

# Novas tendências globais nos cuidados de saúde e as tecnologias de informação

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# The Creative Destruction of MEDICINE



HOW THE DIGITAL REVOLUTION  
WILL CREATE BETTER HEALTH CARE

ERIC TOPOL, M.D.

# Esquema da comunicação

- O que é a e-Health
- Tendências globais nos cuidados de saúde
- O Processo Clínico Electrónico (EHR) como paradigma de uma tecnologia de informação com aplicações múltiplas
- O futuro.

# Definição de e-Health

- A utilização de meios informáticos e electrónicos na gestão e na prática clínica, assim como na comunicação entre os actores envolvidos.
- Constitui uma nova área técnico-profissional com importância crescente nos SNS.

# Algumas tendências actuais\*

- Descentralização dos cuidados de saúde
- Doentes no controlo dos cuidados
- Medicina personalizada
- Realidade virtual e telemedicina
- Valor em saúde baseado em “big data”
- Mega-sistemas de saúde
- Acesso universal aos dados (convergência)
- Informação em saúde para os pacientes
- Medicina de precisão
- Gestão de doença crónica
- A prática baseada na evidência científica.

\*Parte por G. Arnhofer 2014

# Descentralização dos cuidados de saúde (Healthcare Everywhere)

## Healthcare Everywhere

- The rise of ubiquitous connectivity
- The power of smartphones
- The new right care, right place, right time approach

Source: 10 Megatrends shaping medicine's near 20 years

## 'Care anywhere' — the enabling power of technology

New, technology-dependent business models are being used to tackle chronic illness management and primary care.

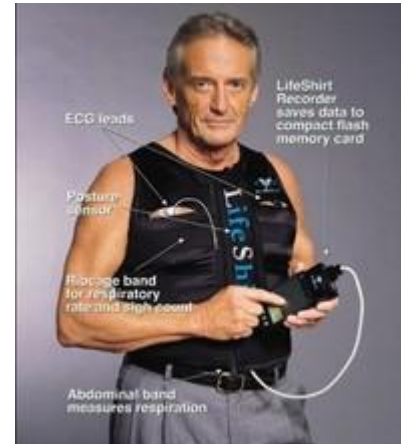
Telecommunications and mobile health companies feature large in these new models, allowing chronic care to become available to even the poorest of populations.

Source: PwC Global healthcare case studies and best practices

## The healthcare sector is industrializing.

Enabled through the power of connectivity to achieve greater efficiency and improved outcomes to satisfy demanding, informed consumers.

Source: PwC Emerging trends in healthcare



[http://smarteconomy.typepad.com/smart\\_economy/2006/05/ubiquitous\\_health.html](http://smarteconomy.typepad.com/smart_economy/2006/05/ubiquitous_health.html)



<http://www.netspective.com/technology-services/development/2012/12/18/mobility-3/>

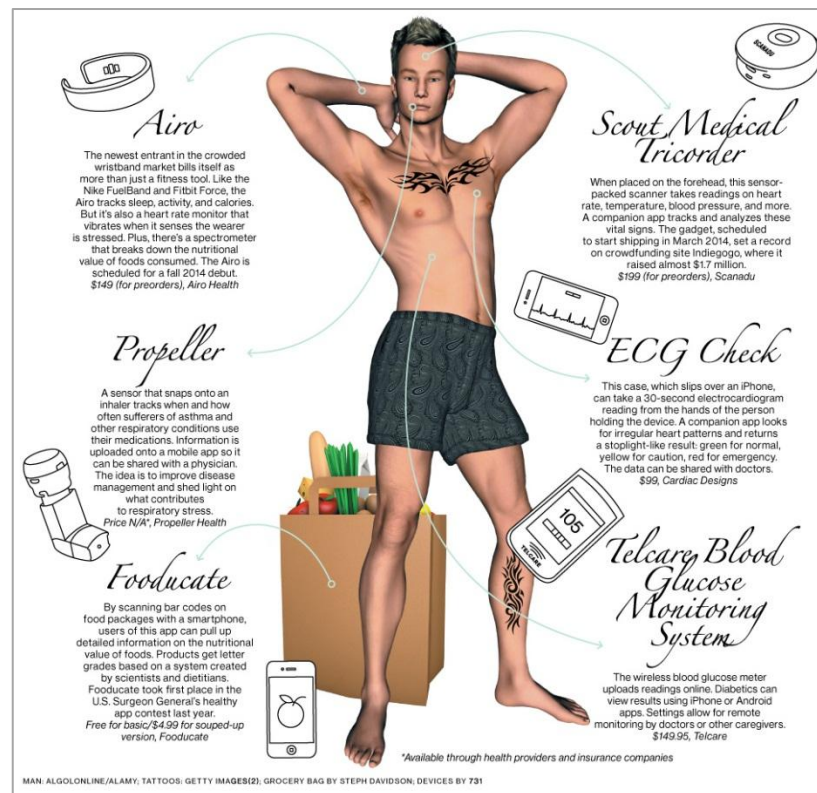


<http://gsvcap.com/market-commentary/bicycles/>

# Doentes no controlo dos cuidados (Consumers Take Charge)

## Consumers Take Charge

- The birth of insurance Marketplaces, resulting in the “Insured Consumer”
- The “information everywhere” phenomenon, leading to the “Engaged Consumer”
- The explosion in self-care, creating the “Responsible Consumer”
- Health communities, supporting the “Active Consumer”



<http://www.businessweek.com/articles/2013-11-14/2014-outlook-health-care-apps-and-gadgets>

Source: 10 Megatrends Shaping Healthcare's Next 10 Years



# Medicina personalizada (Predict, Prevent, Personalize)

- The transformational impact of genomics, epigenetics and predictive diagnostics
- The power of artificial intelligence-based clinical support.
- The shift toward personalized medicine
- The continued emergence of evidence-based clinical support

Source: 10 Megatrends  
Shaping Healthcare's Next 10 Years

Healthcare is becoming a precision-based industry produced by the genomic revolution .

Healthcare is moving from a population-based to a precision-based industry.

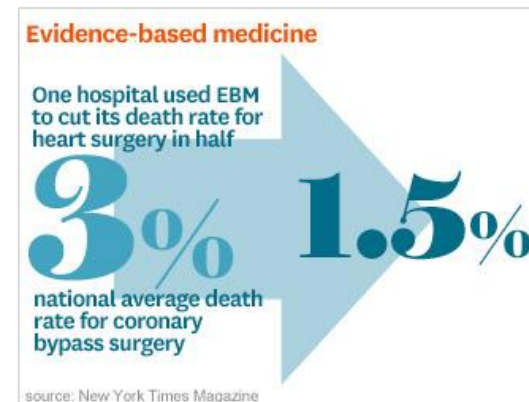
Decoding individual genomes - pharmacogenomics could prevent adverse reactions to medications



<http://genomealberta.ca/blogs/epigenetics-and-personalized-medicine.aspx>



<http://venturebeat.com/2013/01/27/the-personalized-medicine-revolution-is-almost-here/>



Source: Megatrends in Global Health Care (Harvard Business Review)  
<http://hbr.org/web/extras/insight-center/health-care/globaltrends/1-slide>



# Realidade virtual e telemedicina (Virtual-reality Medical Simulations and Telehealth)

In Silico virtual simulations will become essential to medical training, drug discovery and life science development.

Health-care professionals, available via remote Internet connections, will provide services to millions of people who were previously under-served.

Cyber-health care that is customized for us - designed to monitor, diagnose, educate, and intervene regardless of location or time - will be common.



[http://www.medgadget.com/2010/06/virtual\\_reality\\_medical\\_simulator\\_being\\_adopted\\_by\\_duke\\_medical\\_school.html](http://www.medgadget.com/2010/06/virtual_reality_medical_simulator_being_adopted_by_duke_medical_school.html)



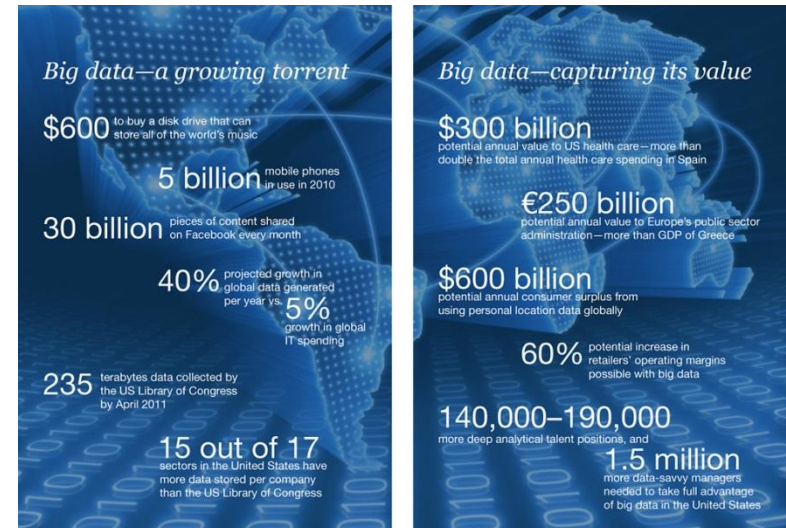
<http://www.ucdmc.ucdavis.edu/welcome/tour/16.html>

Source: Institute for Global Futures

# Valor em saúde baseado em “big data” (Value through Data)

## Value through Data

- The dynamic use of information to improve decision making
- The increase in data-driven discovery, evaluation and innovation for drugs and medical devices
- The facilitation of clinical trials with big data



<http://minnov8.com/2011/11/16/big-healthcare-data/>



<http://www.policymed.com/2010/08/electronic-medical-records-and-final-meaningful-use-regulations.html>

# Acesso universal aos dados (Convergent Care Models)

“Some of the most advanced medical technology companies are adapting by **migrating from an episodic or intervention-focused business model to a convergent care model** that enables them to provide solutions along the continuum of care.

The integrated solutions inherent in this approach to 'owning the disease' combine drug, device, diagnostic and **consumer-centric** solutions to establish creative platforms in which a company can dominate the diagnosis and treatment of a disease or condition.”

**Care4Today™**

**About Care4Today™**

Care4Today™ Heart Health Solutions

Care4Today™ Mental Health Solutions

Care4Today™ Orthopaedic Solutions

Care4Today™ Mobile Health Manager

Visit [www.care4today.com](http://www.care4today.com) for more!

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**Mobile Health Manager**

Providing the tools to help encourage you to take your medication on time

**LEARN MORE**

JHI created the **Care4Today™** master brand to reflect our commitment to transforming healthcare for the consumer. This master brand represents outcomes-focused solutions that are designed to help deliver quality and customized healthcare when and where our patients need it. There are currently four sub-branded solutions within **Care4Today™**: Heart Health Solutions, Mental Health Solutions, Mobile Health Manager and Orthopaedic Solutions.

**Janssen Healthcare Innovation** brings together a diverse group of passionate colleagues focused on transformational healthcare innovation. This future-focused team operates like a nimble startup company with a "fail-fast, learn, iterate, reapply and execute with excellence" mentality that is bringing to life new integrated care models and technology-enabled solutions that will deliver value for patients and new growth for J&J. Based in the US and Europe, JHI

**PILOT PROGRAM**

**care4today™**

**Heart Health Solutions**

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**Mental Health Solutions**

**PILOT PROGRAM**

**care4today™**

**Orthopaedic Solutions**

**Enabling Technology**

**JUST LAUNCHED**

**care4today™**

**Mobile Health Manager**

<http://www.janssenhealthcareinnovation.com/care4today>

Source: PwC "Owning the disease: Adapting strategy into successful business tactics"

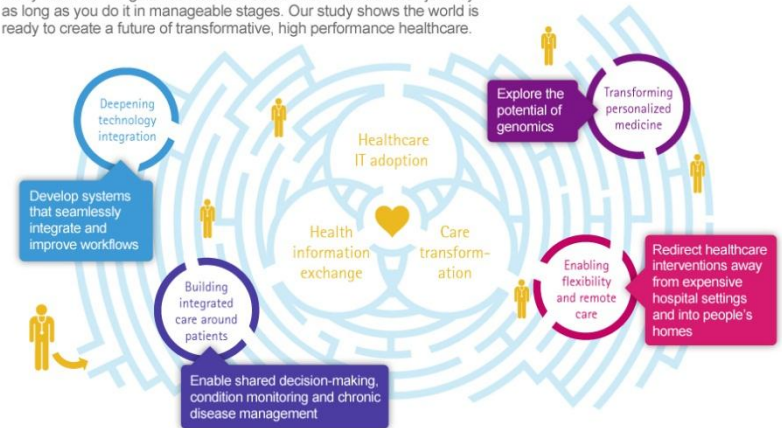
# Mega-sistemas de saúde (Mega Health Systems)

## Mega Health Systems

- The consolidation of healthcare.
- The “take off” of systems re-engineering.
- The optimization of information technology.
- The growth of a multi-billion dollar HIT and services industry for risk management.
- Most hospitals, clinics, trauma centers, physicians, and patients will be connected to one large health care knowledge network enabling access to medical information, drug interactions and interventions.

### The Future of Connected Health

Many roads converge to achieve a successful connected health journey – as long as you do it in manageable stages. Our study shows the world is ready to create a future of transformative, high performance healthcare.

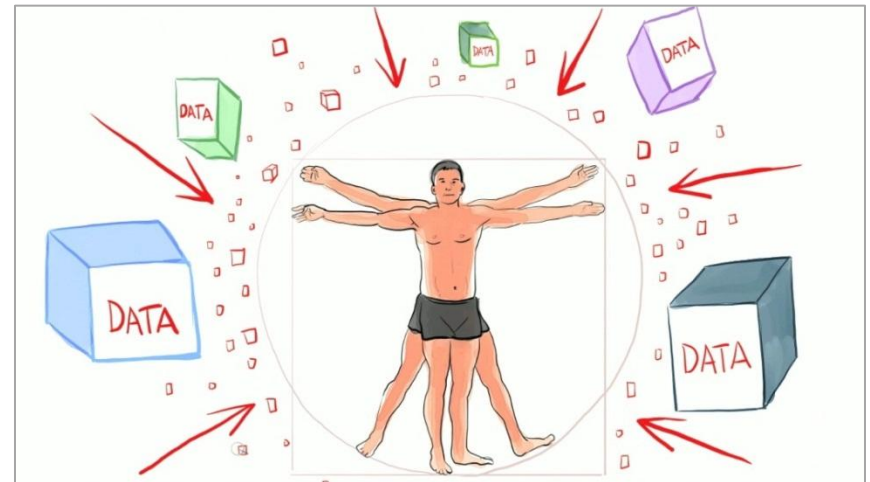


<http://www.hitconsultant.net/2012/05/31/infographicconnected-health-the-drive-to-integrated-healthcare-delivery/>



# Informação em saúde para os pacientes (Patient Information)

- Consumer health information, accessible over a variety of Net channels, will become the most in-demand content worldwide
- High-quality information easily accessed
- The medical industry will face an ethical and social dilemma over the disclosure of patient information.



<http://www.teachprivacy.com/privacy-security-training-programs/hipaa-training/>

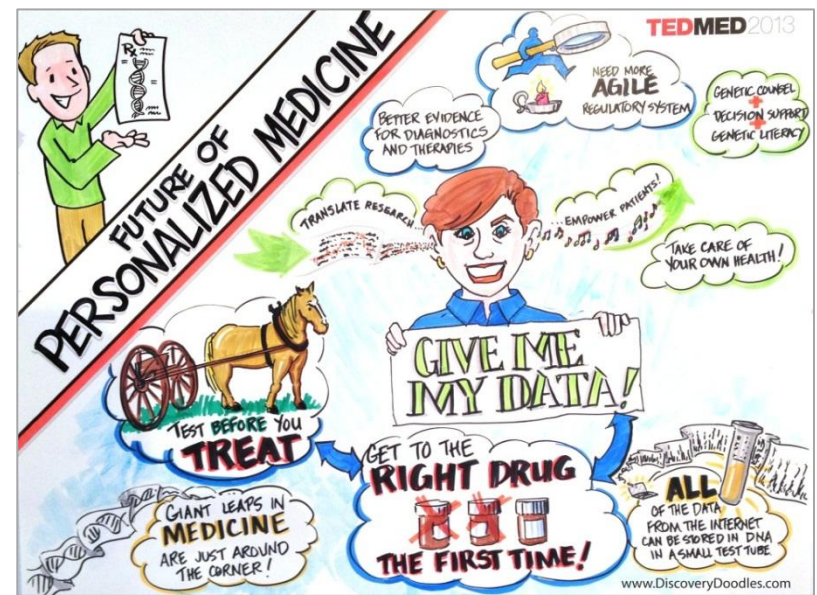
# Medicina de precisão (Precision Medicine)

## Precision medicine

Healthcare is moving from a **population-based** to a **precision-based** industry.

With the blossoming of personalized medicine, this new era of customization should reduce costs and stimulate noticeable quality improvements.

Personalized health care that is customized for us-designed to monitor, diagnose, treat, educate, and intervene -will transform medicine.



<http://blog.tedmed.com/?p=3320>

# Gestão de doença crónica (Chronic Disease Management)

Chronic disease, much of which is preventable, accounts for 75 percent of health care spending in most developed countries

There is now the possibility of, based in CPGs and multidisciplinary teams, to treat the patient at different locations of health care systems.



**CHRONIC DISEASES**  
THE POWER TO PREVENT,  
THE CALL TO CONTROL

<http://www.cdc.gov/chronicdisease/resources/publications/aag/chronic.htm>

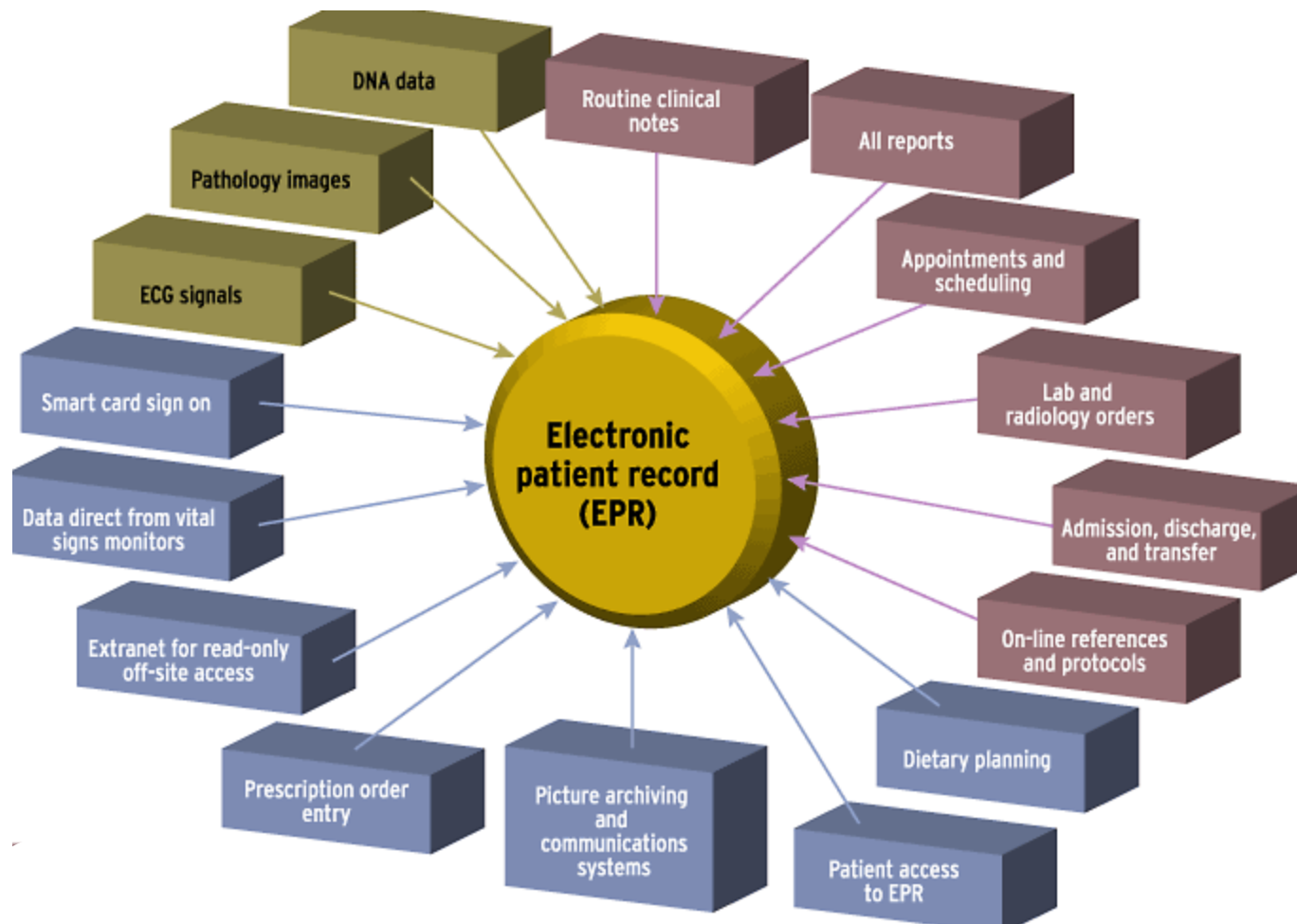


<http://www.mailman.columbia.edu/events/deans-seminars-chronic-disease>

Source: Megatrends in Global Health Care



# EHR

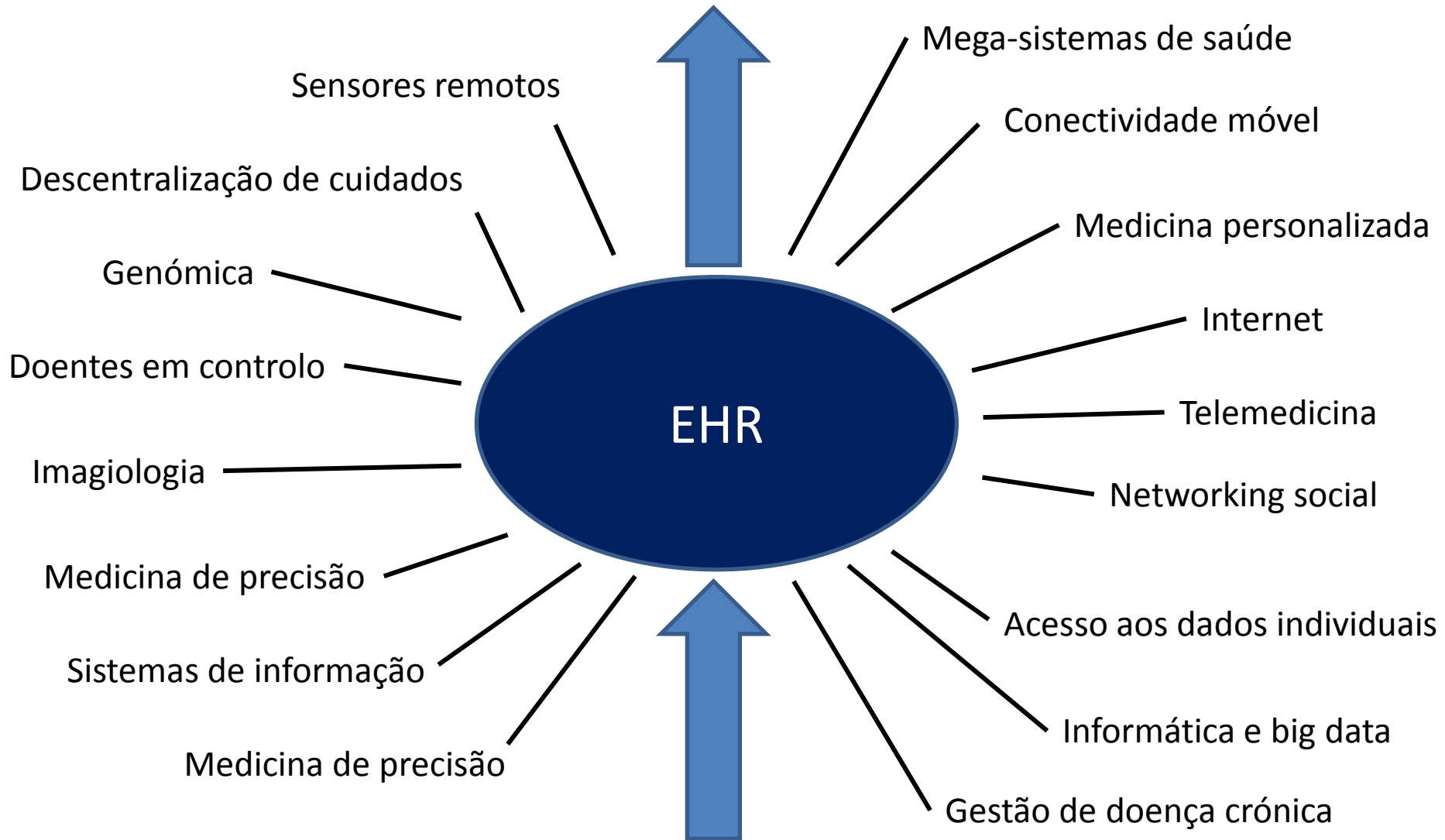


# Processo clínico electrónico (EHR)

Sistema clássico	EHR
Os processos clínicos perdem-se	As files são pesquisáveis e com backup
As actualizações são morosas	Actualizações/classificações instantâneas
Acesso individual	Acesso colectivo simultâneo
Sem NOCs disponíveis imediatamente	Com possibilidade de ter NOCs
Identificação difícil de detalhes clínicos do doente individual	As características do doente individual são pesquisáveis e ligadas à Hx clínica
Dosagens, interações e efeitos adversos dos medicamentos pouco documentados	“Red flags” instantâneos
Difíceis de usar na gestão da doença crónica (GDC)	Excelente base de informação para GDC, incluindo NOCs
Marcação de consultas pelo pessoal	Marcação de consultas automática e acessível
Erros frequentes de entrada de dados	Menor taxa de erros na informação clínica

# O futuro da medicina

# Prática clínica moderna



# Prática clínica clássica



Estou desejosa de mudar para os processos clínicos electrónicos.  
Carregar estes processos em papel dá-me cabo das costas !

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