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CREATING COMMERCIAL VALUE OUT OF THE
CONSUMERIZATION OF MEDICAL DEVICES

con·sum·er

/kən'soōmər/ 

noun

a person who purchases goods and services for personal use.

"consumer demand"

synonyms: [purchaser](#), [buyer](#), [customer](#), [shopper](#); [More](#)

- a person or thing that eats or uses something.

"Scandinavians are the largest consumers of rye"

WIKIPEDIA

CONSUMER MEDICAL DEVICE MARKET

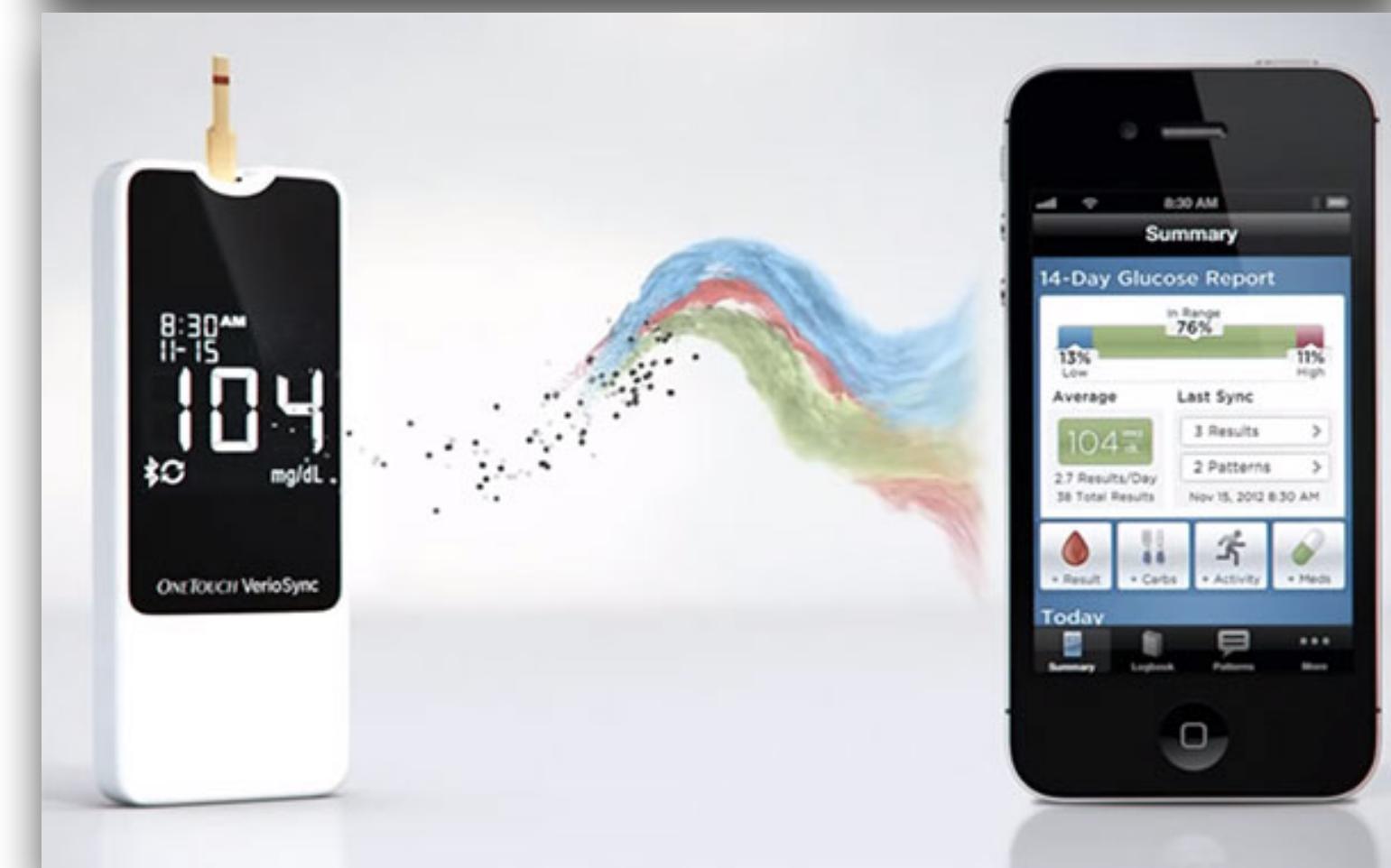
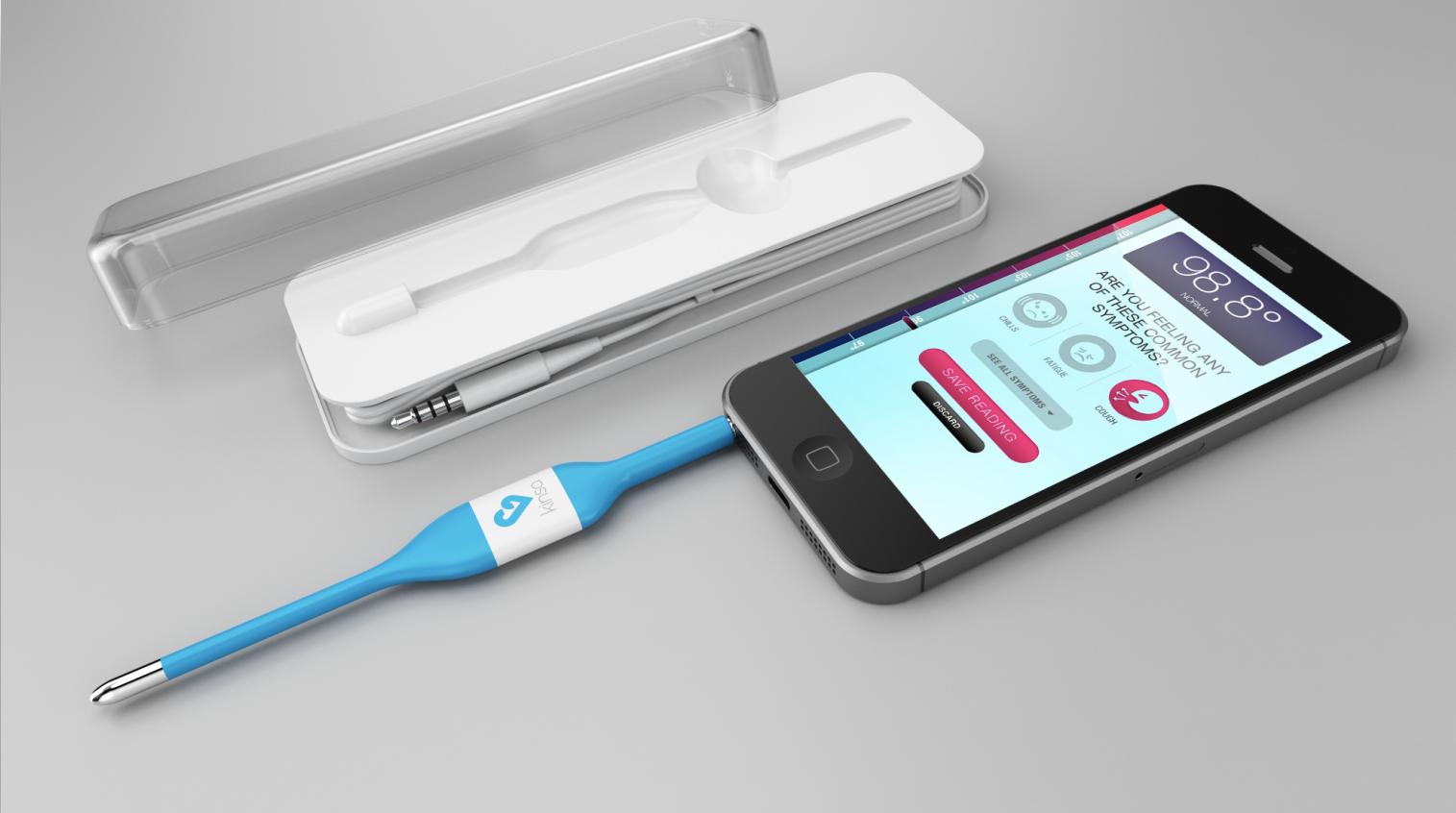
- ~ \$ 8 billion market in 2012 expected to grow to \$10.5 billion in 2017
- Product types include BP monitors, Blood glucose monitors, hearing aids, fertility and pregnancy tests,...
- Overall mature market, commoditization



CONSUMER (MOBILE) MEDICAL DEVICES

- Increasing trend to use display of smartphone
- The smartphone as a hub of computing power, connectivity, display of information, and social.
- Mobile versions of ECG, Blood pressure monitor, glucometer and thermometer

<http://www.medgadget.com/2014/02/lifescan-releases-bluetooth-enabled-glucose-monitor-interview.html>



KEY ASPECTS OF CONSUMER MEDICAL DEVICES

HOW TO MAKE DATA INFORMATION?

ACTIONABLE INFORMATION

Blood Pressure Category	Systolic mm Hg (upper #)	Diastolic mm Hg (lower #)
Normal	less than 120	and less than 80
Prehypertension	120 – 139	or 80 – 89
High Blood Pressure (Hypertension) Stage 1	140 – 159	or 90 – 99
High Blood Pressure (Hypertension) Stage 2	160 or higher	or 100 or higher

INDUSTRIAL DESIGN & USER EXPERIENCE

- Appealing
- Frictionless
- Focus on wellness



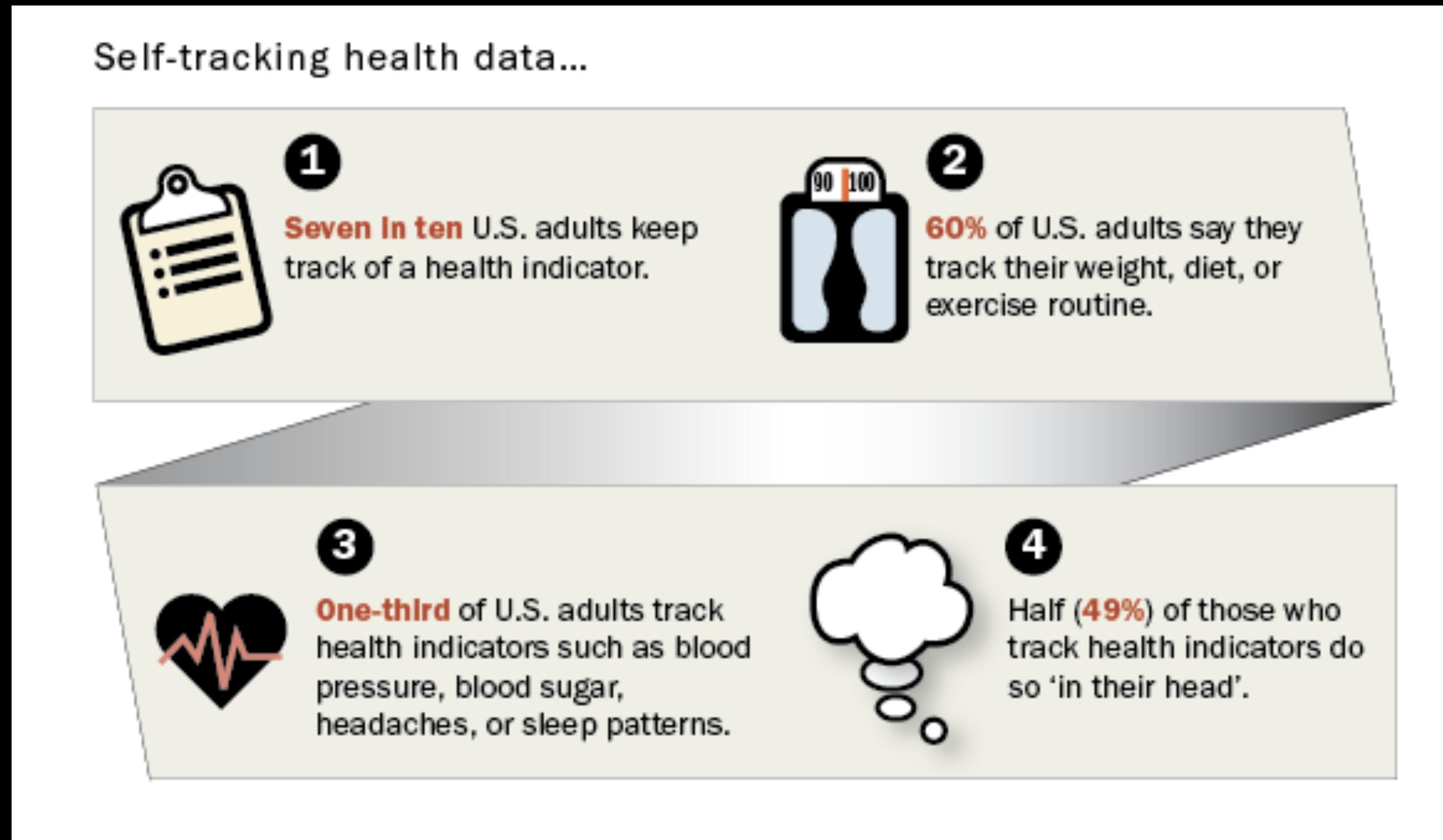
ECOSYSTEM

- Sensor Device
- Additional data from smartphone or other sources: GPS, accelerometer, user input,...
- Display information: color-coded, map, trends
- Sharing with relatives, caregivers and clinicians



HEALTH TRACKING

HEALTH TRACKING



Almost 1 in 2 U.S. adults have a chronic condition.

- 19% of U.S. adults reporting no chronic conditions say they track health indicators or symptoms
- 40% of U.S. adults with 1 condition track
- 62% of U.S. adults with 2+ conditions track

ONLY 1 IN 5 USE SOME FORM OF TECHNOLOGY TO TRACK A HEALTH INDICATOR

IMPACT OF TRACKING

JAMA, November 21, 2007—Vol 298, No. 19

Using Pedometers to Increase Physical Activity and Improve Health A Systematic Review

112

TREATMENT

Review: self monitoring interventions modestly reduce diastolic blood pressure (BP) but do not improve BP control in hypertension

Fahey T, Schroeder K, Ebrahim S. Interventions used to improve control of blood pressure in patients with hypertension. *Cochrane Database Syst Rev* 2005;(1):CD005182.

IF 10% OF ADULTS IN THE UNITED STATES BEGAN A REGULAR WALKING PROGRAM, AN ESTIMATED \$5.6 BILLION IN HEART DISEASE COSTS COULD BE SAVED.

IMPACT OF TRACKING

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A Systematic Review

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TREATMENT

THOUGH ONE IN 10 AMERICANS OWNS THE TYPE OF TRACKING DEVICE MADE BY NIKE, FITBIT, AND JAWBONE TO MONITOR STEPS TAKEN, QUALITY OF SLEEP, OR CALORIE INTAKE, MORE THAN HALF OF THOSE DEVICES ARE NO LONGER IN USE

IF 10% OF ADULTS IN THE UNITED STATES BEGAN A REGULAR WALKING PROGRAM, AN ESTIMATED \$5.6 BILLION IN HEART DISEASE COSTS COULD BE SAVED.

DERIVING COMMERCIAL VALUE

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- Develop a clear use case
- Design for this use case
- Deliver a solution
- Answer to: “what do I do now that I know my numbers?”



BUSINESS MODEL

- Pricing
- Business model
 - Device purchase + free app
 - Device + app for monthly fee through mobile carrier
 - Device + app + premium consults for a fee
 - Retail channels

Clinical Analysis & Report by a U.S. Board Certified Cardiologist

- Best suited for patients with limited technical ECG knowledge
- Doctor recommended course of action
- 24 hour turnaround

\$12

Preliminary Finding by a U.S. Based Cardiac Technician

- Preliminary technical findings by non physicians
- NO recommendations
- Average 30 minute turnaround

\$5

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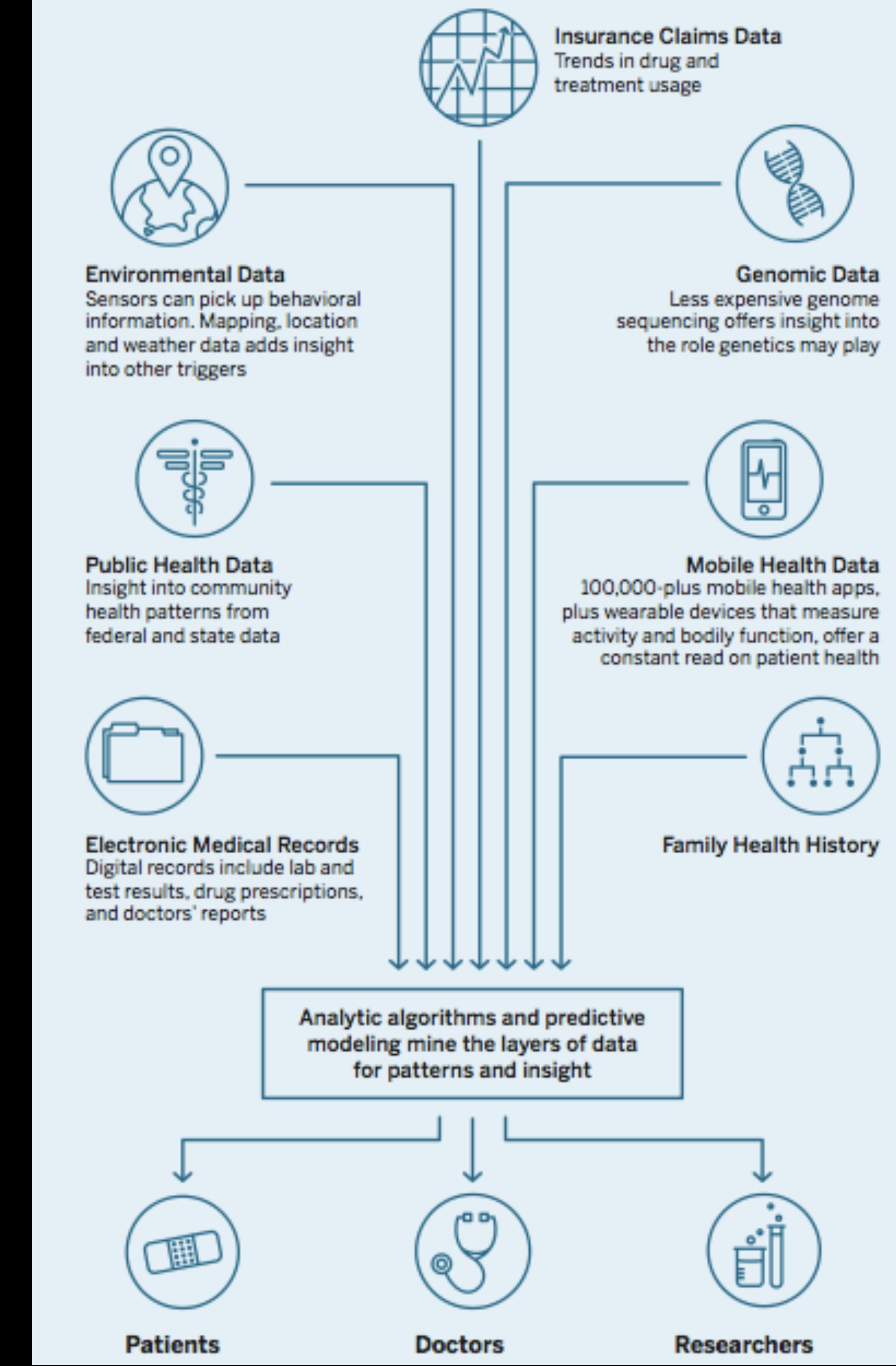
\$2

A TROVE OF DATA

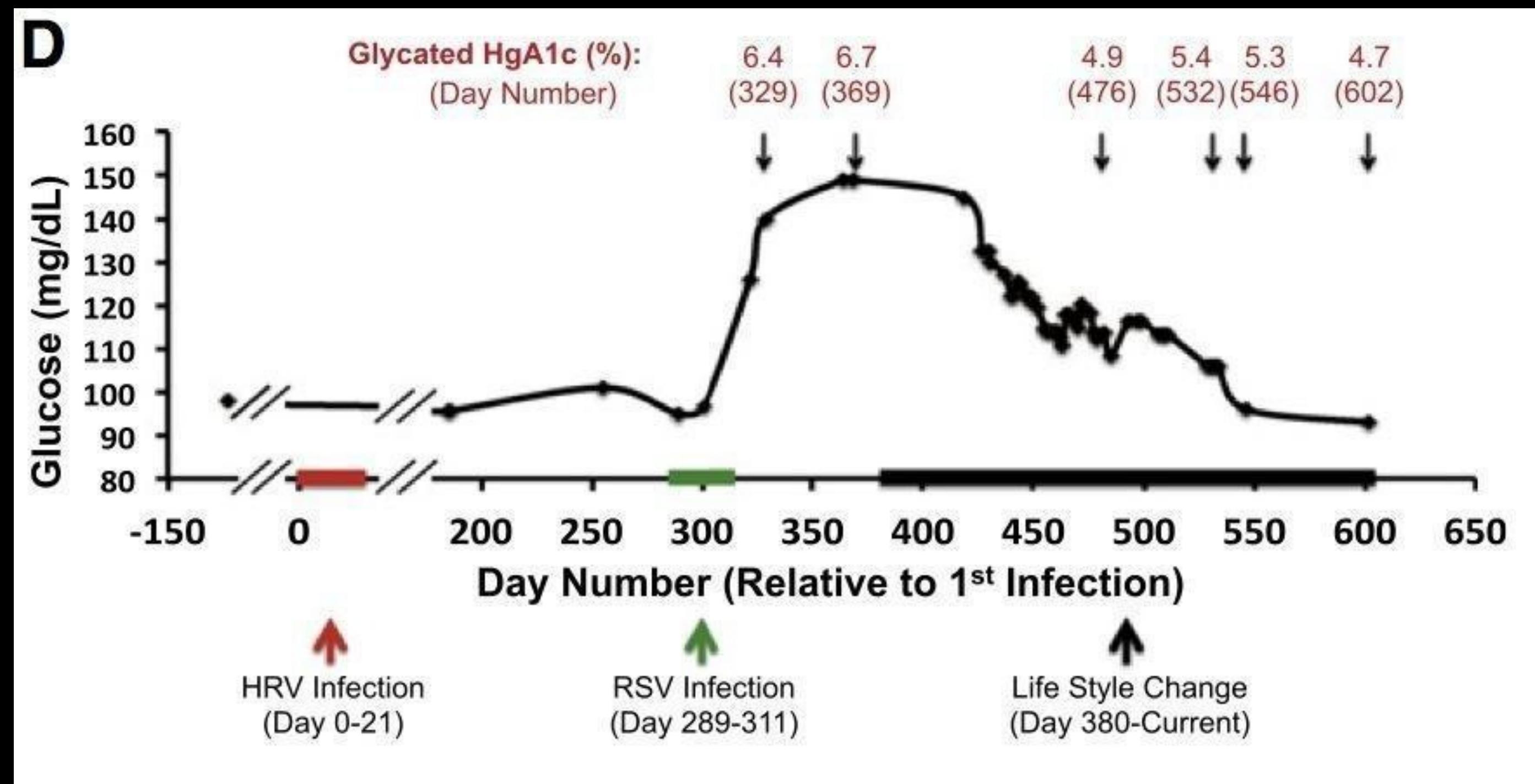
“Much more precise medicine is possible. And I for one want it. Because our smartphones are on us 24/7, we can start to do much more.” —Vinod Khosla

TRANSLATING WELLNESS AND HEALTH DATA

- New field, holds great promise
- More precise diagnosis and care, on the spot decision support and more granular information advancing science
- Diagnostics: Propeller Health, Kinsa
- Disease management: Ginger.io, Welldoc
- Linq (Open mHealth)
- Privacy, liability, interoperability, clinical value of the data



USE CASE 1: DIABETES



INTEGRATION GENETICS, LIFESTYLE
FACTORS AND INFECTION

USE CASE 2: HYPERTENSION

Normal BP at doctor's office

Sustained

Normotension
Normal BP during
office visit and at
home

Masked

hypertension
Normal BP during
office visit and high BP
at home

Better metabolic profile

Low disease risk

High BP at doctor's office

White Coat

Hypertension
High BP during office
visit normal at home

Sustained

Hypertension
High BP during office
visit and at home

Worse metabolic profile

High disease risk

TRANSLATING HEALTH AND WELLNESS DATA

- Everybody his personal Watson?
- Will we finally understand the interplay of behavior, environment and genomics? Nature vs nurture.

THE QUANTIFIED US

TRENDS

EMERGING DEVICES: NEW FIELDS, SENSORS & TECHNOLOGIES

- Urine
- Microfluidics
- EEG
- Voice analysis
- Breath analysis
- ...



SMART CLOTHES
“INTERNET OF THINGS”

SENSORS BECOME ABUNDANT AND INVISIBLE

FWD

THE POLO TECH SHIRT

ALGORITHMIC BIO-METRIC DATA ANALYSIS

COMPREHENSIVE BREATHING & HEART RATE TRACKING

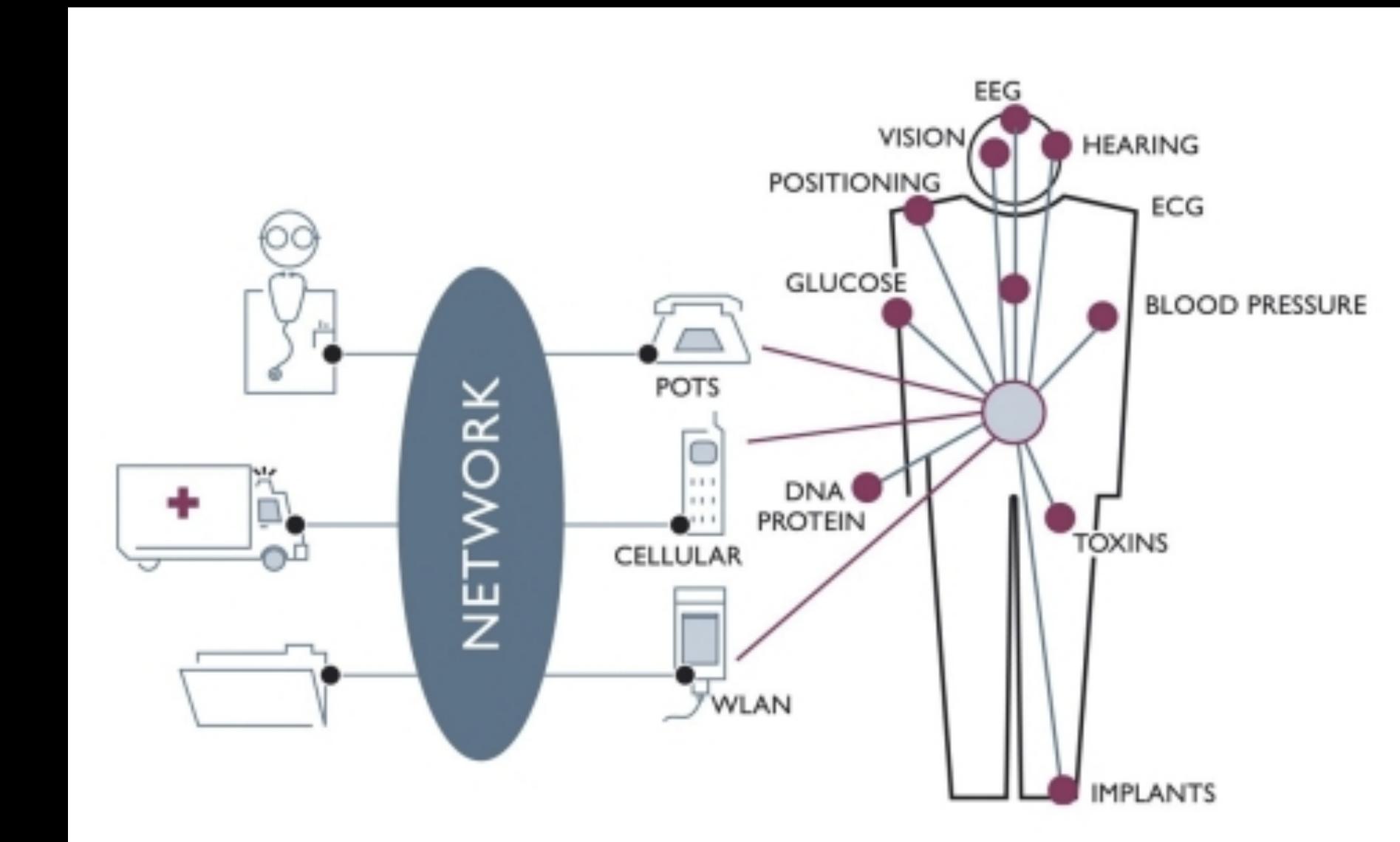
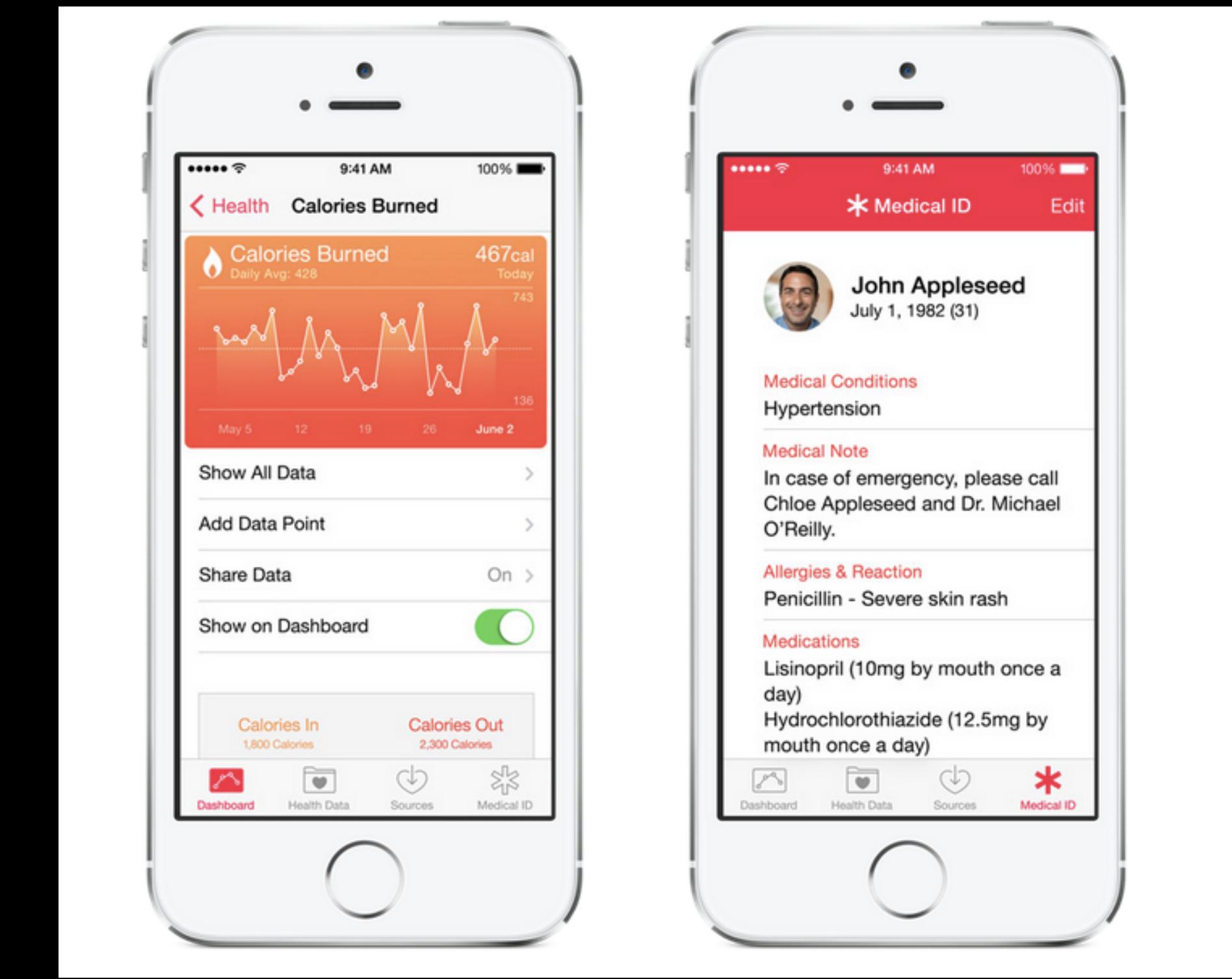
ACCELEROMETER & GYROSCOPE FOR DIRECTIONAL DATA

OBPM



INTEGRATION ACROSS SENSORS AND APPS

- Apple HealthKit, Google Fit, Misfit
- Qualcomm 2net
- Linq



“Give a man a fish and you feed him for a day; teach a man to fish
and you feed him for a lifetime.”

MAIMONIDES



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