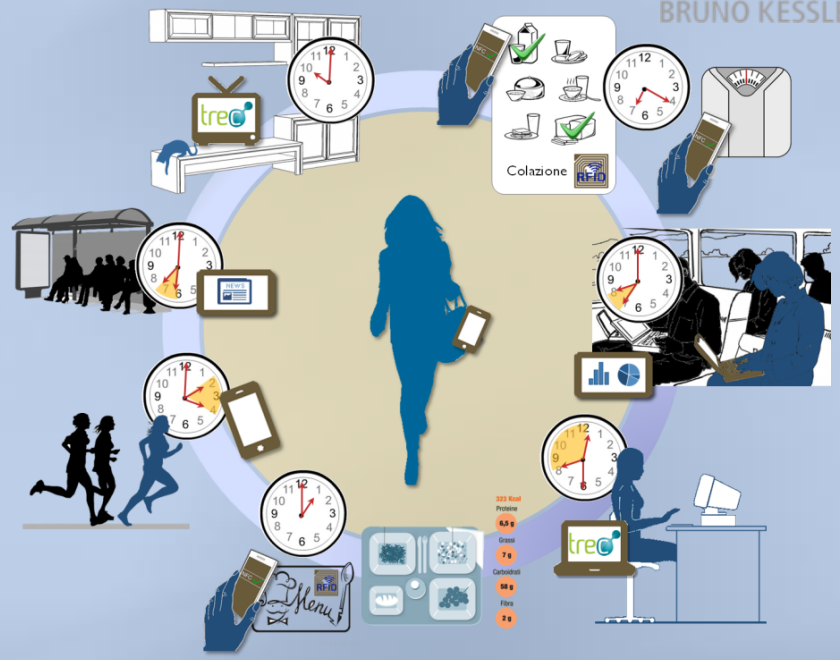
e-Health e m-Health in Oncologia: dal Fascicolo Sanitario Elettronico Personale, al monitoraggio del paziente a domicilio.

TRENTO

18 Settembre 2015
FBK

La tecnologia disponibile e le applicazioni per gli operatori sanitari e il cittadino non esperto



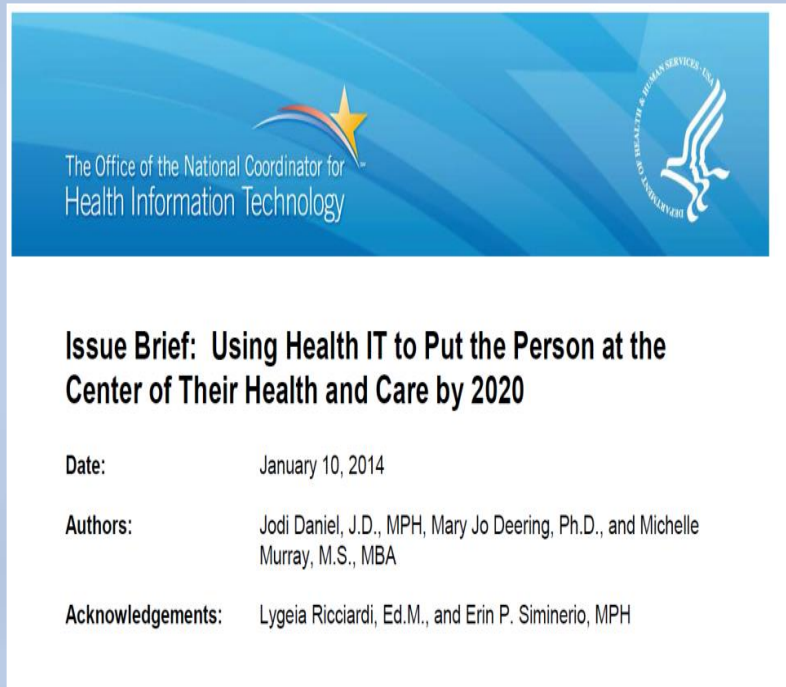
Stefano Forti.
High Impact Initiative “Health & Wellbeing”
Fondazione Bruno Kessler (FBK), Trento

ONC for Health Information Technology

The Office of the National Coordinator for **Health Information Technology** (ONC) is at the forefront of the administration's health IT efforts and is a resource to the entire health system to support the adoption of health information technology and the promotion of nationwide health information exchange to improve health care. ONC is organizationally located within the Office of the Secretary for the U.S. Department of Health and Human Services (HHS).

http://www.healthit.gov/policy-researchers-implementers/consumer-ehealth

The Person at the Center of their Health and Care


The Office of the National Coordinator for Health Information Technology

Issue Brief: Using Health IT to Put the Person at the Center of Their Health and Care by 2020

Date: January 10, 2014

Authors: Jodi Daniel, J.D., MPH, Mary Jo Deering, Ph.D., and Michelle Murray, M.S., MBA

Acknowledgements: Lygeia Ricciardi, Ed.M., and Erin P. Siminerio, MPH

*The vision for the policy framework **empowers** each individual as the **manager** of their health and as a **partner** in their health care with health IT tools and resources to support them.*

*It assumes that people's health and quality of life will improve if they have the assistance of information and technology for **self-care** and **shared decision-making** with their providers*

"The power of each individual is unleashed to be active in managing their health and partnering in their health care, enabled by information and technology."

http://www.healthit.gov/policy-researchers-implementers/person-center

Why are patient-generated data important


The Office of the National Coordinator for Health Information Technology

Issue Brief: Patient-Generated Health Data and Health IT

Date: December 20, 2013

Author: Mary Jo Deering, Ph.D.

Acknowledgements: Elise Anthony, Penelope Hughes, Janice Nsor, Lygeia Ricciardi, Erin Siminerio, Scott Weinstein

*Provide important information about how patients are doing **between medical visits**.*

*Gather information on **an ongoing basis**, rather than only at one point in time.*

*Provide information relevant to **preventive and chronic care management**.*

"The use of PGHD offers an opportunity to capture needed information for use during care, with potential cost savings and improvements in quality, care coordination, and patient safety"

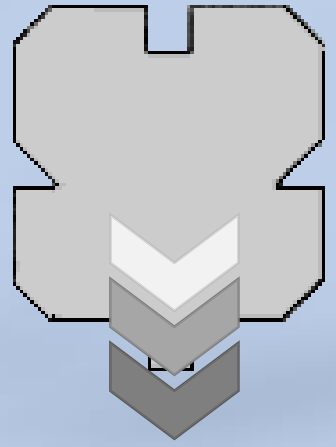
http://www.healthit.gov/policy-researchers-implementers/patient-generated-health-data

Tecnologie eHealth per il Patient Empowerment

GESTIONE INFORMAZIONI PERSONALI

Diario digitale
Sensori/Device
Visualizzazione dati
Analisi dati

EDUCAZIONE/ FORMAZIONE



Multimedia
Digital games

SUPPORTO ALLE DECISIONI

Knowledge based-system
Tecnologie persuasive

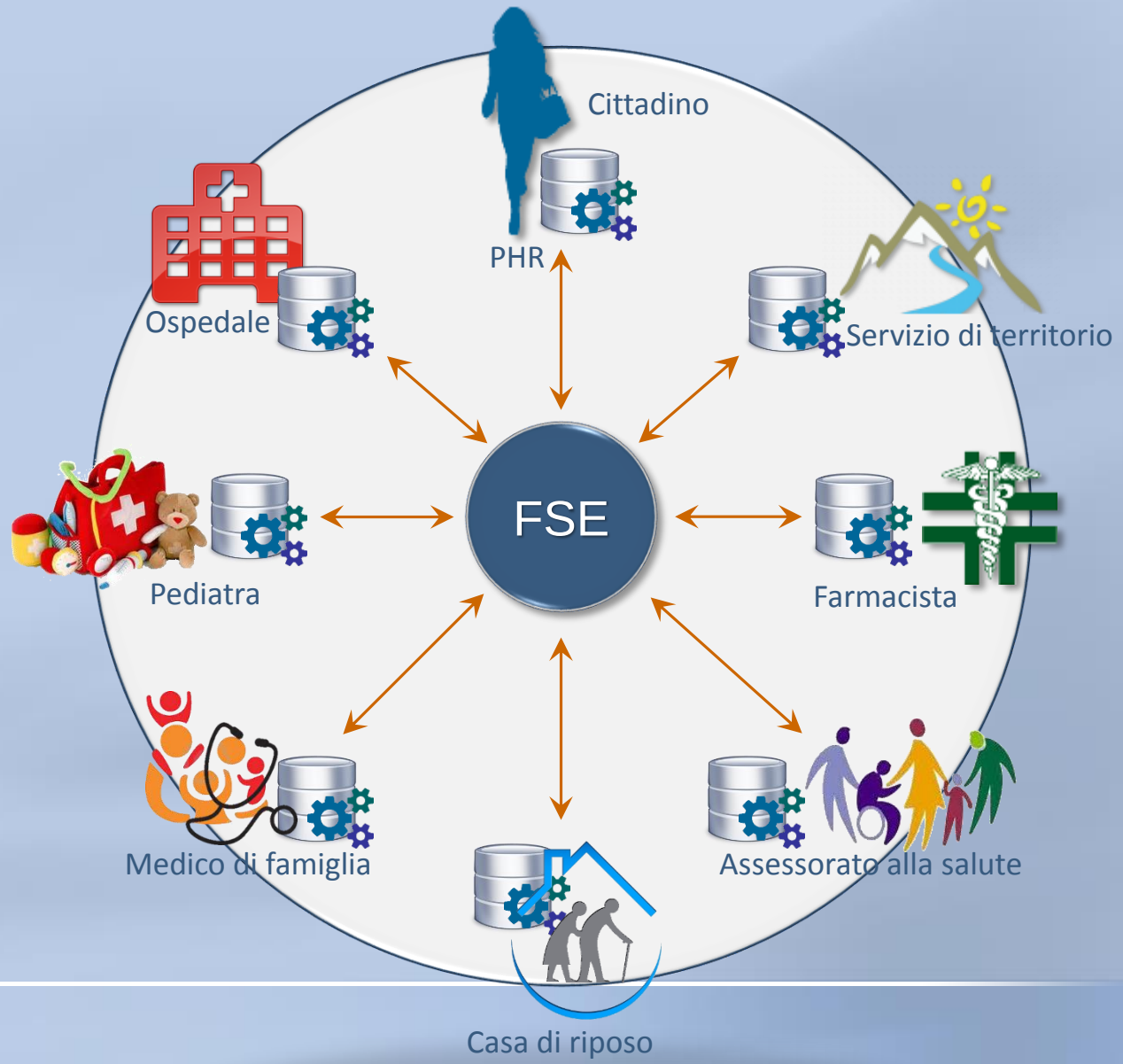
COMUNICAZIONE

Secure messagging
Social network tools

3 tecnologie abilitanti per il patient empowerment

Piattaforme PHR

Il cittadino in rete con il sistema sanitario



Tang et al. "*Personal Health Records: definitions, benefits, and strategies for overcoming barriers to adoption*" JAMIA 2006; 13:121-126

Journal of the American Medical Informatics Association Volume 13 Number 2 Mar / Apr 2006

The Practice of Inf

White Paper ■

Personal Health Records: Definitions, Benefits, and Strategi Overcoming Barriers to Adoption

Paul C. Tang, MD, MS, Joan S. Ash, PhD, David W. Bates, MD, J. Marc Overhage, MI Daniel Z. Sands, MD, MPH

Abstract Recently there has been a remarkable upsurge in activity surrounding the adoption of pers health record (PHR) systems for patients and consumers. The biomedical literature does not yet adequately d the potential capabilities and utility of PHR systems. In addition, the lack of a proven business case for wide deployment hinders PHR adoption. In a 2005 working symposium, the American Medical Informatics Associ College of Medical Informatics discussed the issues surrounding personal health record systems and develop recommendations for PHR-promoting activities. Personal health record systems are more than just static repo for patient data; they combine data, knowledge, and software tools, which help patients to become active parti in their own care. When PHRs are integrated with electronic health record systems, they provide greater benef would stand-alone systems for consumers. This paper summarizes the College Symposium discussions on PI systems and provides definitions, system characteristics, technical architectures, benefits, barriers to adoption, strategies for increasing adoption.

■ **J Am Med Inform Assoc.** 2006;13:121–126. DOI 10.1197/jamia.M2025.

The 2005 Hurricane Katrina disaster exposed the fragility of America's health information infrastructure. When confronted by a hurricane, an avian flu pandemic, or a bioterrorism attack, the public needs to be able to depend on reliable access to their health information. Lack of a robust health information infrastructure undermines any attempt to establish a coherent and reliable plan to deal with natural or other disasters affecting the public's health. Fortunately, large-scale catastrophic disasters are rare, but that does not diminish the need for a robust health information infrastructure that significantly

records (EHRs). All levels of government—federal, state, regional, and local—as well as the private sector, have encouraged EHR adoption. By contrast, personal health record (PHR) systems have not received the same level of attention. While EHR systems function to serve the information needs of health care professionals, PHR systems capture health data entered by individuals and provide information related to the care of those individuals. Personal health records include tools to help individuals take a more active role in their own health. In part, PHRs represent a repository for patient

> *Personal health record systems are more than just static repositories for patient data;*
>
> *They combine data, knowledge, and software tools, which help patients to become active participants in their own care.*
>
> *When **PHRs are integrated with electronic health record** systems, they provide greater benefits than would stand-alone systems for consumers.*

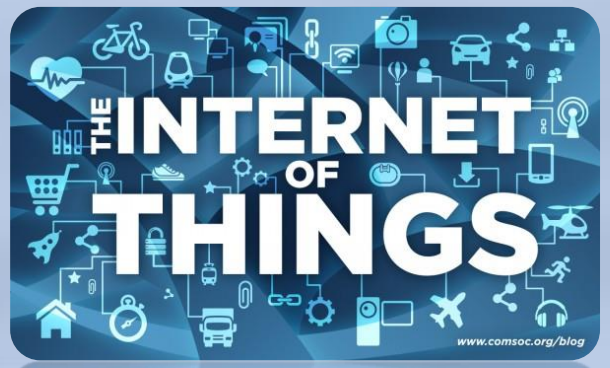
Personal Health Platform

Personal Health Platform

Sensori

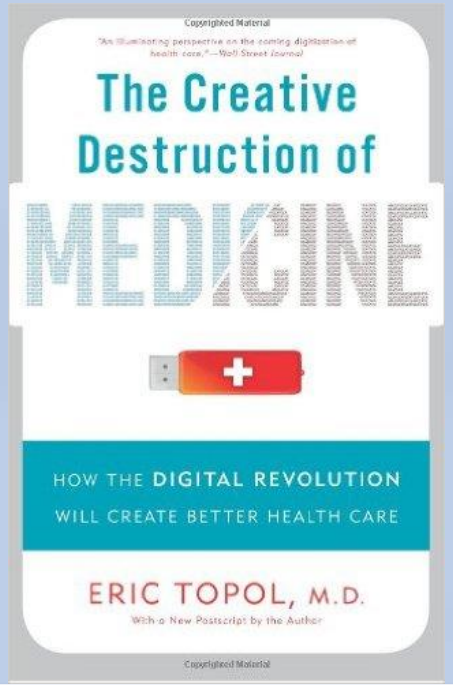
Sensori & Mobile: The Internet of Things

> ***Internet delle cose*** *(IoT-Internet of Things) è un neologismo riferito all'estensione di Internet al mondo degli oggetti e dei luoghi concreti. L'Internet delle cose è vista come una possibile evoluzione dell'uso della Rete.*
>
> http://it.wikipedia.org/wiki/Internet_delle_cose



Le sveglie suonano prima in caso di traffico, le piante comunicano all'innaffiatoio quando è il momento di essere innaffiate, le scarpe da ginnastica trasmettono tempi, velocità e distanza per gareggiare in tempo reale con persone dall'altra parte del globo, i vasetti delle medicine avvisano i familiari se si dimentica di prendere il farmaco.

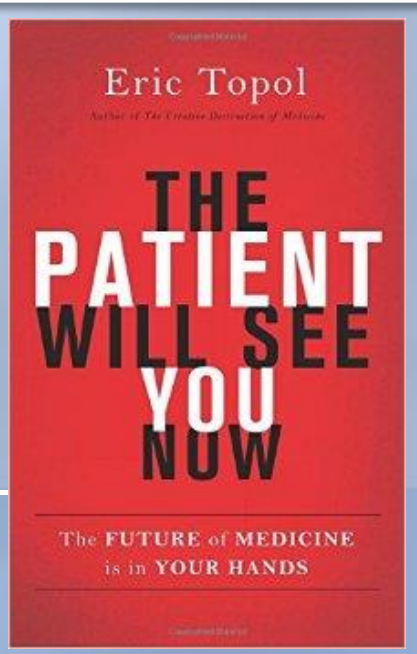
E. Topol



> ***Medicine will be revolutionized by the "Internet of Things"**, a world of interconnected, sensor-laden devices and objects.*
>
> *…..sensors have the power to measure our every action, and as self-regulating organisms, we can profoundly change our behavior once we are provided with the relevant data.*

Part II – Capturing data, Cap 4: Physiology: Wireless sensors

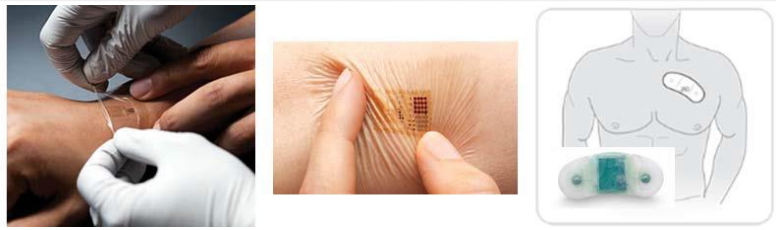
> *We are about **to see a medical revolution** with little mobile devices ……..They will perform blood tests, medical scans, and even parts of the physical examination.*
>
> *Topol calls this "bottom-up medicine," in which digitally **empowered patients** will truly take charge of their own health care. Just as smartphones and social networks powered the uprisings of the Arab Spring, in Topol's view they are now poised to bring **democracy to medicine**.*



Tipologie di sensori

Smartwatches

Brain-Computer Interfaces, Neuro sensing and Emotion mapping



Wearable Sensors and Monitoring Patches

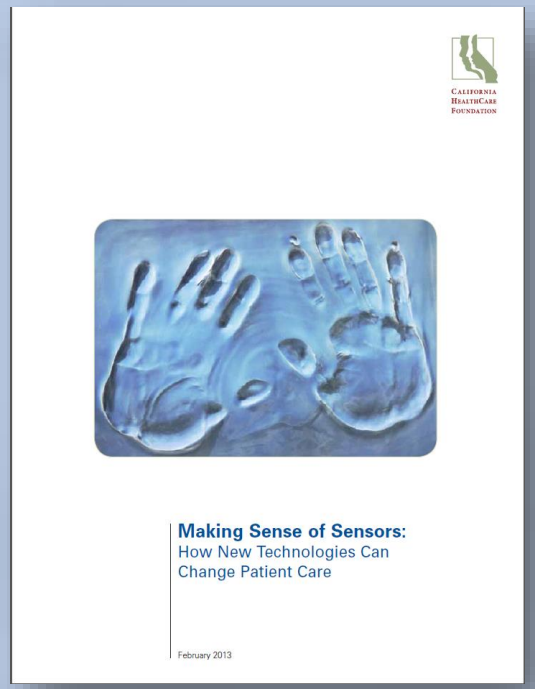
Smartphone and Smartphone plus peripheral

Continuous monitoring and Anvances in Blood testing 2.0

Enviromental monitoring and home automated sensors

Melanie Swan. “Sensor Mania! The Internet of Things, Wearable Computing, Objective Metrics, and the Quantified Self 2.0” J. Sens. Actuator. Netw. 2012, 1, 217-253

Sensori per il diabete

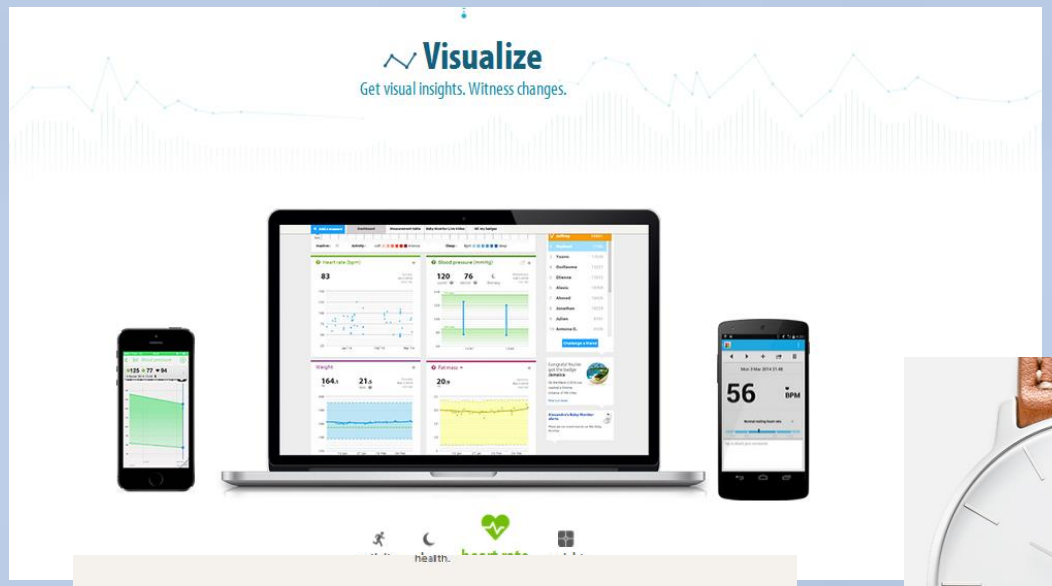


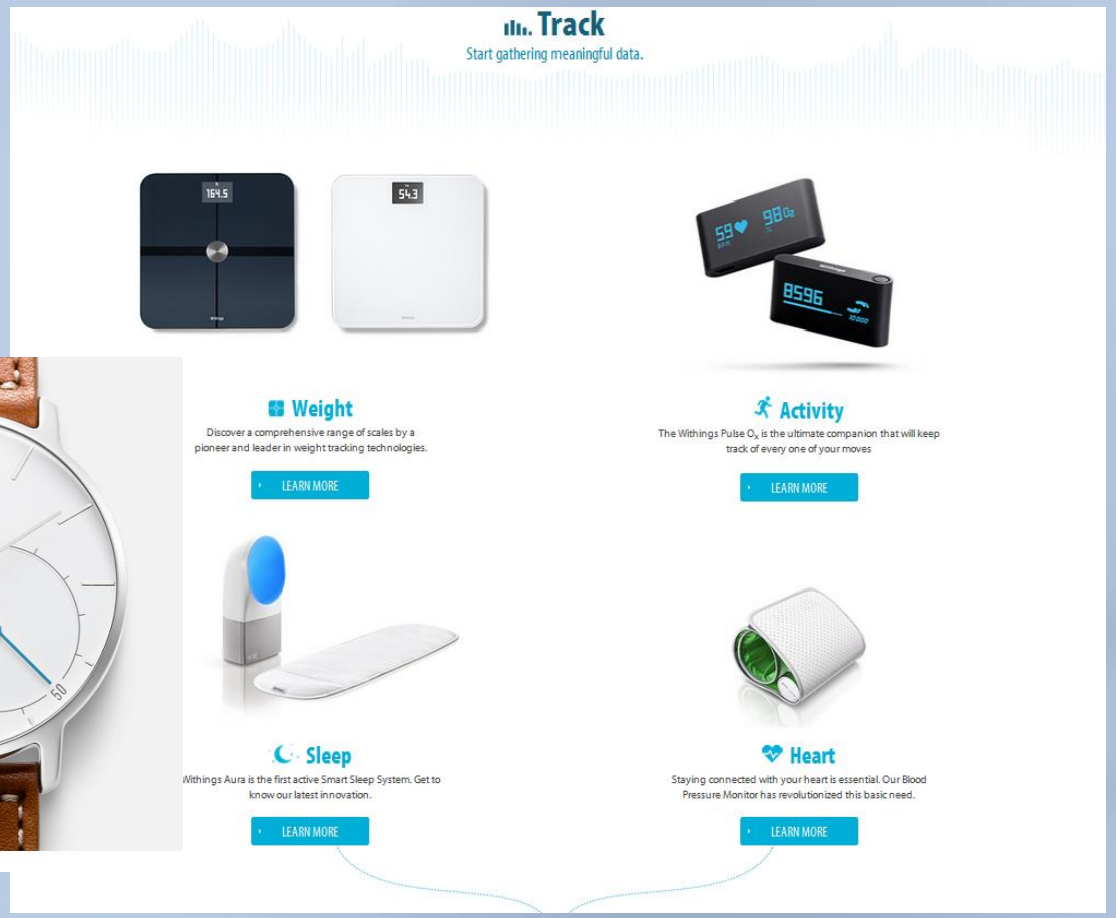
http://www.chcf.org/

Standard

Semi-passivi

Passivi



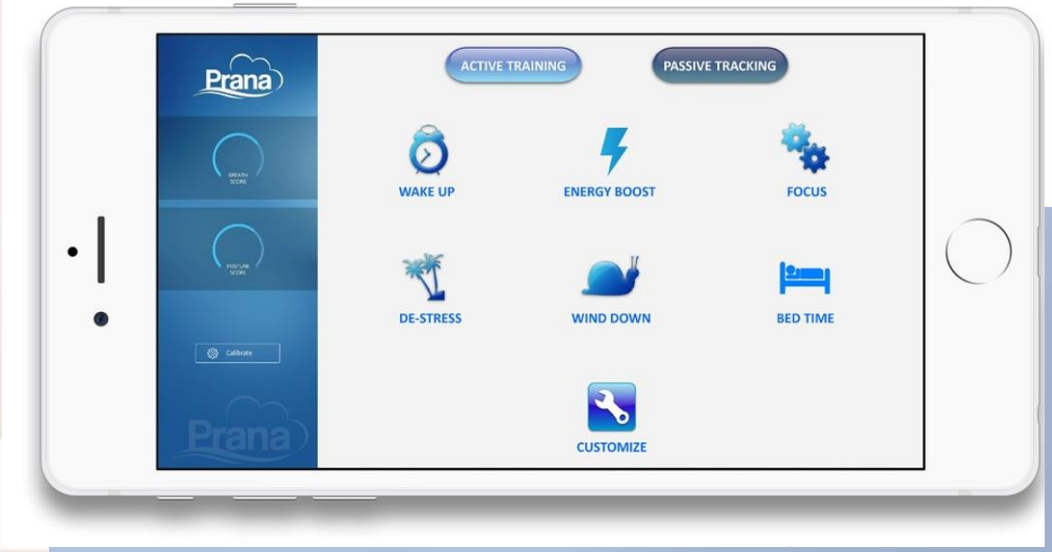


Whitings (www.withings.com)

Nike(fitness tracker, sensore scarpa, wristband)

Jawbone (passi, movimento, sonno, alimentazione)

Lumo (postura)



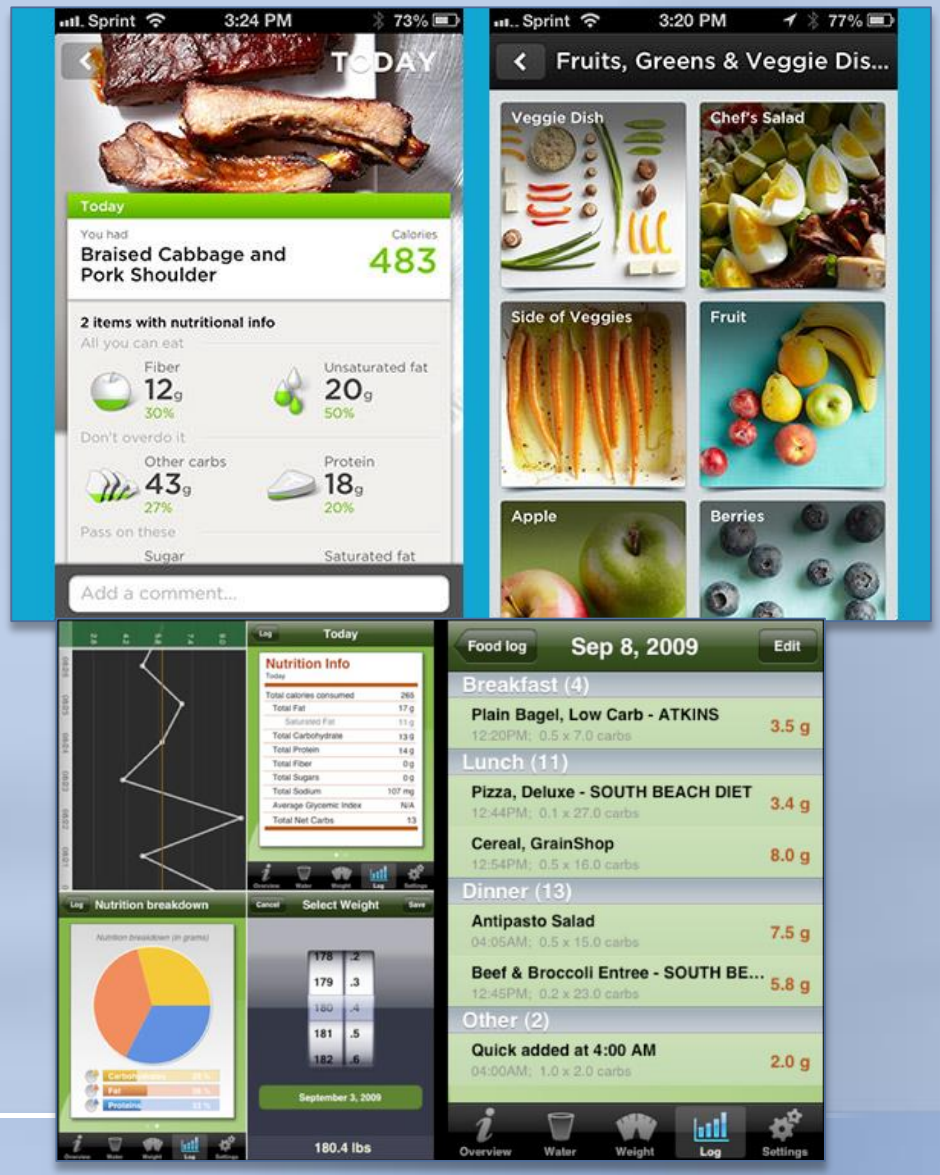
Prana breath (postura, respiro)

Sensoria socks (appoggio piede)

Netadmo June
(esposizione solare),

Quitbit
(conta sigarette)

HAPIfork
(ritmo del cibarsi)



Alimentazione

MANAGE WEIGHT
Track your liquid calories over the course of the day and week. You might be surprised.

STAY HYDRATED
Get to your *Pryme Zone* during the day so you can perform your best.

REGULATE CAFFEINE
Stay sharp, but not jittery. Vessyl will help you smooth out your consumption.

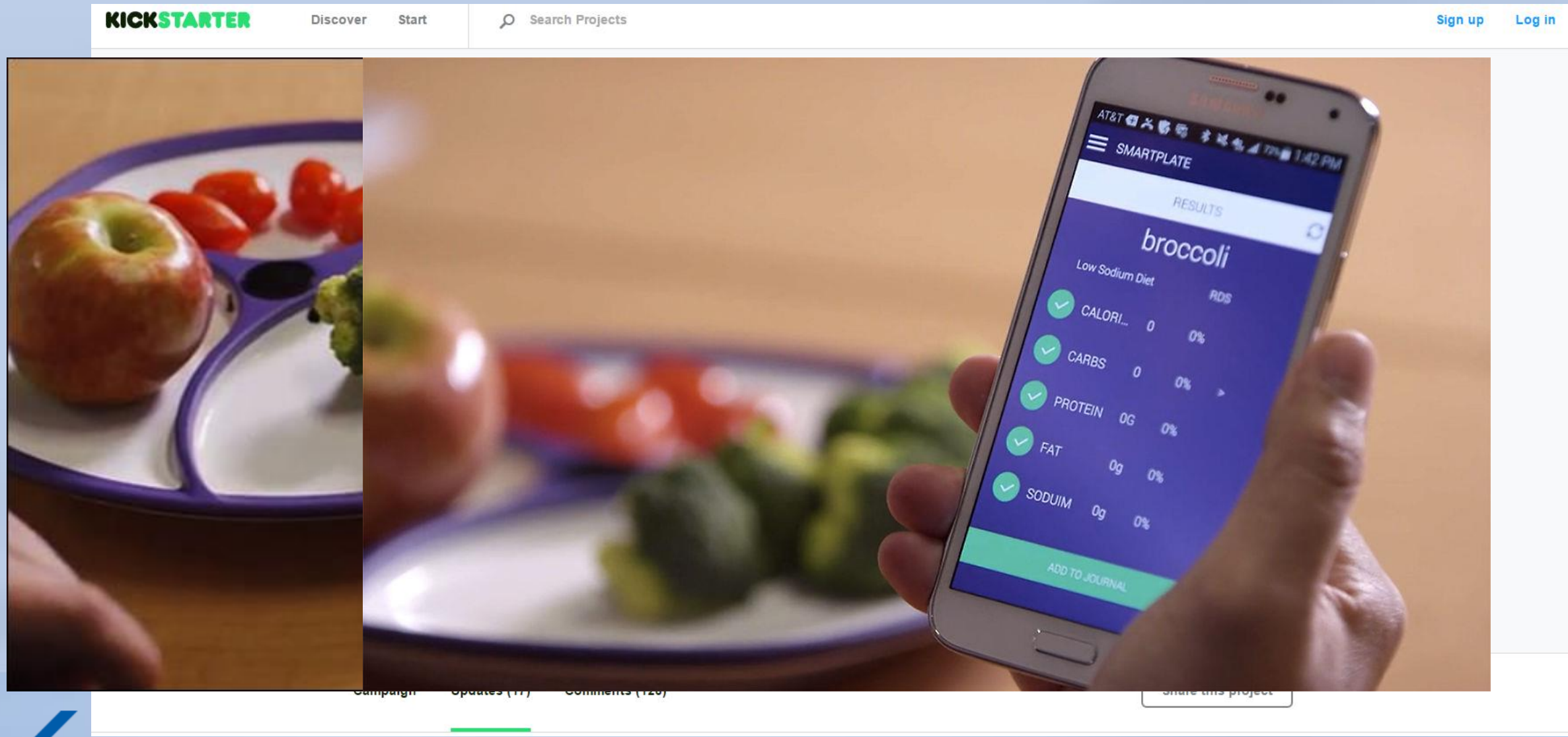
BUILD MUSCLE
You need to do the heavy lifting, but Vessyl will track protein and recovery beverages so you get the most out of your workouts.

SLEEP BETTER
Learn how to choose and time your beverage intake to get quality sleep.

CURB SUGAR
There is nothing sweet about having too much sugar. Don't let sugar sneak in.

Vessyl analizza e tiene traccia di cosa l'utente beve

Smart plate analizza quello che mangi……



First Response Monitor

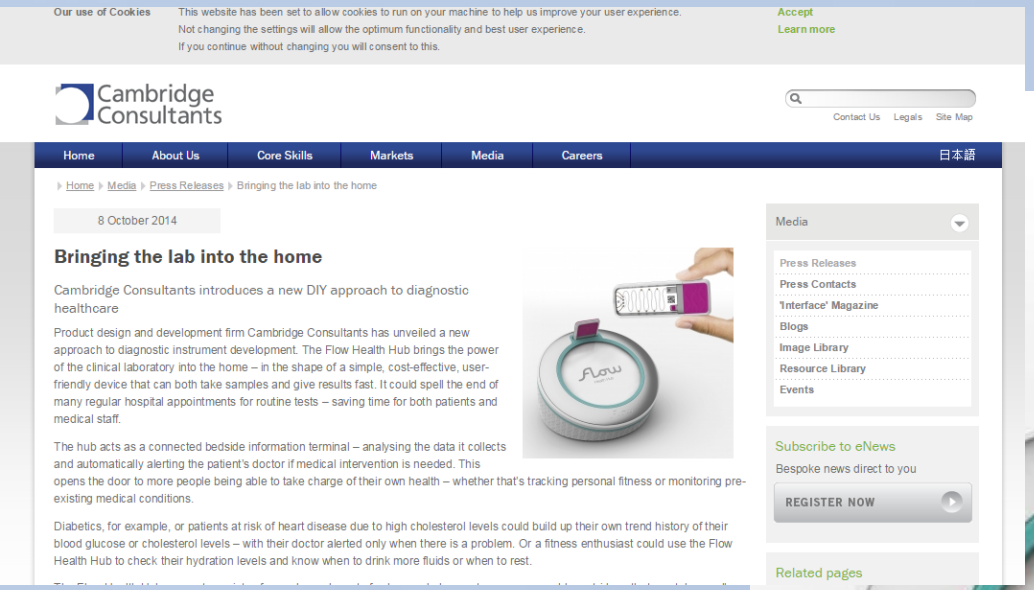
The First Response Monitor is designed to help medics monitor both heart rate and respiratory rate. Respiratory rate is often neglected by automated monitoring systems and has been described as the 'forgotten bio-sign', as many existing wearable monitors focus on heart rate alone and those that do measure respiratory rate have low accuracy or are difficult to use in an emergency situation. However, the benefits of accurately monitoring respiratory rate are clear, and when combined with other parameters – such as heart rate and body temperature – can indicate life-threatening conditions such as sepsis.

The Cambridge Design Partnership, an industrial design consulting firm out of Cambridge, UK, has created a **vital signs monitor** designed to help first responders to manage **multiple victims during emergency situations.**

The First Response Monitor clips onto the nose and **immediately begins monitoring the heart and respiratory rate of the person wearing it**. The readings can be transmitted in real-time to a paired smartphone or tablet via the latest Bluetooth low energy wireless standard.

http://www.cambridge-design.co.uk/news-and-articles/news/connected-wearable-monitor-saves-lives

Flow Health Hub



http://www.cambridgeconsultants.com/media/press-releases/bringing-lab-home

App “intelligenti“

Tecnologie persuasive

Explo
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Abstract—Many pe
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Virtual Coach

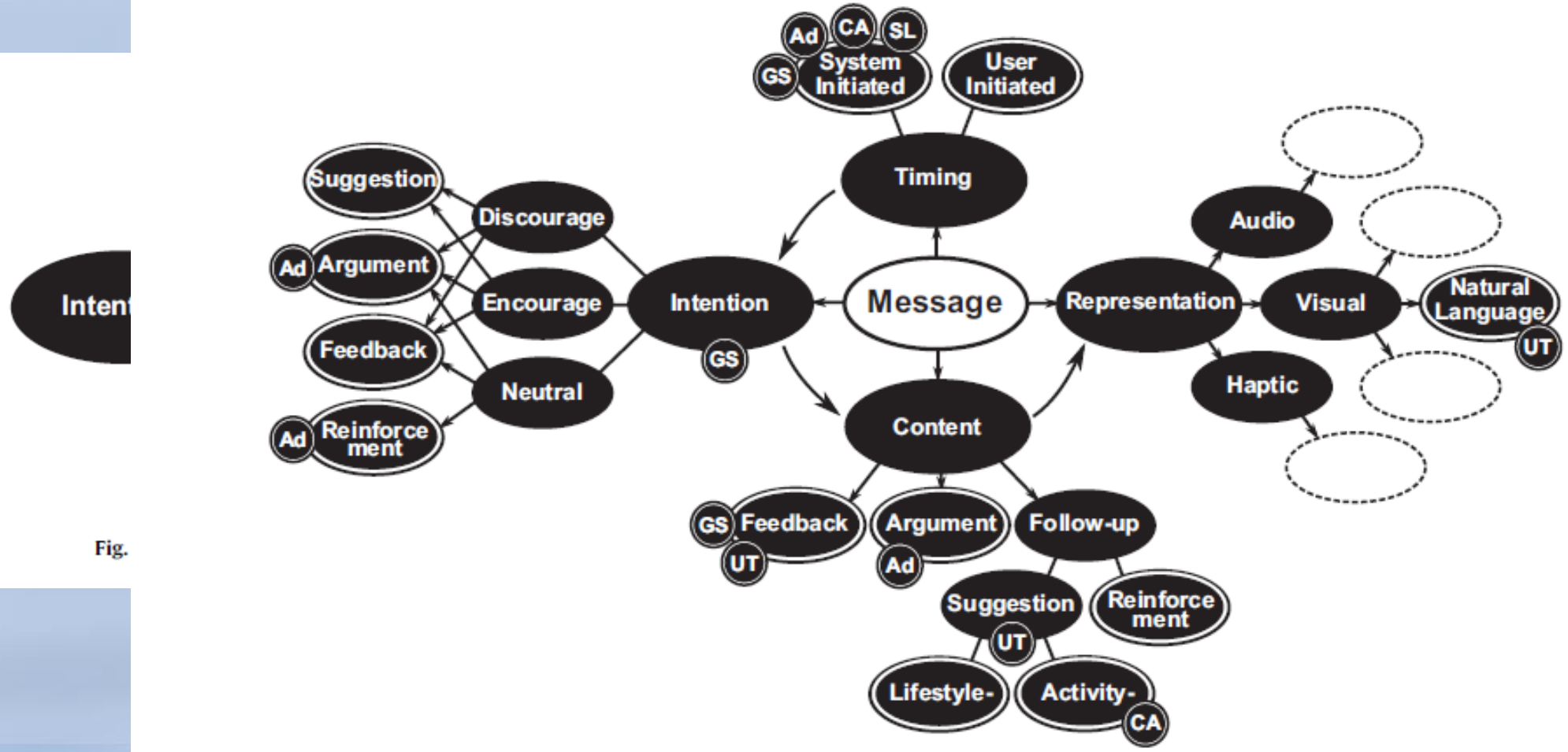


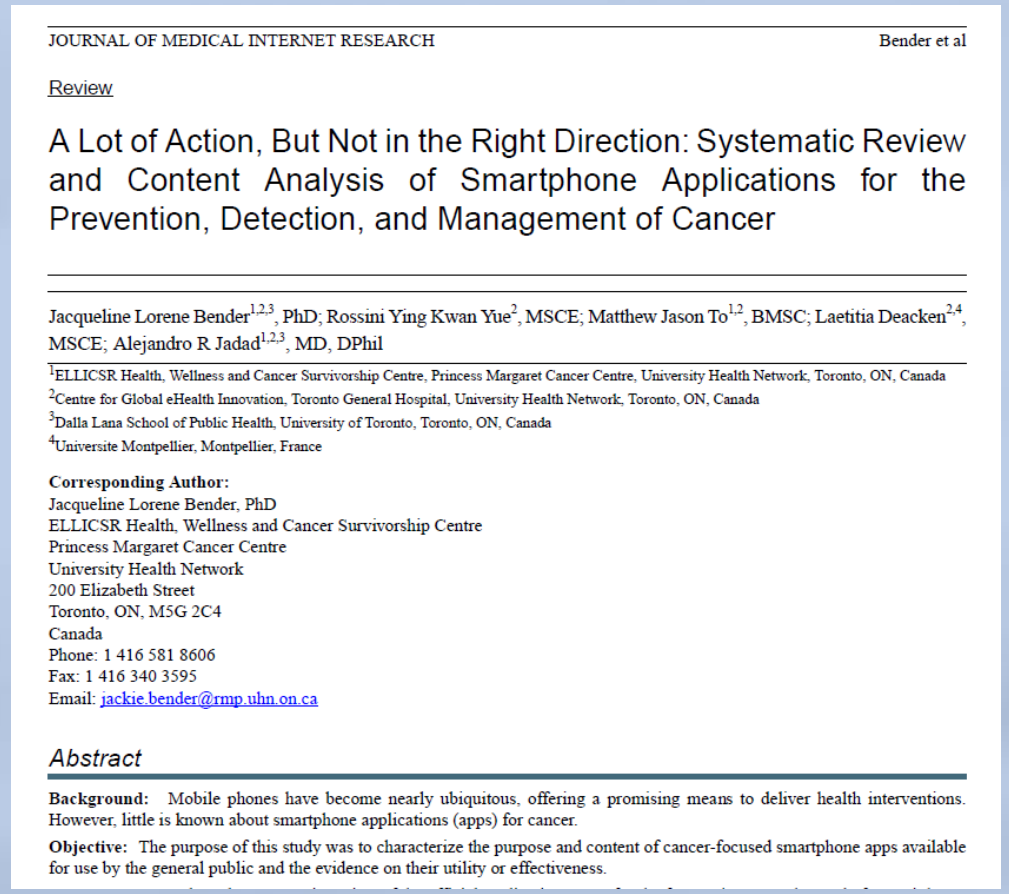
Fig. 6. The complete model of motivational messages encompassing the four major components of timing, intention, content and representation.

Persuasive systems
EHealth

message generation for real-time coaching systems found in the literature. Practical examples are given on how simple tailoring rules can be implemented throughout the various stages of the framework. Such

Apps e Oncologia

Bender et al. "*A Lot of Action, But Not in the Right Direction: Systematic Review and Content Analysis of Smartphone Applications for the Prevention, Detection, and Management of Cancer*" JMIR 2013; 15(12):e287



JOURNAL OF MEDICAL INTERNET RESEARCH Bender et al

Review

A Lot of Action, But Not in the Right Direction: Systematic Review and Content Analysis of Smartphone Applications for the Prevention, Detection, and Management of Cancer

Jacqueline Lorene Bender[1,2,3], PhD; Rossini Ying Kwan Yue[2], MSCE; Matthew Jason To[1,2], BMSC; Laetitia Deacken[2,4], MSCE; Alejandro R Jadad[1,2,3], MD, DPhil

[1]ELLICSR Health, Wellness and Cancer Survivorship Centre, Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada
[2]Centre for Global eHealth Innovation, Toronto General Hospital, University Health Network, Toronto, ON, Canada
[3]Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada
[4]Universite Montpellier, Montpellier, France

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Fax: 1 416 340 3595
Email: jackie.bender@rmp.uhn.on.ca

Abstract

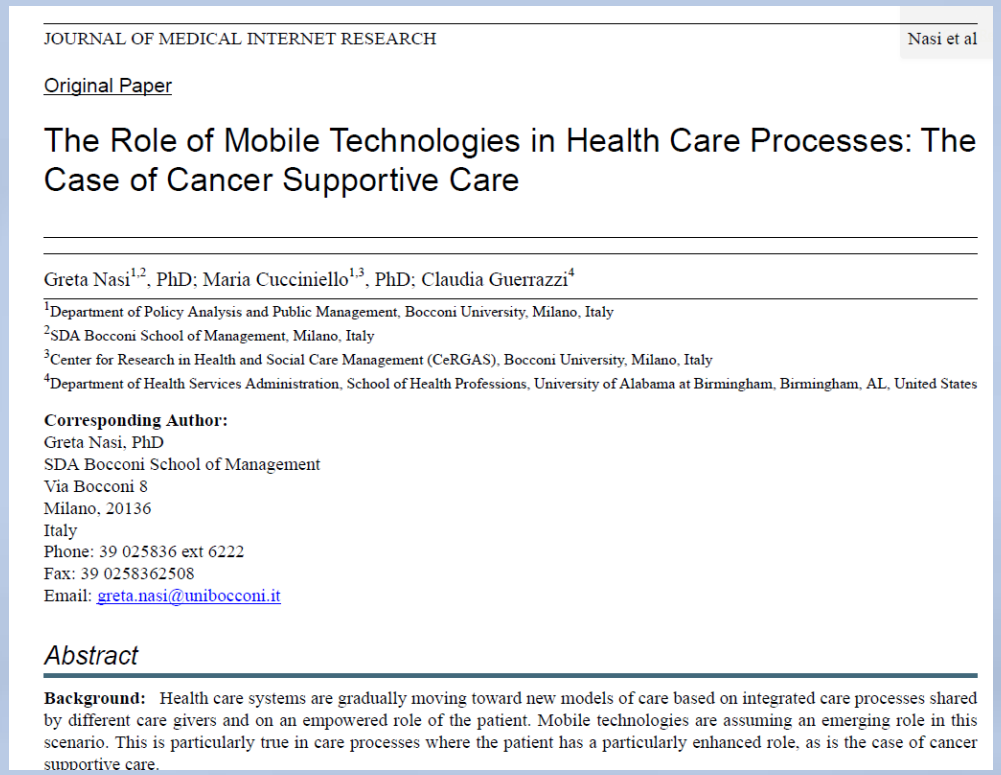
Background: Mobile phones have become nearly ubiquitous, offering a promising means to deliver health interventions. However, little is known about smartphone applications (apps) for cancer.

Objective: The purpose of this study was to characterize the purpose and content of cancer-focused smartphone apps available for use by the general public and the evidence on their utility or effectiveness.

295 apps

> *There are hundreds of cancer-focused apps with the potential to enhance efforts to promote behavior change, to monitor a host of symptoms and physiological indicators of disease, and to provide real-time supportive interventions, conveniently and at low cost.*
>
> *However,* ***there is a lack of evidence on their utility, effectiveness, and safety.***
>
> *Future efforts should focus on improving and consolidating the evidence base into a whitelist for public consumption.*

Nasi et al. “The Role of Mobile Technologies in Health Care Processes: The Case of Cancer Supportive Care” JMIR 2015; 17(2):e26



Original Paper

The Role of Mobile Technologies in Health Care Processes: The Case of Cancer Supportive Care

Greta Nasi[1,2], PhD; Maria Cucciniello[1,3], PhD; Claudia Guerrazzi[4]

[1]Department of Policy Analysis and Public Management, Bocconi University, Milano, Italy
[2]SDA Bocconi School of Management, Milano, Italy
[3]Center for Research in Health and Social Care Management (CeRGAS), Bocconi University, Milano, Italy
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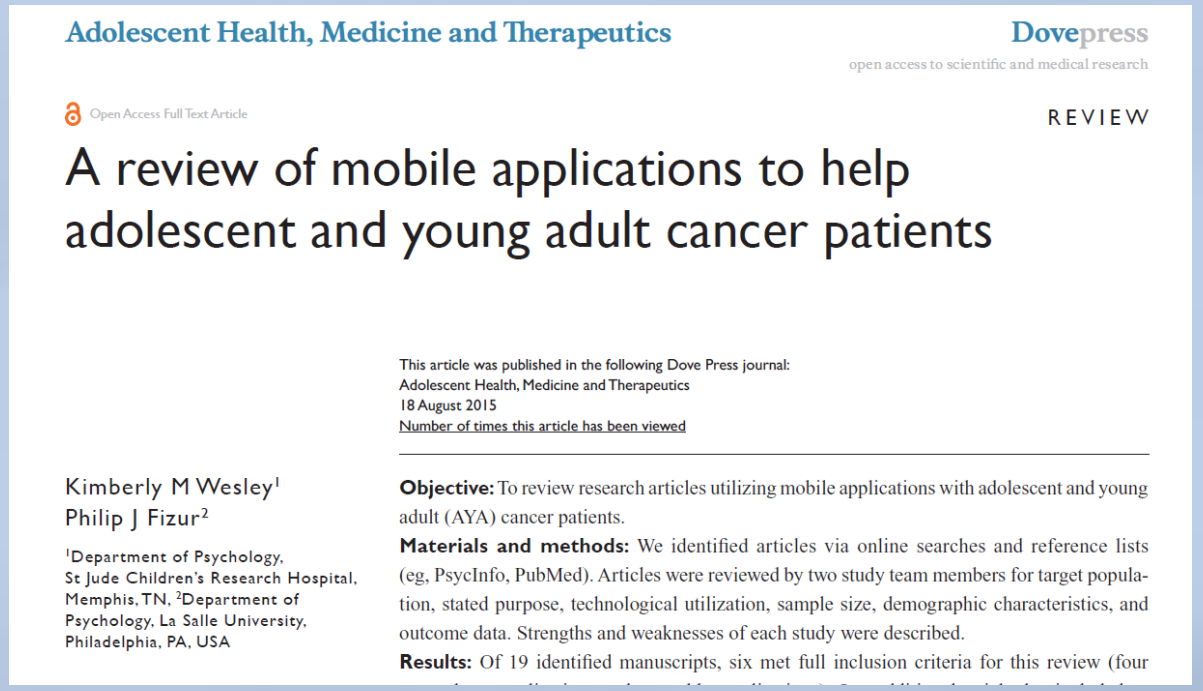
Abstract

Background: Health care systems are gradually moving toward new models of care based on integrated care processes shared by different care givers and on an empowered role of the patient. Mobile technologies are assuming an emerging role in this scenario. This is particularly true in care processes where the patient has a particularly enhanced role, as is the case of cancer supportive care.

106 research articles

> *Looking more generally at cancer care, we found that mHealth is mainly used for self-management activities carried out by patients.*
>
> ***Telehealth technologies** are still rarely used in cancer care processes.*
>
> *Since mHealth seems to be employed only for limited uses and during limited phases of the care process, **it is unlikely that it can really contribute to the creation of new care models**.*
>
> *This under-utilization may depend on many issues, including the **need for it to be embedded into broader information systems**.*

Wesley et al. "*A review of mobile applications to help adolescent and young adult cancer patients*" Adolescent Health, Medicine and Therapeutics 2015:6 141–148



Adolescent Health, Medicine and Therapeutics

Dovepress

open access to scientific and medical research

Open Access Full Text Article

REVIEW

A review of mobile applications to help adolescent and young adult cancer patients

This article was published in the following Dove Press journal:
Adolescent Health, Medicine and Therapeutics
18 August 2015
Number of times this article has been viewed

Kimberly M Wesley[1]
Philip J Fizur[2]

[1]Department of Psychology, St Jude Children's Research Hospital, Memphis, TN, [2]Department of Psychology, La Salle University, Philadelphia, PA, USA

Objective: To review research articles utilizing mobile applications with adolescent and young adult (AYA) cancer patients.

Materials and methods: We identified articles via online searches and reference lists (eg, PsycInfo, PubMed). Articles were reviewed by two study team members for target population, stated purpose, technological utilization, sample size, demographic characteristics, and outcome data. Strengths and weaknesses of each study were described.

Results: Of 19 identified manuscripts, six met full inclusion criteria for this review (four

7 research articles

> *Uses of these applications included symptom tracking, pain management, monitoring of eating habits following bone marrow transplant, monitoring of mucositis, and improving medication management.*
>
> *These applications may prove useful in helping to support AYAs throughout their cancer treatment and beyond. However,* ***few applications provide empirical data supporting their utility.***
>
> *Despite these strengths, numerous limitations are identified, highlighting* ***the need for future research in this area.***

Un esempio

Conclusioni

Grandi opportunità ……

- La letteratura scientifica dimostra come le tecnologie eHealth hanno un grande potenziale per supportare l'implementazione di nuovi servizi per il trattamento dei pazienti sovrappeso-obesi
  - Mobile
  - Sensori
  - Piattaforme Sanitarie Personali (PHR)

- Gli strumenti eHealth sono più efficaci in un contesto di gestione condivisa paziente-operatore sanitario **(Shared management)**

.....ma anche problemi....

- sempre più spesso i cittadini **chiederanno consiglio** ai propri medici di fiducia anche su questioni tecnologiche **(quale apps mi consiglia ?)**;
- decine di migliaia di apps. Come scegliere quella 'giusta' ?
- le tecnologie (sensori) ed i relativi servizi (apps):
  - i dati sanitari personali raccolti da questi servizi **vanno nella "cloud";**
  - questi servizi sono "isolati" per cui il cittadino rischia di avere **i propri dati sanitari "sparsi" su più archivi**;
  - questi servizi si rivolgono direttamente ai cittadini e non sono stati pensati per essere "**integrati" con i sistemi informativi sanitari locali** (e. viceversa)

.....e sfide da affrontare !

- normare l'offerta e l'uso di questi servizi per garantire ai cittadini la **privacy, la sicurezza** dei propri dati personali **e certificarne la qualità**;
- prevedere che questi servizi siano **interoperabili con i sistemi informativi sanitari (FSE)** (e viceversa);
- l'utilizzo delle tecnologie di eHealth ha un **impatto organizzativo** sulle strutture sanitarie;
- programmare **momenti formativi per operatori sanitari** sull'uso delle tecnologie nella pratica clinica;
- ……