

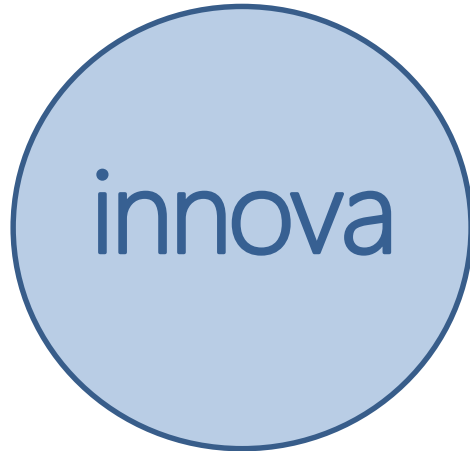
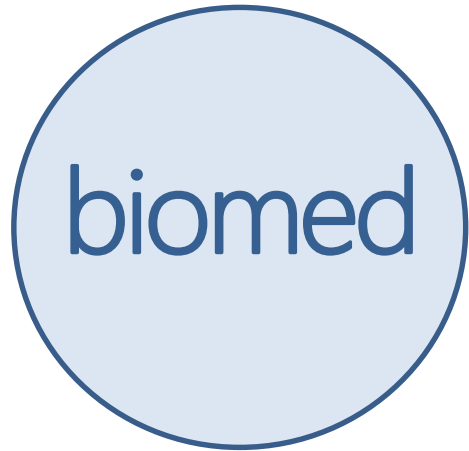


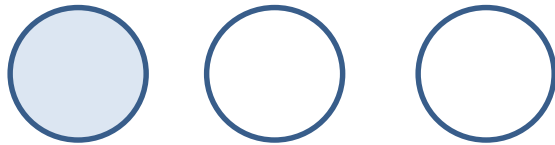
<http://www.biomedaragon.com/>





innovando para el futuro





# integración y sinergias

empresas • instituciones de investigación • hospitales

la creatividad  
simplemente  
consiste en  
conectar cosas



“**el todo es mucho más que la suma de las partes**”

Consolidar una asociación ágil y eficaz que se convierta en un centro de excelencia que agrupe a agentes de investigación e innovación con intereses comunes y que ponga en valor los beneficios de la colaboración mutua público-privada

“**hacer las cosas bien ... o como siempre**”

impulsar una cultura emprendedora que incremente el número de ideas convertidas en proyectos empresariales: ser un centro de gravedad que sirva de polo de atracción de inversión, contribuyendo al desarrollo socioeconómico de la región.

“**gente muy buena ... y muy buena gente**”

En Aragón disfrutamos de excelentes profesionales: empresas, entidades de I+D, administraciones y estructuras de interrelación que apoyan la investigación, la innovación y la transferencia rápida de conocimiento

## Administración y Hospitales Públicos

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Gobierno de Aragón  
Departamento de Salud  
Departamento de Industria e Innovación

## Universidades y Centros Investigación

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IACS, IASS  
Universidad Zaragoza  
Universidad San Jorge

## Hospitales Privados

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MAZ  
Quirón



## Empresas y Cluster

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Fundación SAMCA  
Aragón Exterior  
CEEI  
AlphaSIP  
Nanoinmunotech  
**Goodday**  
Casen Fleet  
BitBrain  
CAGT  
Podoactiva  
Criodental  
Defabar  
Arahealth

“ integrar la I+i en biotecnología, biomedicina y tecnologías médicas y asistenciales ”  
alineando experiencia y competitividad de las empresas bio con conocimiento científico y académico

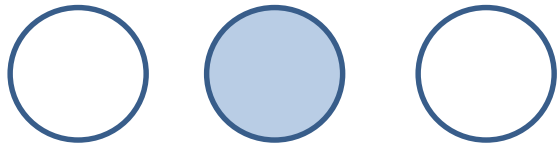




**Red  
Española de  
Biorregiones**



**biorregiones:**  
tendencia de las regiones  
más avanzadas en I+D+i  
de nuestro entorno



# innovación

alianzas estratégicas • nueva cultura • transdisciplinaridad

la mejor forma  
de predecir  
el futuro  
es crearlo





Foros de innovación biomédica  
Horizontes TIC Salud Salud  
Cardiovascular  
Industria Alimentaria  
Envejecimiento Saludable

Iniciativas internacionales  
Horizon 2020 – ERC Calls  
EIP – Active Healthy Ageing  
KIC – País Vasco & Cataluña  
RIS3 – Aragón

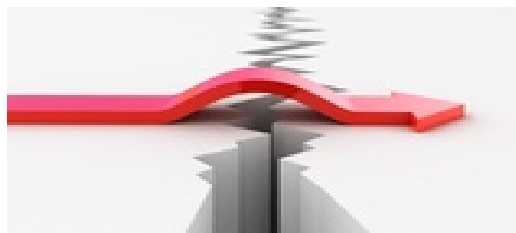


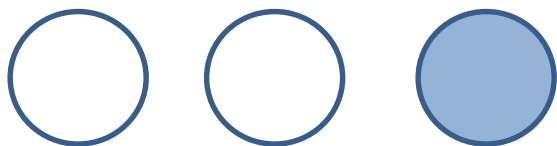
Nueva cultura innovadora  
Hospital innovador  
Científicos emprendedores  
Programa spin-off & start-up

Proyectos conjuntos  
Refbio · POCTEFA  
EU SUMMIT Dublin  
*Ageing Friendly Cities*



punto de referencia 'bio' · puente entre investigación e innovación · cooperación y alianzas





# tecnologías + información

TIC • atención sanitaria a todos los niveles • Salud 4P

la clave no es  
dar años a la vida  
sino conseguir  
dar vida a los años



**europapress.es**

Miércoles, 14 de diciembre 2011

últimas noticias

**LAS VISITAS HOSPITALARIAS BAJARÍAN UN 15%**

**La telemedicina puede ayudar a reducir un 45% las tasas de mortalidad en enfermos crónicos**

**Tecnología**

**La telemonitorización podría ahorrar hasta el 50% de las visitas presenciales**

acta sanitaria 

**informacion.es**

*Domingo Orozco Coordinador de la Estrategia Nacional para el Abordaje de la Cronicidad*

**‘Es insostenible que el sistema sanitario siga tratando a los pacientes crónicos como agudos’**

**‘La telemedicina permitirá ahorrar miles de millones’**

José Perdomo defiende que reducir los gastos hospitalarios se puede conseguir a través de las tecnologías de la información



El director de la Unidad Vertical de EHealth, José Perdomo.

“ TIC como herramienta de motivación,  
sostenibilidad y excelencia ”

transferencia rápida de la innovación al servicio sanitario  
para el ciudadano: tele-consulta/asistencia/monitorización

“ atención sanitaria integral en todos los niveles ”

atención primaria, atención especializada, hospitales,  
institutos sanitarios, universidades y empresas bio

“ nuevos modelos de e-Salud '4P' ”

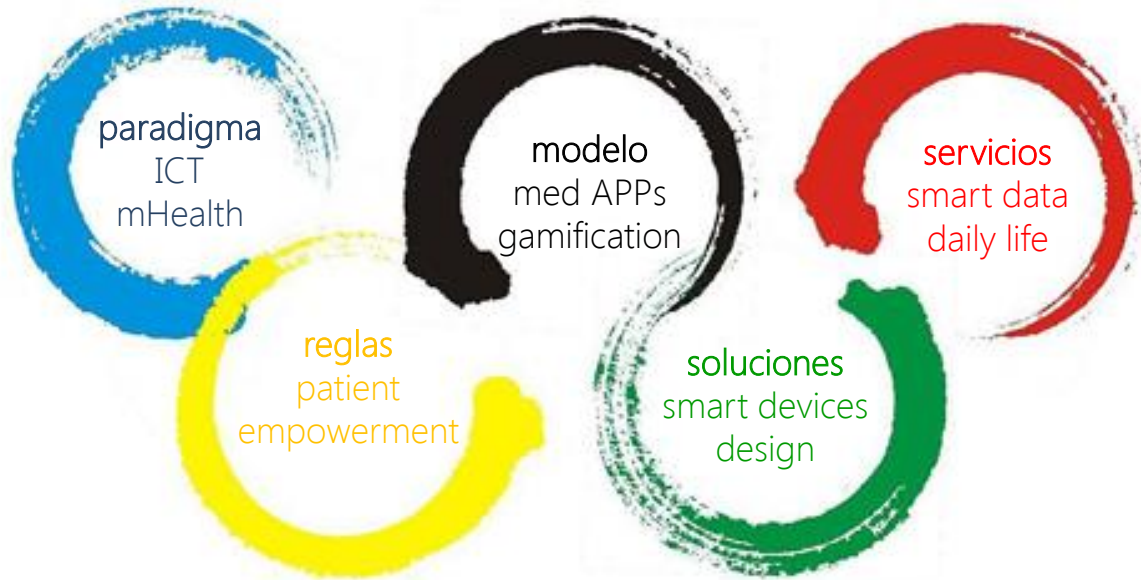
personal y pro-activa para corresponsabilizar al ciudadano (red social)  
prevención y predicción para la promoción de la salud (vida saludable)

“ roadmap en tecnologías emergentes y nuevos horizontes ”

interoperabilidad para integración homogénea con estándares abiertos  
e-Servicios inteligentes, soluciones de conectividad y apps médicas para  
pacientes crónicos, hospitalización domiciliaria y envejecimiento activo



# el cambio del cambio



Cambio de paradigma en el cuidado de la salud

from eHealth to mHealth

1

# mHealth

## What it covers



mobile devices



Personal Digital Assistants (PDAs)



smart watches & other body-worn devices or implants



With these devices it is possible to **collect big amounts of data** such as



health monitoring



lifestyle



daily activity



with this data, your doctor will make a better diagnosis & give the best treatment



patients can take control of their health, accessing their records or getting reminders about their medications

## Why it is important



early diagnosis & better treatment



patients care for their own health & having healthier lifestyle



increased prevention



more efficient & sustainable healthcare



health professionals could **save 30%** of their time spent on accessing & analyzing information

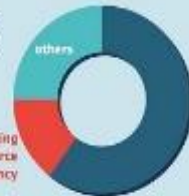
## mHealth market



the mHealth market is sustained by over **6 billion** wireless subscriptions worldwide

## Current deployment breakdown in Europe

solutions for increasing healthcare workforce efficiency



patient treatment & remote monitoring solutions

Forecast: estimated global market value in 2017 **17.6 billion EUR** divided as follows



**97,000 mHealth apps** are currently available



**70%** target consumers & fitness



**30%** target health professionals

By 2017, **3.4 billion people** worldwide will own a smartphone

**1/2** will use health apps



What is the EU doing about this? Targetting potential issues & barriers, such as



lack of knowledge among mHealth manufacturers about the legal framework



data protection & trust



lack of interoperability between healthcare systems in the EU



safety of mHealth apps

Learn more & participate to the European Commission's public consultation [bit.ly/1CmHealth](http://bit.ly/1CmHealth)

**Have your say!**



Cambio de paradigma en el cuidado de la salud from eHealth to mHealth

# M-HEALTH

## PHYSICIAN USE OF MOBILE TECHNOLOGY

DOCTORS ❤️ TABLETS  
**250%** MORE LIKELY TO OWN A TABLET THAN ANY OTHER CONSUMERS



USE TABLETS FOR MEDICAL PURPOSES



FIND THEY EXPEDITE DECISION MAKING



REPORT MOBILE DEVICES DECREASE TIME SPENT ON ADMINISTRATION

## U.S. PHYSICIAN SMARTPHONE ADOPTION



IN 2012  
**85%** OF U.S. PHYSICIANS OWNED OR USED ANY SMARTPHONE PROFESSIONALLY

## ONLINE PATIENT-PHYSICIAN COMMUNICATION



of U.S. physicians communicate online with patients via email, secure messaging system, instant messaging, or online videoconferencing



of clinicians—doctors, nurses, and nurse practitioners—now use smartphones in their practice areas every day, up from 78 percent in 2012



of all clinicians use tablets daily, up from 34 percent in 2012

The emerging field of mobile health (m-health) has enabled consumers to use smartphone technology to answer their own health-related questions with the quick tap of a touch screen. Here's a look at m-health and the impact it's making on our culture and our well-being.



visits to physicians' offices were made by Americans in 2011



of U.S. consumers are interested in m-health solutions

~85%

of doctors use smartphones and medical apps



There are more than **10,000**

medical/healthcare apps available in Apple's iTunes App Store

56% of doctors who use mobile devices say they expedite decision making

40% say they decrease time spent on administration

Only **28%** of smartphone users and **18%** of tablet users describe themselves as "very satisfied" with the quality of medical apps currently available



It's the third-fastest growing app category for both iPhone and Android phones



of doctors would like their patients to monitor their health at home, particularly their weight, blood sugar, and vital signs

## PATIENT USE OF MOBILE TECHNOLOGY



have accessed, stored, or transmitted personal health information or records in the past year  
**48% are interested in doing so**



say they would like access to tools or websites that enable them to review quality rankings, satisfaction rankings, and patient reviews for specific doctors and hospitals



are comfortable in consulting with their physician through a video connection

# The doctor will see you now

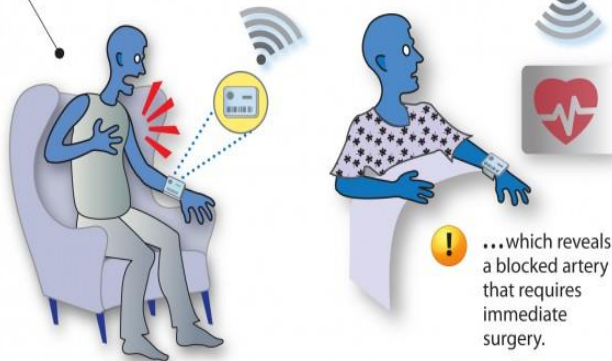
So will the nurses, operating theatres, smart machines, medical databases ...  
 In a building where doctors are always on the move, smarter and more connected machines could increase efficiency, reduce waiting time and improve patient care.



Patient feels sudden chest pain. Wrist sensor detects heartbeat anomaly that may be life-threatening.

Device signals ambulance, alerts hospital that patient is on his way.

In hospital, monitoring equipment linked with medical database orders scan ...



... which reveals a blocked artery that requires immediate surgery.



Operating theatre is booked, surgeon notified  
 Computers scan hospital database, which checks surgery schedule, notifies surgeon, orders pre-op blood tests, books operating theatre.



Source: IDC, Gartner, Forrester, Frost & Sullivan, YouGov, comScore, CISCO Global Cloud Index 2013, CISCO Visual Networking Index Study 2013, Intel, AMD, IMS Research, Manhattan Research 2012, Rock Health Digital Funding Mid Year 2013, Paw Internet and American Life Project, Health Online 2013, Epocrates 2013 report, and American EHR Partners 2013 survey

Cambio de las reglas, relaciones y procesos

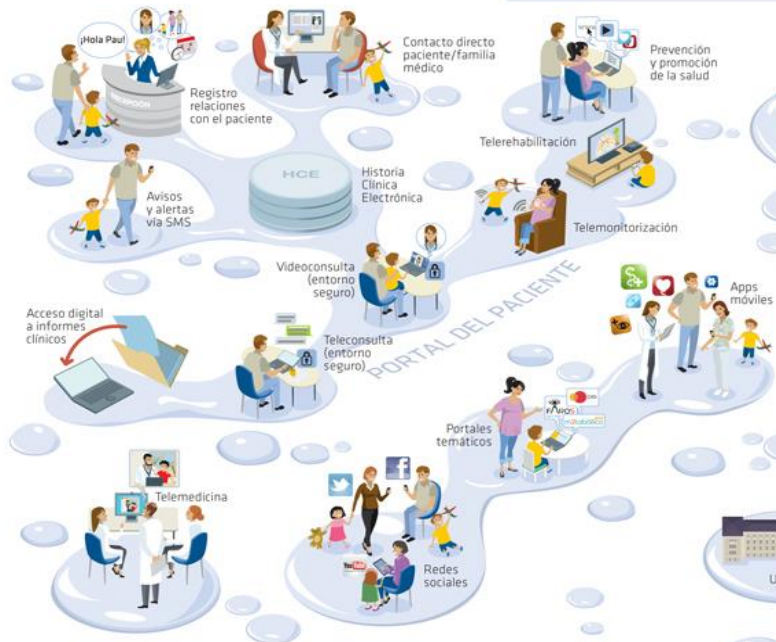
patient empowerment



**H2O+** *Herramientas digitales y sociales*  
Hospital

**LÍQUIDO COMO EL AGUA**, nuestro concepto de hospital donde la información fluye gracias al uso de las nuevas tecnologías

## QUÉ ESTAMOS HACIENDO PARA LOS PACIENTES...



## NUEVO CONCEPTO DE 'SALUD'



**SIGLO XX**  
Medicina paternalista. El médico determina lo que es bueno para el paciente. Toda la atención ocurre dentro del hospital.

**DESDE 2005**  
Medicina participativa. Papel activo del paciente en el cuidado de su salud, gracias a las nuevas herramientas digitales y sociales.

**FUTURO**  
Medicina colaborativa. Procesos de decisión clínica conjuntos y compartidos. La atención tiene lugar dentro y fuera del hospital.

## PARA LOS PROFESIONALES...



## QUÉ NOS APORTA A los pacientes

Acceso universal 24/7  
Calidad de vida

## A los profesionales

Mejor preparación  
Mejores resultados de salud

## ...PARA LA SOCIEDAD



## A la institución

Mayor eficiencia

2

**HOSPITAL LÍQUIDO**  
INNOVACIÓN AL SERVICIO DEL PACIENTE Y LA FAMILIA

**Sant Joan de Déu**  
HOSPITAL MATERNOINFANTIL - UNIVERSITAT DE BARCELONA

Cambio de las reglas, relaciones y procesos

patient empowerment

# REALIZING THE VALUE OF HEALTH IT

Health IT creates **five kinds of value** of benefit to patients, healthcare providers and communities.

Small primary care practice (100 physicians)

Large primary care practice (800 physicians)

Community hospital/health.org

Healthcare systems

S

## SATISFACTION



**118%** INCREASE IN PATIENT SATISFACTION  
—Unity Health Care, Inc., 2012



**90%** INCREASE IN STAFF RETENTION  
—Hudson River Healthcare, Inc., 2011

T

## TREATMENT/CLINICAL



**52%** DECREASE IN 30-DAY READMISSION RATE  
—Mount Sinai Medical Center, 2012



**20%** INCREASE IN PHYSICIAN TIME SPENT WITH EACH PATIENT PER VISIT  
—Jeremy Bradley, MD, FAAAAAP 2012

E

## ELECTRONIC INFORMATION/DATA



**\$500,000** ANNUAL DECREASE IN CLAIM DENIALS  
—Sentara Health Care, 2012

P

## PREVENTION/PATIENT EDUCATION



**96%** COMPLIANCE RATE FOR PATIENT AND MEDICATION SCANS  
—Sentara Health Care, 2012



**191%** INCREASE IN IMMUNIZATIONS  
—James Hoelinger, MD



**150%** INCREASE IN PATIENTS MEETING DIABETES MANAGEMENT METRICS  
—Hawaii Pacific Health, 2012

S

## SAVINGS



**\$9.7 MILLION** SAVINGS DUE TO ELIMINATION OF TRANSCRIPTION SERVICES  
—Hawaii Pacific Health, 2012



**\$3.1 MILLION** REDUCED LENGTH OF PATIENT STAYS  
—Sentara Health Care, 2012



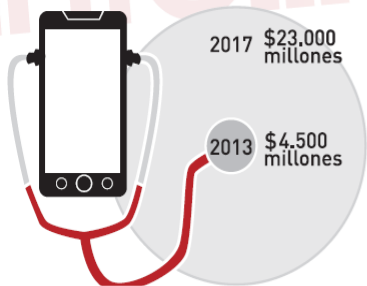
**ROI TOTTALING \$17.7 MILLION**  
—Coastal Medical Group, 2012

2

Cambio de modelo de hábitos cotidianos

APPs Salud gamification

# INFORME 50 MEJORES APPS DE SALUD EN ESPAÑOL



EN SÓLO 4 AÑOS, LOS INGRESOS EN **MHEALTH** AUMENTARÁN UN **511%**

¿CÓMO SE REPARTE ESE MERCADO?



## HEALTH APPS

Las aplicaciones de medicina y salud (en datos de la AppStore) son la tercera categoría de mayor crecimiento.



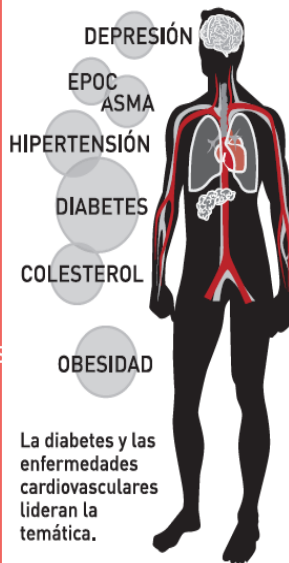
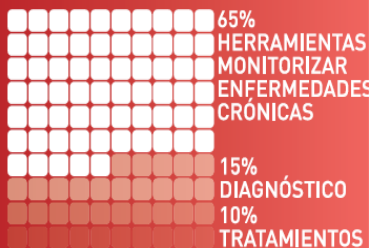
**40.000** APPS MÉDICAS (SÓLO APPLE)

**97.000** APPS MÉDICAS (TODAS LAS PLATAFORMAS)

## ¿A QUIÉNES VAN DIRIGIDAS?



## MERCADO MHEALTH 2017



La mHealth es un negocio de **\$1.600 MILLONES** y crecerá un **50% ANUAL** en los próximos **SEIS AÑOS**



En España la eHealth moverá **4.000 MILLONES EUR** en 2015, volumen de mercado del fútbol nacional en el presente



PACIENTES  
1,6 billones



SISTEMAS MÉDICOS  
0,098 billones

## FOCOS de IMPACTO

## BENEFICIARIOS de los INGRESOS

Brasil, México y Argentina concentrarán el 67% del negocio en LATAM



Cambio  
de soluciones  
smart devices:  
diseño e  
interacción

personal &  
proactiva



## identificación de usuario

seguridad · nuevas tecnologías  
algoritmos · inteligencia · biometría  
huella dactilar · iris · patrón facial  
reconocimiento de voz



## dispositivos médicos

conectividad · interoperabilidad  
estándares internacionales  
modelo de negocio · kit low cost  
adaptadores hardware



## smart devices

trends (AAL, M2M, ZB4O, OSGi)  
infraestructura cross-domain  
smart glass · smart ring · smart watch

diseño · interacción del usuario

# "Vamos hacia una experiencia completa de atención médica en el hogar"

Cambio de soluciones smart devices: diseño e interacción

personal & proactiva

# 4

**1. PATIENT RIBBON** | The canopy above the bed, the patient ribbon, extends from the head wall to the footwall. It contains electrical, technological and gas components normally found in any hospital room. It also includes a sound system that can create a cocoon above the patient's head to block out unwanted noise and minimize the transmission of noise to other areas of the room.

1

**2. HALO LIGHTBOX** | The halo lightbox in the patient ribbon above the bed can be programmed for mood or light therapy, and can simulate cloud movements, blue skies and other lighting conditions.

2

**3. HEADWALL** | The head wall contains the equipment needed to check vital signs (heartbeat, breathing rate, temperature and blood pressure), as well as oxygen and other supplies, all stowed neatly out of sight but easily accessible through pull-down panels in the wall.

3

**7. ENTRY WORKSTATION** | The workstation is located at the entrance to the patient room. As a staff member or other person enters, the sink lights up in red to indicate that hands should be washed. When hands are disinfected, a green light blinks. A dashboard in the wall stores a computer, where information on the patient can be found and entered.

6

7



**4. FOOTWALL** | The footwall contains a large screen that can be used for entertainment, video consultations with doctors, and access to hospital information, educational content and social-media sites. It's controlled from the bed by a tablet computer that allows the patient to adjust lighting, sound, and temperature.

4

5

**5. RUBBER FLOORS** | The floors are made of low-porosity rubber, which doesn't contain or need chemical sealers or waxes that often trap bacteria and other substances that can cause infections and allergic reaction. Rubber is quieter, softer and less slippery than other traditional floor materials. In case of a fall, it reduces impact.

**6. ROOM SURFACES** | All surfaces in the room other than the floor are made of Corian or similar solid-surface materials commonly found in homes as kitchen countertops. The material is nonporous and seamless, making it easy to clean and minimizing the chances for mold, mildew or bacteria to grow. That all reduces the risk of infection.

**9. PATIENT COMPANION** | The mobile patient companion contains both an eating surface and a flat computer when flipped over. Operated by touch, the computer controls the screen on the footwall and the light and sound in the patient area. The surface has colored rings to indicate when power is low and icons to touch to call for help.



9

**8. BEDSIDE CAREGIVER HUB** | At the bedside caregiver hub, a wall panel holds another computer. Other technology is embedded in the wall, and when the panel is closed, ultraviolet light kills bacteria that might have formed on surfaces. The computer keyboard, like all others in the room, is a flat, nonporous typing surface that's easy and quick to clean, unlike conventional keyboards, which can harbor bacteria.

6

8



7



Cambio  
de servicios  
smart data:  
plataforma y  
comunidad

predictivo &  
preventivo

5



servicios de valor añadido  
plataforma inteligente  
interacción de la comunidad

retos · calendario · recordatorios  
informes · seguimiento · avisos  
nutrición · adherencia tratamiento  
emergencias · integración EHR  
big data · redes sociales · nube  
algoritmos predictivo/preventivo

¿para qué vive la gente?

<https://www.youtube.com/watch?v=mmvp3Jd-Y-4>









<http://www.biomedaragon.com/>