 WWW.MEDGADGET.COM

Video selfies could be the future of blood pressure monitoring

A new study published in Circulation: Cardiovascular Imaging found that a **smartphone camera combined with a transdermal optical imaging system** could accurately predict blood pressure.

By [Laura Lovett](#) August 08, 2019 www.mobihealthnews.com

The technology used in the study combined transdermal optical imaging (TOI), a type of technology developed to that employs machine learning and is able to image blood flow patterns from videos of the face, with smartphone cameras.



Duke study: Activity, but not skin tone, can impact wearables' PPG heart rate accuracy

The new investigation also found substantial differences between the performance of specific devices, with **consumer products generally outperforming research wearables.**

By [Dave Muoio](#) February 11, 2020 www.mobihealthnews.com



“We were initially surprised that the commercial devices were more accurate, but they also have **huge user bases**, so they’re able to use lots of data to clean up their signals and improve their algorithms,”

American Well, Stanford physicians to share lessons learned from Apple Heart Study at HIMSS

By [Jonah Comstock](#) February 10, 2020 www.Mobihealthnews.com



Apple Heart Study

In partnership with  Stanford | MEDICINE

1. Organizations should emphasize and prioritize **collaboration**, and recognize ahead of time that research institutions, consumer companies, and digital health firms all have different ways of operating and it may not be natural or easy to synthesize them together.
2. When dealing with such large numbers of patients, it's important to **automate** as many of the processes involved as possible.
3. Organizations should shift their thinking from enrollment to a mindset of **consumer engagement**.
4. In the model they used it's important to make sure **providers are engaged** as well, and give the study as much attention as their other duties. **Make sure the providers are motivated and don't see this as an undue burden."**

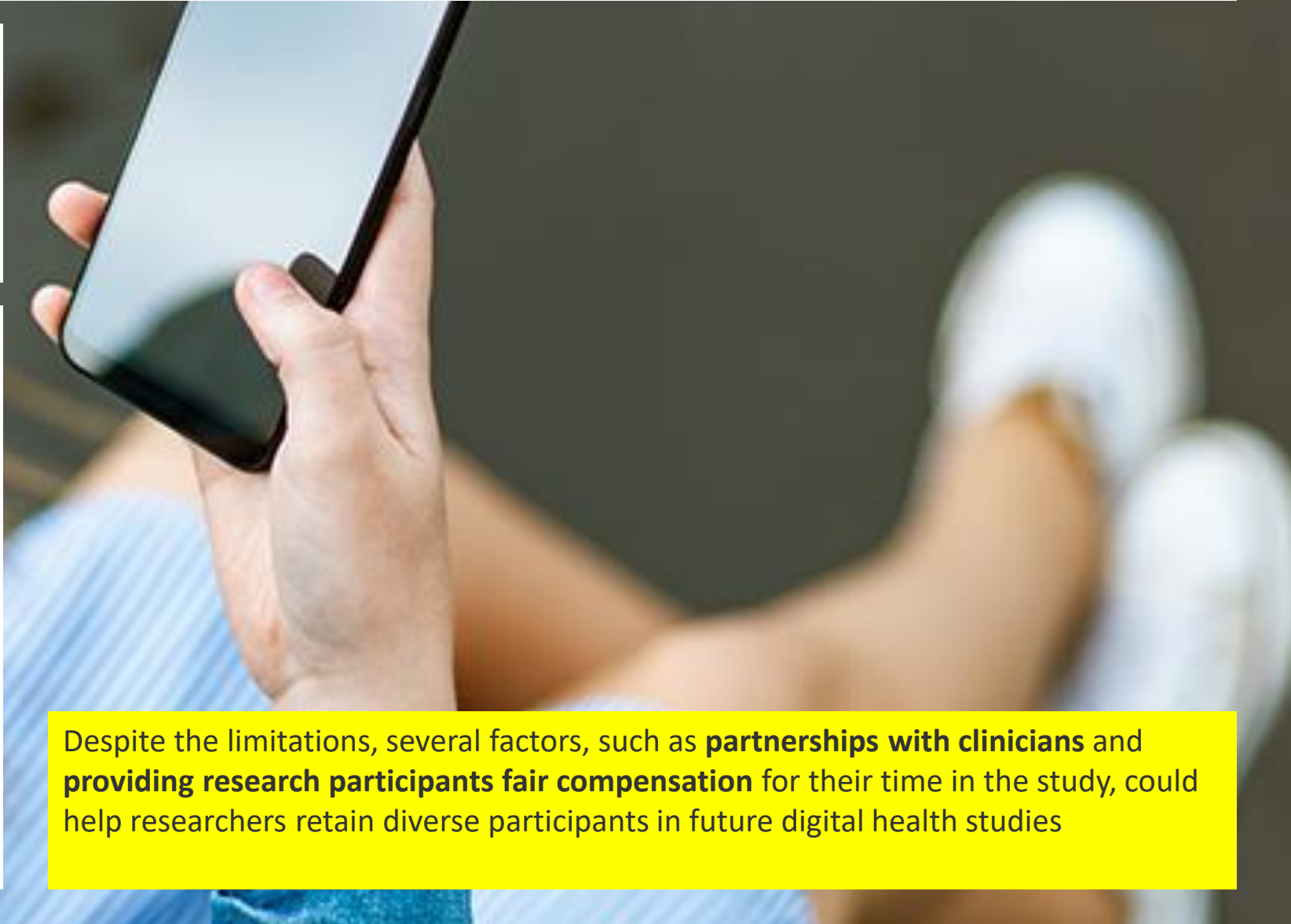
Low retention, unrepresentative samples prevalent among large app-based digital health studies

A recently published analysis of eight digital studies found a median dropoff of 5.5 days, as well as a predominantly young and white pool of participants.

By [Dave Muoio](#) February 21, 2020 www.mobihealthnews.com

In reviewing the behaviors of nearly 110,000 study participants across more than 850,000 study days, the researchers also identified a handful of study design decisions that were associated with continued participation.

- The researchers saw significantly increased retention among those who had **clinical conditions relevant to the study**, as opposed to the non-disease controls.
- Median retention time was also significantly higher for those **referred to a study by their clinician** when compared to those who self-selected.
- While declared gender was not tied to retention behavior, **participant age analyses showed those over 60 years** to stick with the study for longer than their younger, more prevalent peers.



Despite the limitations, several factors, such as **partnerships with clinicians** and **providing research participants fair compensation** for their time in the study, could help researchers retain diverse participants in future digital health studies

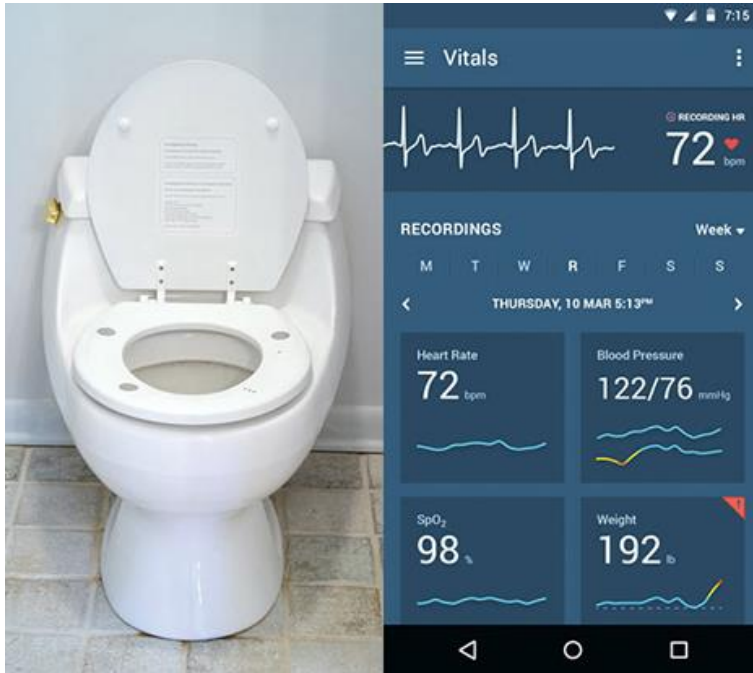
Off-the-person electrocardiography: performance assessment and clinical correlation

Health and Technology 2015

Toilet Seat Automatically Measures Host of Cardiac Parameters to Monitor Heart Health

FEBRUARY 7TH, 2019

WWW.MEDGADGET.COM



Pervasive ECG: Integrating Body Sensors Into Everyday Things (Interview)

OCTOBER 15TH, 2018

WWW.MEDGADGET.COM



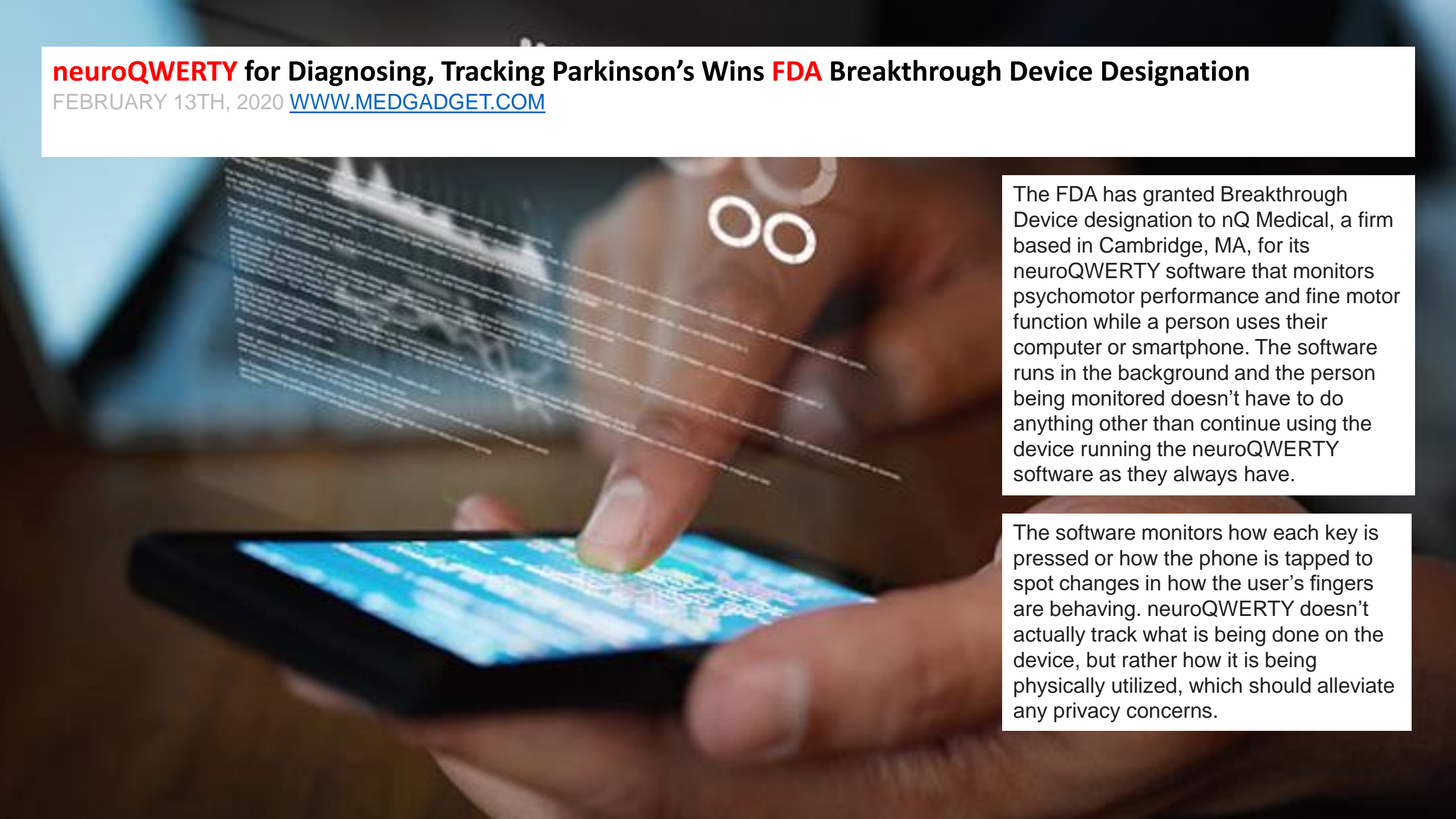
Computer keyboard interaction as an indicator of early Parkinson's disease

[Sci Rep.](https://doi.org/10.1038/s41598-016-03446-8) 2016; 6: 34468



neuroQWERTY for Diagnosing, Tracking Parkinson's Wins FDA Breakthrough Device Designation

FEBRUARY 13TH, 2020 WWW.MEDGADGET.COM

A close-up photograph of a person's hand holding a smartphone. The phone's screen displays a colorful, abstract digital interface with blue and green patterns. Overlaid on the scene are several glowing white lines and circles, suggesting a futuristic or data-driven theme. The background is blurred, focusing attention on the hand and the device.

The FDA has granted Breakthrough Device designation to nQ Medical, a firm based in Cambridge, MA, for its neuroQWERTY software that monitors psychomotor performance and fine motor function while a person uses their computer or smartphone. The software runs in the background and the person being monitored doesn't have to do anything other than continue using the device running the neuroQWERTY software as they always have.

The software monitors how each key is pressed or how the phone is tapped to spot changes in how the user's fingers are behaving. neuroQWERTY doesn't actually track what is being done on the device, but rather how it is being physically utilized, which should alleviate any privacy concerns.

BioSticker FDA Cleared for Month-Long Vitals Monitoring

FEBRUARY 7TH, 2020 WWW.MEDGADGET.COM



“The use of the BioSticker device for continuous health monitoring (3months) enables us to monitor a patient in their home and recognize when a patient may have an exacerbation of illness even before they manifest symptoms. This may reduce hospitalizations, emergency department visits and shorten hospital stays, creating cost efficiencies for health systems.”
The system is designed for single use.





Apple's 2019 in review: Research programs, health records, patents and features

New clinical efforts, more personal health record partners and continued smartwatch support defined the Cupertino company's year in digital health.

By [Dave Muoio](#) December 27, 2019 MobiHealthNews

Rubix S&I présente une montre connectée pour la détection de nuisances environnementales

Après le Rubix Pod, dédié à la surveillance de la qualité de l'air dans les bâtiments, et le WatchTower, adapté à l'analyse de l'environnement extérieur, la start-up toulousaine Rubix S&I revient pour la troisième fois à Las Vegas avec un nouveau produit miniaturisé et portable.

[Marina Angel](#) | Publié le 13 décembre 2019 L'Usine digitale

L'objectif est de détecter et d'identifier toutes sortes de nuisances environnementales à partir de l'analyse de l'air ambiant, mais aussi, et c'est une nouveauté pour l'entreprise, à partir de l'haleine et des fluides corporels (sueur et salive) du porteur de l'objet connecté.

Le nouveau produit associe des micro capteurs de gaz et de liquides à des modèles d'intelligence artificielle (IA) établis à partir de bases de données constituées depuis la création de l'entreprise.

SANTÉ: BIENTÔT DES CONSULTATIONS EN LIGNE



LA MÉDECINE DE DEMAIN...

JE PEUX SAVOIR
CE QUE TU FAIS DEVANT
L'ORDINATEUR ?



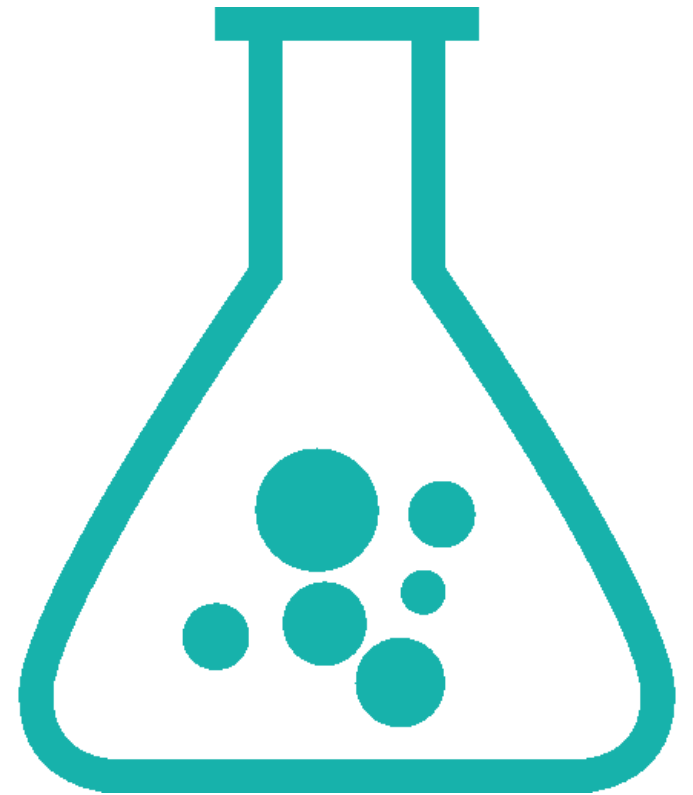
JE SUIS CHEZ
LE DOCTEUR !



10/18.



BLOOD ANALYSIS



Other Body Fluids

Tasso scores \$6.1M for patch-based home blood testing

The Cedars Sinai-incubated company plans to launch its first product in Q2 2019.

By [Jonah Comstock](#) March 05, 2019 www.mobihealthnews.com

Tasso's first product, Tasso **OnDemand** (previously known as Hemolink), is a blood collection device that can be mailed to the patient, used at home, and transmit the data directly to a lab for processing. Rather than using a needle, the patient collects the blood through a patch worn on their forearm, which can be configured to collect whole blood, plasma, or dried blood spots.



TAP At-Home Blood Collection System Now FDA Cleared

DECEMBER 18TH, 2019 WWW.MEDGADGET.COM

Seventh Sense Biosystems, a company based outside of Boston, MA, won FDA clearance for its TAP device to be used by laypersons to collect blood. Moreover, the device is now cleared to be used at home by individuals for “wellness testing,” according to the company.

The sing-use device features microneedles that penetrate the skin without causing significant pain, unlike large needles that can be both painful and frightening. It is only a few centimeters in diameter and can draw up to 100 micro liters of whole blood, which is sufficient for many clinical lab tests.



Science Fiction Inspired Handheld Diagnostic Device

SEPTEMBER 28TH, 2018 WWW.MEDGADGET.COM



The handheld diagnostic device consists of a fingertip-sized sensor that interfaces with a user's smartphone.

The [results](#) of early tests of the device focused on **four metabolite biomarkers** (choline, xanthine, cholesterol and sarcosine), all of which are associated with heart attack, kidney failure, and prostate cancer risk.

The readings made by the device were validated against standard tests for **glucose** and **cholesterol** in UK's National Health Service (NHS) labs and found to be in good agreement.

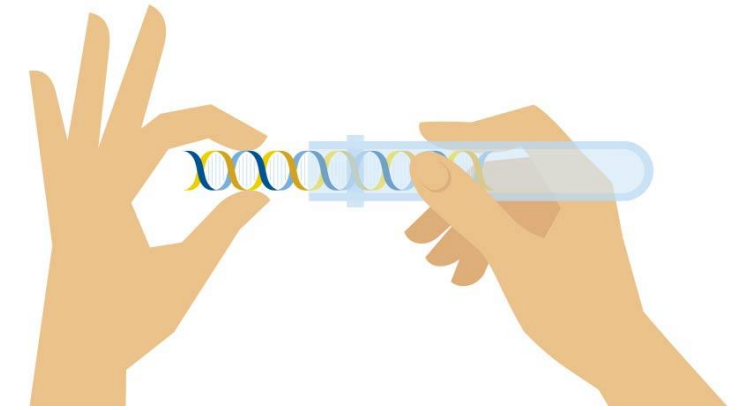
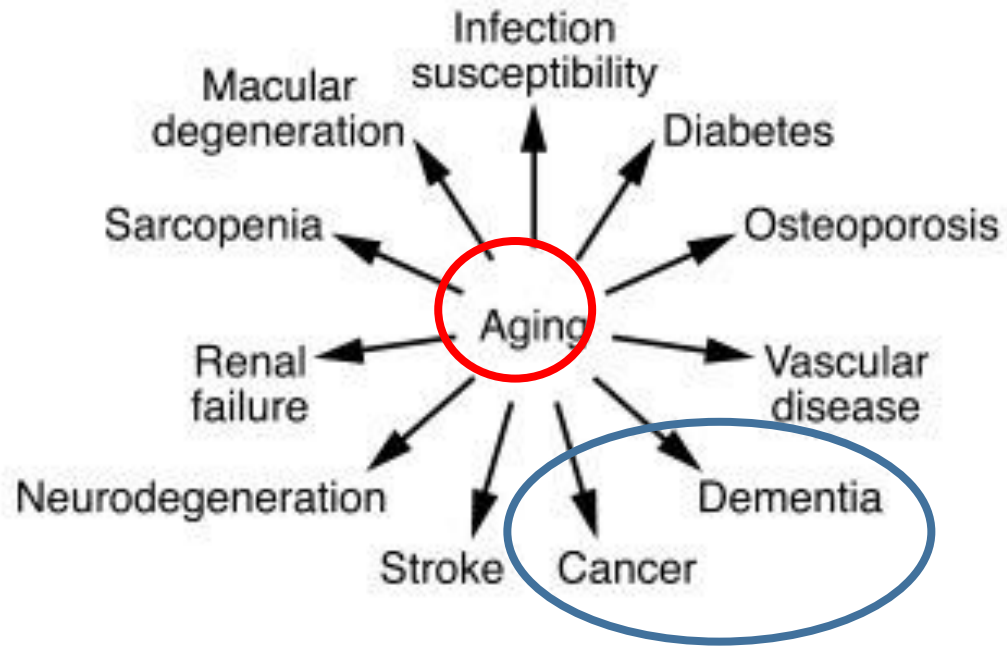
Credit Card Sized Diagnostic Lab Plugs into Smartphone

FEBRUARY 7TH, 2020 WWW.MEDGADGET.COM



Researchers at the University of Cincinnati have developed a tiny portable diagnostic device that can detect the **presence of specific pathogens in a saliva sample**, and relay the results to a doctor when plugged into a smartphone. The device can potentially diagnose a wide array of diseases, including malaria, HIV and Lyme disease, and could be useful for point-of-care testing and even self-testing.

Interestingly, in addition to helping diagnose infectious or chronic diseases, the system could also help people **to monitor their mental health by measuring levels of stress hormones**. Many measurements of mental health are subjective, but sending such stress hormone data to a doctor could provide objective data related to someone's mental health.



Un test sanguin détecte plusieurs types de cancer avec une grande précision

MediQuality Medscape 8-10-2019

Le test, développé par GRAIL, Inc., utilise la technologie de séquençage de nouvelle génération pour détecter les profils de méthylation de l'ADN associés au cancer dans de l'ADN sans cellule.

La spécificité globale du test était de 99,4%, avec seulement 0,6% des résultats indiquant à tort que le cancer était présent.

La sensibilité du test était moins impressionnante, à 54,7% en général et à 75,8% dans les types de cancer pré-spécifiés.

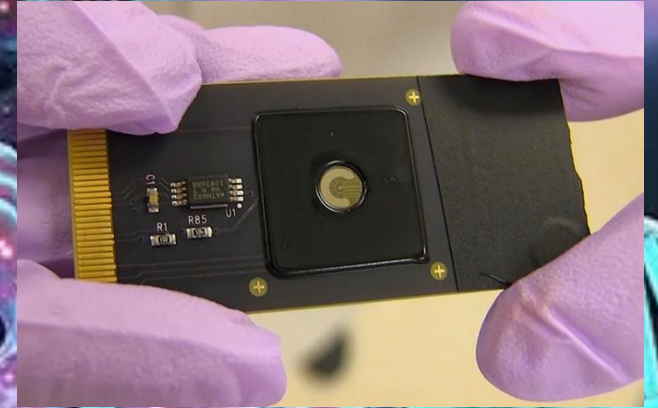
NEW BLOOD TEST COULD DETECT ALZHEIMER'S 20 YEARS BEFORE SYMPTOMS

WWW.FUTURISM.COM AUGUST 2ND 2019

It's not quite ready to become a fully-fledged diagnostic test just yet: the success rate of the new test was only 88 percent in a test involving 158 adults over 50 years old.

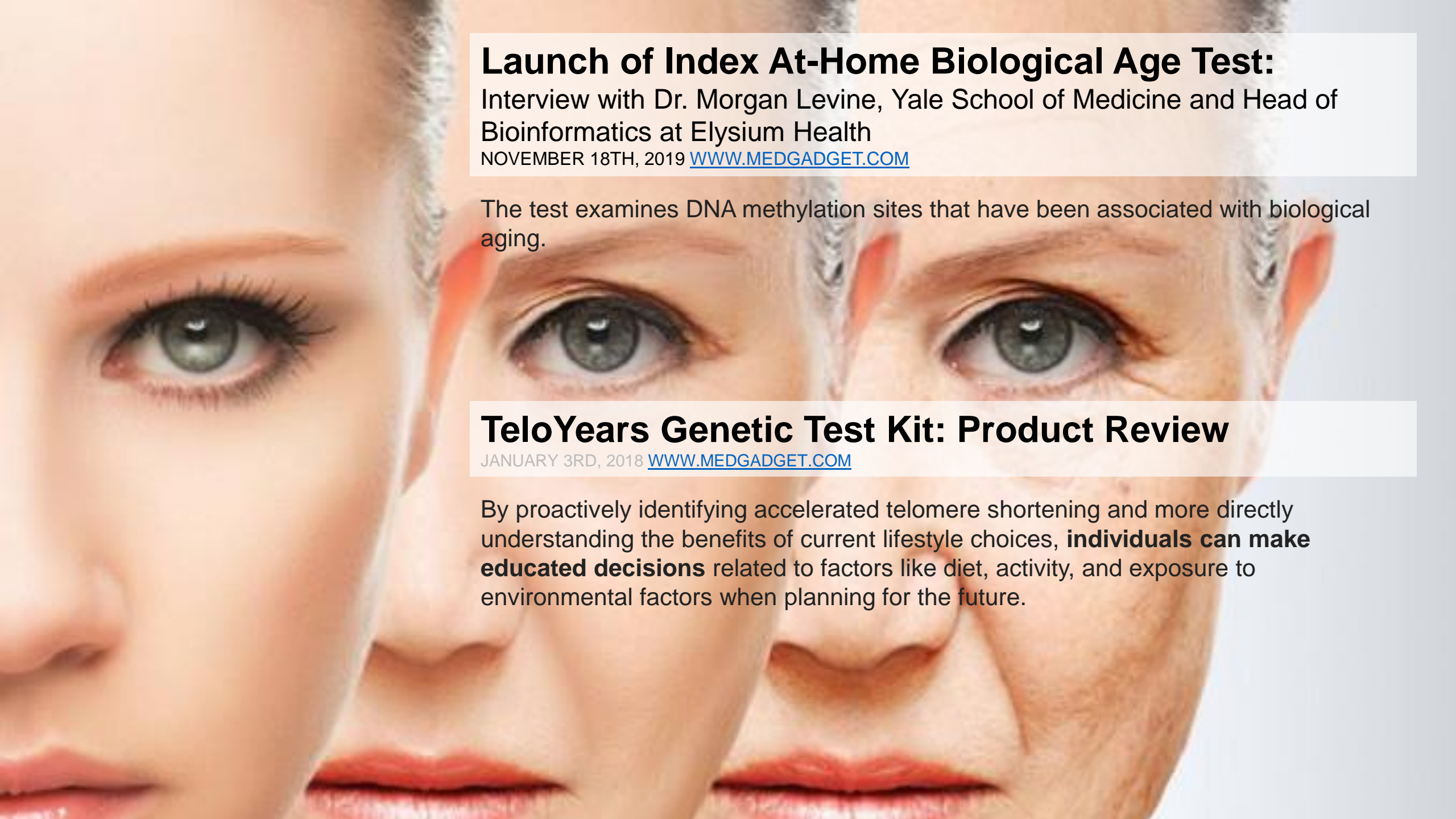
CRISPR-Chip Can Detect Genetic Mutations Within Minutes

MARCH 26TH, 2019 WWW.MEDGADGET.COM



Researchers at the University of California, Berkeley and the Keck Graduate Institute of The Claremont Colleges have developed a **hand-held device** that can **detect genetic mutations**, such as those causing genetic diseases or affecting how people respond to certain drugs, in **just minutes**.

The device employs a combination of CRISPR and graphene transistors to achieve this. The researchers hope that it could make the process of diagnosing genetic conditions and predicting drug responses easier and more accessible, potentially **leading to point-of-care DNA analysis**.



Launch of Index At-Home Biological Age Test:

Interview with Dr. Morgan Levine, Yale School of Medicine and Head of Bioinformatics at Elysium Health

NOVEMBER 18TH, 2019 WWW.MEDGADGET.COM

The test examines DNA methylation sites that have been associated with biological aging.

TeloYears Genetic Test Kit: Product Review

JANUARY 3RD, 2018 WWW.MEDGADGET.COM

By proactively identifying accelerated telomere shortening and more directly understanding the benefits of current lifestyle choices, **individuals can make educated decisions** related to factors like diet, activity, and exposure to environmental factors when planning for the future.

Blood-Based “Liquid Health Check” Beats Traditional Predictors of Multiple Disease Risks

December 3, 2019 Genetic Engineering & Biotechnology News

The results of their proof-of-concept study involving more than **16,000 participants**, and published in *Nature Medicine*, showed that while the accuracy of models based on **specific protein expression patterns** varied, they were all either **better predictors** than models based on traditional risk factors, or would constitute **more convenient and less expensive** alternatives to traditional testing.

Plasma protein patterns as comprehensive indicators of health.
[Nature Medicine](#) volume 25, pages1851–1857(2019)

Wearables prove reliable in determining mortality risk in adults, study shows

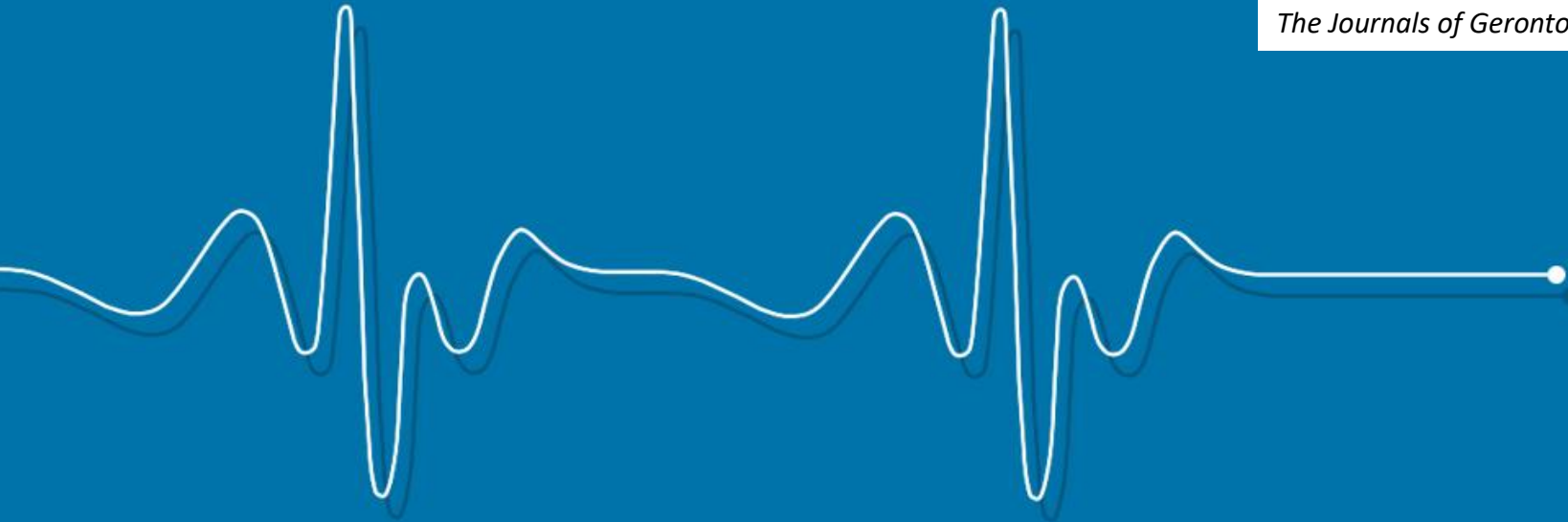
Data from the **accelerometers** allowed researchers to correctly rank the mortality risk using 30-40 percent more accuracy than when using data about smoking status or a patient's stroke or cancer history.

By [Nathan Eddy](#) November 01, 2019 www.HealthcareITNews.com

The [study](#) indicated wearable devices like fitness trackers, smart health watches, heart rate monitors and GPS tracking devices are more effective than patient surveys and other methodologies in providing key predictors of mortality

The Predictive Performance of Objective Measures of Physical Activity Derived From Accelerometry Data for 5-Year All-Cause Mortality in Older Adults: National Health and Nutritional Examination Survey 2003–2006.

The Journals of Gerontology: Series A, glz193, <https://doi.org/10.1093/gerona/glz193>

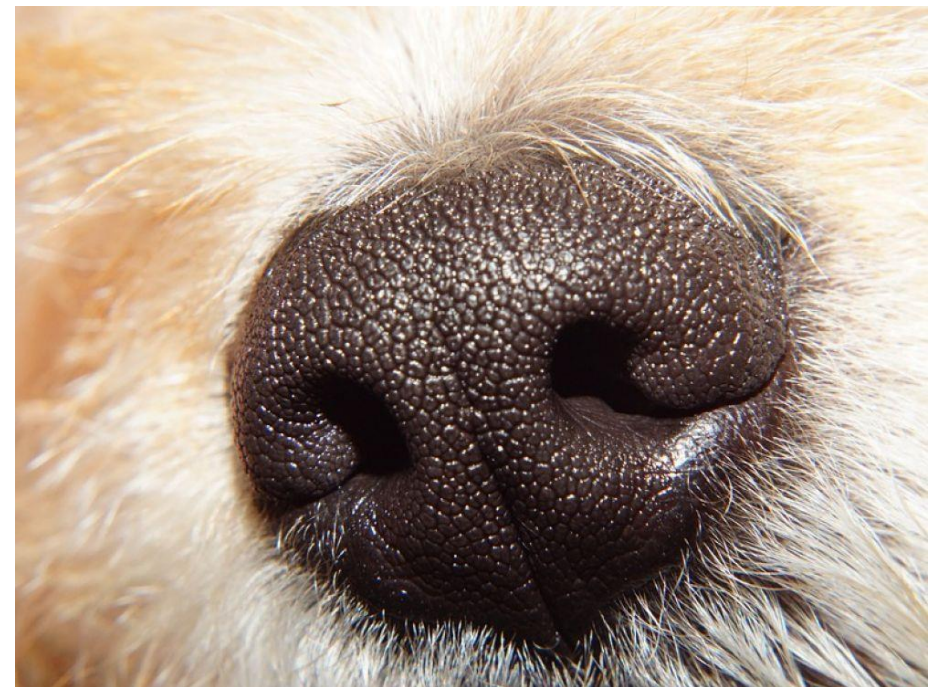




Coucke PA:

Poser un diagnostic: avez-vous du flair?

Rev Med Liège 2019; 74(11):611-615.



How Accurate Are Breath Tests for Cancer Detection?

Nick Mulcahy August 23, 2018 www.medscapeoncology.com

As a group, breath tests to detect cancer have a **relatively high level of sensitivity and specificity**, despite the fact that they are still only in experimental stages of development. This is the conclusion from a new meta-analysis of early trials of the concept.

The study was [published online](#) August 16 in *JAMA Oncology*.

In the new analysis, Hanna and colleagues identified **63 studies**, all of which were phase 1 biomarker trials. They report that the studies showed that for cancer diagnosis, **the mean (SE) area under the ROC curve for breath VOC analysis was 0.94** (0.01). The team also reports a **pooled sensitivity of 79%** (95% confidence interval [CI], 77% - 81%), and a **pooled specificity of 89%** (95% CI, 88% - 90%).

Do people with Parkinson's disease smell different?

Published Thursday 21 March 2019 Medical News Today

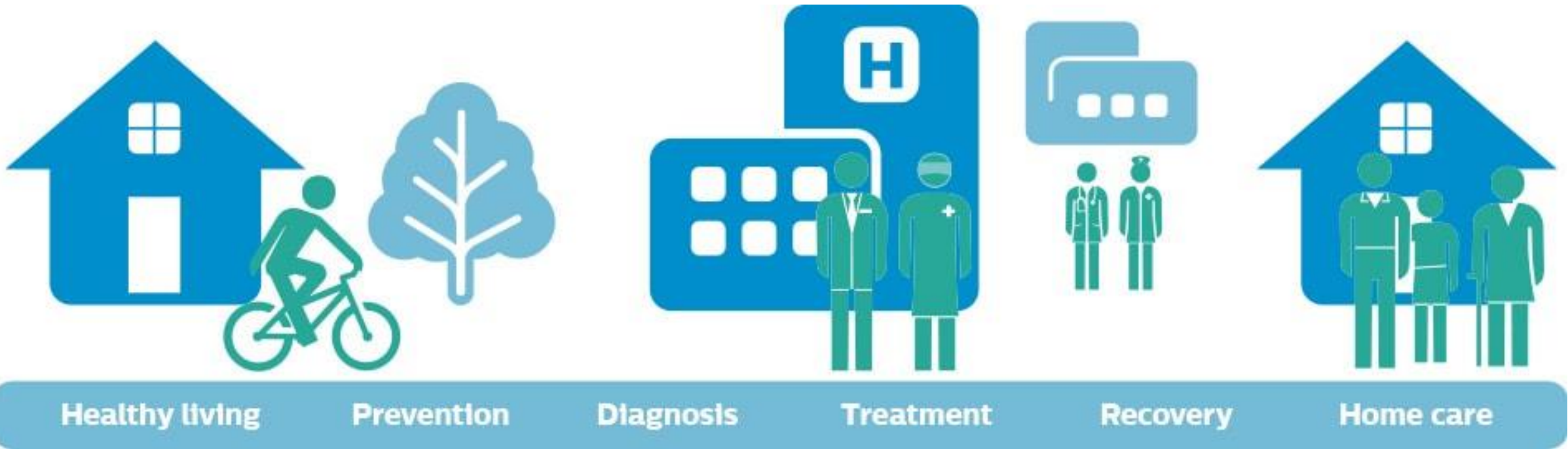
Discovery of Volatile Biomarkers of Parkinson's Disease from Sebum

*ACS Cent. Sci.*201954599-606

Publication Date: March 20, 2019 <https://doi.org/10.1021/acscentsci.8b00879>



From hospital care to home care in a connected ecosystem



A hospital without patients

The cutting edge of health care is tucked off a St. Louis highway exit. And it's eerily quiet.

By [ARTHUR ALLEN](#) 11/08/2017 Politico

It has nurses and doctors and a cafeteria, and the staff spend their days looking after the very sick—checking their vital signs, recording notes, responding to orders and alarms, doing examinations and chatting with them.

There's one thing Mercy Virtual doesn't
have:
Beds !



The most important factor driving Mercy Virtual isn't technology or new thinking but **new payment systems**. In the near future, the hospital's administrators believe, instead of earning fees for each treatment administered, **insurers and the government will pay Mercy Virtual to keep patients well.**

Votre séjour à l'Hôtel des Patients

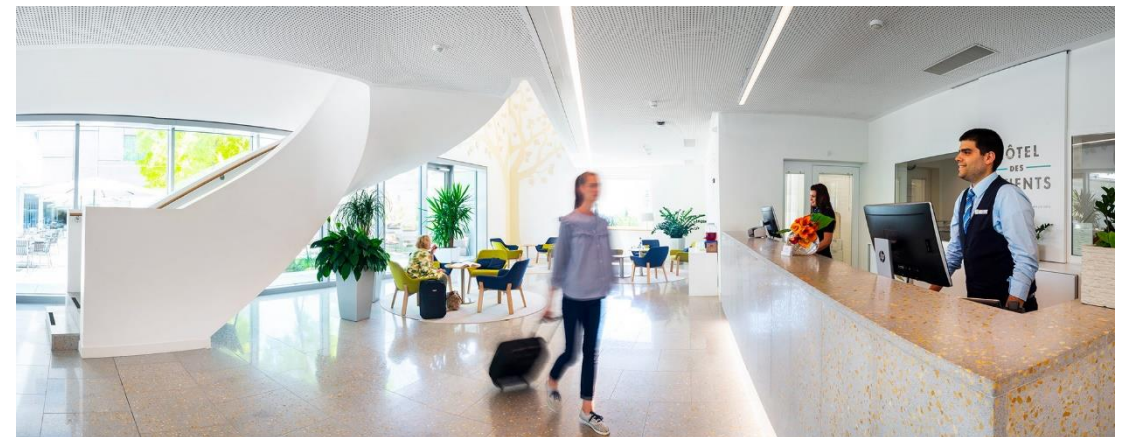


Des hôtels hospitaliers pour le confort des patients

Le CHU de Montpellier figure parmi les 41 établissements retenus par le ministère des solidarités et de la santé pour tester le dispositif des hôtels hospitaliers.

Ces structures d'hébergement doivent permettre de servir de sas entre l'hôpital et le domicile de certains patients.

Ysis Percq, à Montpellier, le 21/07/2017 Lacroix





Patient of the Future New 'smart' tools will empower millions to diagnose and manage their condition at home.

September 2nd 2015 health.usnews.com

Home-based connected health to overtake hospital-based by 2019

October 14th 2014

www.mobihealth.news

UK NHS to spend nearly 6 billion\$ to go digital including remote care & health apps

February 12th 2016 imdeicalapps.com



One of the NHS' goals is to have 25% of chronic conditions like hypertension and diabetes monitoring their health remotely by 2020

NHS to offer free devices and apps to help people manage illnesses

June 17th 2016 The Guardian



FDA clears Current Health's remote monitoring platform for home use

Recently deployed in US and UK hospitals, the company's upper-arm wearable and accompanying platform may now go home with the patient.

By [Dave Muoio](#) April 24, 2019 www.mobihealthnews.com

Current Health is experiencing overwhelming **customer demand** for its platform, combining its all-in-one wireless wearable, which provides **ICU-level accuracy and tracks more vital signs** than any other all-in-one wearable available, with analytics to derive actionable insights

Patients open to remote monitoring to reduce doctor visits, survey shows

Overall interest in wearables devices such as Fitbit or the Apple Watch was high, with more than half of those polled saying they would use such a device at home.

By [Nathan Eddy](#) June 26, 2019 www.HealthcareITNews.com

The study of 100 participants ages 40 and over, conducted by connected healthcare solutions provider VivaLNK, found **nearly two-thirds (64 percent) would put on a wearable health monitoring device** if it meant it reducing the number of trips made to visit a doctor or hospital.

Satelia mise sur la télésurveillance pour réduire l'hospitalisation des insuffisants cardiaques

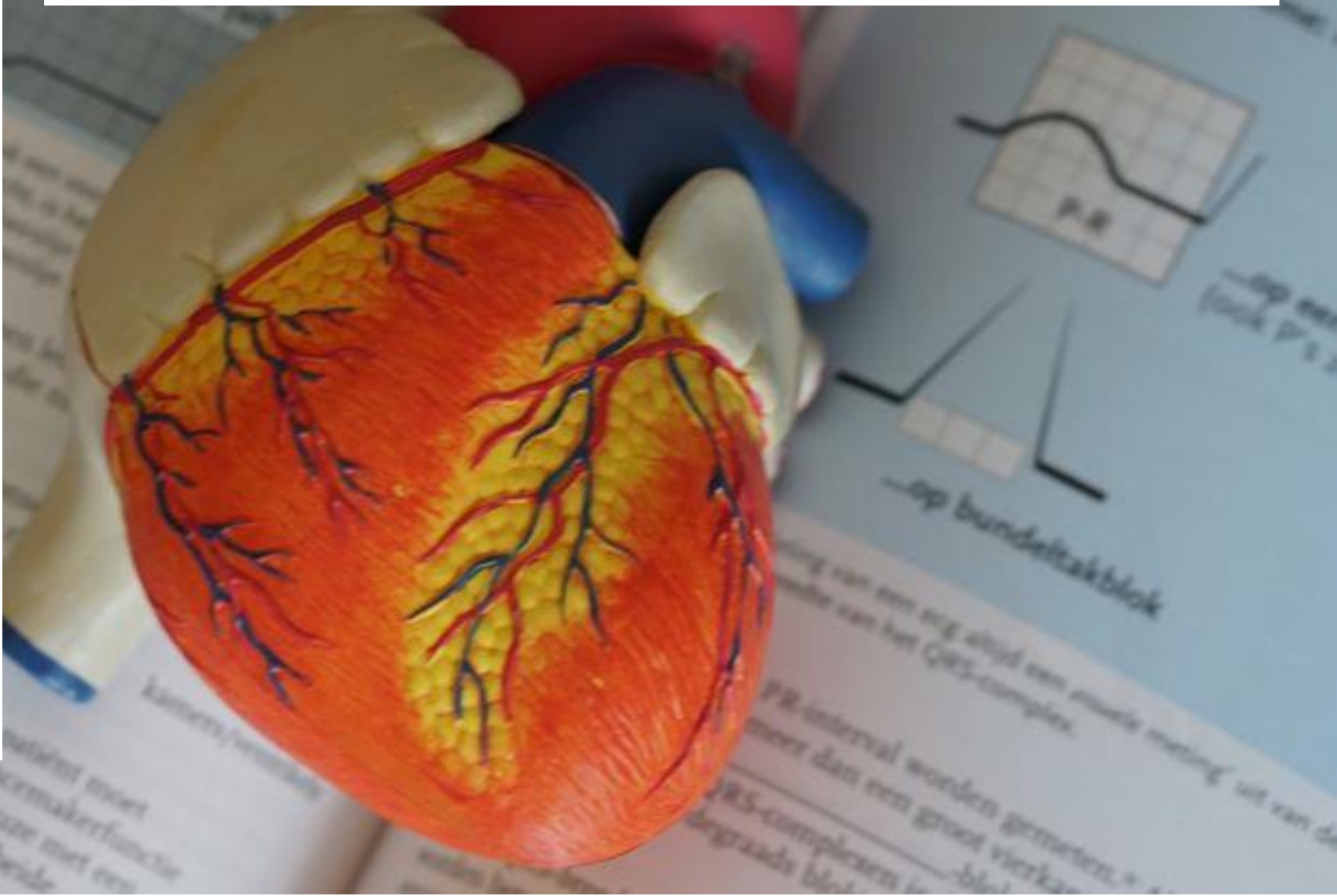
La start-up bordelaise Satelia a mis au point une application de télésurveillance pour les **500 000 personnes** atteintes d'insuffisance cardiaque en France.

Reposant sur l'utilisation d'un algorithme prédictif, ce dispositif médical est géré à distance par les cardiologues qui sont alertés quand les réponses remplies par le patient sont préoccupantes. L'objectif de Satelia est double : diminuer le taux de mortalité grâce à un suivi accru et réduire le taux d'hospitalisation, qui coûte très cher à la collectivité.

[Alice Vitard](#)

Publié le 13 février 2020 L'Usine Digitale

*"Avec le Centre hospitalier universitaire de Bordeaux, on a développé un algorithme qui analyse les réponses des patients et qui **prédit s'ils vont être hospitalisés**"*





Alert fatigue!

CareMore, Sentrion's remote monitoring pilot combines machine learning, human insight

By [Jonah Comstock](#) May 18, 2016 WWW.MOBIHEALTHNEWS.COM

The Sentrion Remote Patient Intelligence platform uses biosensors to monitor patients remotely, but the company uses **machine learning to customize the alert parameters for each patient.**

When they set the initial parameters, determined by CareMore physicians, they were predicting 60 to 70 percent of COPD hospitalizations, with a high number of false positives, Kriendler said. After six months of machine learning, they'd created an algorithm that detected 88 percent of hospitalizations five days in advance, with only a 3 percent incidence of false positives.



**Telemédecine ...
Myth or reality?**

Symptomatic employees often turn to online searches rather than doctors

Data from an **Aetna International survey** also suggest that employers and convenient digital tools could play a role in connecting these potential patients to care.

By [Dave Muoio](#) February 06, 2020 www.mobihealthnews.com

Telemedicine eases work-life balance for solo practitioner, adds revenue stream

800 of Dr. Scott Jensen's patients have thus far opted for virtual visits in rural Arizona. The telehealth tech has an easy ROI, he says, and boosts patient satisfaction.

By [Bill Siwicki](#) February 04, 2020 www.HealthcareITNews.com

AMA sees surge in health IT adoption, 'rise of the digital-native physician'

Its new report on emerging technologies sees appetite and aptitude growing for telehealth and virtual visits, remote patient monitoring, clinical decision support and more.

By [Mike Miliard](#) February 06, 2020 www.HealthcareITNews.com

- A new survey polling thousands of international office workers suggests that **two in five will opt to search their symptoms online and self-medicate** rather than visit a doctor, with the same amount admitting that doing so makes them more nervous about seeking care from a professional.
- And while 40% said they hadn't seen a doctor in the past year despite long-term health worries, 35% and 33% noted that they **would be more likely to visit a professional if they could book their service or view their personal health data through an app or online tool**.
- Digital adoption, including telehealth, is a top priority for healthcare professionals, but thus far, fewer than 10% have executed a full digital strategy.



Connecting Los Angeles: LANES drives interoperability across LA County

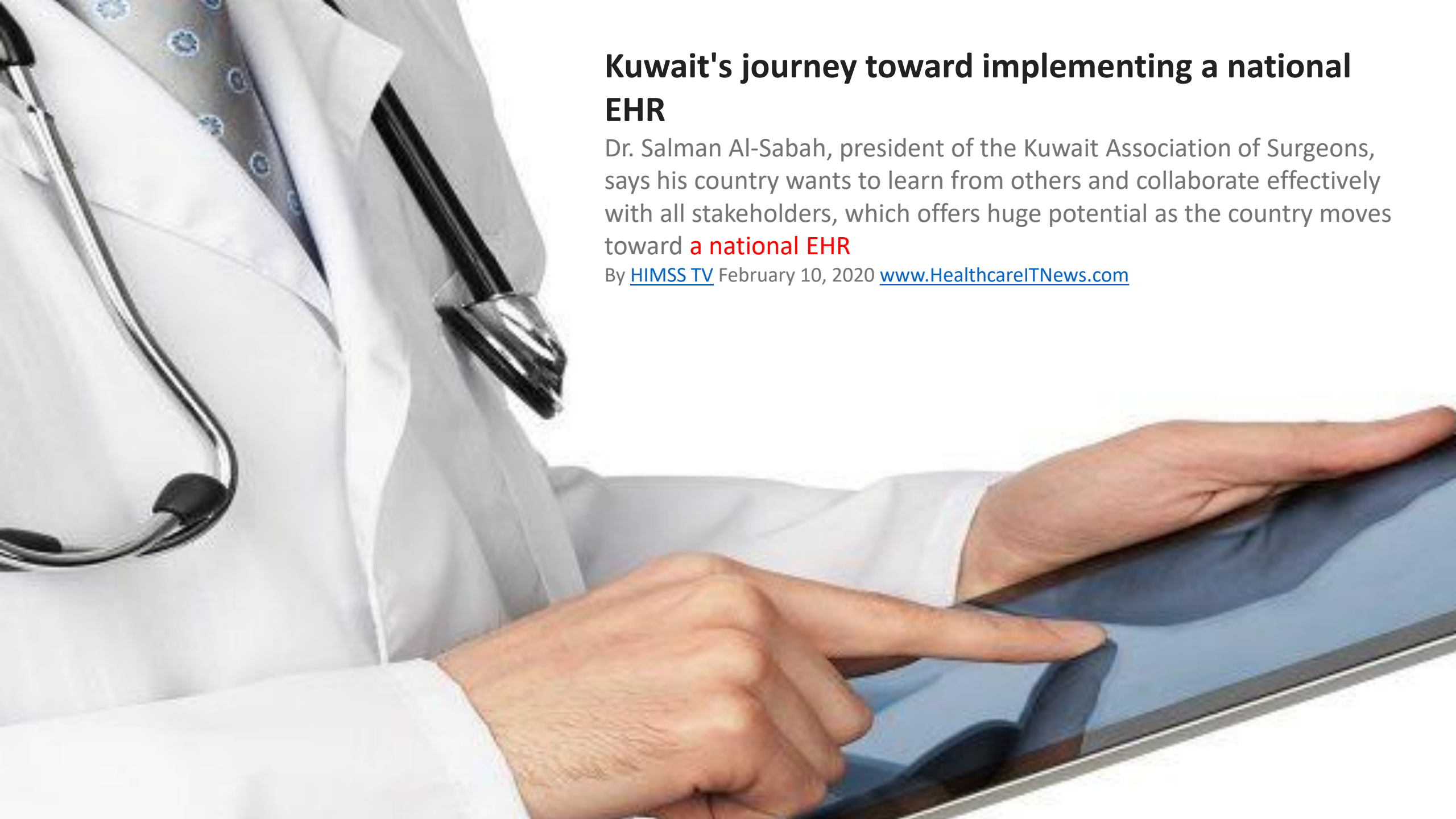
In a region of 10 million residents, the nonprofit Los Angeles Network for Enhanced Services is helping achieve care coordination, closing care gaps when providers are able to access data at the point of care, using a central interoperable platform.

By [Ali Modaressi](#) February 06, 2020 www.HealthcareITNews.com

AHA also identified "**connecting beyond electronic health records**" as one of six pathway goals to accelerate interoperability.

It's time to **aggregate** medical records and put them to good use for the LA providers and our patient community. Our healthcare ecosystem is littered with fragmented patient encounter data. LANES connects local providers across the care continuum to the most up-to-date patient data when needed from various sources.

Our lack of quality, relevant and reliable patient data and the inability to share it poses a significant challenge for providers as patients transpose across care settings.



Kuwait's journey toward implementing a national EHR

Dr. Salman Al-Sabah, president of the Kuwait Association of Surgeons, says his country wants to learn from others and collaborate effectively with all stakeholders, which offers huge potential as the country moves toward **a national EHR**

By [HIMSS TV](#) February 10, 2020 www.HealthcareITNews.com

Big Data



Patients generate 1 million data points an hour. What can healthcare do with that?

HIMSS June 4th 2018



Big Data in Health Care in the era of a **connected** patient in the **IoMT**

- Electronic Health Records
- Public Records
- Search Engine Data
- Wearable Devices →
- Smart Phones
- Payer Records
- Government Agencies
- Patient Portals
- Research Studies
- Generic Databases

Continuomics

OMICS

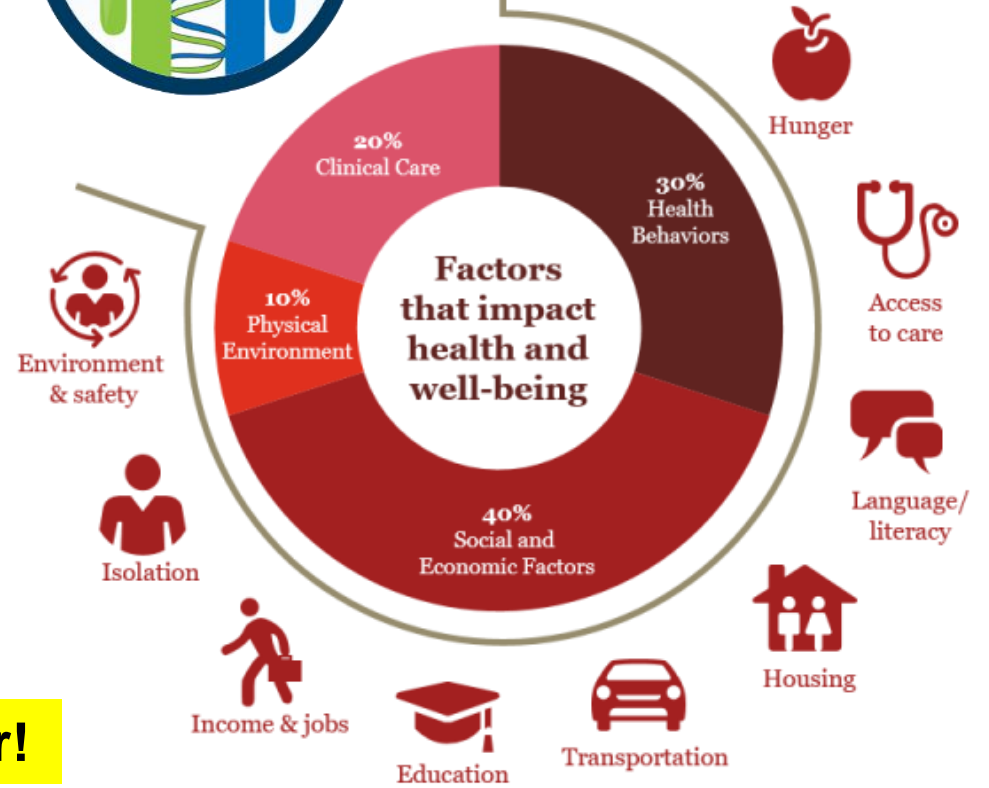
Exposome

amazon.in

UBER



80% of individuals' health is determined by behaviors and the social and environmental conditions in which they live, work and play



Genetic loads the gun, environment pulls the trigger!

SDoH have a significant impact on patient health – more so, in fact than clinical care, which is associated with just 20 percent of a person's health status.



Analytics to help understand social determinants can improve care, boost revenue

More and more providers understand the key role social determinants play in delivering better health outcomes. AI and predictive analytics can help harness that data for better care and higher reimbursement.

By [Benjamin Harris](#) December 13, 2018 www.healthcareITNews.com

Analytics with social determinants drives millions in value-based savings at Carilion

Carilion Clinic has been on a path toward value-based care for more than a decade, but staff realized they needed more support in gaining better insights into their patient population.

By [Bill Siwicki](#) October 22, 2018 www.HealthcareITNews.com

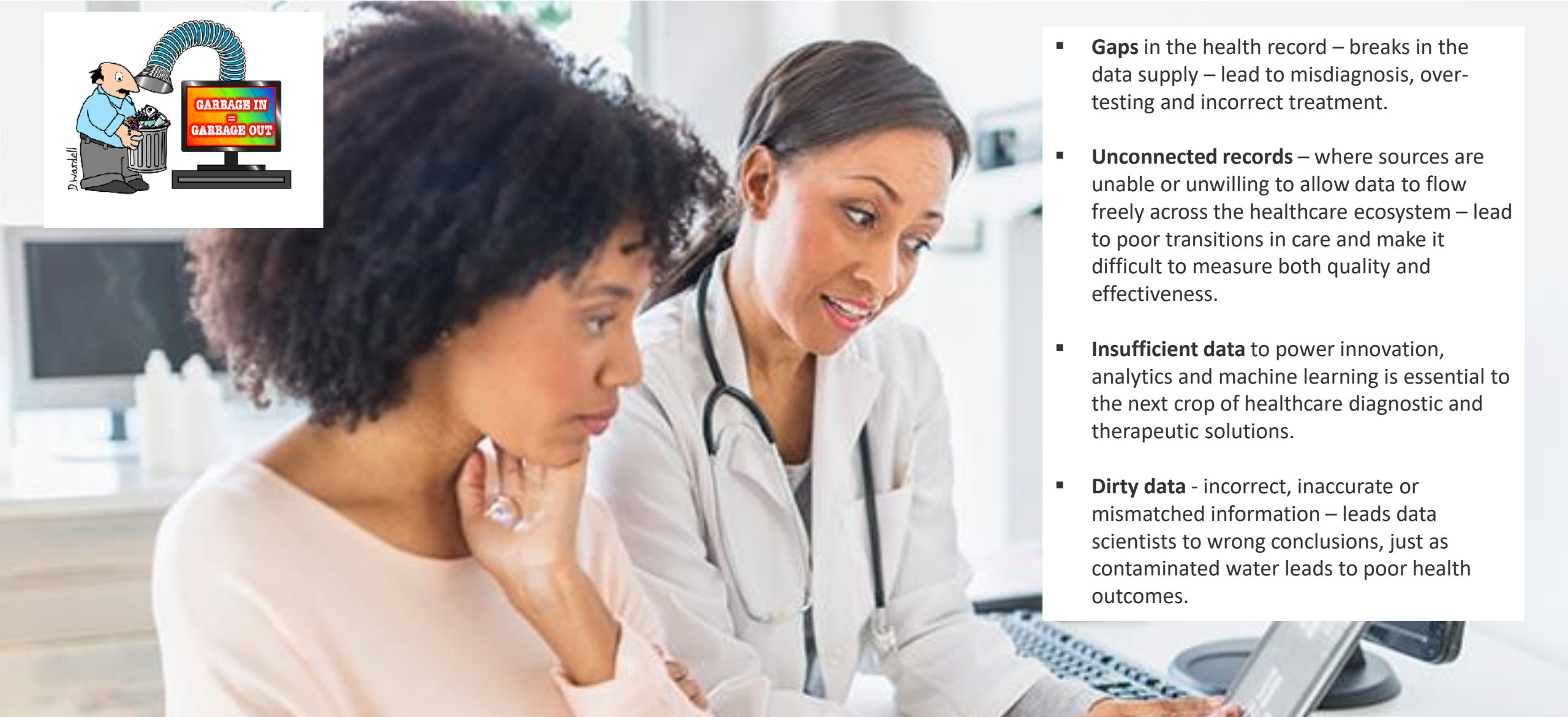
Healthy data is essential to advances in digital health

Digital health requires a healthy data pipeline that's aggregated, normalized, and deduplicated, and ready to be integrated into workflows across the health ecosystem for care coordination, analytics and machine learning.

January 28th 2020 www.HealthcareITNews.com InterSystems



- **Gaps** in the health record – breaks in the data supply – lead to misdiagnosis, over-testing and incorrect treatment.
- **Unconnected records** – where sources are unable or unwilling to allow data to flow freely across the healthcare ecosystem – lead to poor transitions in care and make it difficult to measure both quality and effectiveness.
- **Insufficient data** to power innovation, analytics and machine learning is essential to the next crop of healthcare diagnostic and therapeutic solutions.
- **Dirty data** - incorrect, inaccurate or mismatched information – leads data scientists to wrong conclusions, just as contaminated water leads to poor health outcomes.





Artificial intelligence

- Image analysis
- Medical chatbots
- Prediction

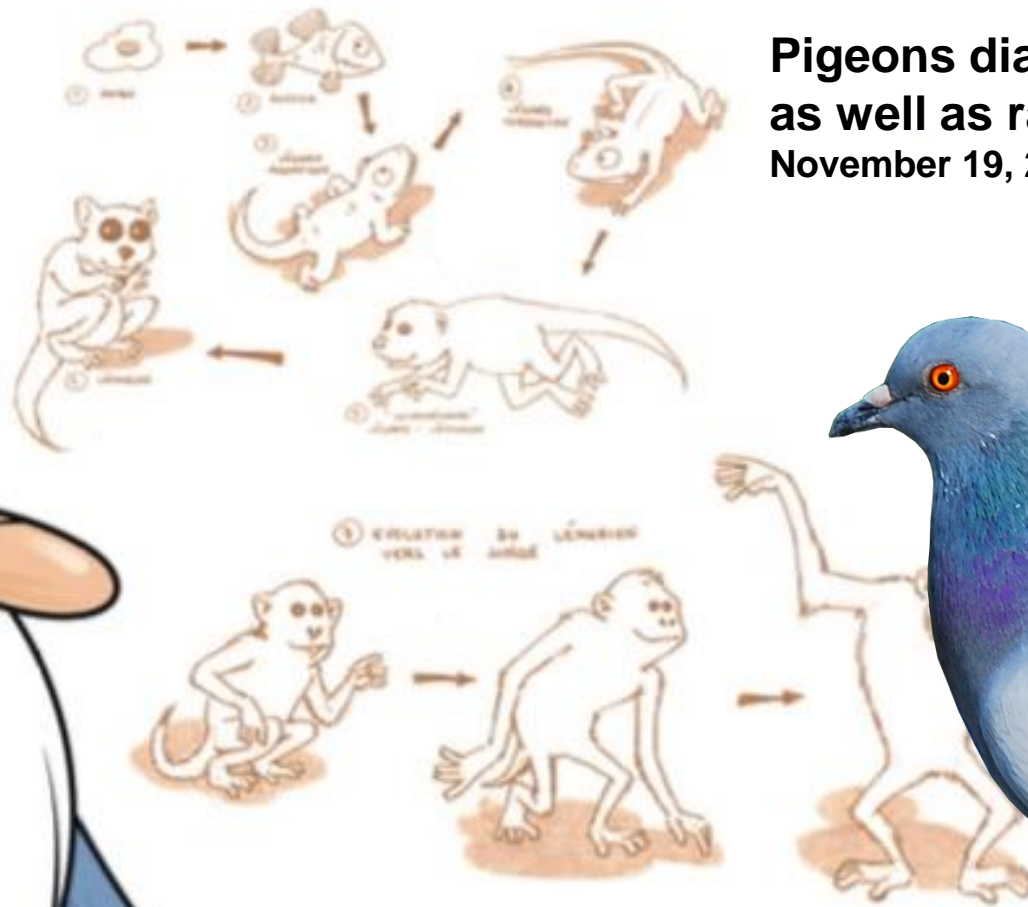


Pigeons diagnose breast cancer on X-rays as well as radiologists

November 19, 2015

Pigeons (*Columba livia*) as Trainable
Observers of Pathology and Radiology Breast
Cancer Images

Published: November 18, 2015
DOI: 10.1371/journal.pone.0141357



IL ÉTAIT UNE FOIS...

...la belle histoire

Industrial Players in the field and their announcements

Watson to Gain Ability to “See” with Planned \$1B Acquisition of Merge Healthcare

CHICAGO - 06 Aug 2015: IBM

GE Healthcare builds out AI, radiology partnerships with Intel, **Nvidia**

By [Bernie Monegain](#) November 28, 2017
www.mobihealthnews.com

NYU and **Facebook** Release Database to Teach AI to Read MRI Scans

NOVEMBER 29TH, 2018
WWW.MEDGADGET.COM

Nvidia launches AI toolkit for radiologists Clara AI*

The toolkit will include **13** classification and segmentation AIs and software tools, designed to help assist radiologists.

By [Laura Lovett](#) March 19, 2019 www.HealthcareITNews.com

*[Microsoft](#) Azure Cloud

Users in the field and their announcements

Intermountain taps Zebra to bring AI to medical imaging

By [Bernie Monegain](#) March 16, 2017

www.mobihealthnews.com

PARTNERS HEALTHCARE (BOSTON) LAUNCHES 10-YEAR PROJECT TO BOOST AI USE

By [Bernie Monegain](#) May 18th, 2017

www.mobihealthnews.com

Digital health news briefs for 1/3/2018

By [Jonah Comstock](#) January 03, 2018 www.mobihealthnews.com

NHS set to offer AI system free to all hospitals.

The [BBC is reporting](#) that new AI systems for interpreting cardiac and lung scans could save England's National Health Service a **billion pounds**.

The cardiac system, called **Ultromics**, was developed at Oxford's John Radcliffe Hospital. It checks radiology scans for signs of heart disease and will be offered to hospitals starting this summer. The other system, which will be commercialized by a startup called **Optellium**, aims to diagnose lung cancer from radiological imagery.



Users in the field and their announcements

GOOGLE'S NEW AI IS GREAT AT SPOTTING BREAST CANCER IN X-RAYS

COULD THIS AI REDUCE OUR DEPENDENCE ON HUMAN RADIOLOGISTS?

BY VICTOR TANGERMANN / JANUARY 02 2020 NEOSCOPE

Compared to human radiologists, the AI model flagged 9.4 percent fewer false negatives and 5.7 percent fewer false positives in the US dataset, and 2.7 and 1.2 percent respectively for the much larger UK dataset.

International evaluation of an AI system for breast cancer screening
[Nature](#) volume 577, pages89–94(2020)

From Niche to Platform

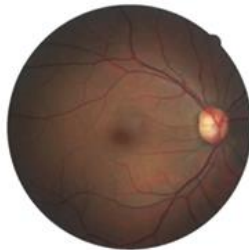
VoxelCloud Automated Medical Image Analysis: Interview with Xiaowei Ding, CEO of VoxelCloud

JUNE 19TH, 2017 WWW.MEDGADGET.COM



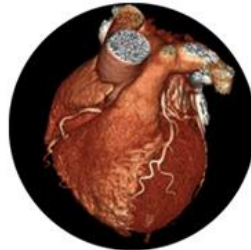
Lung Cancer

Early lung cancer screening workflow with computed tomography



Diabetic Retinopathy

Fully automated retinal lesion staging with digital color fundus photography



Coronary Heart Disease

Coronary heart disease imaging analytics and risk assessment



Liver Disease

Automated liver lesion analysis based on computed tomography

Nvidia focuses on AI, radiology, genomics as it carves out its spot in health

MobiHealthNews sat down with Nvidia's VP of Health Kimberly Powell to talk AI, radiology and what health tech can learn from self-driving cars.

By [Laura Lovett](#) March 20, 2019 WWW.MOBHEALTHNEWS.COM

“I believe our legacy could really be making that contribution to **creating the computing platforms** for everyone. This is going to take an army. It's not one company that is going to solve the problem, it's not one institution who can solve the problem, and that is Nvidia's contribution — enabling a whole **ecosystem** to transform things.”



NVIDIA®

Professional organizations

American College of Radiology unveils free AI software development platform

By [Nathan Eddy](#) April 08, 2019 www.HealthcareITNews.com

- The software, developed by the ACR's Data Science Institute (vendor neutral), gives radiologists a set of tools to develop AI algorithms at their own facilities, using their own data, engineered behind their own institutional firewalls.
- The open, vendor-neutral framework will also give radiologists the ability to learn about AI, contribute datasets, share algorithms, develop and evaluate models.



Siemens Healthineers, European Society of Radiology partner on digitalization

By [Nathan Eddy](#) April 29, 2019 www.HealthcareITNews.com

- Siemens Healthineers and the European Society of Radiology (ESR), which represents more than 10,000 members worldwide, are launching a collaborative arrangement to promote digitalization within the radiology community.
- The partnership started with a first course on AI, which was held in Barcelona earlier this month as part of the European Congress of Radiology (ECR), where it focused on the digital future of radiology.

"No human being is going to be able to read a radiology PACS image nearly as well as a computer would, just because the pixelation gets down to such fine points that our eyes can't see it," *Healthcare IT News January 30rd 2018*

Why Vinod Khosla thinks radiologists still practicing in 10 years will be 'causing deaths'

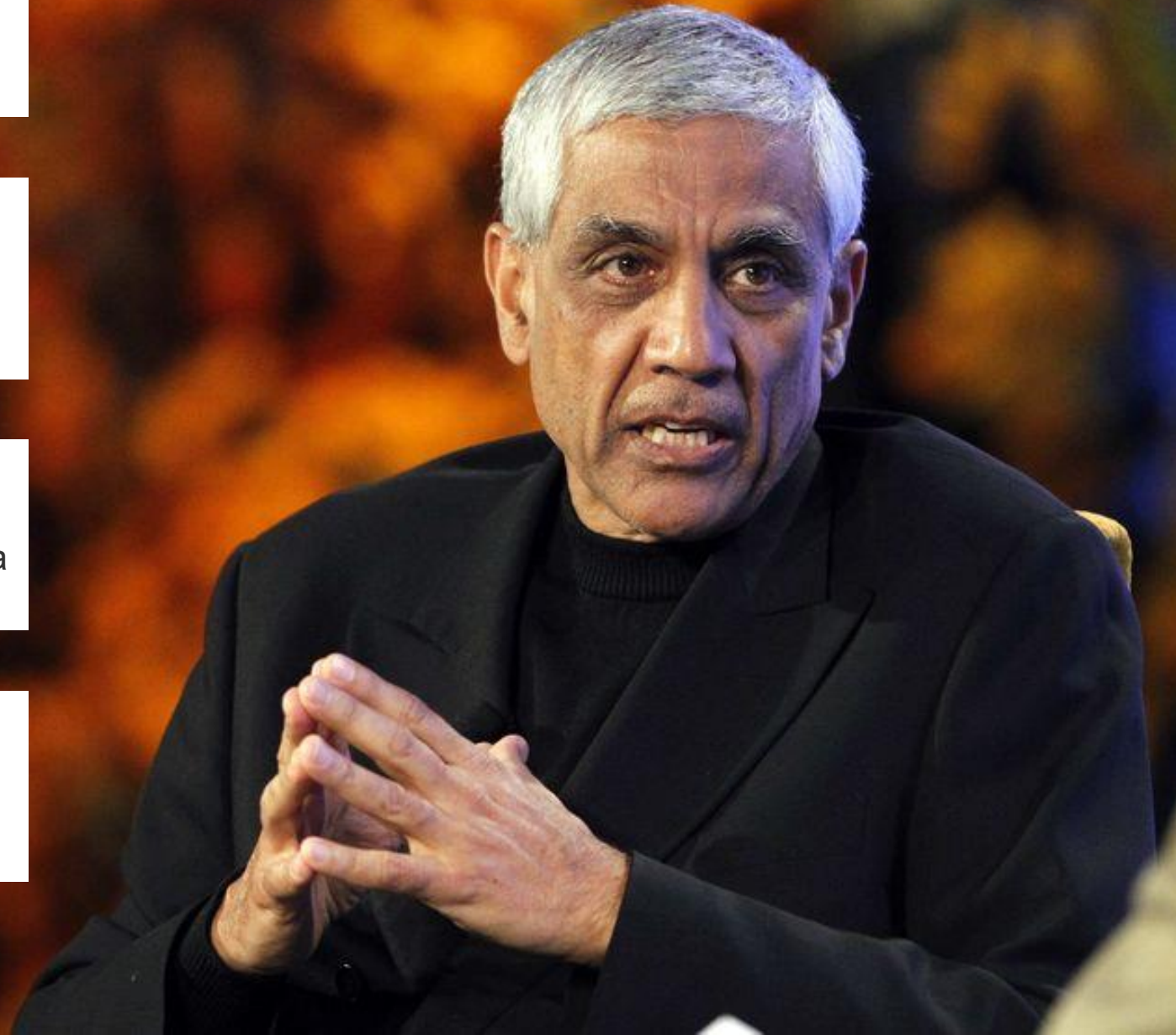
Darrell Etherington@etherington / June 2019 TechCrunch

Investor and Sun cofounder Vinod Khosla says 80% of IT jobs can be replaced by automation and it's 'exciting'

Business Insider November 8th 2016

Khosla added that he also believes that oncologists will also be surpassed by alternatives based on domain-specific AI solutions, but that that's probably a bit further out on the 15-year horizon.

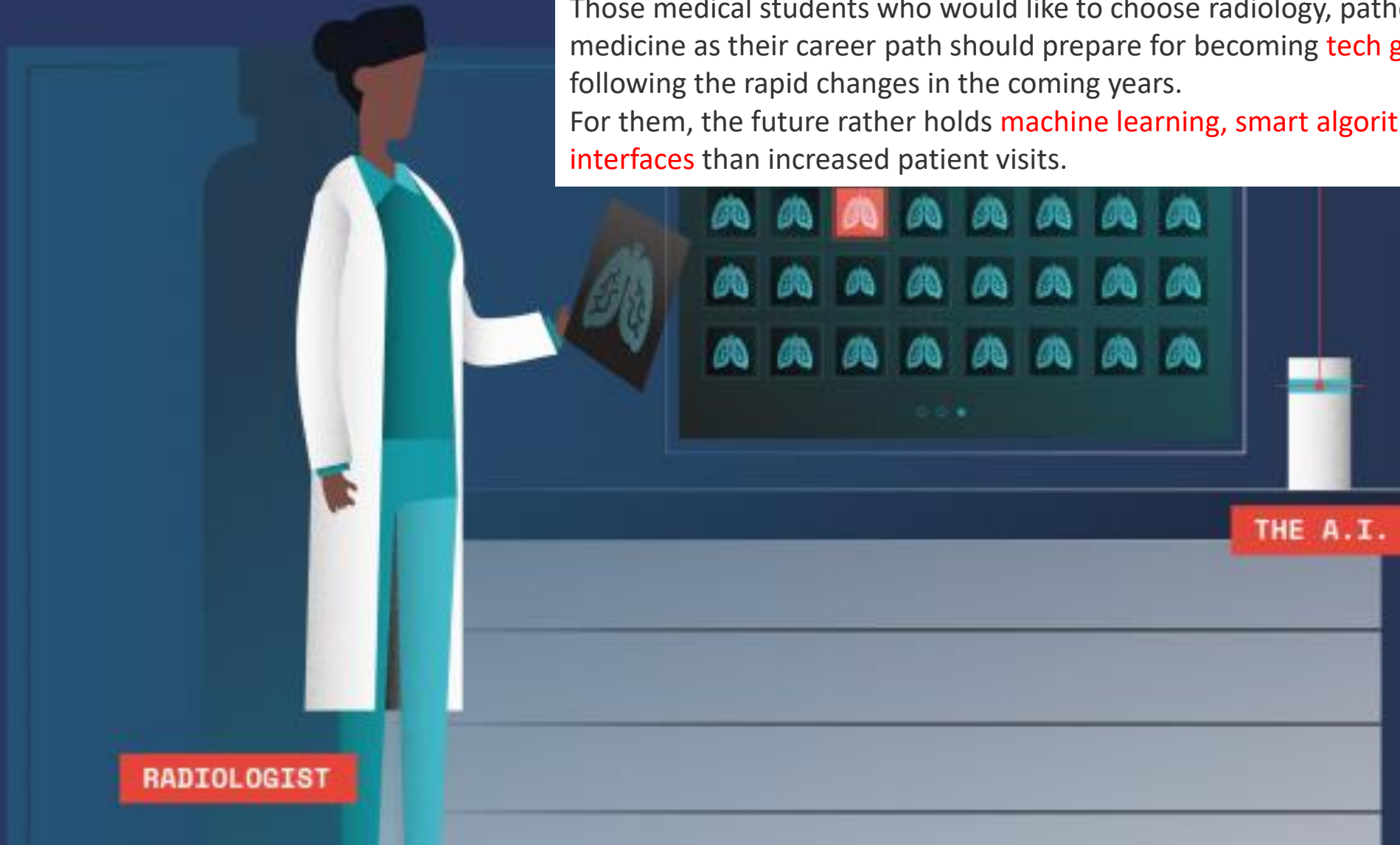
Khosla noted further that oncology is "much easier to automate" than the job of a factory worker, since the job of a factory worker "has much more dimensionality."



Peeking Into The Technological Future of Medical Specialties

The Medical Futurist 9 May 2019

Those medical students who would like to choose radiology, pathology or forensic medicine as their career path should prepare for becoming **tech gurus** and closely following the rapid changes in the coming years. For them, the future rather holds **machine learning, smart algorithms, or interactive interfaces** than increased patient visits.



Nuance to debut new AI-powered systems for imaging at HIMSS20

They will be in the Nuance AI Marketplace for Diagnostic Imaging, which is designed to provide a **one-stop shop** for radiologists to review and purchase AI models to improve their workflow.

By [Bill Siwicki](#) February 05, 2020 www.HealthcareITNews.com



The AI Marketplace is similar **to the idea of an app store** – a digital marketplace that enables subscribers to **purchase applications**, or, in the case of Nuance, AI models.

The goal is to connect developers to radiologists, creating a direct line of communication to help build and improve AI models **to meet their evolving needs and improve functionality** of algorithms from development to practice.

AI-assisted cardiac ultrasound guidance software receives De Novo clearance

Caption Health's tool instructs **non-expert medical staff** on how best to produce high-quality diagnostic images in real time.

By [Dave Muoio](#) February 07, 2020 www.Mobihealthnews.com

The Caption Guidance tool guides medical professionals through a heart disease diagnostic test that normally requires an ultrasound expert.

Today's marketing authorization enables medical professionals who may not be experts in ultrasonography, such as a registered nurse in a family care clinic or others, to use this tool.



Astronauts tap into telehealth to treat a blood clot

A new case study published in the New England Journal of Medicine runs through how astronauts employed telemedicine to get the right medications to a patient in space.

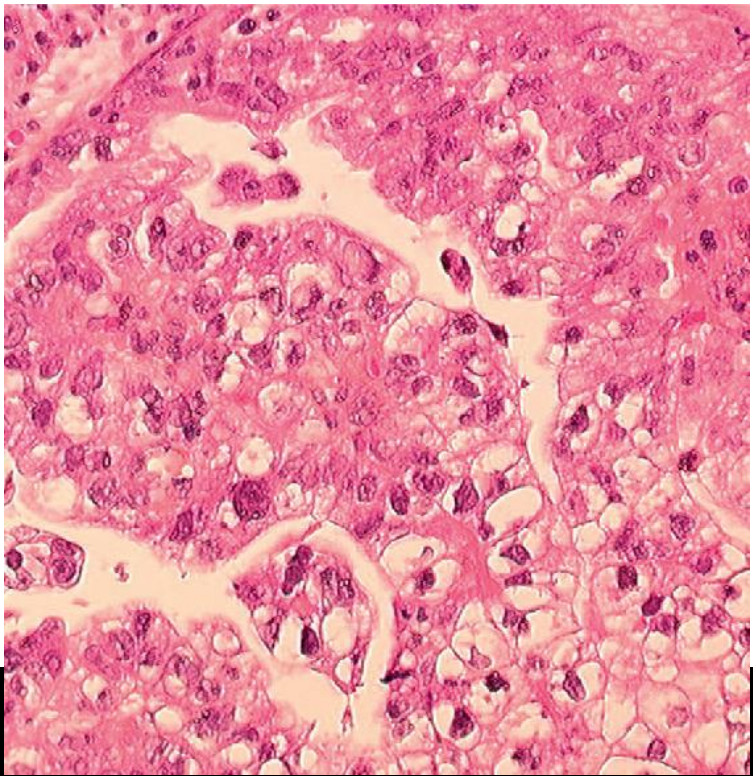
By [Laura Lovett](#) January 07, 2020 www.Mobihealthnews.com

Recently the [New England Journal of Medicine](#) published a case study outlining a situation when telehealth came into practice in outer space.

Using telemedicine, doctors onboard the ISS performed a follow-up **ultrasound** with the help of two radiologists on Earth. After the blood clot was confirmed, a team of multiple physicians on Earth evaluated the patient.

The doctors decided to treat the patient with blood thinner, but the medications were restricted by what was available onboard.







How Chatbots Can Ease Primary Care Burden Artificial intelligence in primary medicine isn't just the future -- it's already here

Bertalan Mesko PhD May 10th , 2018 MedPage Today

Un robot chinois vous accueille à l'hôpital pour le prédiagnostic

15 novembre 2018 MediQuality

Nourri avec **53 livres** de médecine, **deux millions de dossiers de patients**, **400'000 rapports médicaux** et plus d'un **million d'images** au total.

Babylon's triage chatbot launches in British Columbia

By [Dave Muoio](#) March 07, 2019 www.mobihealthnews.com

Babylon Health to launch its triage chatbot service in US next month

The company's US lead said that two "very large" strategic partners have already been secured, with hopes to lock down as many as five by next year.

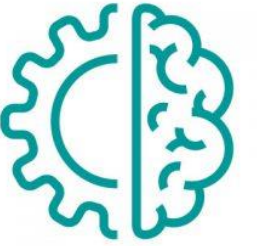
By [Dave Muoio](#) December 18, 2019 www.mobihealthnews.com

New study finds health chatbot decreases uncertainty among patients

The JAMA study also found that patients employing Buoy Health's tool reduced the level of urgency they originally associated with their condition.

By [Laura Lovett](#) January 02, 2020 MobiHealthNews

Predictive power of AI:





Machine learning helps UI Health Care reduce **surgical site infection** by 74%, save \$1.2 million

By [Bill Siwicki](#) September 10, 2018 www.HealthcareITNews.com

An electronic health record–based real-time analytics program for patient **safety** surveillance and improvement.

November 2018 Patient safety network

Machine learning eliminates **false alarms** in intensive care

In intensive care units (ICU), some monitoring device or other is always sounding the alarm. Soon, a smart algorithm might tell apart the really important alarms.

January 24th 2019 www.Healthcare-in-Europe.com

Algorithm Predicts Early Mortality Risk on Starting Chemo

www.MedscapeOncology.com July 27th 2018

Should Coma Patients Live or Die? Machine Learning Will Help Decide.

September 27th 2018 www.futurism.com

Artificial Intelligence Improves Ovarian Cancer Prognosis

February 15, 2019 Genetic Engineering & Biotechnology News

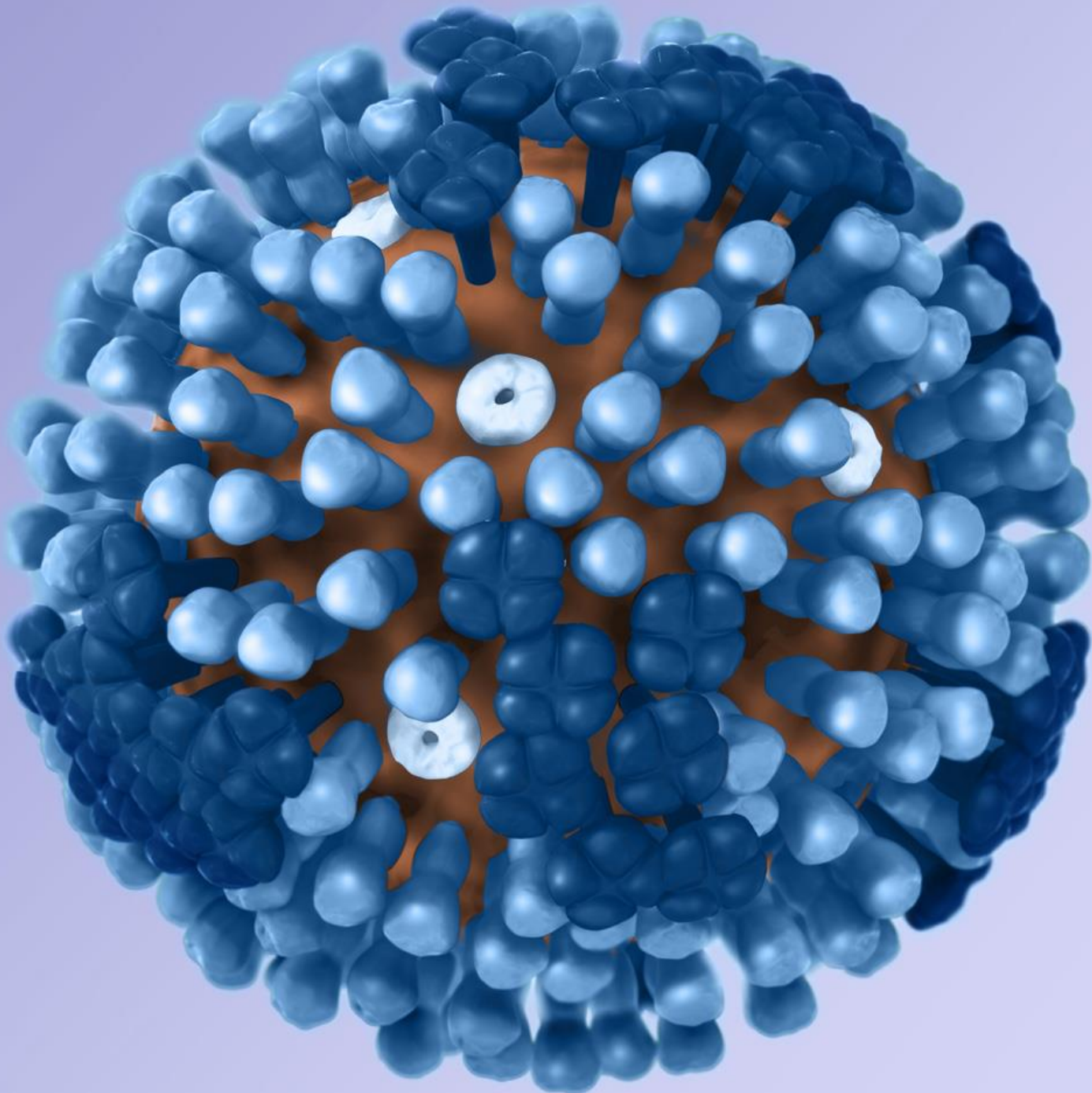


Des hôpitaux et Synapse Medicine s'associent pour déceler les interactions médicamenteuses grâce à l'IA

Les CHU de Bordeaux et Rennes, l'Inserm, l'Hôpital Georges Pompidou et la start-up Synapse Medicine s'associent pour concevoir un outil capable d'identifier les risques d'interactions médicamenteuses, responsables de 2 à 5% des hospitalisations des personnes âgées. Ils viennent de remporter un appel à projet lancé par le ministère de la Santé.

[Alice Vitard](#) |

Publié le 21 janvier 2020 L'Usine Digitale



Fitbit user data could be key to swifter population flu tracking

By combining prior CDC data with **heart rate and sleep measurements**, Scripps developed a new disease tracking model that they say could deliver speedy and accurate estimates.

By [Dave Muoio](#) January 20, 2020 www.MobiHealthnews.com

The Scripps researchers obtained and **used de-identified sensor data from more than 200,000 US Fitbit users** between the dates of March 1, 2016 to March 1, 2018. By honing in on users from five states who wore their device for at least 60 days and met other eligibility criteria, they landed on a final dataset of more than **13.3 million resting heart rate and sleep duration measurements**.

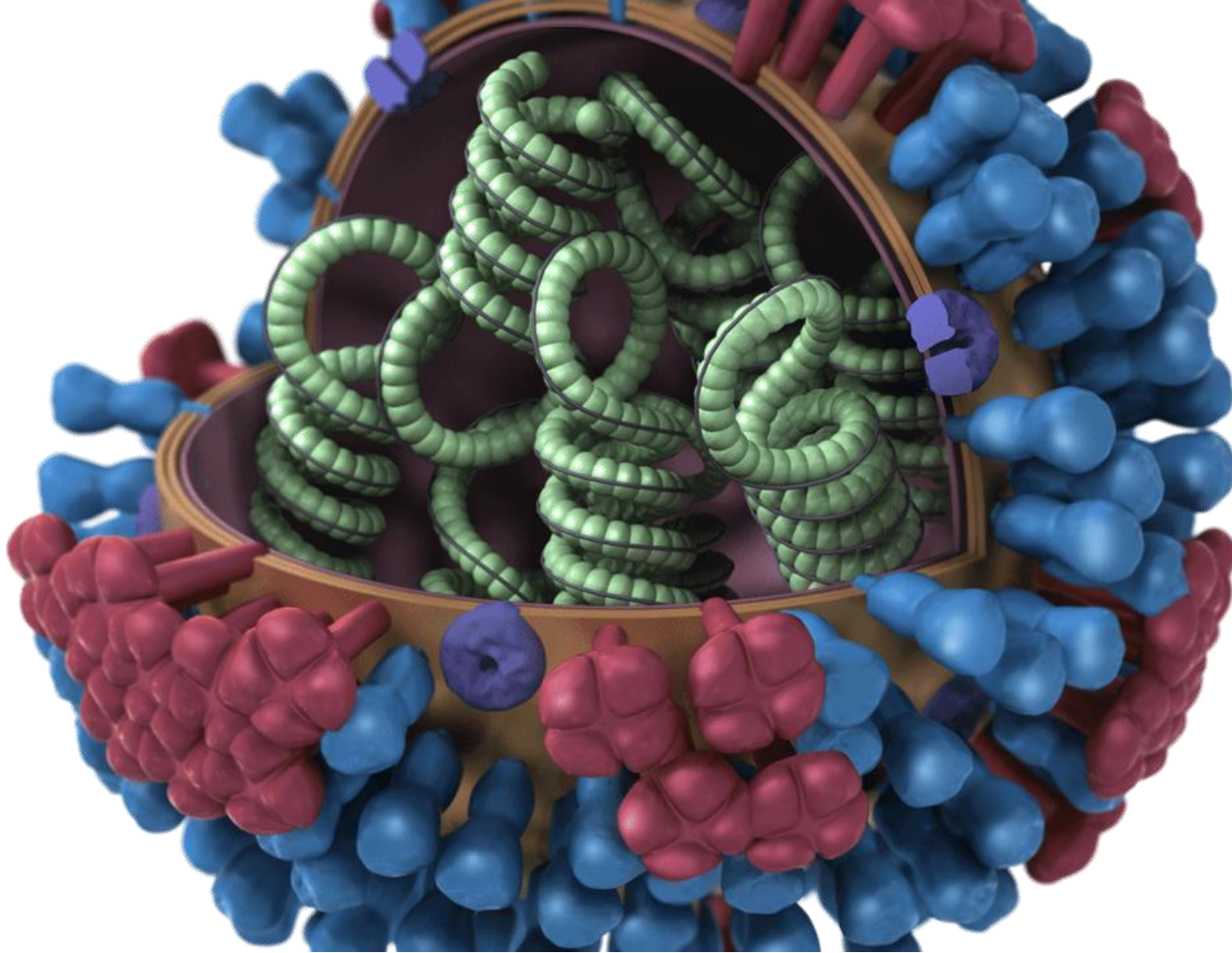
The team set weekly thresholds for increased resting heart rates and sleep level that would denote periods of illness, and developed models that took these biomarkers into account alongside three-week lagged CDC ILI incidence data.

Harnessing wearable device data to improve state-level real-time surveillance of influenza-like illness in the USA: a population-based study

Published: January 16 The Lancet Digital Health ,
2020 DOI: [https://doi.org/10.1016/S2589-7500\(19\)30222-5](https://doi.org/10.1016/S2589-7500(19)30222-5)

Improved PCR Flu Diagnostic for Pandemic Response: Interview with Chris Hole of TTP

FEBRUARY 20TH, 2020 WWW.MEDGADGET.COM



[TTP](#), a technology company based in Melbourn, UK, is developing a handheld PCR (polymerase chain reaction) diagnostic device that can rapidly detect influenza viruses, and one day other viruses, in samples of nasal mucus.



Such technology could be crucial in providing diagnostic and surveillance capability for infectious disease outbreaks such as the current coronavirus situation in China.

Smartphone With Laser and Thermal Cameras to Screen Passersby for Fever

FEBRUARY 13TH, 2020 WWW.MEDGADGET.COM

One way to limit spread of coronavirus: remote diagnosis

As fears over the coronavirus continue to circulate—despite the current low likelihood of infection in the United States—telehealth can make a big difference in providing support, information and advice for worried consumers.

By [PETER ANTALL M.D.](#) Feb 20, 2020 MedCityNews

Israel's Sheba Hospital turns to telehealth to treat incoming coronavirus-exposed patients

Datos's remote patient monitoring platform, [Tyto Care's connected devices](#), and a robot from [InTouch Health](#) will help the hospital treat and monitor patients in [quarantine](#) and at home.

By [Jonah Comstock](#) February 19, 2020 [www.mobihealthnews.com](http://WWW.MOBIHEALTHNEWS.COM)

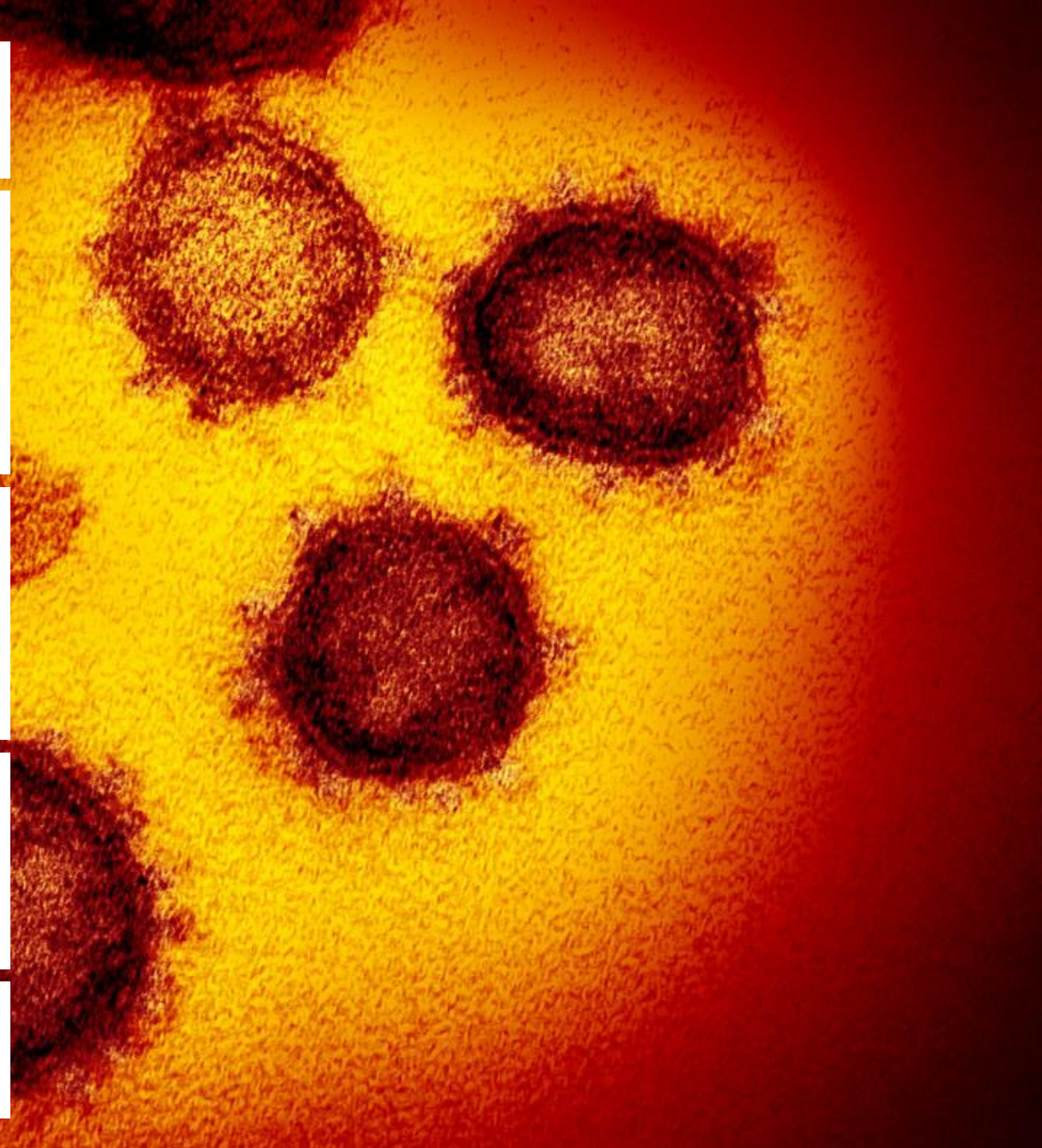
RESEARCHERS TAP AI TO TRACK SPREAD OF CORONAVIRUS

Among other data, researchers can use AI to analyze flight travel data to determine where a disease might appear next.

Jeff Rowe | Jan 28, 2020 AI Empowered Healthcare

AI Predicts Coronavirus Vulnerable to HIV's Atazanavir

[Julianna LeMieux, PhD](#)- February 5, 2020 Genetic Engineering & Biotechnology News



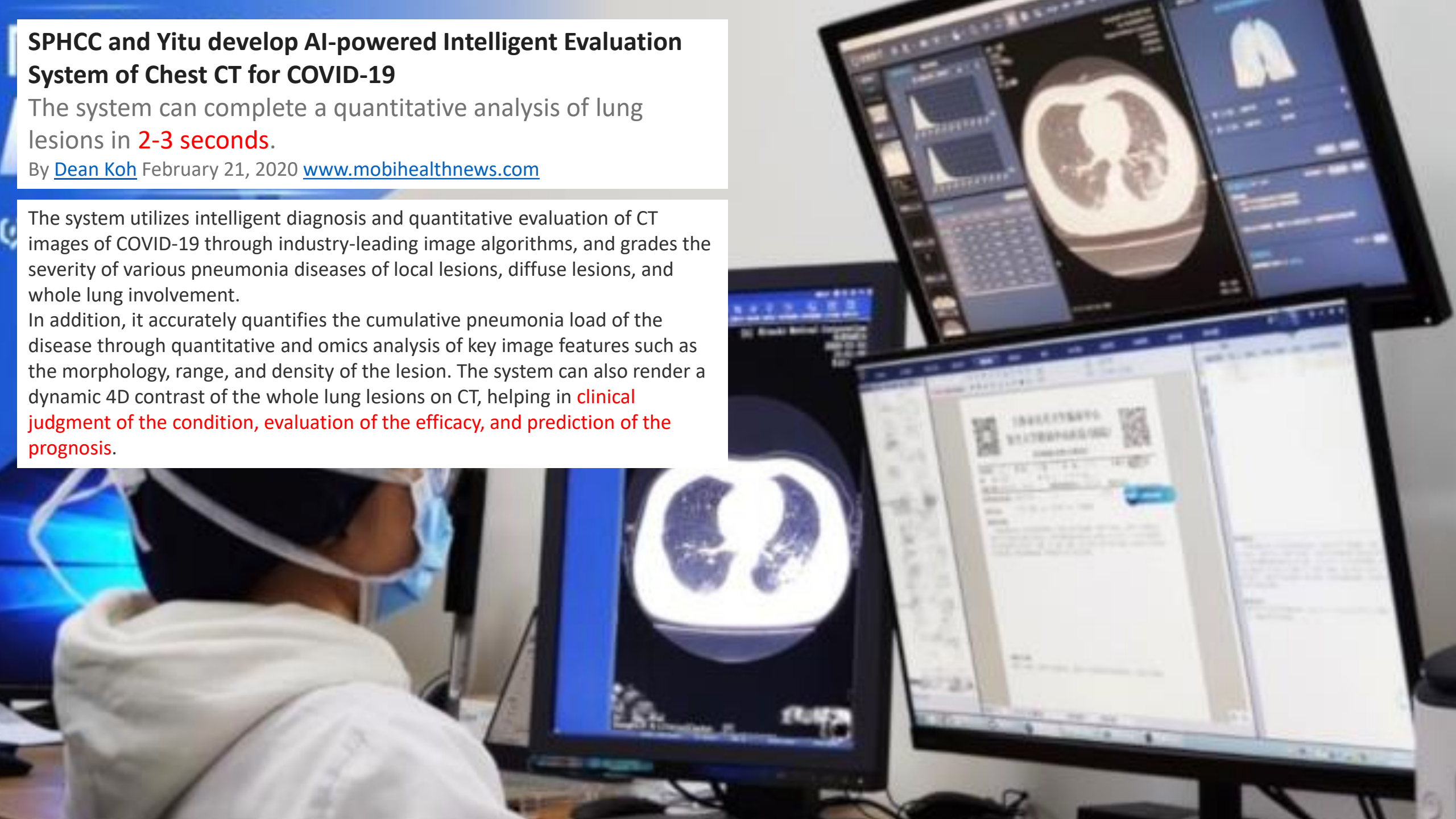
SPHCC and Yitu develop AI-powered Intelligent Evaluation System of Chest CT for COVID-19

The system can complete a quantitative analysis of lung lesions in **2-3 seconds**.

By [Dean Koh](#) February 21, 2020 www.mobihealthnews.com

The system utilizes intelligent diagnosis and quantitative evaluation of CT images of COVID-19 through industry-leading image algorithms, and grades the severity of various pneumonia diseases of local lesions, diffuse lesions, and whole lung involvement.

In addition, it accurately quantifies the cumulative pneumonia load of the disease through quantitative and omics analysis of key image features such as the morphology, range, and density of the lesion. The system can also render a dynamic 4D contrast of the whole lung lesions on CT, helping in **clinical judgment of the condition, evaluation of the efficacy, and prediction of the prognosis**.





**KEEP
CALM
AND
TAKE
CONCLUSION**

KeepCalmAndPosters.com

We are beginning an era where we will go from the practice of medicine to the **science of medicine**

Vinod Koshla

Doctors should be involved in the **most human elements of care**. A very large percentage of what doctors do can be done with technology, which would free the doctor to do other things. **No doctor spends enough time with the typical patient.**

Vinod Koshla

HOW AI MIGHT CHANGE MEDICINE IN THE VERY NEAR FUTURE

For decades, there has been a steady erosion of the practice of medicine, says one prominent stakeholder, but AI may provide at least one effective antidote.

Jeff Rowe | Dec 24, 2019 MedCityNews

Eric Topol:

- Giving doctors and patients **the gift of time** – to get back to where medicine was decades ago, when the relationship was characterized by a deep bond with trust and empathy.
- Instead of the big business that health care has become, we have a unique chance to bring back its essence – the **humanity** of medicine.
- It is ironic that we may depend on artificial intelligence and machines to **promote emotional intelligence**, the time for humans to think and be more human. ... whereby health systems and practices actually compete on the basis of how much time they give to their patients.

PROVIDERS: AI IS HELPING US SPEND MORE TIME WITH PATIENTS

Among the positive developments a new **survey** found, nearly half of respondents said they believe AI has helped to increase their time to consult and treat patients.

Jeff Rowe | Dec 17, 2019 AI Empowered Healthcare



According to the survey of more than 900 healthcare professionals in the U.S. and U.K., nearly half of medical professionals surveyed **said AI is already increasing their ability to spend time with and provide care to patients.**





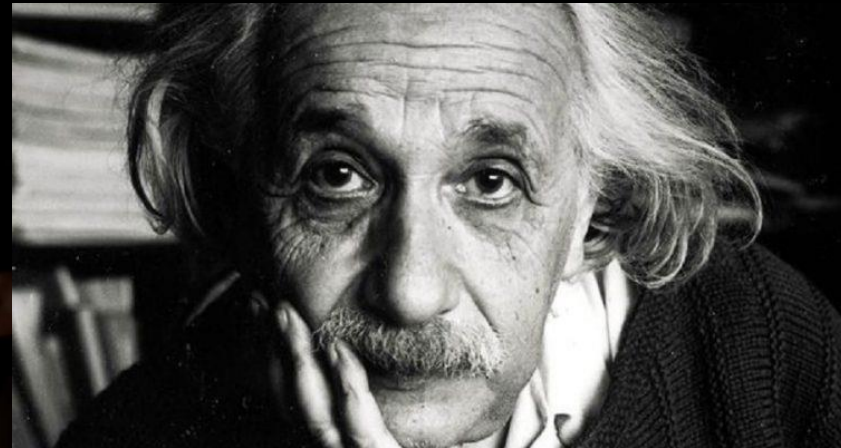
- Care Anywhere
- Care by Teams
- Care by Large Data Sets
- Care by Machines
- Care Globally



**The risk of AI, is failing to work on it,
because it can effect billions of people**

Sundar Pichai

CEO Alphabet (Google) WEF January 22nd 2020



**Insanity is doing over and over again the same thing
and expecting a different result**

Albert Einstein

Intelligence is the ability to change!

Stephen Hawking

Pr Philippe Coucke

La médecine du futur

Ces technologies qui nous sauvent déjà



MARDAGA

Autres écrits récents en cours de publication (RMLG):

1. Coucke PA, Deleuze P: Professionnels de l'imagerie médicale et spécialités annexes: une remise en question s'impose. (Avril 2020)

Articles publiés sur la disruption technologique (RMLG):

1. Coucke PA: Les hackers ont plusieurs longueurs d'avance. Rev Méd Liège 2020; 75(2): 125-129.
2. Coucke PA: Poser un diagnostic: avez-vous du flair? Rev Med Liège 2019; 74(11):611-615.
3. Coucke PA: Laennec contre Forbes: match nul! Comment la technologie nous aide à interpréter l'auscultation. Rev Med Liège 2019; 74(10):543-551.
4. Coucke PA, Gilson L. Nécessité d'un nouvel écosystème en santé. Tous les éléments sont déjà disponibles. Rev Med Liège 2018; 73(9):454-461.
5. Coucke PA. La convergence technologique provoquera rapidement des changements disruptifs en oncologie. Rev Méd Liège 2016; 71(6):291-297.
6. Coucke PA. L'explosion des couts, la recherche de l'efficacité et la transparence: les trois moteurs du changement en Santé publique. Rev Méd Liège 2016; 71(6):287-290.
7. Coucke PA. L'eau se retire, le Tsunami arrive. Healthcare Executive 2015; 81:31-33.
8. Coucke PA. La médecine de demain: science-fiction ou science réalité ? Revue multidisciplinaire d'Oncologie 2015; 9(6):3-4.