

mHealth and IoT



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JAN
2022

ESSENTIAL DIGITAL HEADLINES

OVERVIEW OF THE ADOPTION AND USE OF CONNECTED DEVICES AND SERVICES



GLOBAL OVERVIEW

TOTAL
POPULATION

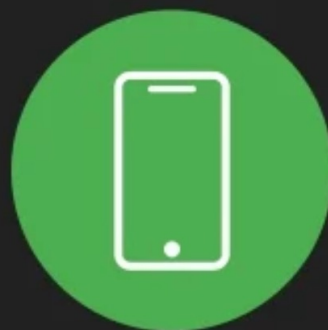


7.91
BILLION

URBANISATION

57.0%

UNIQUE MOBILE
PHONE USERS



5.31
BILLION

vs. POPULATION

67.1%

INTERNET
USERS

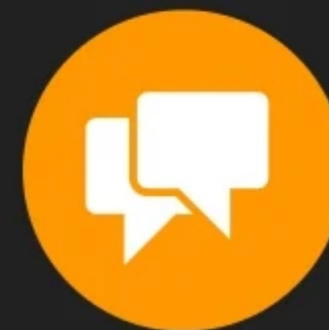


4.95
BILLION

vs. POPULATION

62.5%

ACTIVE SOCIAL
MEDIA USERS



4.62
BILLION

vs. POPULATION

58.4%





GLOBAL OVERVIEW

JAN
2022

DIGITAL GROWTH

CHANGE IN THE USE OF CONNECTED DEVICES AND SERVICES OVER TIME

TOTAL
POPULATION

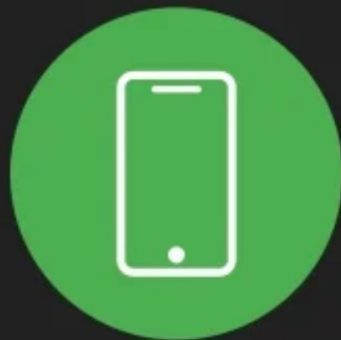


+1.0%

YEAR-ON-YEAR CHANGE

+80 MILLION

UNIQUE MOBILE
PHONE USERS



+1.8%

YEAR-ON-YEAR CHANGE

+95 MILLION

INTERNET
USERS

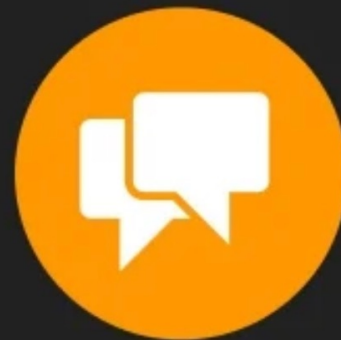


+4.0%

YEAR-ON-YEAR CHANGE

+192 MILLION

ACTIVE SOCIAL
MEDIA USERS



+10.1%

YEAR-ON-YEAR CHANGE

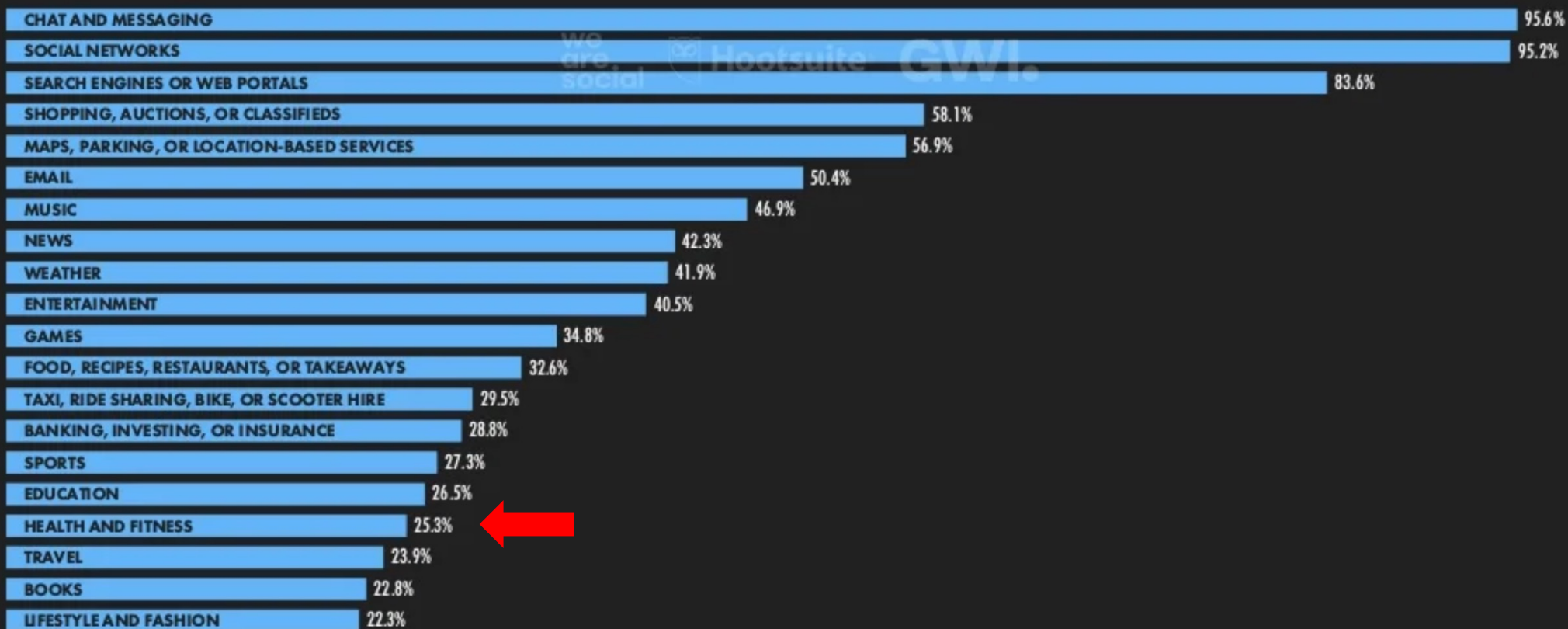
+424 MILLION



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2022

TOP TYPES OF WEBSITES VISITED AND APPS USED

PERCENTAGE OF INTERNET USERS AGED 16 TO 64 WHO HAVE VISITED OR USED EACH KIND OF DIGITAL PROPERTY IN THE PAST MONTH



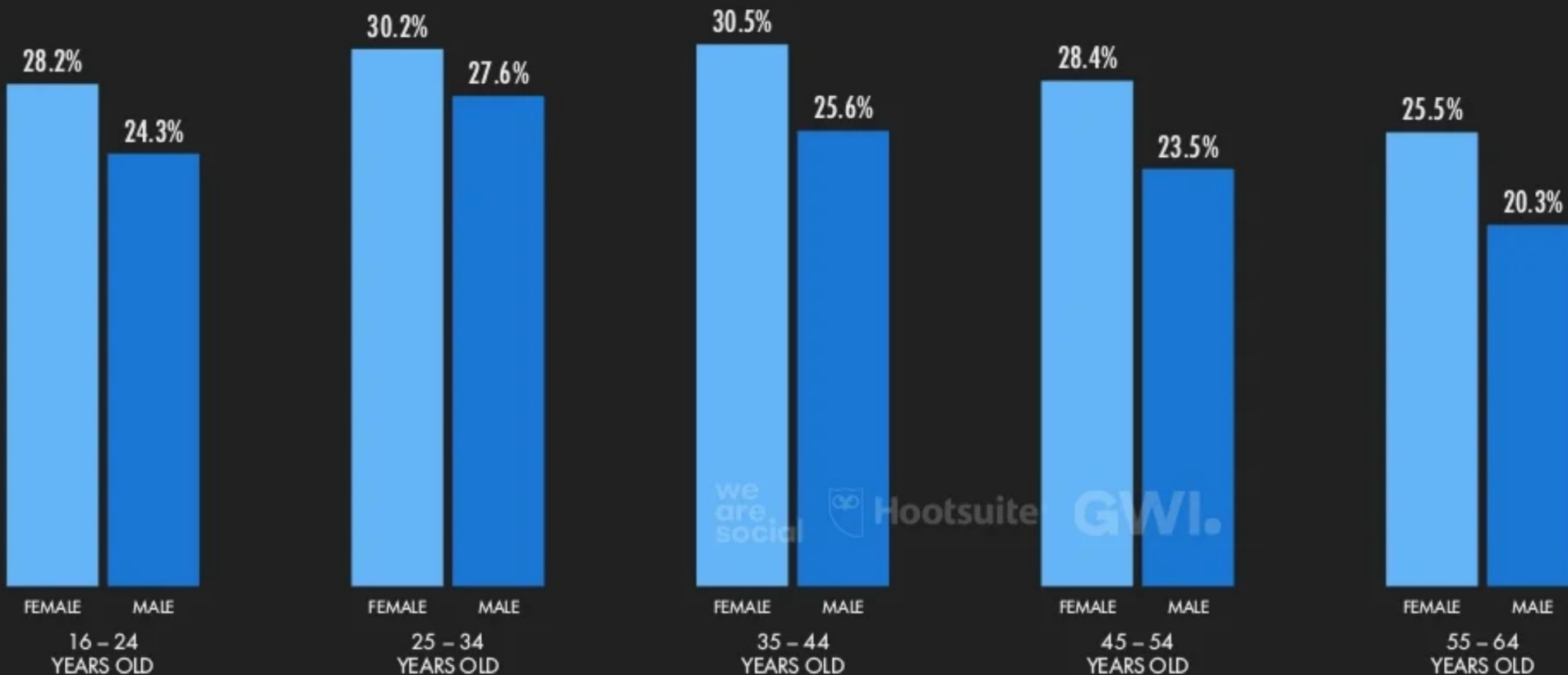
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CHECKING HEALTH SYMPTOMS ONLINE

PERCENTAGE OF INTERNET USERS WHO CHECK HEALTH SYMPTOMS ONLINE EACH WEEK



GLOBAL OVERVIEW





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HEALTH and SOCIAL MEDIA

CORONAVIRUS Fake news

RAFFREDDORE
TACHIPIRINA
IGIENE
ANTIBIOTICI
CANDEGGINA
PANE
LIMONI
FEBBRE
CALDO
CORONAVIRUS
ZANZARE
LIMONI
Distanza
5G
COVID-19
PROTEINE
TBC
CASA
ANTIVIRALI
MANI
BARBA
TOSSE
AGLIO
SINTOMI
UV
CAPELLI
CASA
ANTIVIRALI
MANI
BARBA



Istituto di ricovero e cura a carattere scientifico

VIDEO OPINION: IL MEDICO È ONLINE ▶



COR
Leggi

REFERTO
ONLINE

CHI SIAMO | DIAGNOSI E CURA | EQUIPE | RICERCA E FORMAZIONE | SEDI | CONVENZIONI | GALLERY | CONTATTI | EVENTI



CORONAVIRUS E VITAMINA C: STOP ALLE BUFALÉ



Istituto Ricerca Forma:

April 17, 2020

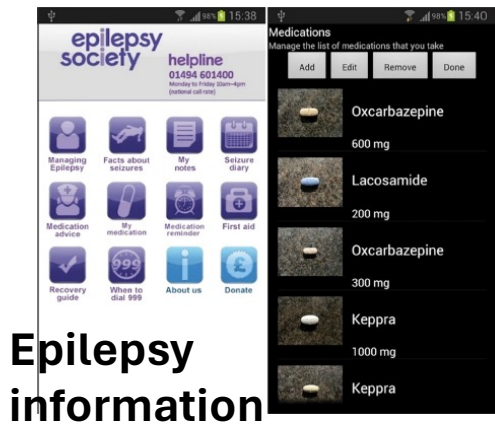
Coronavirus: attenzione alle bufale su social e chat

NEWS

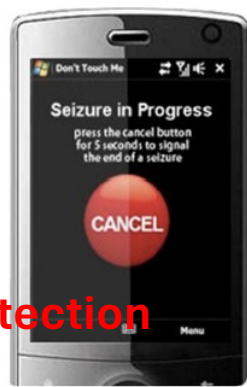
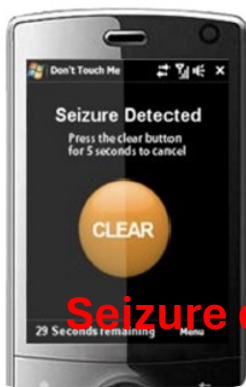




EXAMPLE APPs



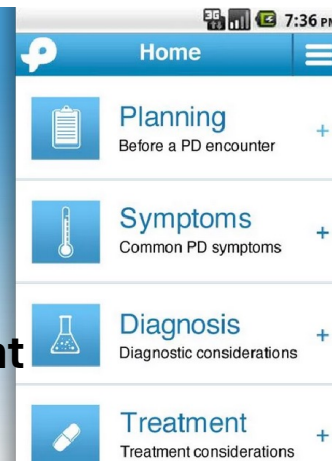
Epilepsy information



Seizure detection



Parkinson's management



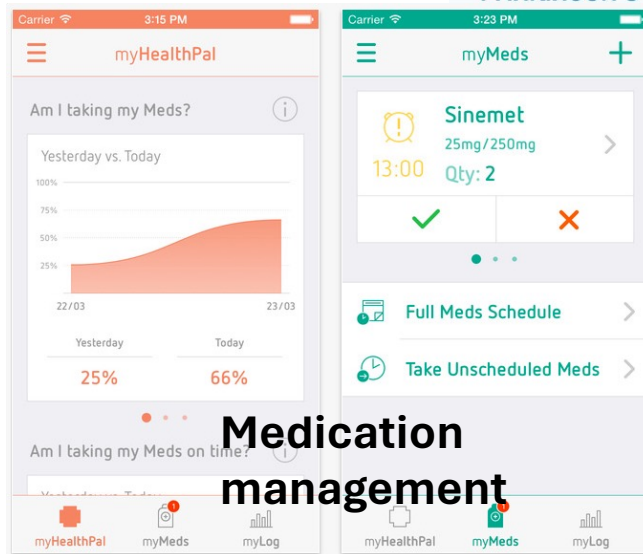
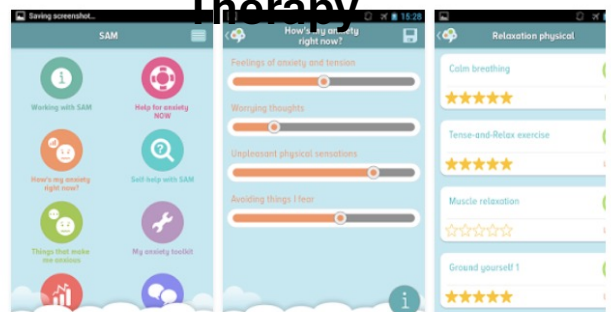
Post-stroke recovery



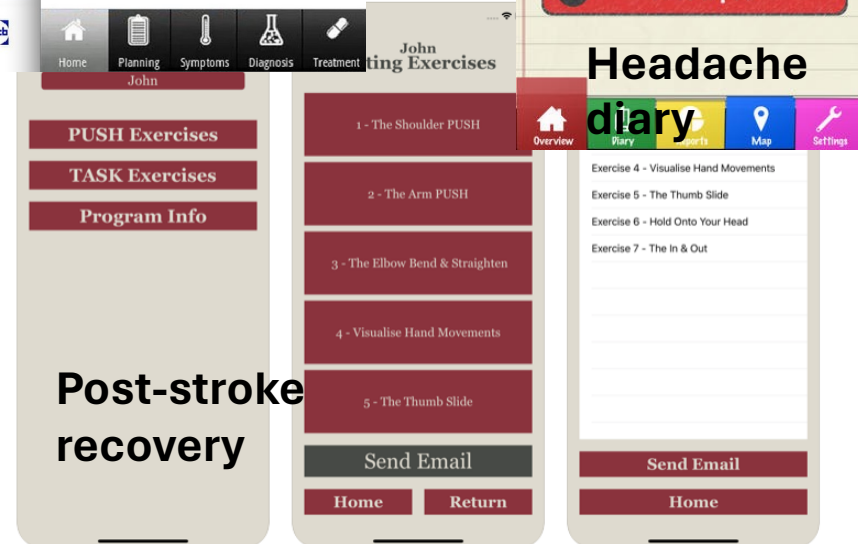
Headache diary



Cognitive Behavioural Therapy



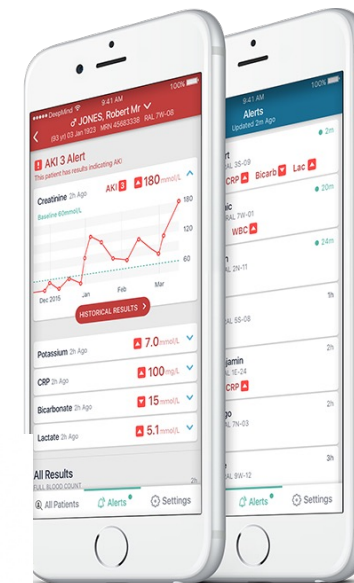
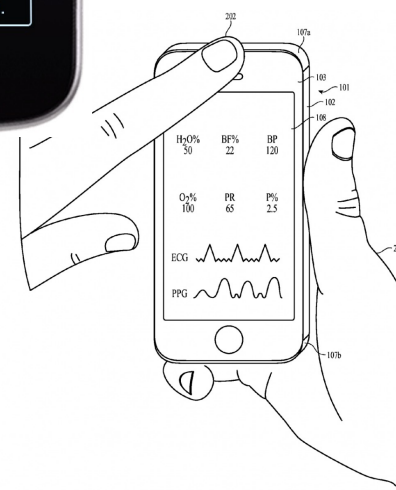
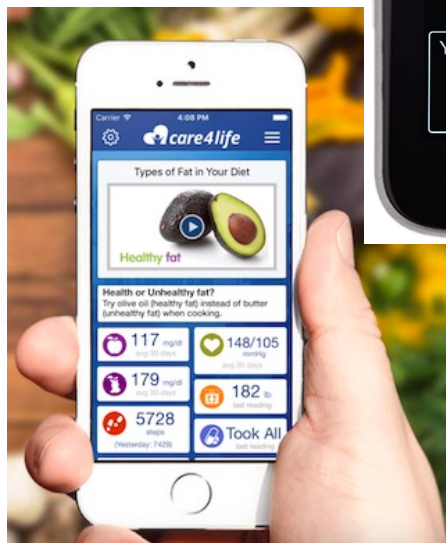
Medication management





m-Health → the use of mobile technologies to deliver e-Health

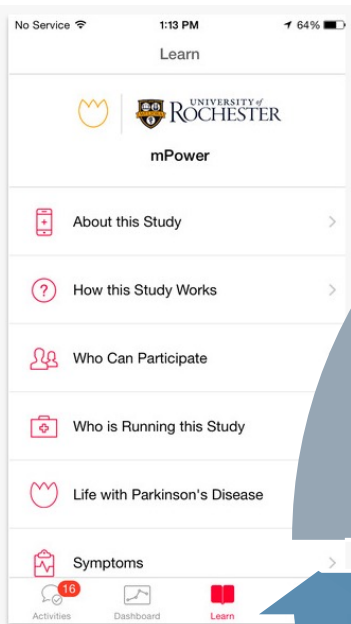
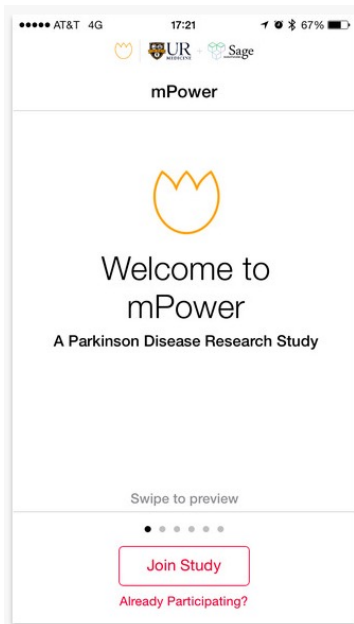
The mobile app Orchestra connects patients with their doctors for more continuous care, while researchers have access to useful data





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EXPECTATIONS



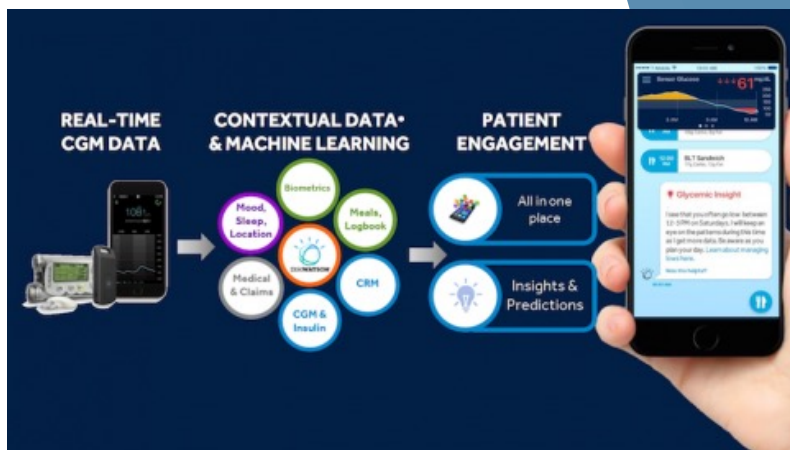
Data collection for research

Healthcare inclusion

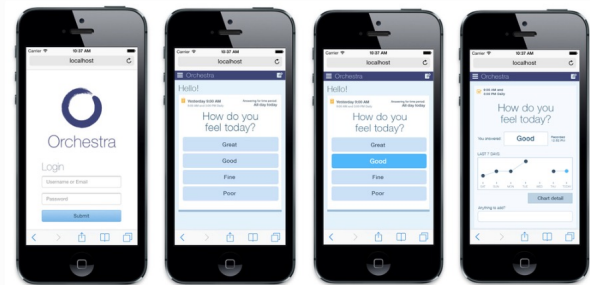


Personalized care

Real-time communication



The mobile app Orchestra connects patients with their doctors for more continuous care, while researchers have access to useful data



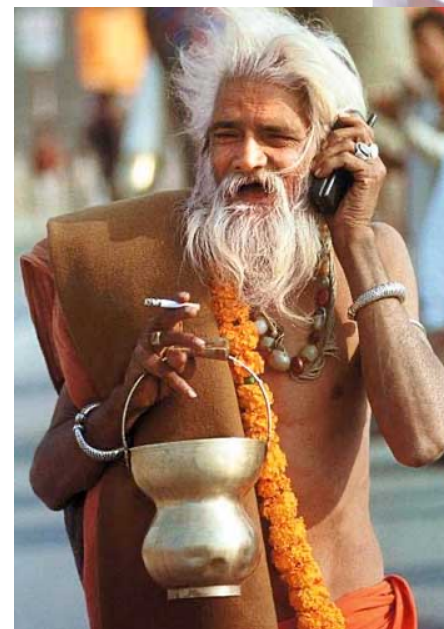
INTERACTIVE JOURNAL OF MEDICAL RE

[Original Paper](#)

WhatsApp Messenger as an Adjunctive Tool for Telemedicine: An Overview

WHY MOBILE: HEALTHCARE INCLUSION

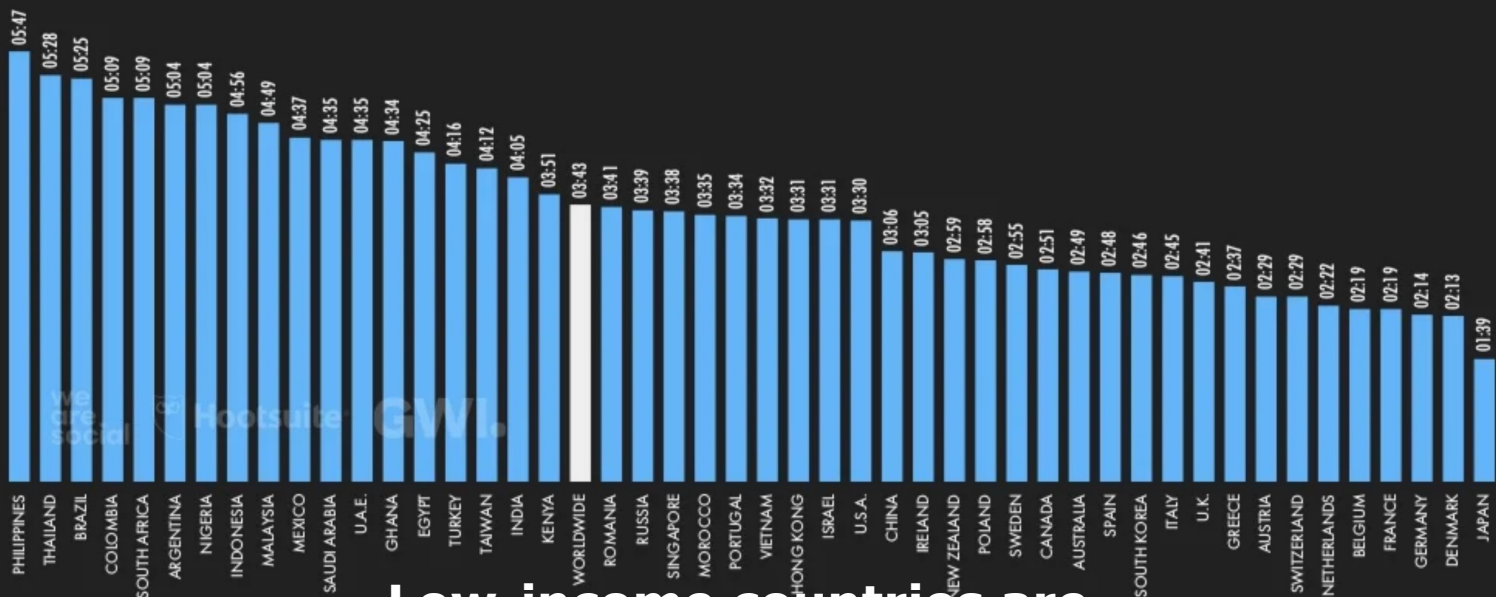
- Digital inclusion also of developing countries
- Distributing healthcare benefits across society (equity)



JAN
2022

TIME SPENT USING THE INTERNET ON MOBILES

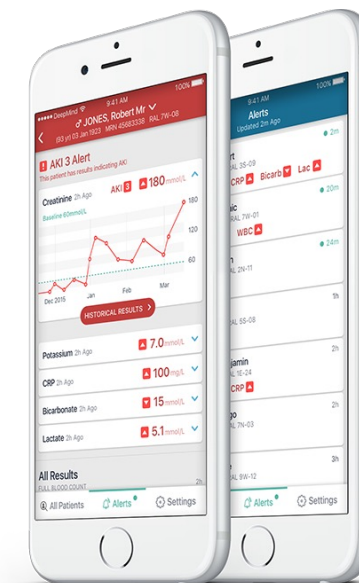
AVERAGE AMOUNT OF TIME PER DAY THAT INTERNET USERS AGED 16 TO 64 SPEND USING THE INTERNET ON MOBILE PHONES



Low-income countries are above the world global average

WhatsApp Messenger as an Adjunctive Tool for Telemedicine: An Overview

The mobile app Orchestra connects patients with their doctors for more continuous care, while researchers have access to useful data



The app helps doctors get information about their acute kidney failure patients to enable faster diagnostics in situations where time is of the essence.

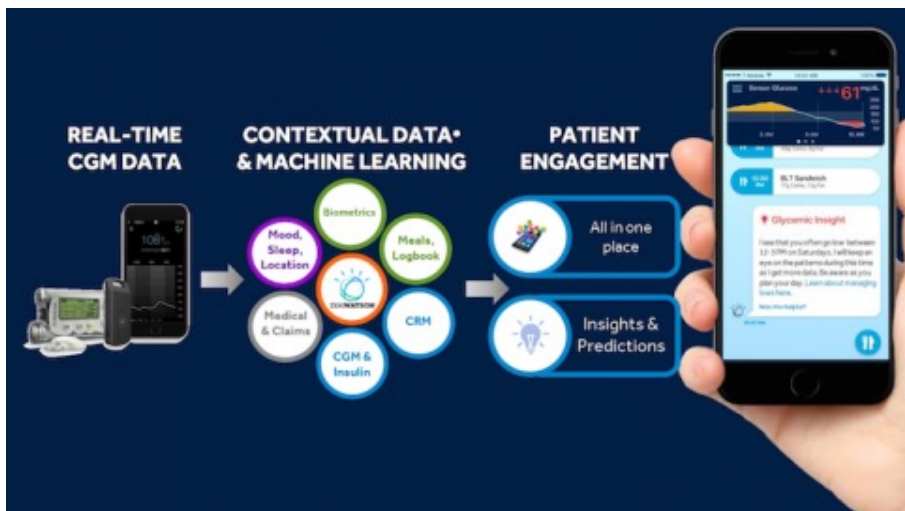
The app uses 'breaking news' alerts to make sure doctors' attention is directed to the patients who need it the most in the moment.



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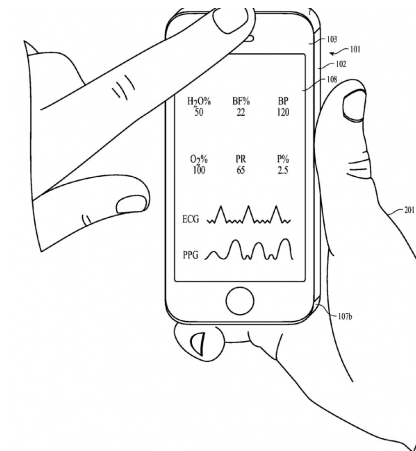
WHY MOBILE: PATIENT CENTERED MEDICINE

- Patient inclusion in healthcare delivery
- Increased education capability
- Services for non-patients (wellness, healthy lifestyle)
- Moving some health responsibilities to patients

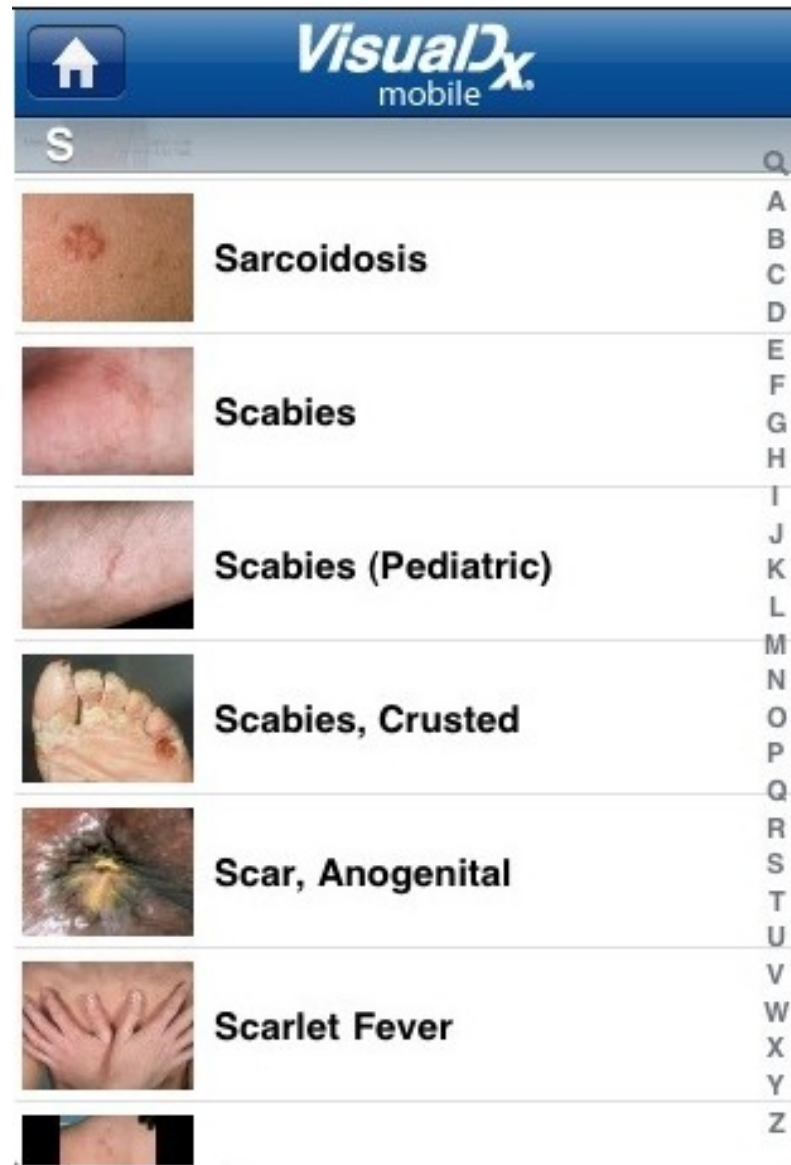


Newly granted Apple patent shows ways to turn an iPhone into a health sensor

Cochlear Limited launches FDA-cleared, Apple-compatible cochlear implant
By Jeff Lagasse



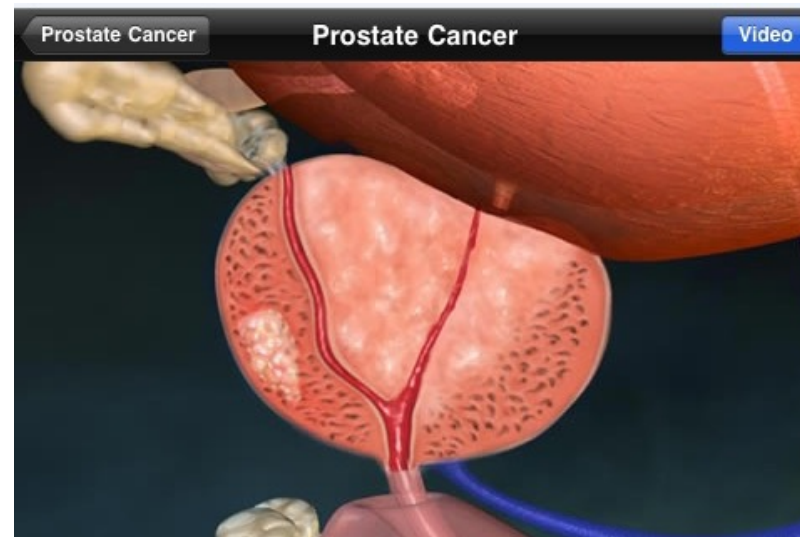
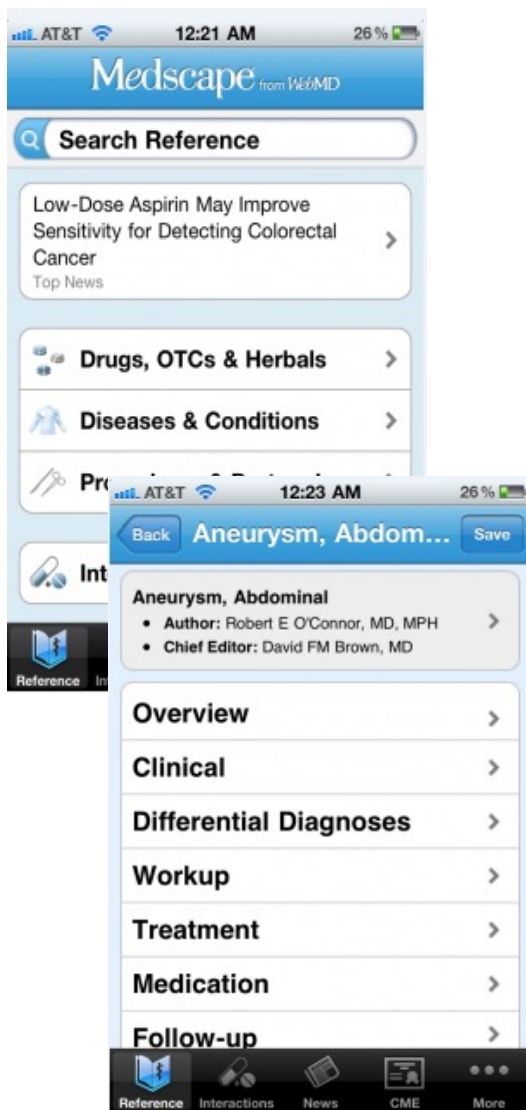
WHY MOBILE: MEDICAL PRACTICE





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WHY MOBILE: MEDICAL EDUCATION





Crowdsourcing for research

A Wandering Mind Is an Unhappy Mind



Matthew A. Killingsworth* and Daniel T. Gilbert

We solved this problem by developing a Web application for the iPhone (Apple Incorporated, Cupertino, California), which we used to create an unusually large database of real-time reports of thoughts, feelings, and actions of a broad range of people as they went about their daily activities. The application contacts participants through

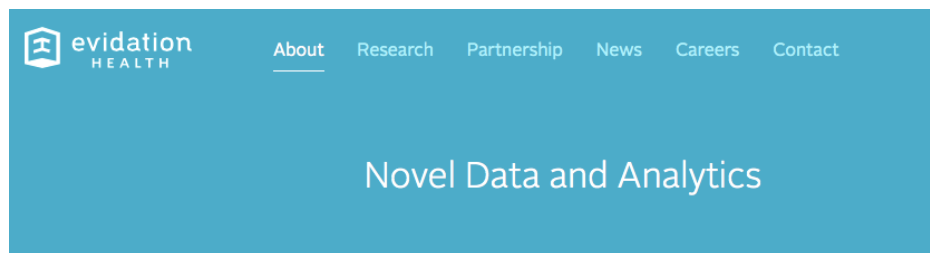
Large DNA study using 23andMe data finds 15 sites linked to depression

Collecting data for epidemics

Boston research company collecting COVID-19 data in new app

Coronavirus: NHS contact tracing app to target 80% of smartphone users

By Leo Kelion



Collect digital data for advanced analytics

Evidation Health's technology platform and services enable healthcare companies to partner with patients and consumers who are engaged in understanding and improving health outcomes.



Sanofi and Evidation Health to work together to understand, treat disease

By Jeff Lagasse | August 1, 2017

Medicines aren't the only tools that biopharma companies like Sanofi are using to help patients. Information technology has become a key tool in every part of Sanofi's business, and among the most important digital tools are data and analytics; they enable the company to apply insights gained from real world evidence to the discovery, development and delivery of new medicines. To advance that...



Brigham and Women's partners with Evidation Health to research impact of digital tools in clinical trials

By Heather Mack | October 21, 2016

The innovation arm of Brigham and Women's Hospital has partnered with efficacy-focused digital health company Evidation Health to collaborate on a project measuring the real life impact of digital health solutions on clinical and financial outcomes. The idea is to combine forces to develop methods of creating direct-to-patient trials of digital health solutions, leveraging the research...



Medical apps for smartphones: lack of evidence undermines quality and safety

Arthur Willem Gerard Buijink,¹ Benjamin Jelle Louise Marshall³



BMJ 2013;346:f1811 doi: 10.1136/bmj.f1811 (Published 20 March 2013)

Page 1 of 2

How do we know whether medical apps work?

Smartphone apps have the potential to transform the way the public manage their health and interact with health services, says **Margaret McCartney**, but regulation of medical apps has only just started

STUDY

Margaret McCartney *general practitioner, Glasgow*

Diagnostic Inaccuracy of Smartphone Applications for Melanoma Detection

Joel A. Wolf, BA; Jacqueline F. Mor Joseph C. English III, MD; Jonhan I

OPEN ACCESS Freely available online



mHealth: A Strategic Field without a Solid Scientific Soul. A Systematic Review of Pain-Related Apps

Rocío de la Vega, Jordi Miró*

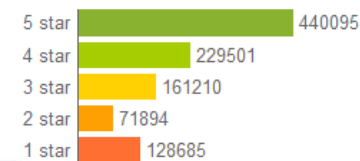
Unit for the Study and Treatment of Pain - ALGOS, Research Center for Behavior Assessment, Department of Psychology and Institut d'Investigació Sanitària Pere Virgili, Universitat Rovira i Virgili, Tarragona, Spain



Literature shows that **apps** provided for patients can be **inaccurate** or **uncontrolled** and that **apps reviewed in the scientific literature are not those available in stores**

- Internet search engines like **Google** are the **3rd source of information** (51,4%), **Facebook** is the **fifth** (43,7%).
- Among younger people:
 - **First: Facebook (71,1%)**
 - **Second: Google (68,7%)**
 - **Fourth: YouTube (53,6%)**

User Reviews

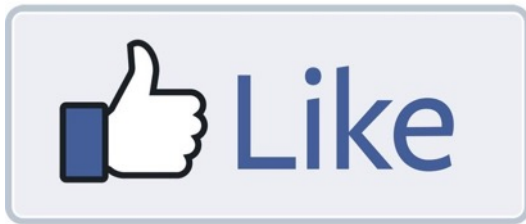


Average rating:

3.8



1,028,105



Apps are chosen based on the review of other users but **there are no recognized systems for app review**



- Individuals may have a **limited or incorrect understanding of when data about their health is protected by law, and when it is not** → some health-related information are stored in places that usually treat non-health information (e.g., Twitter, Facebook, etc) → HIPAA rule does not apply
- Health information collected in **different places without consistent security standards** may pose a cybersecurity threat (of which individuals may be unaware)
- Medical device manufacturers may not be covered entities or business associates under HIPAA. This leaves a **health care provider using a medical device with potentially greater responsibility for assuring privacy and security protections** for health information created and shared by the device





Cyberpsychology, Behavior, and Social Networking, VOL. 19, NO. 11 | Original Articles

normal

The Facebook Experiment: Quitting Facebook Leads to Higher Levels of Well-Being

Tromholt Morten

Published Online: 1 Nov 2016 | <https://doi.org/10.1089/cyber.2016.0259>

SLEEP

Getting worked up with anxiety or envy from what we see on social media keeps the brain on high alert, preventing us from falling asleep

DISOTERTED MEMORIES

“If we direct all of our attention toward capturing the best shots for our social media followers to admire, less will be available to enjoy other aspects of the experience in real time,”

Gen Z is quitting social media in droves because it makes them unhappy, study finds

March 09, 2018 by Oliver McAteer, Campaign

It's the most socially savvy generation, but many are leaving multiple platforms and marketers need to know why.

American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

Guidance for the Clinician in
Rendering Pediatric Care

Clinical Report—The Impact of Social Media on
Children, Adolescents, and Families



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RESPONSE: REGULATORY BODIES



Contains Nonbinding Recommendations

Mobile Medical Applications

Guidance for Industry and Food and Drug Administration Staff

Document issued on February 9, 2015.

This document supersedes "Mobile Medical Applications: Guidance for Food and Drug Administration Staff" issued on September 25, 2013.

This document was updated to be consistent with the guidance document "Medical Devices Data Systems, Medical Image Storage Devices, and Medical Image Communications Devices" issued on February 9, 2015.

For questions about this document regarding CDRH-regulated devices, contact Bakul Patel at 301-796-5528 or by electronic mail at Bakul.Patel@fda.hhs.gov or contact the Office of the Center Director at 301-796-5900.

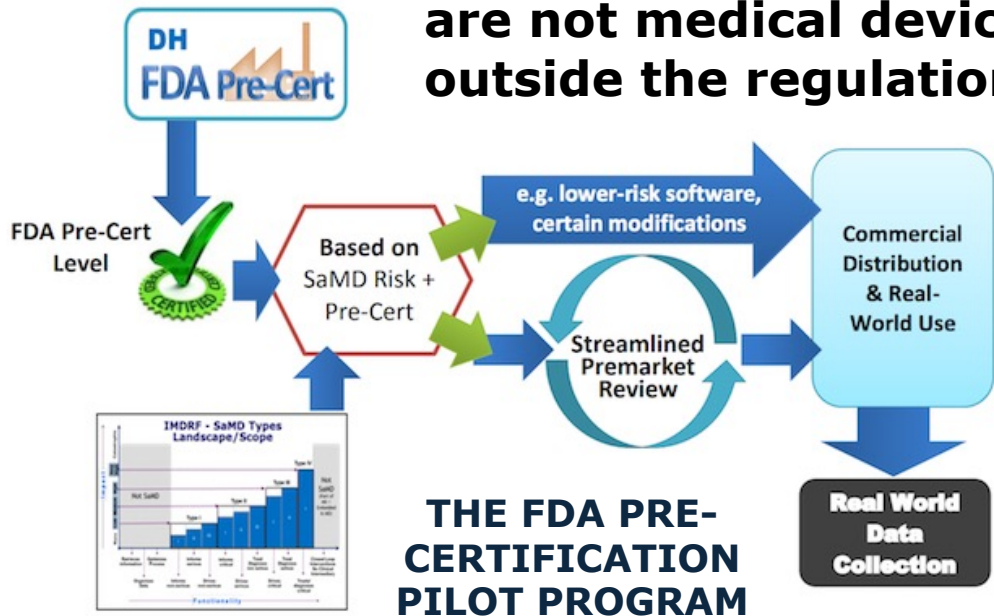
For questions about this document regarding CBER-regulated devices, contact the Office of Communication, Outreach and Development (OCOD), by calling 1-800-835-4709 or 240-402-...

Software e app mediche sono "dispositivi medici" e dovranno avere il marchio CE. La sentenza della Corte di Giustizia Europea

La Corte ha stabilito che "un software è di per sé un dispositivo medico quando è specificamente destinato dal fabbricante ad essere impiegato per una o più delle finalità mediche stabilite nella definizione di dispositivo medico" e partendo da tale assunto hanno dichiarato che il software può essere dispositivi medico anche senza impiego "sull'uomo". [LA SENTENZA](#)



There is a grey zone of Apps that are not medical devices and fall outside the regulation



Reclassification of mobile medical apps for smartphones and other mobile devices → generally risk class IIa, but under certain conditions can be risk class IIb or III. (Rule 11 in Annex VIII MDR)

May 2017



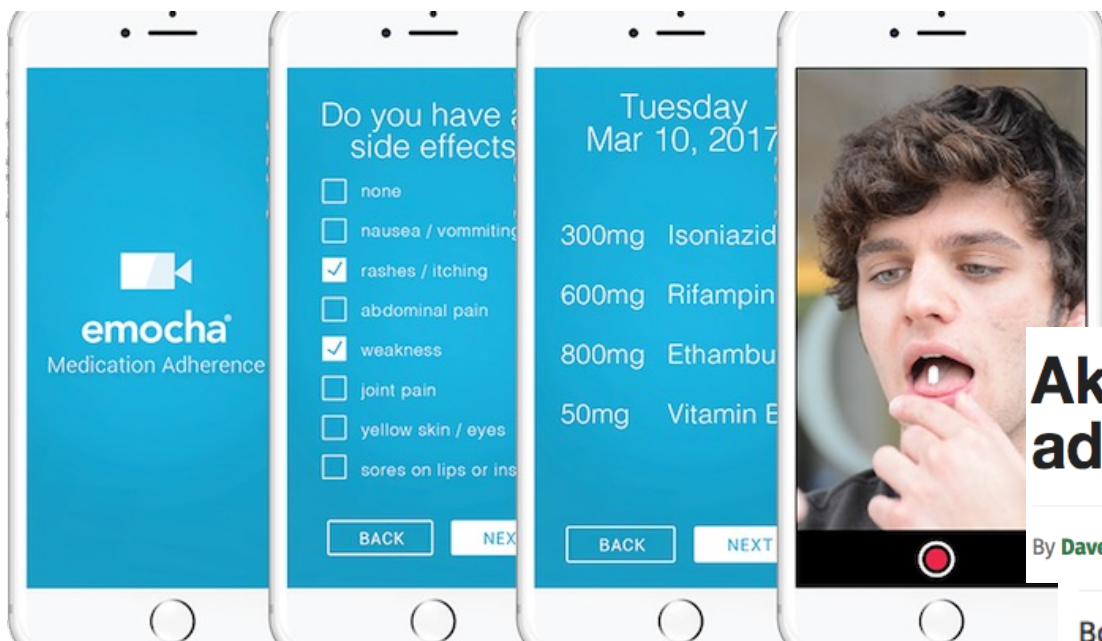
[Global Edition](#) [Medical Devices](#)

FDA hopes draft guidance on device software will offer 'clarity, simplicity'

The new document, published this past week, takes stock of a fast-changing technology environment – and would replace the agency's previous medical device guidance, first issued more than 16 years ago.

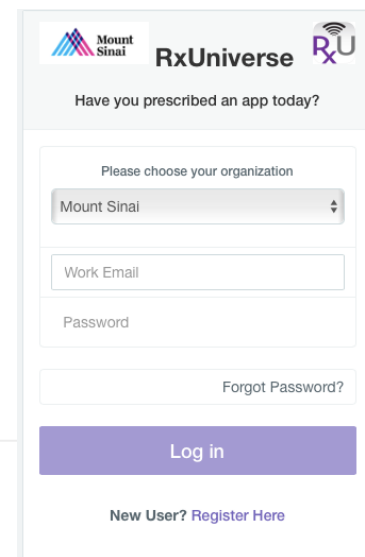
<https://www.healthcareitnews.com/news/fda-hopes-draft-guidance-device-software-will-offer-clarity-simplicity>

With \$1.7M NIDA grant, emocha will evaluate its app for treating opioid addiction



Mount Sinai launches RxUniverse, a system-wide platform to prescribe medical apps

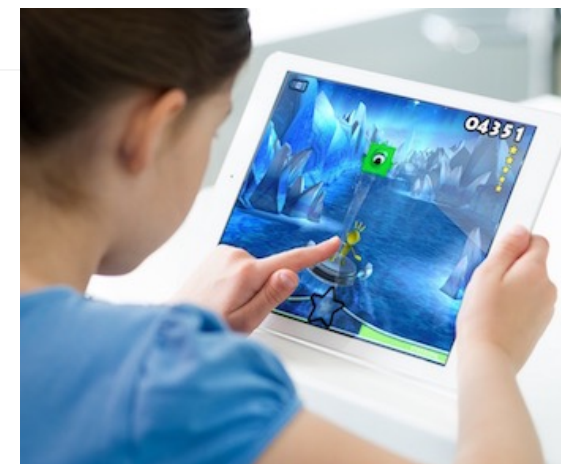
By Heather Mack (/content/heather-mack) | November 03, 2016



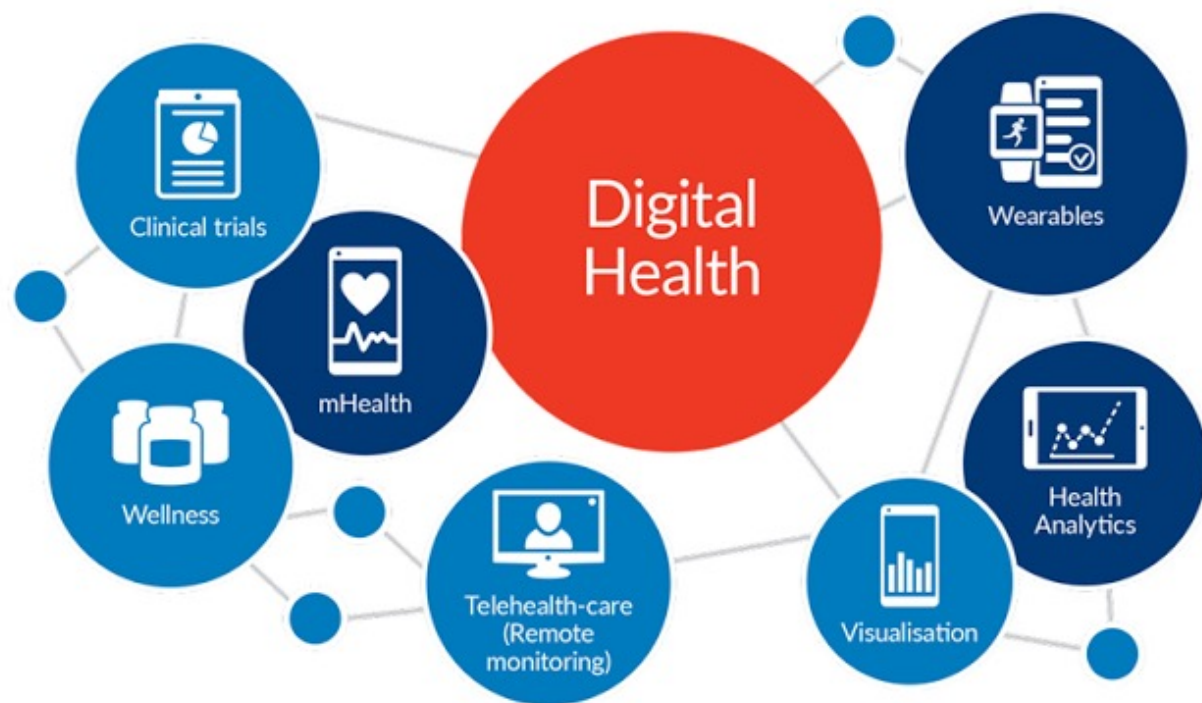
Akili preparing FDA bid following strong results of adolescent ADHD trial

By Dave Muoio | December 04, 2017

Boston-based **Akili Interactive Labs** has announced positive results from the largest clinical trial of its video game-based pediatric ADHD treatment yet. In light of these data, the company announced that it now plans to file AKL-T01, also known as Project: Evo ADHD Treatment, for FDA clearance as a novel treatment for children and adolescents with ADHD



Internet of Things



*"Interconnection of sensing and actuating **devices** providing the ability to **share information** across platforms through a unified framework, developing a common operating picture for **enabling innovative applications**. This is achieved by seamless **ubiquitous sensing, data analytics and information representation with Cloud computing** as the unifying framework."*



Hollywig launches smartphone-controlled pain management wearable

By Dave Muolo | October 09, 2017

SHARE



GIZWEAR.net

SOWATCH: lo smartwatch che previene l'ictus

Digital Health | Ultime Notizie | 26/09/2016 | Gianluca Patrignani



THIM, il primo wearable al mondo "migliora-sonno" | Video

The number of devices connected to the Internet was 12.5 billion in 2010, making the number of connected devices per person >1 (1.84) for the first time in history. Now they are 25 billions



Hodei Technology helps hospitals use Google Glass for surgical collaboration; rural telemedicine



Medtronic implantable device for treating chronic pain by delivering neurostimulation at the spinal cord is connected to a Samsung Galaxy Tab S2, to allow data capturing and IPG controlling

Apple Watch adds gym equipment integration, built-in Bluetooth



"Apple Watch is designed to help you live a healthier life," CEO Tim Cook said, "and people are absolutely loving the fitness capabilities, the health capabilities, the quick access to information, and even the ability to swim with it."

The biggest update to the Apple Watch health and fitness suite was an integration between the watch and fitness equipment at the gym. Brands like LifeFitness, Matrix, TechnoGym, Star Trac, Cybex, Schwinn, and StairMaster, which sell 80 percent of the country's fitness equipment, will start to roll out Apple Watch-integrated equipment this fall.

In-Depth: How digital sensors could change the face of pharma

By [Jonah Comstock](#) | November 17, 2017

Earlier this week, Proteus Digital Health and Otsuka Pharmaceuticals announced that Abilify MyCite, a new, sensor-enabled version of Otsuka's drug for schizophrenia, **had received FDA approval** for mental health conditions including schizophrenia and bipolar disorder.

The Proteus digital medicine platform is a medication management and adherence system that includes sensor-enabled pills, a peel-and-stick biometric sensor patch worn on the body, and a companion smartphone app. The patch records when a pill is ingested and can also track other things like sleep patterns and physical activity levels.

A historic clearance

For those who have been aware of Proteus for a long time, the importance of this latest regulatory win might not be obvious. It's far from the first FDA nod for the startup, which saw its patch first cleared in 2010 and its pill first cleared in 2012. Proteus has also been using its technology in small hospital deployments for some time.



Nonetheless, this is something new and potentially game changing. For one thing, previous clearances went through the FDA's medical device pathway and didn't allow the system to be prescribed the way the Abilify's clearance eventually will.



TELEMEDICINE

- Integration, monitoring and management of patients, as well as education of patients and healthcare professionals using systems and technologies allowing a prompt communication with experts and an effective access to patient's information, independent from where the patient is or the information are stored" (*EC commission, 1990*)

TELEHEALTH

- Delivery of health care services, where patients and providers are separated by distance. Telehealth uses ICT for the exchange of information for the diagnosis and treatment of diseases and injuries, research and evaluation, and for the continuing education of health professionals. Telehealth can contribute to achieving universal health coverage by improving access for patients to quality, cost-effective, health services wherever they may be. It is particularly valuable for those in remote areas, vulnerable groups and ageing populations (*WHO*)



Synchronous telemedicine

Real-Time

Provider and patient communicate via live video-conferencing. Used often in telepsychiatry, telehomecare, telecardiology and remote consults (teleconsults) with specialists, primary care physicians, counselors, social workers and other health care professionals.

Asynchronous telemedicine

Store & Forward

Digital images, video, audio, clinical data are captured and stored on a patient's computer or mobile device and then transmitted securely to a provider for later study or analysis. Used often in teledermatology and telepathology.

Telemonitoring

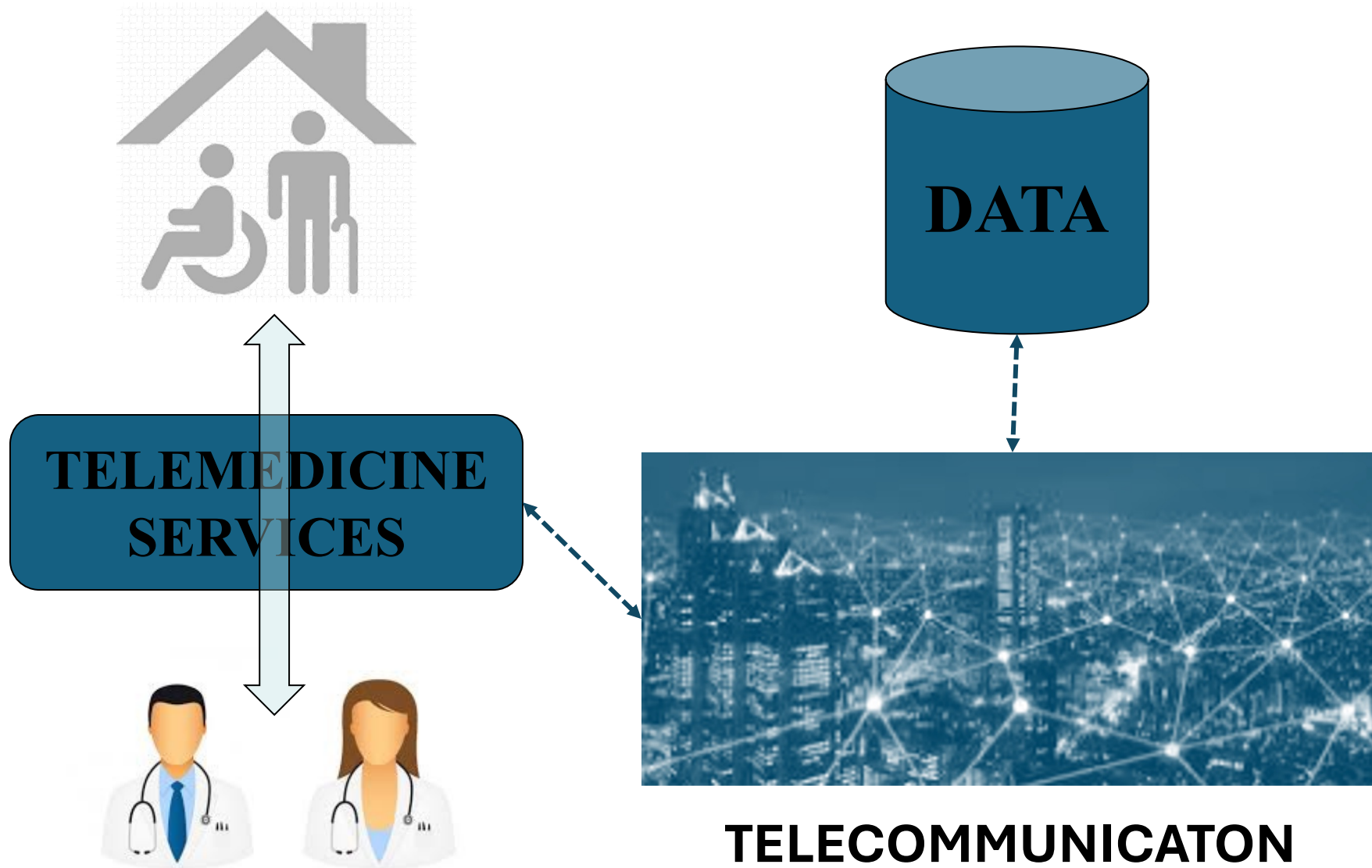
Remote Monitoring

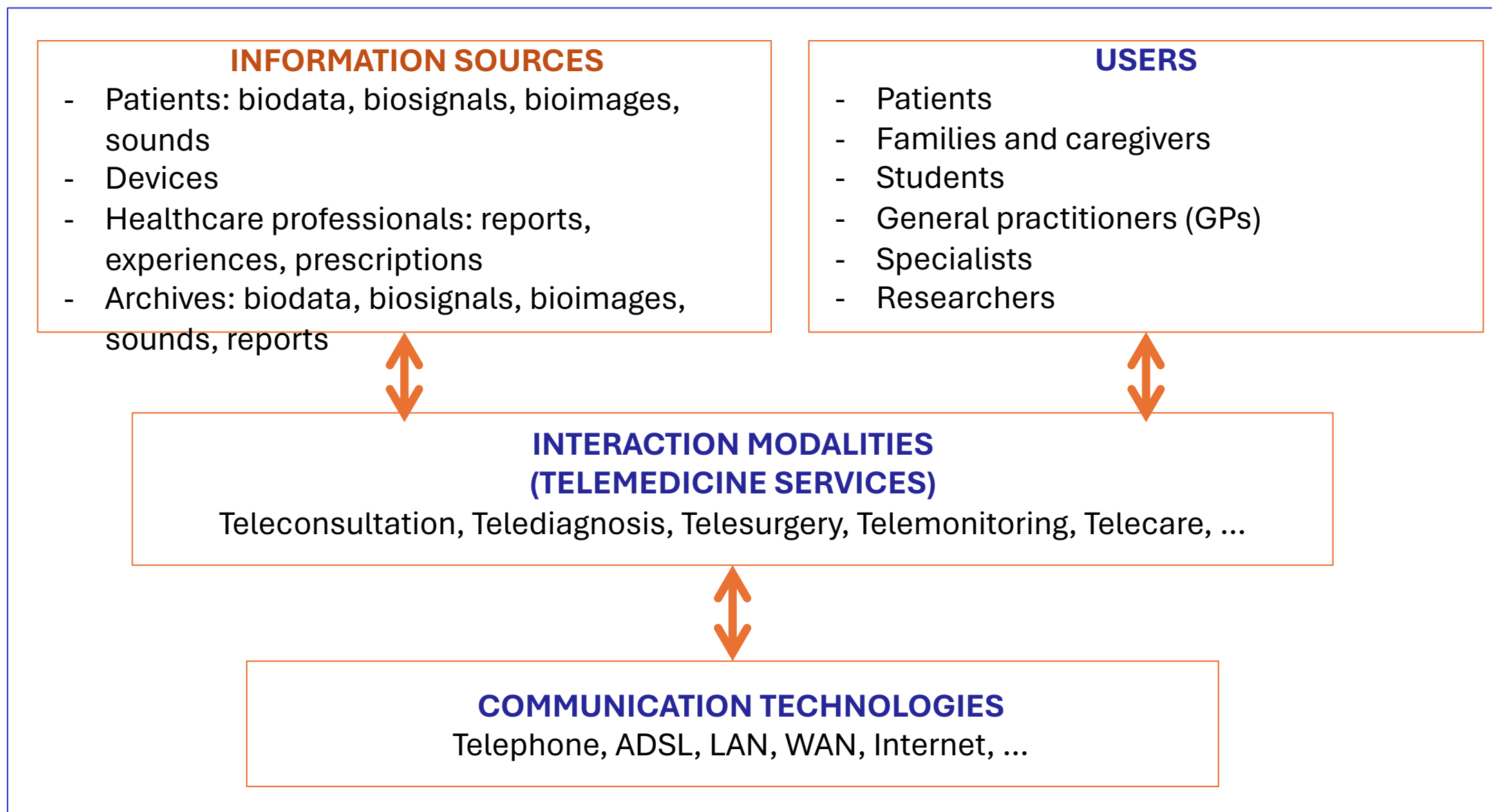
Patient uses a system that feeds data from sensors and monitoring equipment to an external monitoring center so that health care professionals can monitor a patient remotely. Used to monitor chronic conditions such as heart disease, diabetes and asthma.



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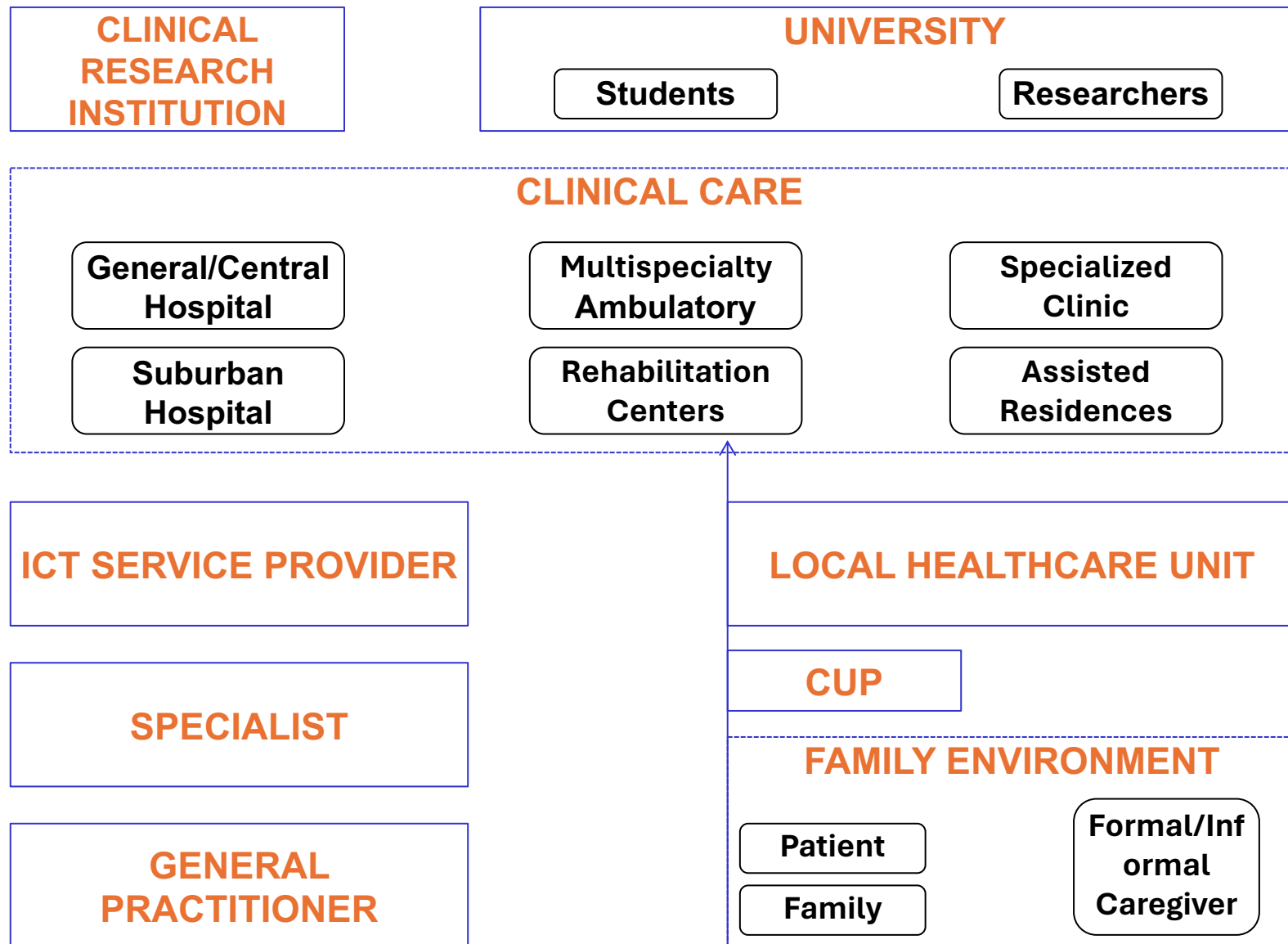
APPLICATION SCENARIO







ACTORS INVOLVED





Tele-reporting

- the reports are created and visualized remotely

Tele-consultation

- a second opinion is asked remotely

Tele-explanation

- from a specialized to a non-specialized physician

Tele-psychology

- to provide comfort to the patient/family

Tele-monitoring

- remote monitoring of patient's clinical condition

Tele-prescription

- remote prescribing (drug, therapies, rehabilitation, activities, exercises,..)

Tele-control

- possibility to remotely change what is monitored

Tele-booking

- remote booking of visits, exams, ...

Tele-administration

- remote control of administrative procedures

Tele-education

- training, support, and even examination in a remote fashion



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EXAMPLES - TELEVISITS



[HOME](#) [COME FUNZIONA](#) [COSA TRATTIAMO](#) [CHI SIAMO](#) [NOVITÀ MAMME](#)

ACCEDI

TELEMONITORAGGIO

VICINI VINCIAMO

EMERGENZA COVID

Consulti Online Gratuiti

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JAMA Neurology August 2020 Volume 77, Number 8

VIEWPOINT

The Coronavirus Disease 2019 Crisis as Catalyst for Telemedicine for Chronic Neurological Disorders

Vol. ■ No. ■ 2020

Journal of Pain and Symptom Management 1

COVID-19 for Fast Track Publication

Telemedicine in the Time of Coronavirus

Brook Calton, MD, MHS, Nauzley Abedini, MD, MSc, and Michael Fratkin, MD
Division of Palliative Medicine (B.C., N.A.), Department of Medicine, University of California, San Francisco (UCSF), San Francisco, California; and ResolutionCare (M.F.), Eureka, California, USA

Tele-Neuro-Ophthalmology During the Age of COVID-1

Kevin E. Lai, MD, Melissa W. Ko, MD, Janet C. Rucker, MD, Jeffrey G. Odel, MD, Linus D. Sun, MD, PhD, Kimberly M. Wings, MD, Arko Ghosh, BS, Shruthi Harish Bindiganavile, MD, Nita Bhat, MD, Sydney P. Wendt, BS, Jackson M. Scharf, BS, Marc J. Dinkin, MD, Nailyn Rasool, MD, Steven L. Galetta, MD, Andrew G. Lee, MD

PERSPECTIVES IN HOSPITAL MEDICINE

Keep Calm and Log On: Telemedicine for COVID-19 Pandemic Response

Ameet Doshi, MD, MBA*, Yonatan Platt, MD, John R Dressen, MHA, Benji K Mathews, MD, FACP, SFHM, Jerome C Siy, MD, MHA, SFHM

Department of Hospital Medicine, HealthPartners, Bloomington, Minnesota.

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From Isolation to Coordination: How Can Telemedicine Help Combat the COVID-19 Outbreak?

Yunkai Zhai, Yichuan Wang, Minhao Zhang, Jody Hoffer Gittel, Shuai Jiang, Baozhan Chen, Fangfang Cui, Xianying He, Jie Zhao, Xiaojun Wang

doi: <https://doi.org/10.1101/2020.02.20.20025957>

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should not be used to guide clinical practice.

Ruggero Capra¹ · Flavia Mattioli²



The NEW ENGLAND JOURNAL of MEDICINE

Virtually Perfect? Telemedicine for Covid-19

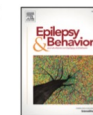
Judd E. Hollander, M.D., and Brendan G. Carr, M.D.

Epilepsy & Behavior 111 (2020) 107282

Contents lists available at ScienceDirect

Epilepsy & Behavior

journal homepage: www.elsevier.com/locate/yebeh



Review

Telehealth in pediatric epilepsy care: A rapid transition during the COVID-19 pandemic

Shifteh Sattar^a, Rachel Kuperman^{b,*}



Accelerating Telemedicine for Cerebral Palsy During the COVID-19 Pandemic and Beyond

Hilla Ben-Pazi^{1,2,3*}, Liana Beni-Adani^{1,4} and Ron Lamdan¹



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TELEMEDICINE

Rapporto ISS COVID-19 • n. 12/2020

**Indicazioni *ad interim* per servizi
assistenziali di telemedicina durante
l'emergenza sanitaria COVID-19**

versione 13 aprile 2020

Ministero della Salute

TELEMEDICINA
Linee di indirizzo nazionali

2014



CLASSIFICAZIONE		AMBITO	PAZIENTI		RELAZIONE
TELEMEDICINA SPECIALISTICA	TELE VISITA	sanitario	Può essere rivolta a patologie acute, croniche, a situazioni di post- acuzie	Presenza attiva del Paziente	B2C B2B2C
	TELE CONSULTO			Assenza del Paziente	B2B
	TELE COOPERAZIONE SANITARIA			Presenza del Paziente, <i>in tempo reale</i>	B2B2C
TELE SALUTE		sanitario	E' prevalentemente rivolta a patologie croniche	Presenza attiva del Paziente	B2C B2B2C
TELE ASSISTENZA		socio- assistenziale	Può essere rivolta ad anziani e fragili e diversamente abili		

* B2B: individua la relazione tra medici

B2B2C: individua la relazione tra un medico e un paziente mediata attraverso un operatore sanitario

B2C: individua la relazione tra medico e paziente



Dipendentemente dal tipo di relazione tra gli attori coinvolti, le prestazioni della Telemedicina Specialistica si possono realizzare secondo le seguenti modalità:

Televisita

La Televisita è un atto sanitario in cui il medico interagisce a distanza con il paziente. L'atto sanitario di diagnosi che scaturisce dalla visita può dar luogo alla prescrizione di farmaci o di cure. Durante la Televisita un operatore sanitario che si trovi vicino al paziente, può assistere il medico. Il collegamento deve consentire di vedere e interagire con il paziente e deve avvenire in tempo reale o differito.

Teleconsulto

Il Teleconsulto è un'indicazione di diagnosi e/o di scelta di una terapia senza la presenza fisica del paziente. Si tratta di un'attività di consulenza a distanza fra medici che permette a un medico di chiedere il consiglio di uno o più medici, in ragione di specifica formazione e competenza, sulla base di informazioni mediche legate alla presa in carico del paziente.

Telecooperazione sanitaria

La Telecooperazione sanitaria è un atto consistente nell'assistenza fornita da un medico o altro operatore sanitario ad un altro medico o altro operatore sanitario impegnato in un atto sanitario. Il termine viene anche utilizzato per la consulenza fornita a quanti prestano un soccorso d'urgenza.



La registrazione e trasmissione dei dati può essere automatizzata o realizzata da parte del paziente stesso o di un operatore sanitario.

La Telesalute prevede un ruolo attivo del medico (presa in carico del paziente) e un ruolo attivo del paziente (autocura), prevalentemente pazienti affetti da patologie croniche, e in questo si differenzia dal Telemonitoraggio. La Telesalute comprende il Telemonitoraggio, ma lo scambio di dati (parametri vitali) tra il paziente (a casa, in farmacia, in strutture assistenziali dedicate,...) e una postazione di monitoraggio non avviene solo per l'interpretazione dei dati, ma anche per supportare i programmi di gestione della terapia e per migliorare la informazione e formazione (knowledge and behaviour) del paziente.

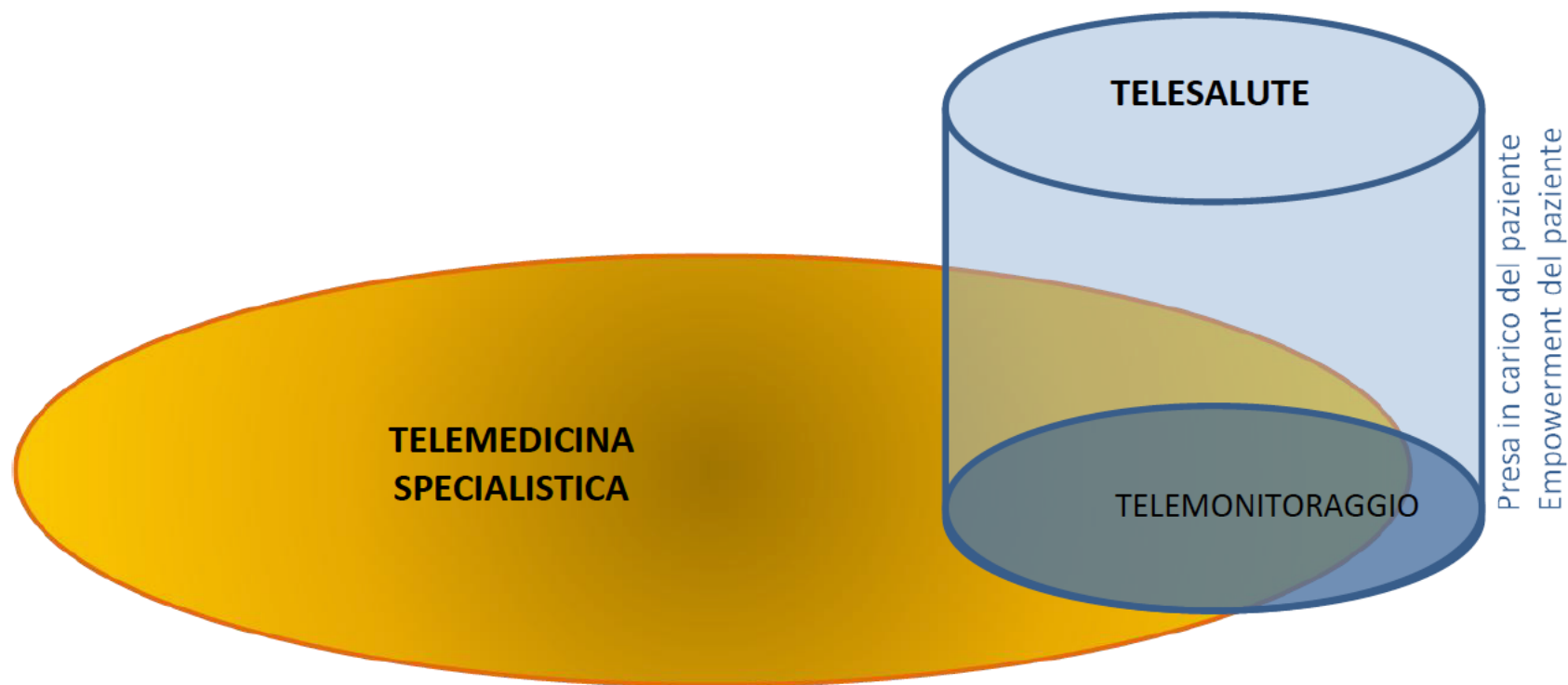


Figura 2.1 Rappresentazione schematica dei rapporti tra Telemonitoraggio, Telemedicina Specialistica e Telesalute. Si evidenzia il ruolo attivo del Paziente (Empowerment) e del Medico (presa in carico) nel caso della Telesalute, che espande il concetto del curare nella direzione del prendersi cura (medicina di iniziativa).



Per Teleassistenza, si intende un sistema socio-assistenziale per la presa in carico della persona anziana o fragile a domicilio, tramite la gestione di allarmi, di attivazione dei servizi di emergenza, di chiamate di “supporto” da parte di un centro servizi. La Teleassistenza ha un contenuto prevalentemente sociale, con confini sfumati verso quello sanitario, con il quale dovrebbe connettersi al fine di garantire la continuità assistenziale. Non rivolgendosi all’ambito sanitario, ma a quello socio-assistenziale, non sarà oggetto di queste Linee di Indirizzo.



Following the onset of the COVID-19 pandemic, the Centers for Medicare & Medicaid Services **expanded billing options for telemedicine including “e-visits,” defined as asynchronous patient portal messages that require medical decision-making and at least 5 minutes of clinician time over a 7-day period.** During the pandemic, patient messaging increased by more than 50%, requiring a substantial amount of uncompensated clinician time

Research Letter

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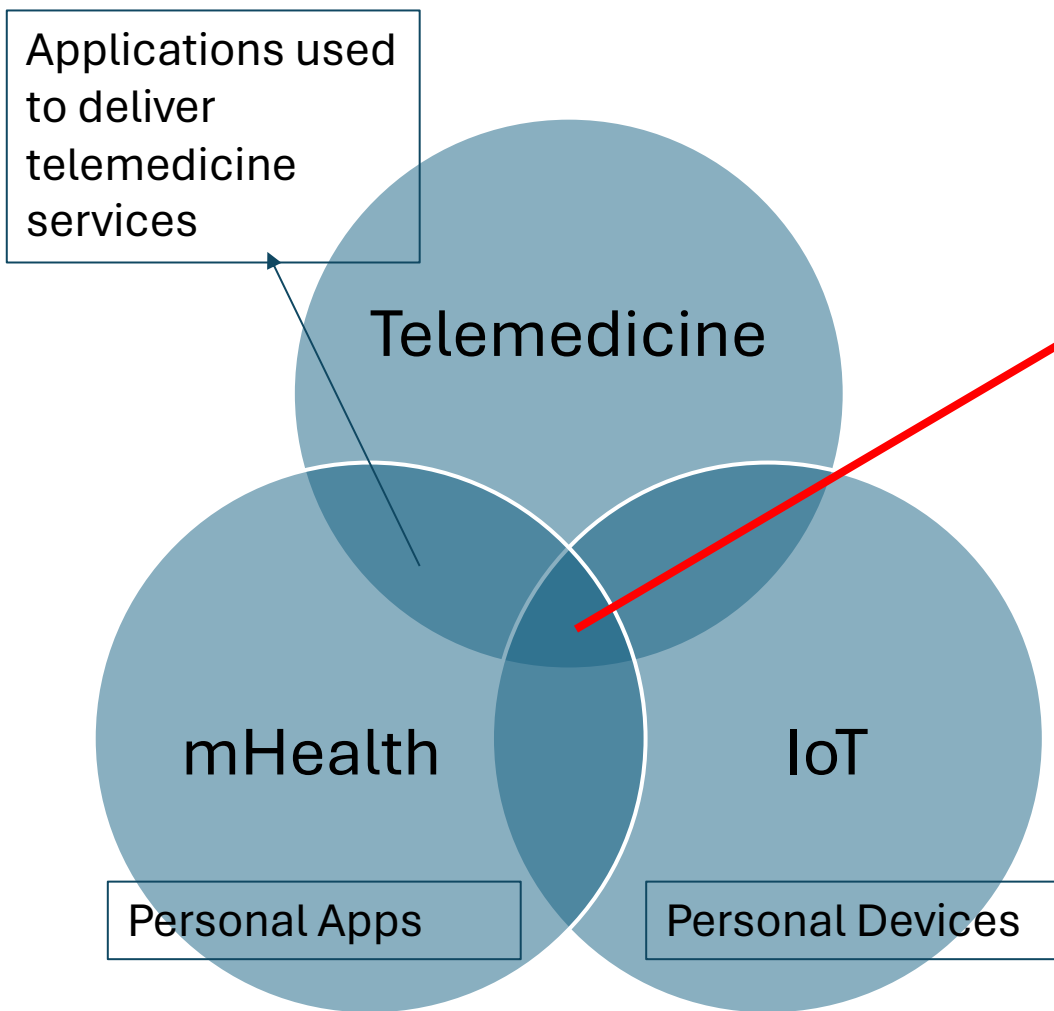
January 6, 2023

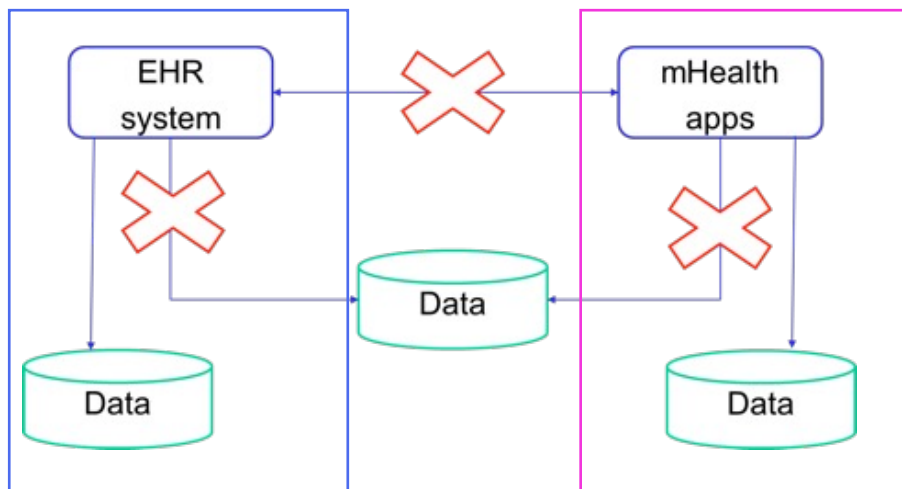
Association Between Billing Patient Portal Messages as e-Visits and Patient Messaging Volume

A. Jay Holmgren, PhD, MHI¹; Maria E. Byron, MD²; Carrie K. Grouse, MD³; [et al](#)

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JAMA. Published online January 6, 2023. doi:10.1001/jama.2022.24710



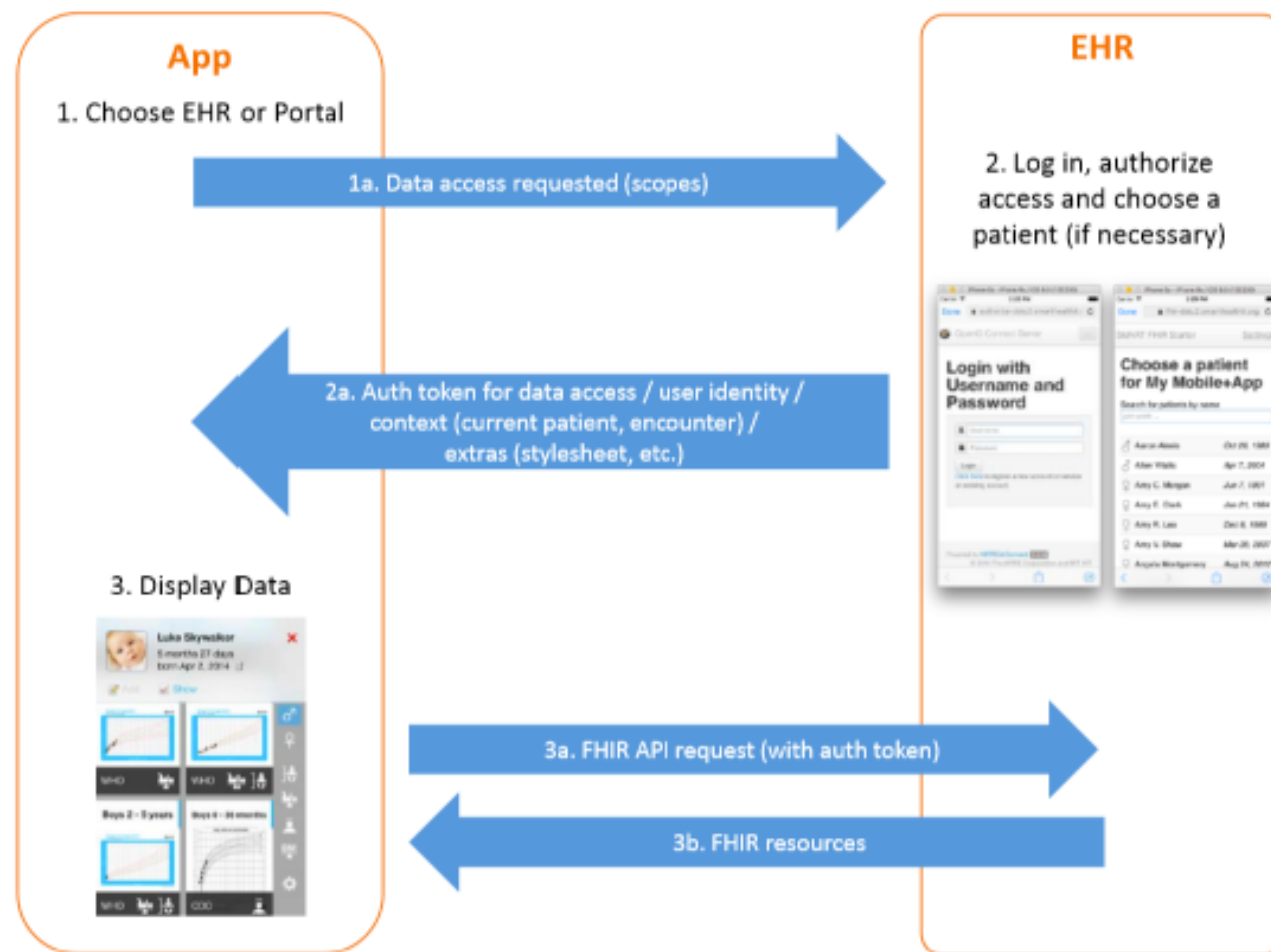


Healthcare professional
in Hospital

Patient at
Home



Fast Healthcare Interoperability Resources



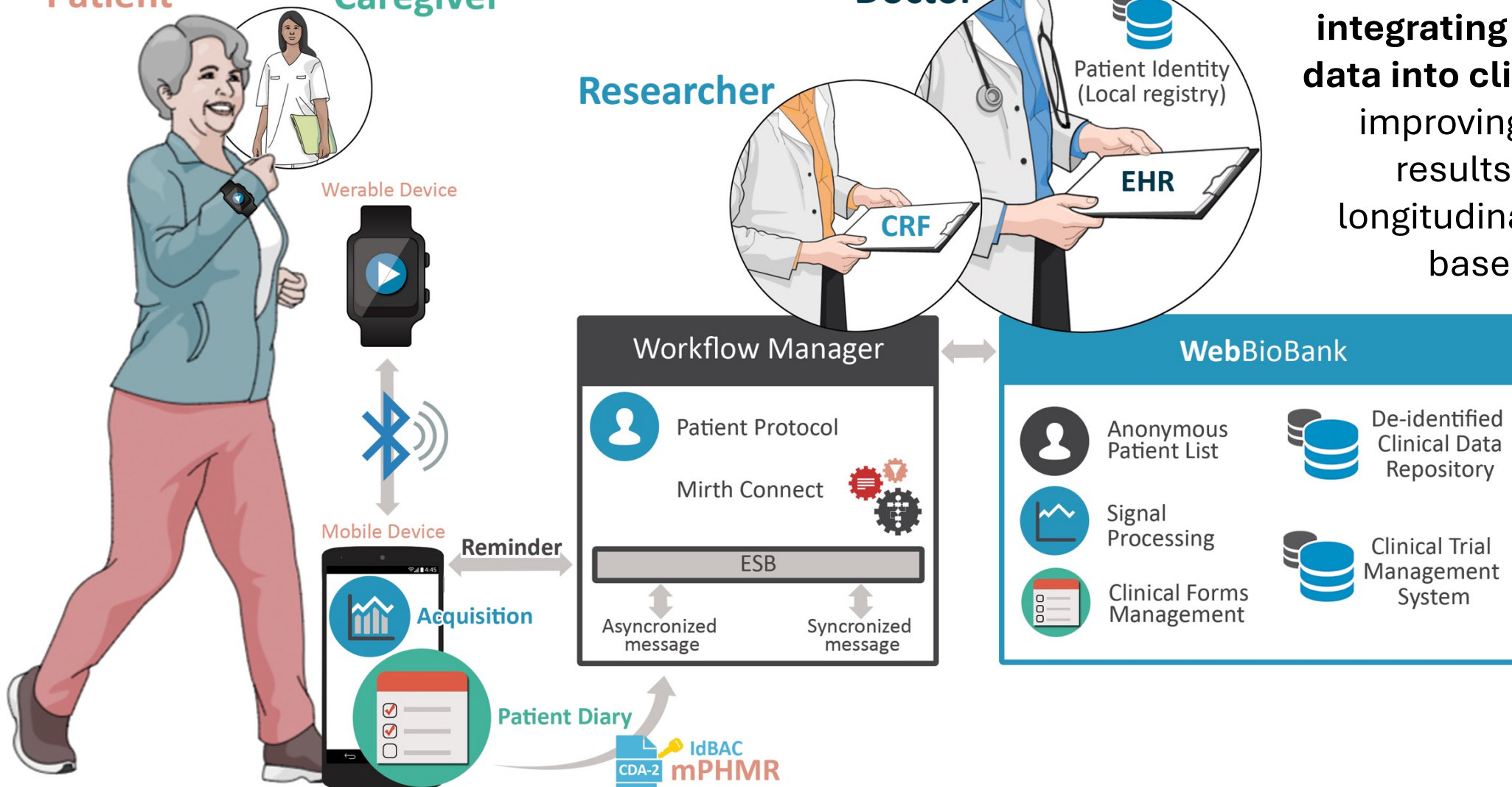
Patient

Caregiver

Doctor

Researcher

Telemedicine/app ecosystems based on standards allow **integrating patient-generated data into clinical research** thus improving the reliability of results, especially for longitudinal, chronic, home-based monitoring





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localhost:82/PatientPrivacy/Pages/WorkbenchDefault.aspx#

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List Management

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Select a XML File Clear sensitive data New Patient Download XML Patient Data

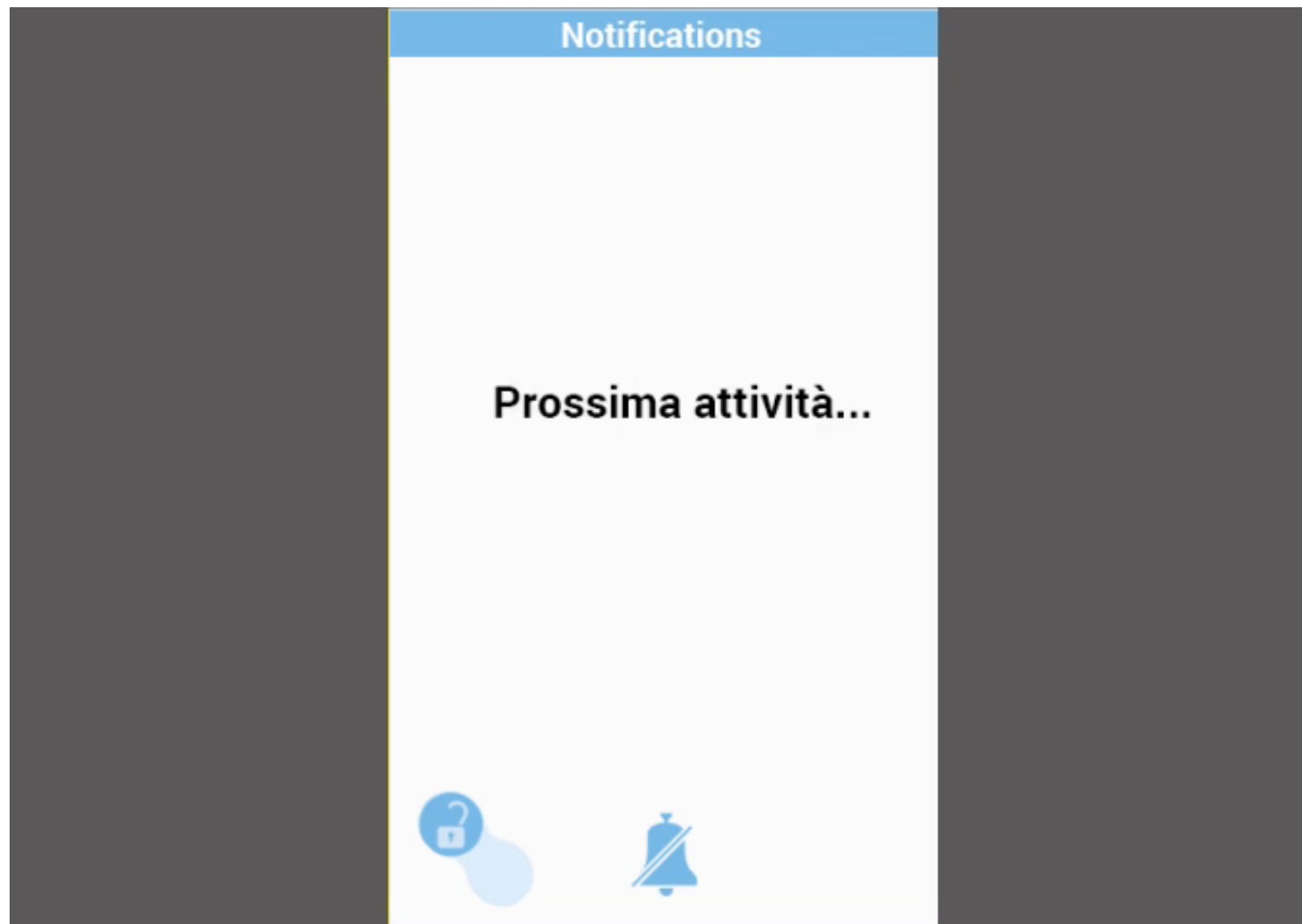
Patient List - Ospedale Maggiore Policlinico - U.O. di Neurofisiopatologia Clinica, Neurochirurgia

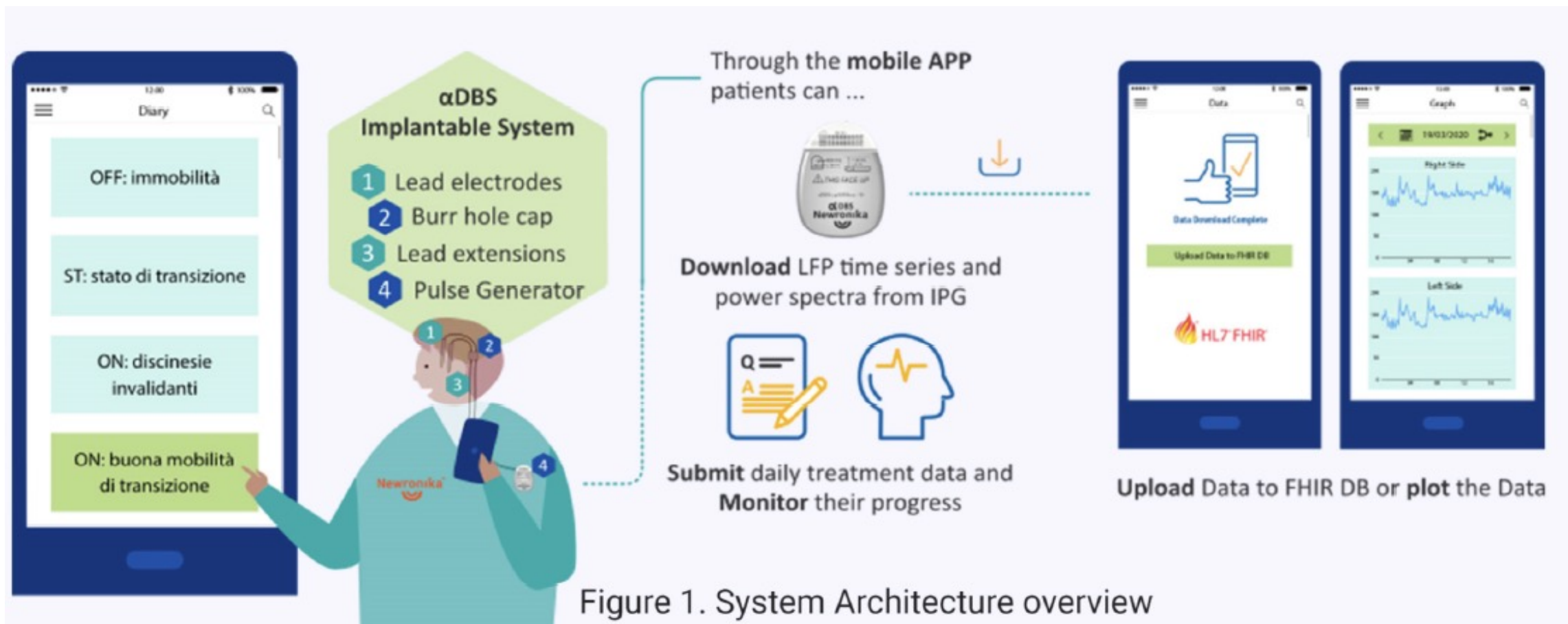
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3317	11461	10/07/2017 23:02:48		722					
3321	11465	18/10/2017 17:41:39		P004					
3316	11460	10/07/2017 23:01:40		122					
3320	11464	13/07/2017 16:57:25		123					
3318	11462	11/07/2017 11:39:04		812					
3319	11463	11/07/2017 17:30:14		890					
3323	11467	19/10/2017 15:36:11		P001					
3322	11466	19/10/2017 15:23:06		P002					
3324	11468	21/10/2017 16:48:32		P003					
98	42	22/10/2011 17:49:37							

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- Adaptive Deep Brain Stimulation (aDBS) devices can record neural signals and adapt the neuromodulation therapy accordingly, thus being fully bi-directional computer interfaces
- It is now necessary to study brain dynamics 24/7, and to define optimized algorithms for providing personalized stimulation
- A data management ecosystem



- mHealth apps are increasingly adopted, together with wearable and IoT devices
- There are no recognized review systems for health-related apps that are not certified as medical devices
- A full Internet of Health System including telemedicine (communication technologies), apps, and devices could be an effective way to exploit the full potentials of apps
- There are medical informatics standards (HL7-FHIR) that enable the connection of apps to electronic health records and hospital systems
- The use of apps can boost medical research thanks to the possibility to collect data in ecologic environments and to include patient's generated data
- The COVID-19 pandemic boosted the adoption of apps and telemedicine opening the way for its adoption also in non-emergency situations