

# TOPICAL REPORT

## HEALTHCARE

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### COVID-19 UPDATES



#### Could artificial intelligence have predicted the COVID-19 coronavirus?

"The use of artificial intelligence is now the norm in many industries, from integrating the technology in autonomous vehicles for safety, to AI algorithms being used to improve advertising campaigns. But, by using it in healthcare, could it also help us predict the outbreak of a virus such as the COVID-19 coronavirus?"

Source: Euronews

### DIGITAL HEALTHCARE

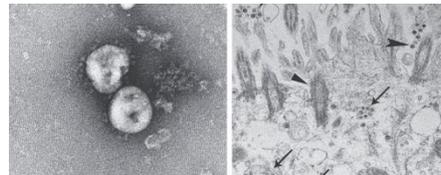


#### Why Apple and Johnson & Johnson's new heart study is a big deal for digital health

"Apple and Johnson & Johnson, a pharma giant, announced plans to team up on Tuesday on a new study that aims to study whether Apple Watch can detect a heart rhythm irregularity called atrial fibrillation among seniors, and encourage them to seek medical help."

Source: CNBC

### COVID-19 RESEARCH



#### Incubation Period and Other Epidemiological Characteristics of 2019 Novel Coronavirus Infections with Right Truncation: A Statistical Analysis of Publicly Available Case Data

"Using publicly available event-date data from the ongoing epidemic, the present study investigated the incubation period and other time intervals that govern the epidemiological dynamics of COVID-19 infections. Our results show that the incubation period falls within the range of 2–14 days with 95% confidence and has a mean of around 5 days when approximated using the best-fit lognormal distribution."

Source: Journal of Clinical Medicine

#### Clinical Characteristics of 24 Asymptomatic Infections with COVID-19 Screened among Close Contacts in Nanjing, China

"Previous studies have showed clinical characteristics of patients with the 2019 novel coronavirus disease (COVID-19) and the evidence of person-to-person transmission. Limited data are available for asymptomatic infections. This study aims to present the clinical characteristics of 24 cases with asymptomatic infection

### HEALTHCARE REPORTS



#### Medicine.nxt

"Doctors, nurses, and patients will see more involvement with medical care, less non-medical overhead, and better health results, along with—hopefully—a reduction in patient costs. Improvements in medical care technologies are expected to bring significant benefits for patients, giving them more control over their ability to self-direct their care. Advances will also help medical professionals who are under pressure to deliver life-saving results while also handling all the compliance paperwork demanded today. In addition, medical professionals will be able to more carefully sculpt medical procedures to patients' needs and deliver more accurate, personalized diagnoses to direct treatments."

Source: Hewlett Packard

## IncludeHealth launches equipment-agnostic digital musculoskeletal platform

"IncludeConnect provides a single digital platform configurable with all strength and cardio equipment, regardless of brand or location, to enable better health and performance outcomes"

Source: EurekAlert

## MACHINE LEARNING & AI IN HEALTHCARE



### New AI Tech Offers Rapid Breast Cancer Screening, without Any Radiation

"A new system that uses sensors and AI technology has been invented by researchers. It will catch breast cancer early, save money, and all without exposing the patients to radiation. The technology was created by researchers at the University of Waterloo in Canada, and uses harmless microwaves and AI software to detect early-stage tumors in a matter of minutes."

Source: Interesting Engineering

### The AI doctor will see you now

"If artificial intelligence in healthcare brings to mind visions of robot surgeons, BioIntellisense's stick-on sensor is bound to be a disappointment. Just 3 inches wide by 1 inch tall, this plastic and metal double hexagon was cleared last month by the US Food and Drug Administration for remote monitoring of vital signs with medical-grade accuracy."

Source: Financial Times

### How AI and machine learning are transforming clinical decision support

"At HIMSS20, Mayo Clinic Platform President Dr. John Halamka and medical journalist Paul Cerrato will explore emerging technologies that are reshaping screening, diagnosis and treatment."

Source: Healthcare IT News

### KPMG: 89% of healthcare execs say AI already is creating efficiencies in their health systems

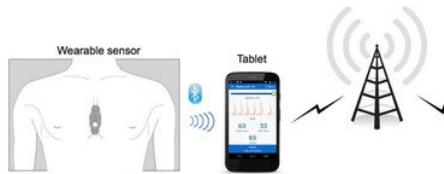
"A majority believe healthcare is ahead of other industries in AI adoption, but 37% say healthcare's pace of AI implementation is too slow, according to the new KPMG report."

Source: Healthcare IT News

screened from close contacts and to show the transmission potential of asymptomatic COVID-19 virus carriers."

Source: MedRxiv

## HEALTH WEARABLES

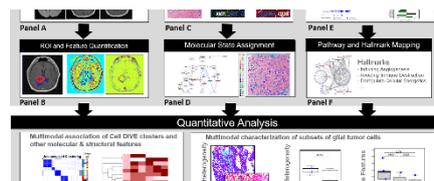


### Continuous Wearable Monitoring Analytics Predict Heart Failure Hospitalization

"Implantable cardiac sensors have shown promise in reducing re-hospitalization for heart failure (HF), but the efficacy of noninvasive approaches has not been determined. The objective of this study was to determine the accuracy of noninvasive remote monitoring in predicting HF re-hospitalization."

Source: Circulation: Heart Failure.

## MEDICAL IMAGING

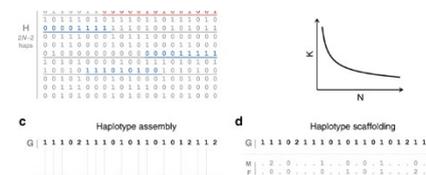


### Multiscale, multimodal analysis of tumor heterogeneity in IDH1 mutant vs wild-type diffuse gliomas

"this study suggests that the tumor microenvironment -- essentially all the cells both in and surrounding a tumor -- play a vastly under-studied role in the development and growth of cancer."

Source: The Translational Genomics Research Institute

## DIGITAL HEALTHCARE



### Privacy Gaps for Digital Cardiology Data

"This lack of protection could lead to people's sensitive data becoming available to unscrupulous third parties with sales interests, or those making decisions about life or disability insurance or employment."

Source: Circulation

## MEDICAL DEVICES

## Consumer Technology Association develops healthcare AI standard

"Billed as the first of its kind, the ANSI-accredited spec defines terms such as assistive intelligence, synthetic data and others related to how artificial intelligence is used in healthcare."

Source: Healthcare IT News

## How AI Can Live Up To Its Hype In The Healthcare Industry

"Billed as the first of its kind, the ANSI-accredited spec defines terms such as assistive intelligence, synthetic data and others related to how artificial intelligence is used in healthcare."

Source: Healthcare IT News

## MEDICAL NEWS



### Brain-wave pattern can identify people likely to respond to antidepressant, study finds

"Stanford researchers and their collaborators used electroencephalography, a tool for monitoring electrical activity in the brain, and an algorithm to identify a brain-wave signature in individuals with depression who will most likely respond to sertraline, an antidepressant marketed as Zoloft."

Source: EurekAlert

### Smart pregnancy

"The purpose of the study is to find out how we can make it as easy as possible for expectant mothers to carry out routine antenatal examinations themselves"

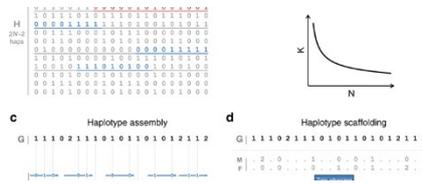
Source: FAU

### The top 5 technologies that will change health care over the next decade

"Dr. Bertalan Mesko, aka The Medical Futurist, says with advancements in exoskeleton technology, AI's ever-increasing importance in health care, and technologies like 5G and quantum computing soon going mainstream, there's much to be excited about"

Source: Market Watch

## MEDICAL DEVICES



### A new microchannel capillary flow assay (MCFA) platform with lyophilized chemiluminescence reagents for a smartphone-based POCT detecting malaria

"Engineers with the University of Cincinnati have created a tiny portable lab that plugs into your phone, connecting it automatically to a doctor's office through a custom app UC developed. The lab the size of a credit card can diagnose infectious diseases such as coronavirus, malaria, HIV or Lyme disease or countless other health conditions like depression and anxiety."

Source: Nature Microsystems & Nanoengineering

### Automatic Posture and Movement Tracking of Infants with Wearable Movement Sensors

"Here, we describe the development of an infant wearable, a multi-sensor smart jumpsuit that allows mobile accelerometer and gyroscope data collection during movements. Using this suit, we first recorded play sessions of 22 typically developing infants of approximately 7 months of age."

Source: Scientific Reports

### Knowledge-guided analysis of "omics" data using the KnowEnG cloud platform

"We present Knowledge Engine for Genomics (KnowEnG), a free-to-use computational system for analysis of genomics data sets, designed to accelerate biomedical discovery. It includes tools for popular bioinformatics tasks such as gene prioritization, sample clustering, gene set analysis, and expression signature analysis."

Source: PLOS Biology

### First-in-human evaluation of a hand-held automated venipuncture device for rapid venous blood draws

"A Rutgers-led team has created a blood-sampling robot that performed as well or better than people, according to the first human clinical trial of an automated blood drawing and testing device. The device provides quick results and would allow healthcare professionals to spend more time treating patients in hospitals and other settings."

Source: Technology



### **Wearable device shown to predict worsening heart health**

"Heart failure isn't necessarily something that happens all at once, but is instead an ongoing condition that has to be monitored. A new wearable device is designed to help, by preemptively detecting changes that could ultimately require hospitalization."

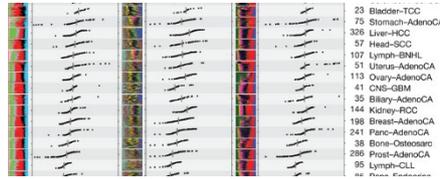
Source: New Atlas

### **First Noninvasive Cortisol Detector to Monitor Stress, Mental Conditions**

"Stress related to our mental well-being, including that associated with depression, anxiety, and PTSD, is difficult to measure in practice. Levels of cortisol, a steroid hormone, are closely linked to changes in one's mental state and blood tests are available to measure cortisol. But a blood test can raise a person's stress level itself and it can't be done frequently, nor without a medical professional."

Source: Medgadget

## **HEALTHCARE RESEARCH**



### **The repertoire of mutational signatures in human cancer**

"The data from these thousands of cancers allowed us to describe mutational signatures in much more detail, and we are confident that we now know most of the signatures that exist."

Source: Nature

### **Iron-Based Core-Shell Nanowires for Combinatorial Drug Delivery and Photothermal and Magnetic Therapy**

"Drug-coated iron nanowires that can be guided to the site of a tumor using an external magnetic field before activating a three-step cancer-killing mechanism could provide an effective option for cancer therapy. Co-developed by KAUST researchers, these nanowires release their drug cargo inside cancer cells, while also punching holes in the cell's membrane and delivering a blast of heat. While the combination therapy maximizes cancer cell death, its highly targeted nature should minimize side effects."

Source: ACS Appl. Mater. Interfaces

### **Magnetic nanostructures for emerging biomedical applications**

"This work focuses on understanding three different magnetic nanostructures, disks in the vortex state, synthetic antiferromagnetic particles and nanowires, first, by explaining their interesting properties and how they behave under an applied external field, before reviewing their potential applications for each of the aforementioned techniques."

Source: Applied Physics Reviews 7