

Digital Therapeutics

ICS 491

mHealth



Wearable Sensors



Electronic health records



Telehealth



Precision medicine



Big data



Hospital at home



Decision support algorithms



DIGITAL THERAPEUTICS

The New Prescription for Health

Smartphone Applications

Video Games

Virtual Reality

Smart Headbands

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8 Emerging Technologies

in Digital Therapeutics You Need to Know

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Smart Pills & Devices

Wearables

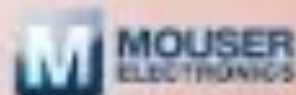
Connected Devices

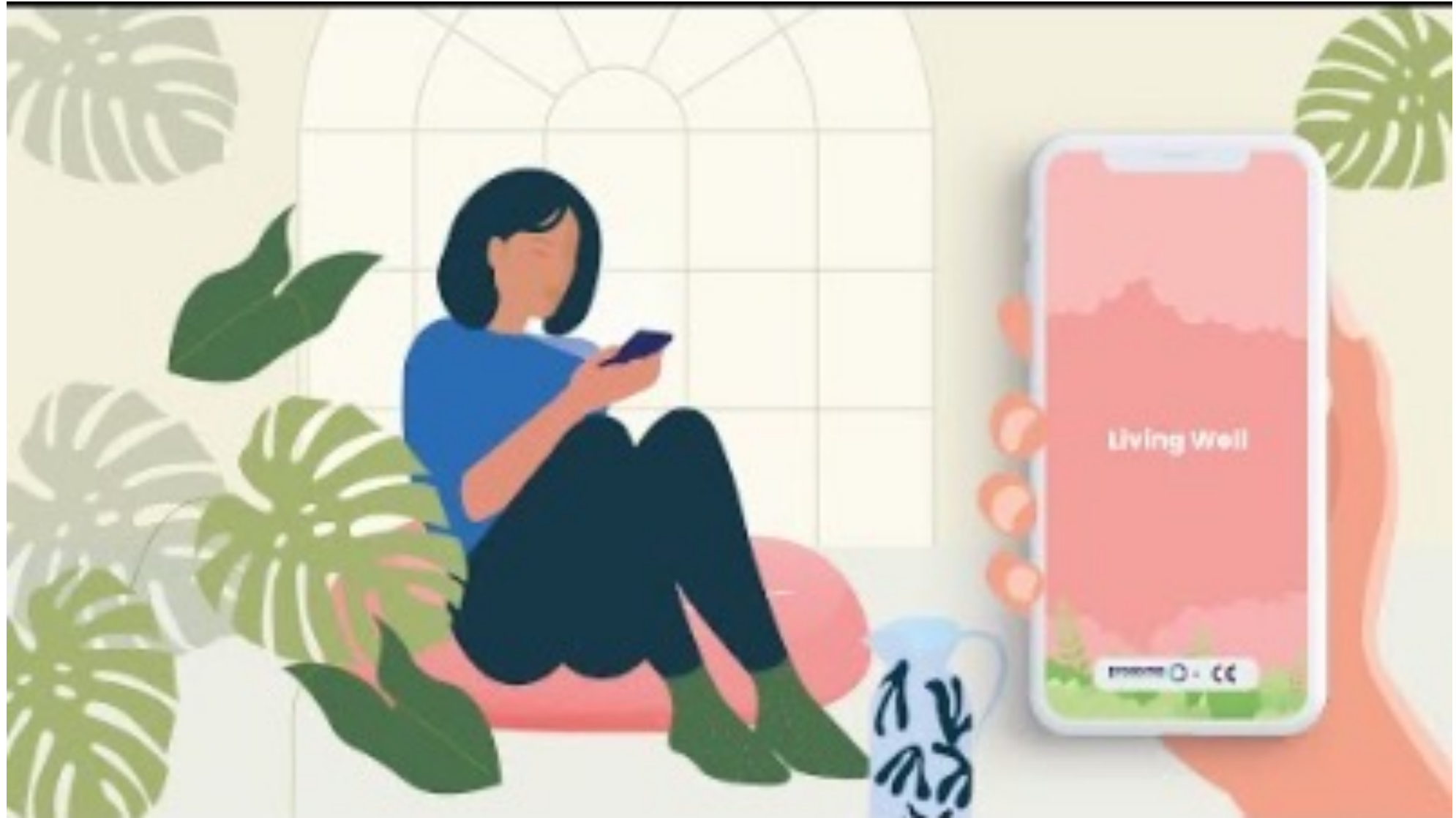
Contactless Sensors



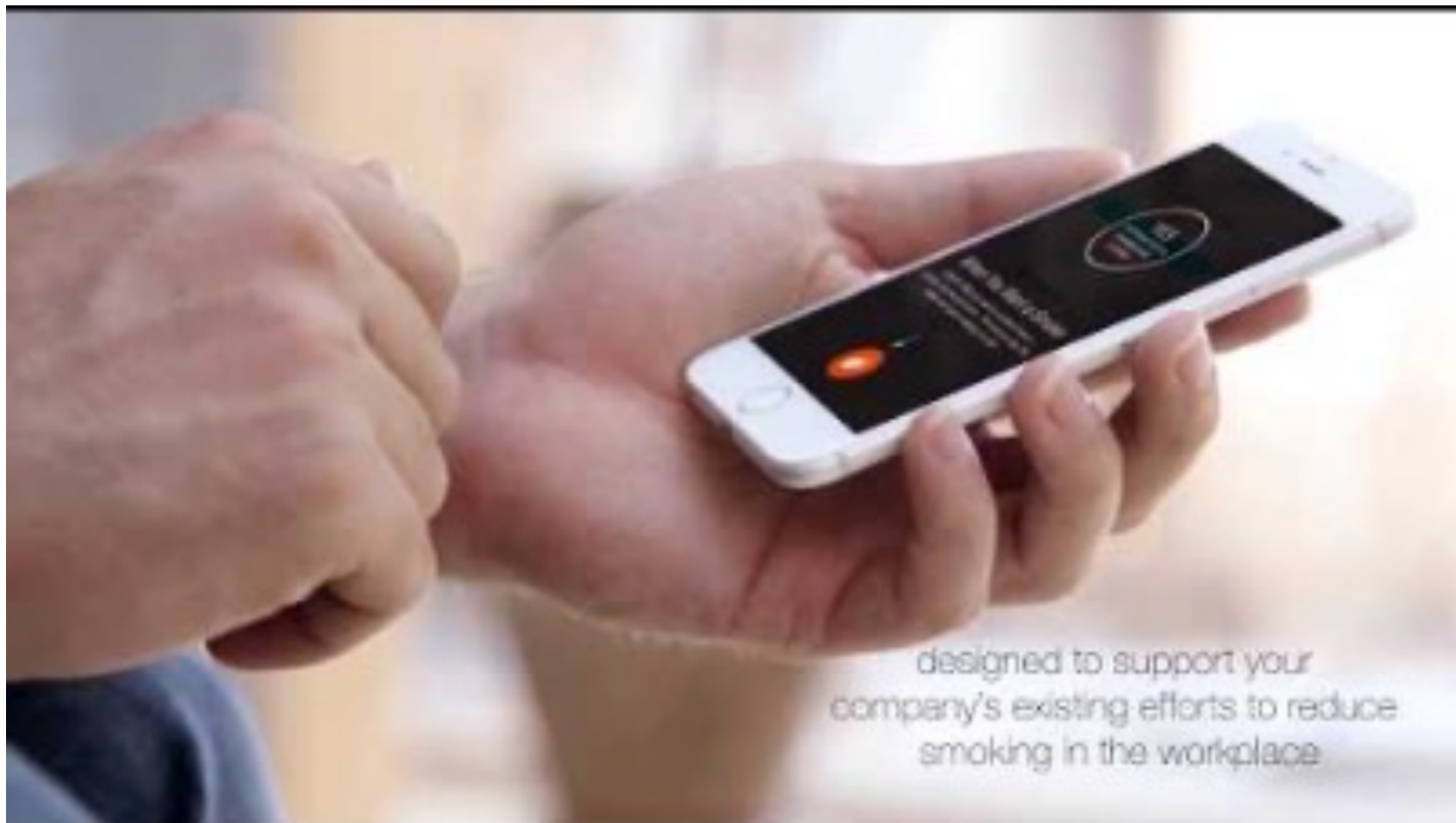
Digital Therapeutics puts healthcare in your hands

Brought to you by:









designed to support your
company's existing efforts to reduce
smoking in the workplace



GOING PUBLIC

yahoo!
finance

**AKILI PRODUCES PRESCRIPTION VIDEO
GAME FOR KIDS WITH ADHD**

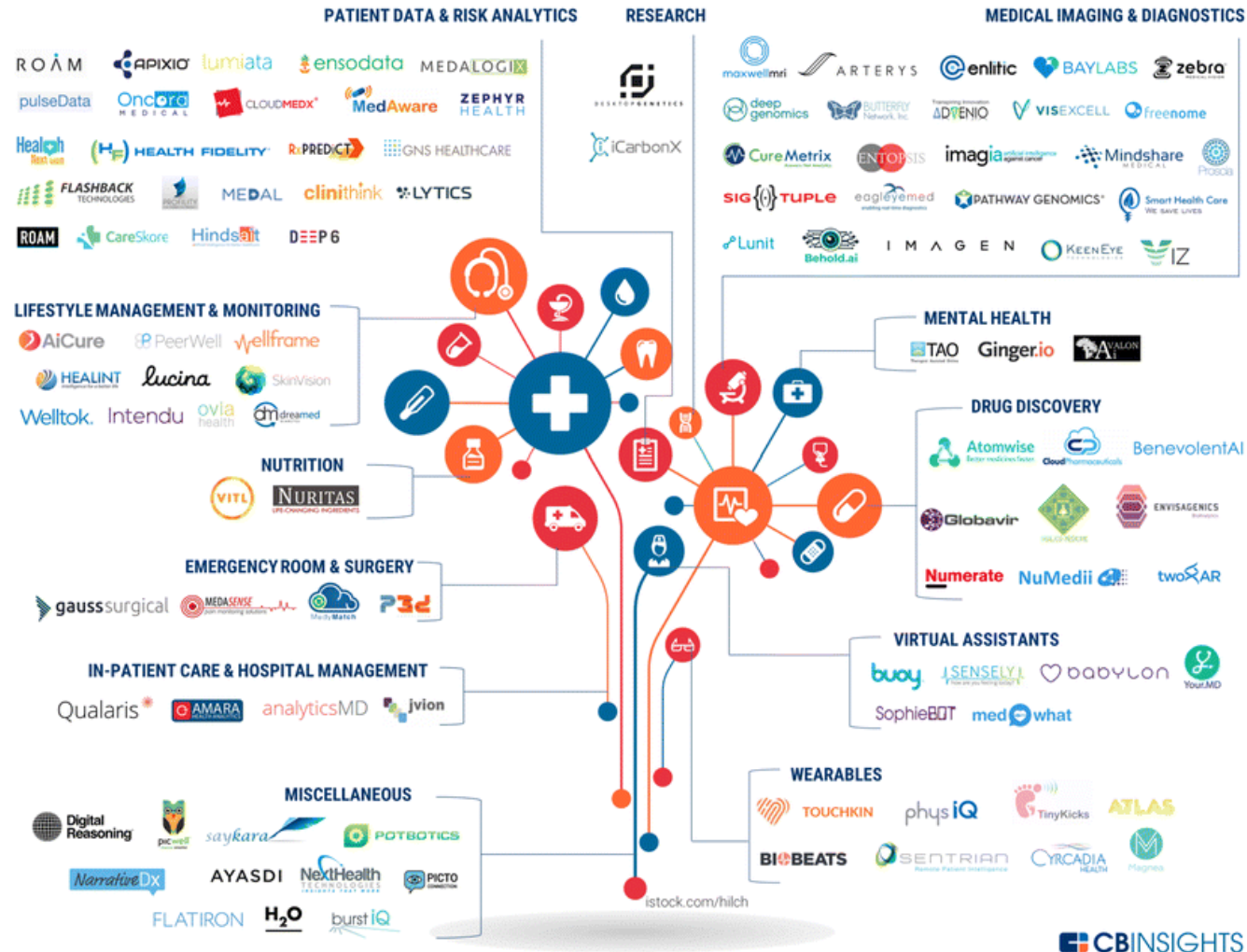


LIVE

Digital Therapeutics Companies

AI for Healthcare Startups

106 STARTUPS TRANSFORMING HEALTHCARE WITH AI



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Your digital clinic for joint and muscle care

Take control of your pain. Recover from injury. Even prepare for surgery. Join Hinge Health for expert care that fits into your busy life.

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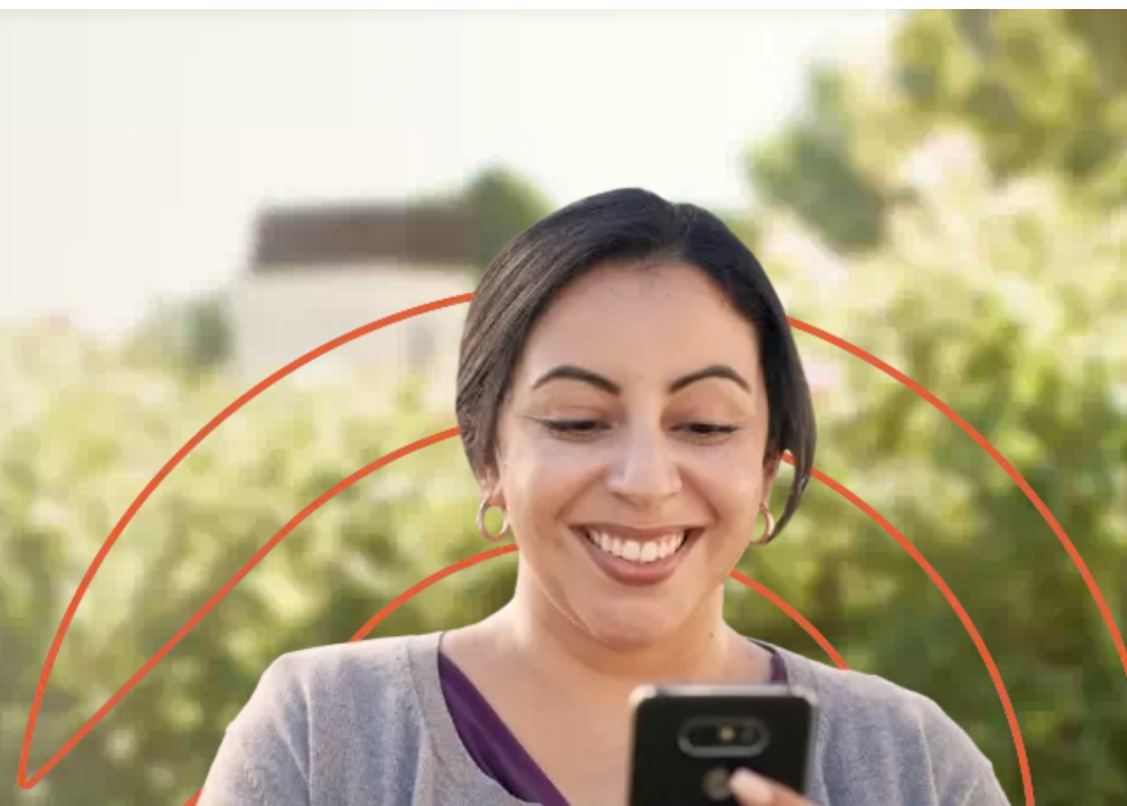
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Changing *mindsets* to change health

A virtual-first chronic care provider helping members make lasting changes to improve health and reduce care costs for organizations.

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Breathe in

Take control of your mental health.

Mental health support for your whole being. Effective and affordable.



Redefining Medicine

Pear Therapeutics

The leader in Prescription Digital Therapeutics

Biotechnology Research · Boston, Massachusetts · 18,852 followers · 201-500 employees



Expert care when and where you need it in the palm of your hand

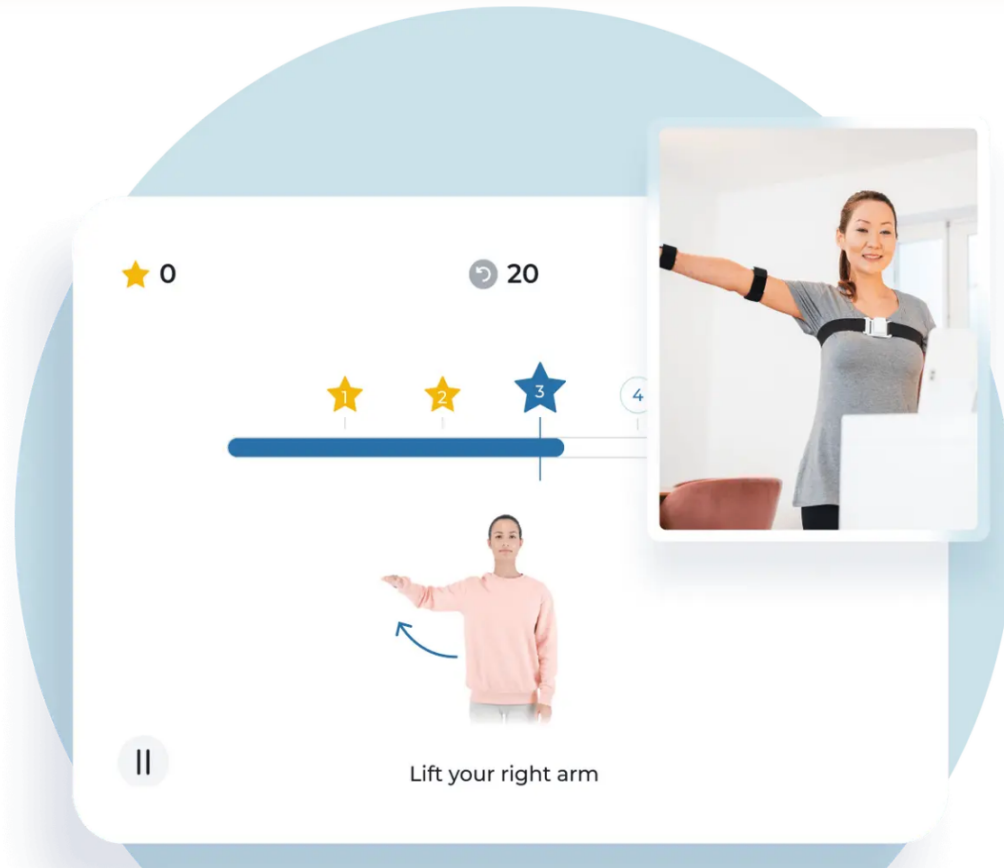
You have access to dedicated care teams and customized resources, providing guidance and support via our easy-to-use app.

[Learn more](#)



Digital Physical Therapy

Movement is medicine, but poor form can dramatically slow—or even reverse—relief. Sword's Digital Therapist® uses sensor technology to deliver real-time feedback. All the movement data is then shared with the PT, who adapts the program based on actual performance. Data > guesswork.



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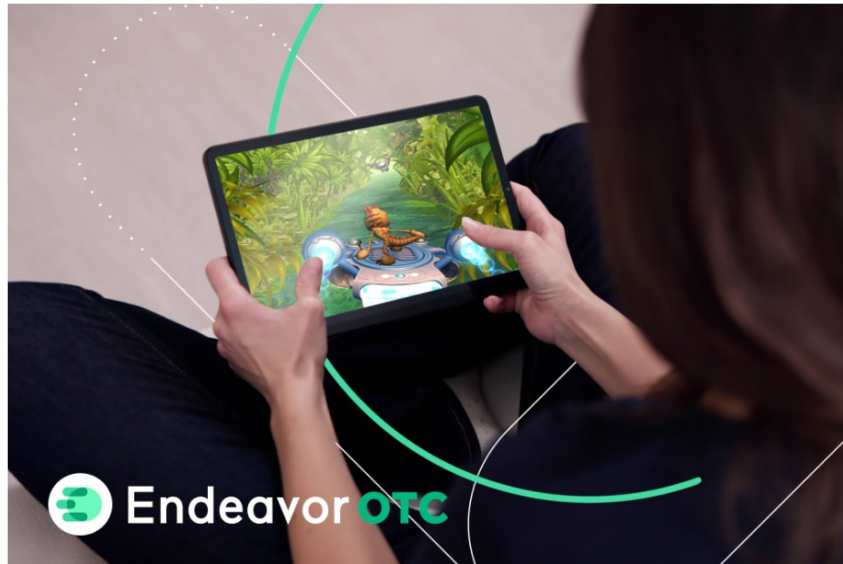


Who We Are

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Introducing EndeavorOTC™ - a new immersive mobile video game treatment clinically proven to improve attention and focus, specifically in adults with ADHD!

Available now through Apple's App Store®

Visit EndeavorOTC.com

Maven's pioneering virtual care model is built around women and families, delivering better outcomes and lower costs for everyone.

We're setting a new standard of care for families across geographies, cultures, and backgrounds.



Whole-person care

A holistic approach that offers comprehensive care for all families.



Exceptional outcomes

Dedicated Care Advocates and data-driven insights deliver better outcomes.



Lower costs

Proactive intervention reduces the need for costly procedures.



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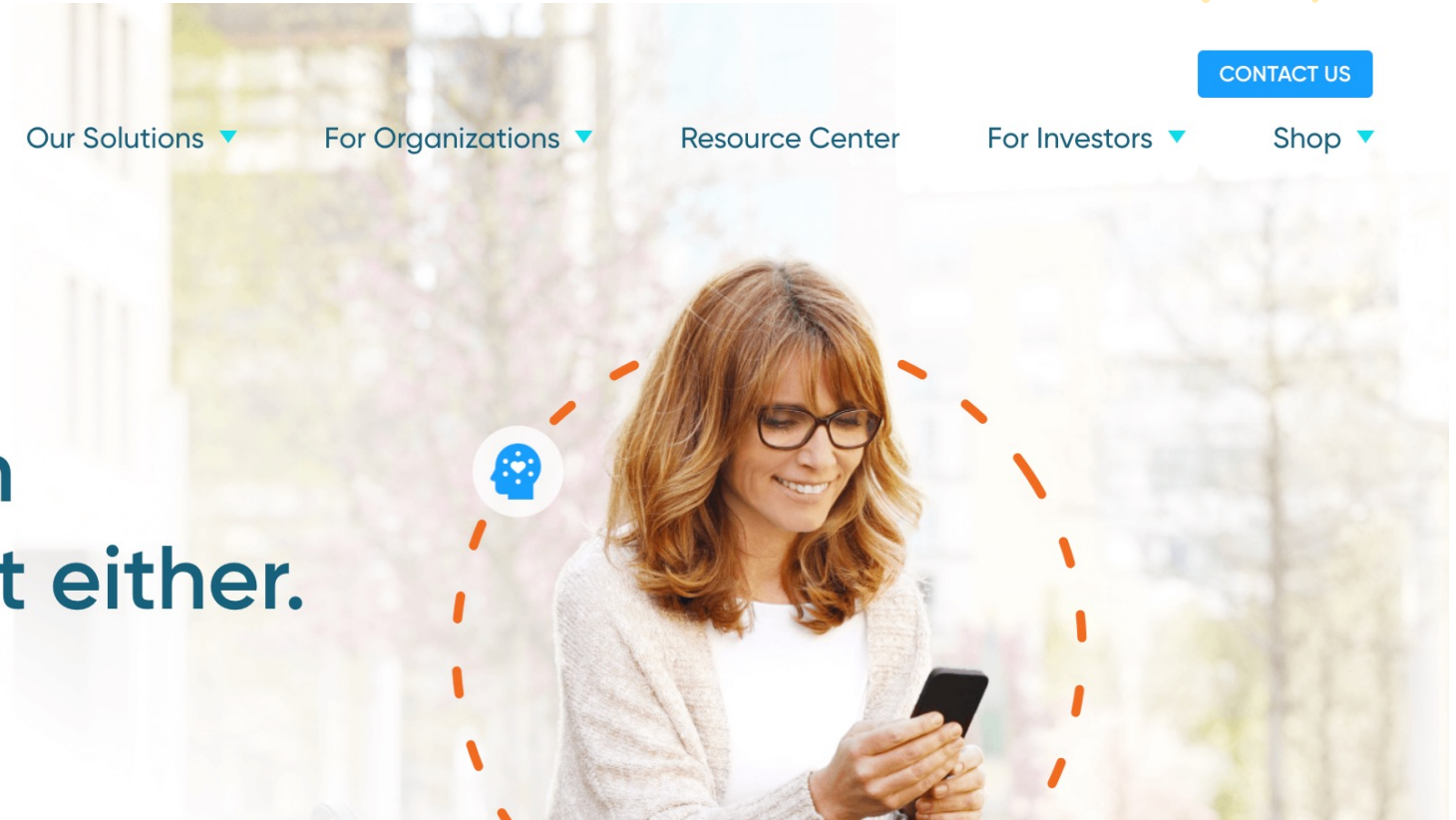
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Chronic conditions don't exist in silos.

Your digital health solutions shouldn't either.

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Lose weight and feel healthier on your own terms

Lark has provided proven, digital-first coaching to over 2 million people, helping them build healthy habits and manage chronic conditions to stay on the healthy side of life.

2M+

MEMBERS USING LARK

CDC

CERTIFIED DIABETES PREVENTION PROGRAM

2000+

EMPLOYER PARTNERSHIPS



See if digital coaching and a smart scale is covered by insurance

Explore medication such as Ozempic® (semaglutide)

[For Employers](#) →

Expert support in your pocket

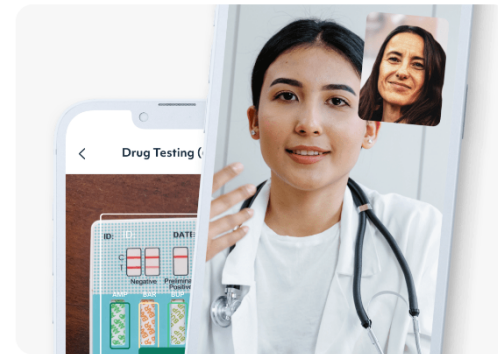
Private and effective recovery
that's tailored to you for opioid
or alcohol addiction.

[Explore the app](#)



Medical treatment

- ✓ Video visits with a licensed clinician who listens
- ✓ Medication prescribed to your local pharmacy



Modern recovery tools

- ✓ 60+ online groups led by therapists and peers
- ✓ Build a network of others on a similar journey



Shame-free recovery

- ✓ Choose your own recovery goals without judgment
- ✓ Rooted in harm reduction, and never

The logo for Kaia Health, consisting of the words "kaia" and "health" stacked vertically in a white, lowercase, sans-serif font, enclosed within a dark blue circular background.


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Democratizing Healthcare

Proven MSK care that combines human care with superior technology to achieve better outcomes.

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Mindstrong Health

Improvement through information

Our measurement-based care model uses data to track progress and make decisions that ensure your treatment reflects any changes in your needs. Thanks to our advanced AI technology, we're able to capture and analyze data from three important sources.

Data comes from:

Sessions with your care team

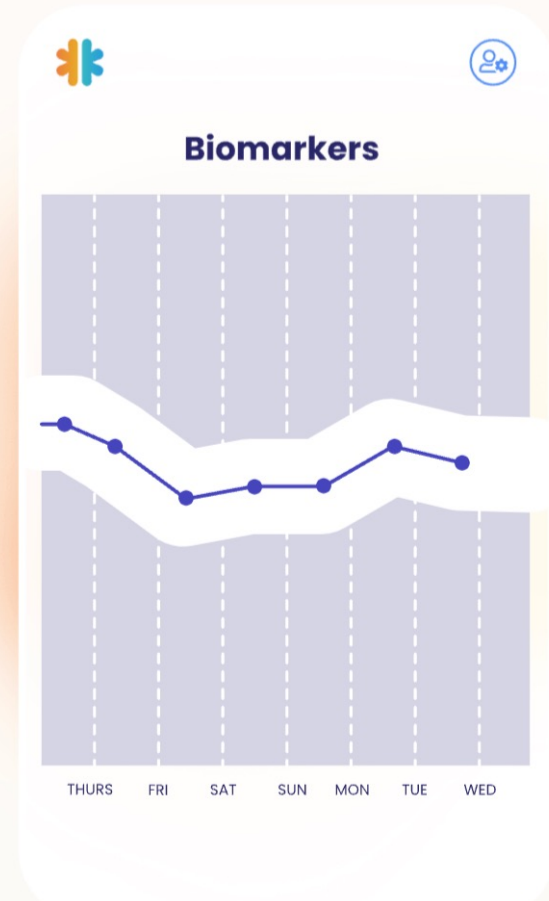
Your provider takes notes and updates your Care Plan with you in session.

Self-assessment surveys

You report on your mood, activities, and changes in your symptoms so we can track patterns and progress.

Passive data from your phone activity

If you opt in to passive monitoring, how you use your phone is analyzed for changes that could signal an oncoming crisis.





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Bringing Science to Mental Health®

Committed to helping improve the lives of individuals suffering from mental health concerns



Scientific Publications

Peer reviewed analysis and research

[Integration and Validation of a Natural Language Processing Machine Learning Suicide Risk Prediction Model Based on Open-Ended Interview Language in the Emergency Department](#)



Abstract: Emergency departments (ED) are an important intercept point for identifying suicide risk and connecting patients to care, however, more innovative, person-centered screening tools are needed. Natural language processing (NLP) -based machine learning (ML) techniques have shown promise to assess suicide risk, although whether NLP models perform well in differing geographic regions, at different time periods, or after large-scale events such as the COVID-19 pandemic is unknown.

Frontiers in Digital Health
Pestian, John, et al.
2/2/2022

[Read more](#)

[A Feasibility Study Using a Machine Learning Suicide Risk Prediction Model Based on Open-Ended Interview Language in Adolescent Therapy Sessions](#)

Abstract: As adolescent suicide rates continue to rise, innovation in risk identification is warranted. Machine learning can identify suicidal individuals based on their language samples. This feasibility pilot was conducted to explore this technology's use in adolescent therapy sessions and assess machine learning model performance.

International Journal of Environmental Research and Public Health
Cohen, Joshua, et al.
11/5/2020

[Read more](#)



[A Machine Learning Approach to Identifying Changes in Suicidal Language](#)



Abstract: With early identification and intervention, many suicidal deaths are preventable. Tools that include machine learning methods have been able to identify suicidal language. This paper examines the persistence of this suicidal language up to 30 days after discharge from care.

Biomedical Informatics Insights
Pestian, John, et al.
8/2/2010

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[A Machine Learning Approach to Identifying the Thought Markers of Suicidal Subjects: A Prospective Multicenter Trial](#)

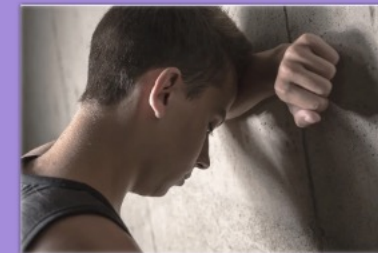
Abstract: In this novel prospective, multimodal, multicenter, mixed demographic study, we used machine learning to measure and fuse two classes of suicidal thought markers: verbal and nonverbal.

Suicide and Life-Threatening Behavior
Pestian, John, et al.
6/2/2020

[Read more](#)



[A Controlled Trial Using Natural Language Processing to Examine the Language of Suicidal Adolescents in the Emergency Department](#)



Abstract: What adolescents say when they think about or attempt suicide influences the medical care they receive. Mental health professionals use teenagers' words, actions, and gestures to gain insight into their emotional state and to prescribe what they believe to be optimal care.

Suicide and Life-Threatening Behavior
Pestian, John, et al.
8/7/2015

[Read more](#)

[Suicide Note Classification Using Natural Language Processing: A Content Analysis](#)

Abstract: Suicide is the second leading cause of death among 25–34 year olds and the third leading cause of death among 15–25 year olds in the United States. This paper presents our second attempt to determine the role of computational algorithms in understanding a suicidal patient's thoughts, as represented by suicide notes.

Biomedical Informatics Insights
Pestian, John, et al.
8/4/2010

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Digital Precision Medicine Platform

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Precision Digital Therapeutics

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Digital Health Programs

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Digital Precision Medicine for Mental Health

Developing Digital Biomarkers & Therapeutics for Mental Health.



Continuous Measurement 24/7

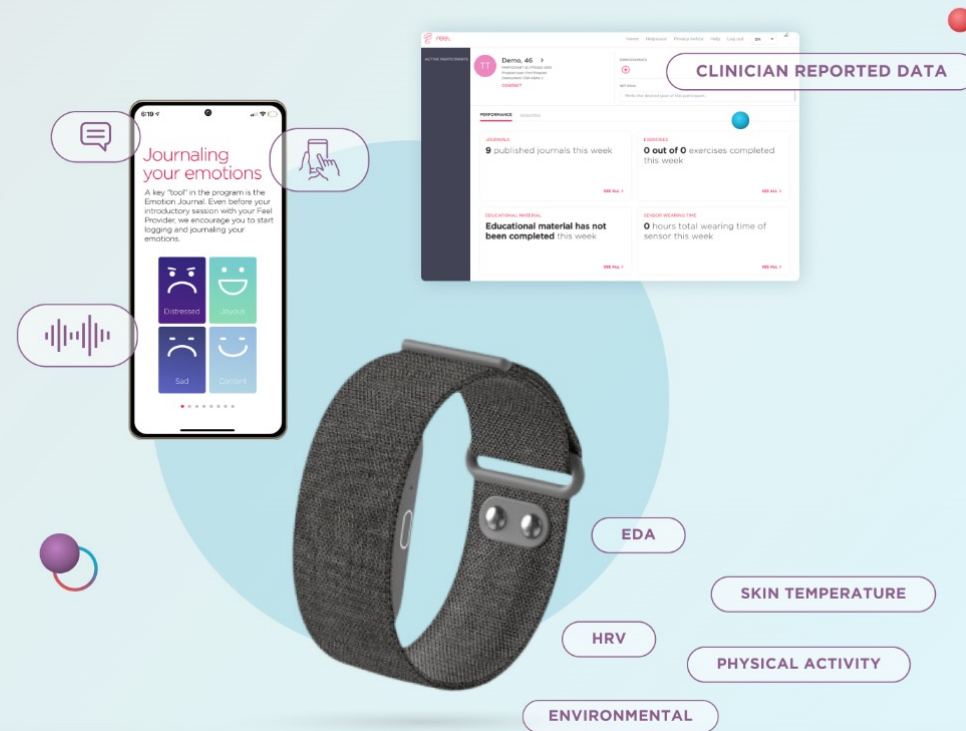
We collect physiological, digital, and clinical data 24/7/365 from wearables, digital health apps, mobile phones, and clinician dashboards.



Physiological and Digital Biomarkers & Metrics



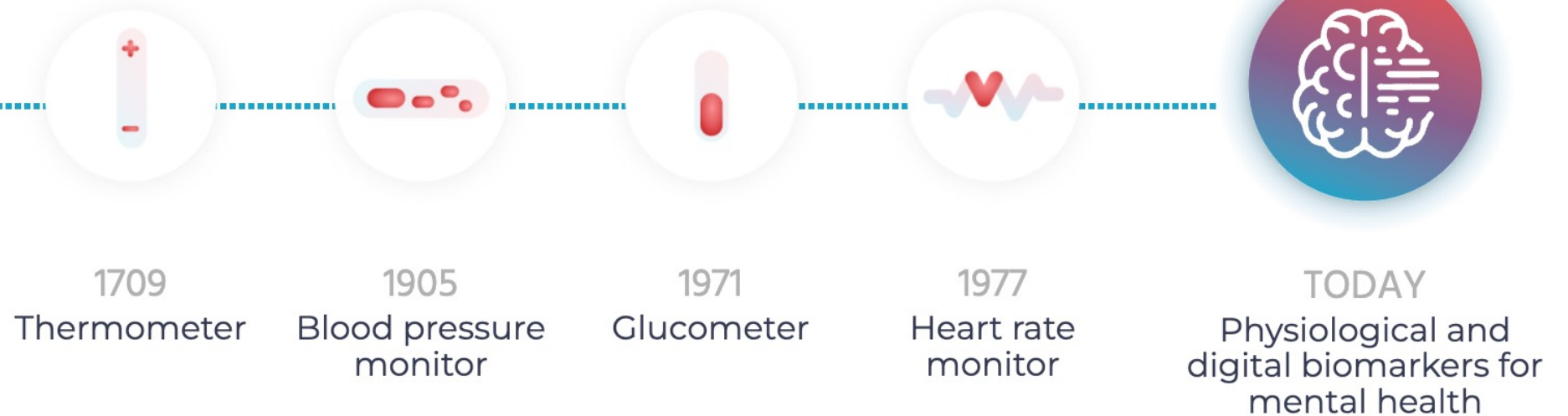
Data-Driven Digital Therapeutics



Reinventing mental health

Objective measurement tools have been utilized in almost every medical field for centuries—time to bring objective measurement into the field of mental health TODAY.

EVOLUTION OF SCIENTIFIC MEASUREMENT



Publications & Patents



Outcomes of Feel DTx for Depression and Anxiety

Feel DTx introduces multiple benefits for people suffering from mild or moderate depression and/or anxiety

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Precision and accuracy of emotional state detection and recognition

The Feel Emotion Sensor can accurately capture and identify emotional events

[Read publication](#) >



Method for detecting and recognizing an emotional state of a user

Method for tracking the emotional state of a user and recognizing emotional biomarkers

Patent No: US11410682B2



Psychophysiological index for Stress

HRV strongly correlates with changes in Cortisol levels

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Psychophysiological index for Stress Resilience

Electrodermal Activity (EDA) can be a stress resilience metric in stressful conditions

[Read publication](#) >



Psychophysiological index for Stress

HRV strongly correlates with changes in the Endocannabinoid System

[Read publication](#) >



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Who We Are



Sage Bionetworks is a nonprofit health research organization that is speeding the translation of science into medicine. We believe that high-quality, well-annotated data acts as the foundation of modern biomedical innovation. We dream of a world where people work together across institutional boundaries to meaningfully address major medical research problems. We incubate new ways for diverse groups of people to practice research together.



[BiAffect](#)

A project to develop methods for assessing cognition via interactions with smartphone keyboards and other passively collected remote sensor data.



[DIAN Project](#)

A project to remotely assess cognitive function in patients suffering from Alzheimer Disease.



**COVID
RECOVERY
CORPS**

[The Covid Recovery Corps](#)

A study to understand how people recover from COVID-19, and how the disease impacts communities over time.



The Psorcast Study

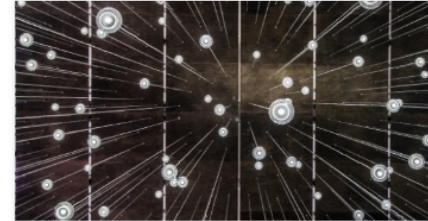
[The Psorcast Study](#)

Predictive Forecasts of Psoriatic Disease from Remote, Patient-Driven Measurements.



[Digital Health Data Repository](#)

We make the data from our studies and those of others willing to share available in the digital health portal



[MobileToolbox](#)

MobileToolbox is a set of tools that allow you to embed self-administered cognitive tests into your research study.



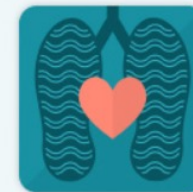
[Sage Digital Health Catalyst Program](#)

Sage Digital Health Catalyst Program helps to bootstrap innovative research projects.



[All of Us Research Program - Digital Health Technology](#)

Historic program to gather data from one million or more people living in the U.S. to



[Cardiorespiratory Fitness Module](#)

We have developed and validated a remote measurement of cardiorespiratory fitness (VO2Max) that can be used in the home.

2018 DIGITAL HEALTH ACQUISITIONS

Acquirer



\$1.9 BILLION

Target



\$1 BILLION



\$1 BILLION



Acquirer



\$800 MILLION

Target



\$225 MILLION



UNDISCLOSED



Note: Displayed acquisitions were selected based on deal size and potential industry impact.

Source: Company releases, 2018

BUSINESS INSIDER
INTELLIGENCE

This is all just a small taste of digital
therapeutics companies out there