

Medicina do Futuro



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Medicina e todas as áreas da saúde são profissões

Científicas

Conceitos

- Dogmáticos
- Empíricos
- Científicos

Dogmático

- Conceito formulado com base na crença



Empírico

- Conceito formulado com base na observação



Científico

- Conceito formulado com base na mensuração metodológica

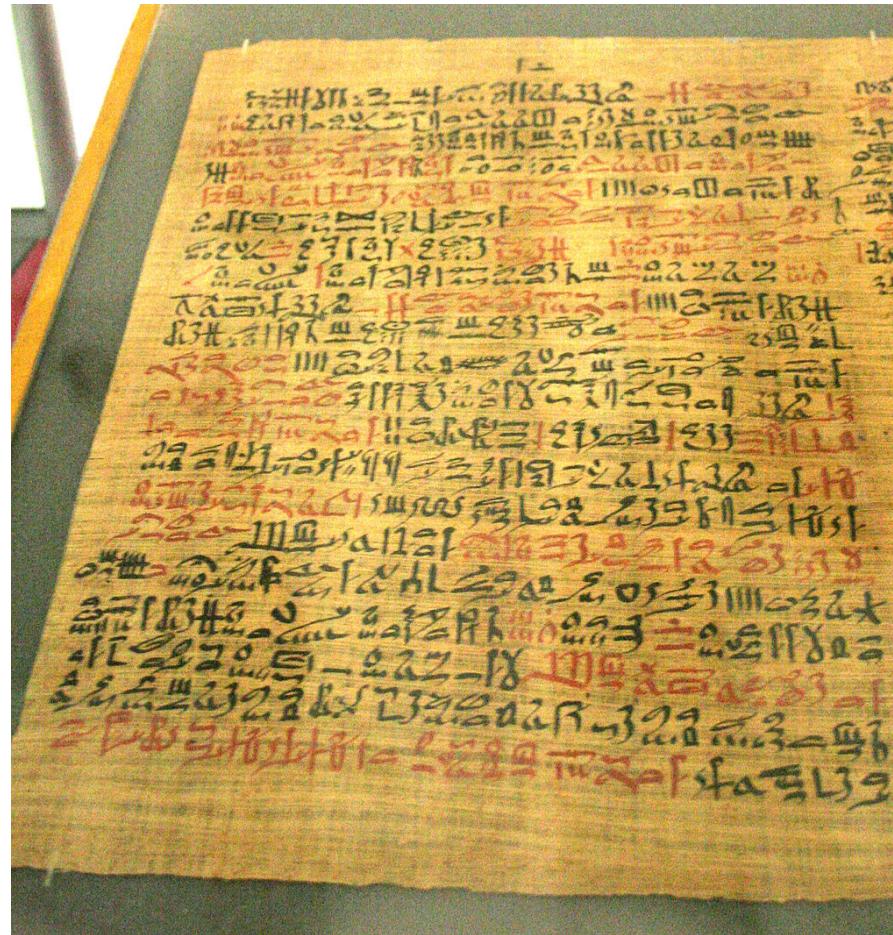


Medicina e os Conceitos

- Dogmáticos
- Empíricos
- Científicos

Uso de salicilato

- Empírico



Papiro Ebers, 1550 BC

Casca do tronco do salgueiro

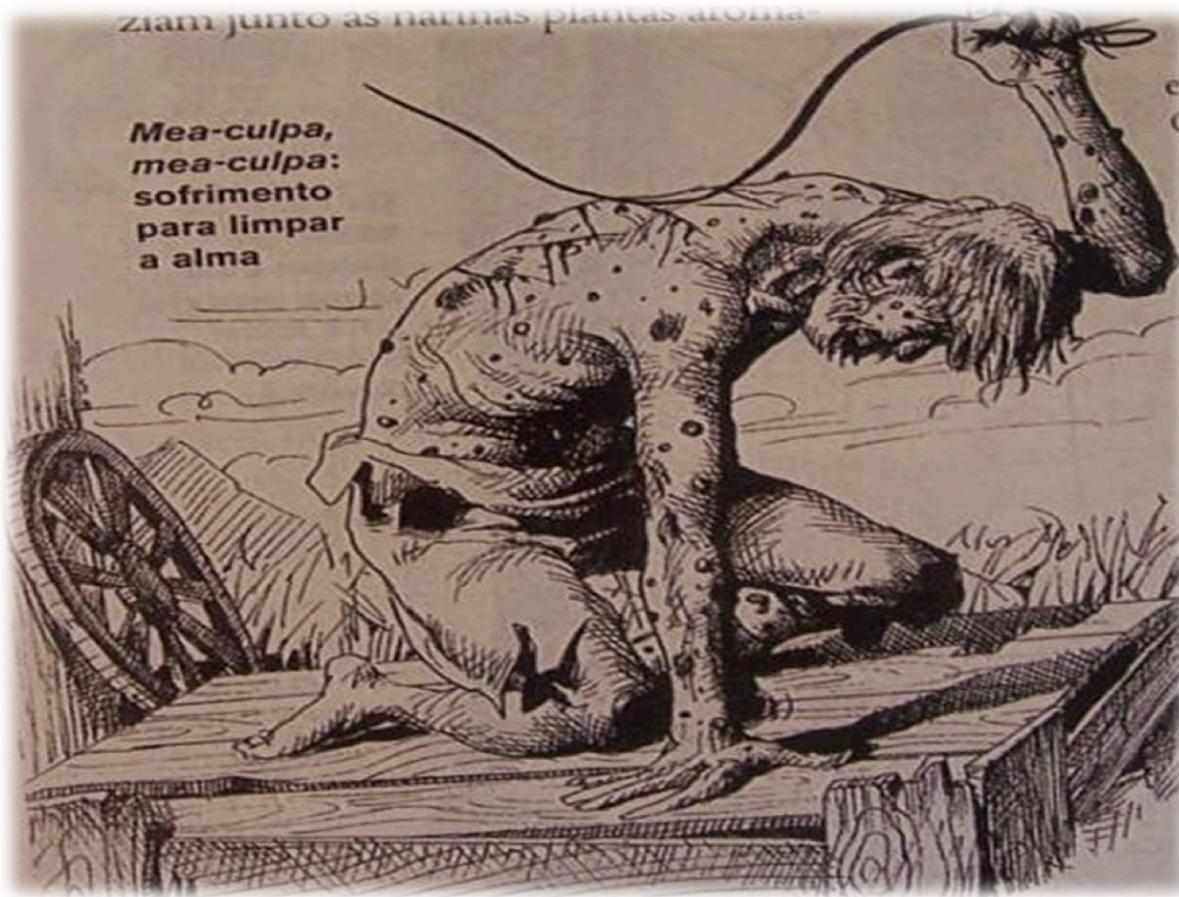


Autoflagelação para proteção contra doenças

- Dogmático



Peste – Idade Média



Vacina para prevenção de doenças

- Científico







Observação

- Pessoas que ordenham vacas tem menos varíola

Hipótese

- O contato com a varíola bovina protege da varíola humana

Experimento proposto

- Inocular secreção de varíola bovina em uma pessoa sadia (que nunca tenha tido varíola humana) e depois de algum tempo (apos o desaparecimento das lesões da varíola bovina) inocular com varíola humana e verificar se ocorria proteção

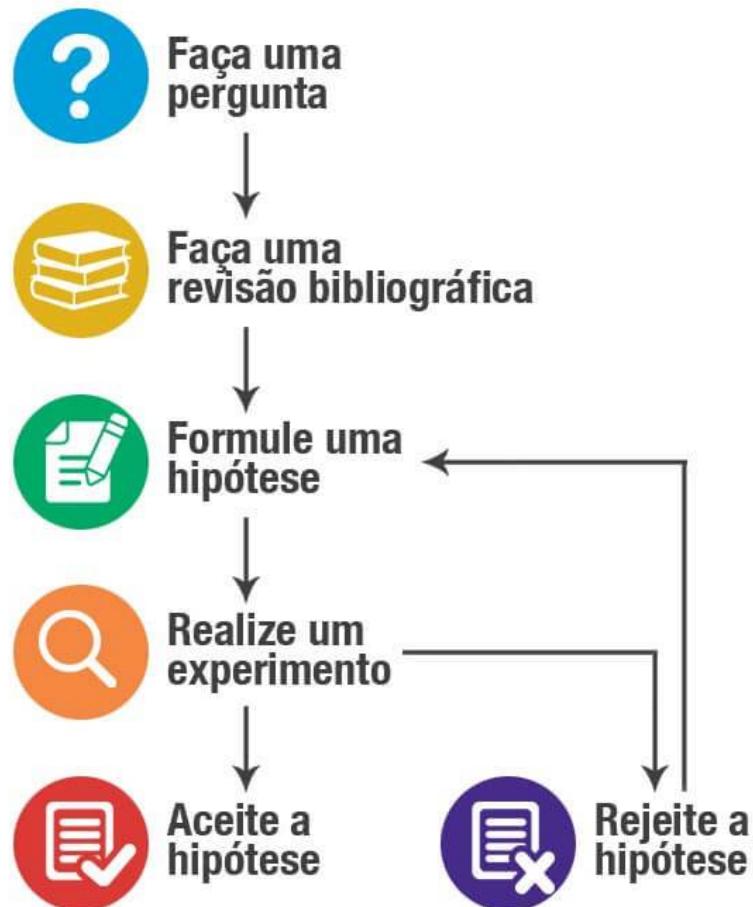
Experimento realizado

- Inoculação de secreção de varíola bovina em 17 crianças e apos o desaparecimento das lesões, nova inoculação com secreção de varíola humana.

Resultado

- Crianças não desenvolveram varíola

MÉTODO CIENTÍFICO



Medicina – Século XXI

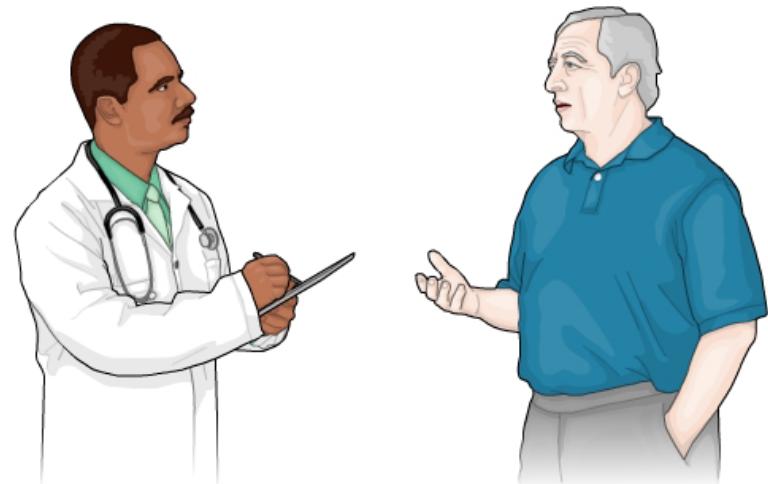
- Profissão que tem por base princípios 100% científicos

A prática da medicina atual

- Qualquer procedimento utilizado para:
 - Diagnóstico
 - Prevenção
 - Tratamento
- Deve ser baseado em conceitos científicos estabelecidos por estudos:
 - Básicos
 - Translacionais
 - Pré-clínicos
 - Clínicos

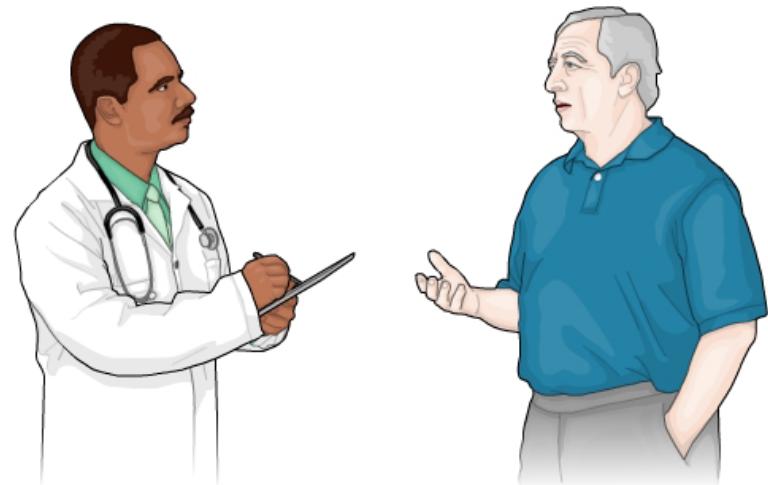
Diagnóstico

- Dor no peito em aperto sempre que faz alguma atividade física como caminhada, subir escadas etc.



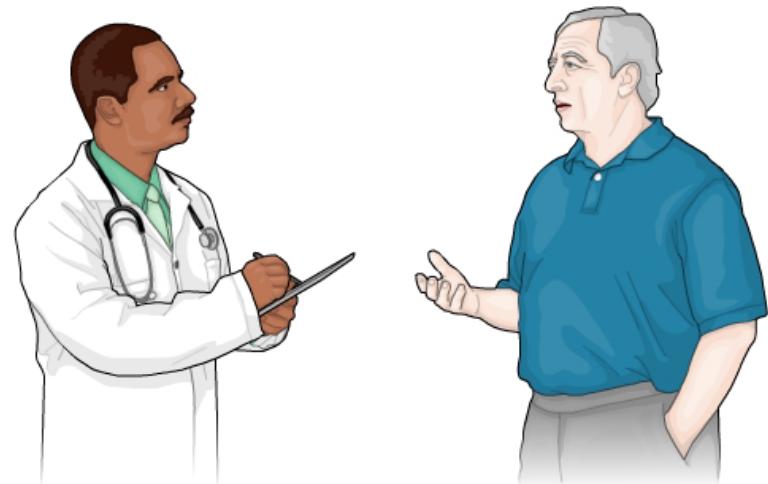
Diagnóstico

- Diagnóstico de suspeição:
Dor no peito + aperto +
atividade física:
— isquemia do miocárdio



Diagnóstico

- Outros dados clínicos que reforçam a hipótese:
 - Antecedentes familiares
 - Alimentação
 - Sedentarismo



Base científica?

The screenshot shows a search interface for the PubMed database. At the top, there is a search bar containing the query "clinical diagnosis heart ischemia". Below the search bar, the "Format" is set to "Summary", "Sort by" is "Most Recent", and "Per page" is "20". A section titled "Best matches for clinical diagnosis heart ischemia:" lists several research articles:

- [Acute mesenteric ischemia after heart surgery.](#)
Goleau V et al. Chirurgia (Bucur). (2014)
- [Chronic pelvic ischemia: etiology, pathogenesis, clinical presentation and management.](#)
Kapoor H et al. Minerva Urol Nefrol. (2014)
- [Acute bowel ischemia after heart operations.](#)
Lorusso R et al. Ann Thorac Surg. (2014)

A blue button at the bottom of this list says "Switch to our new best match sort order".

Search results

Items: 1 to 20 of 12199

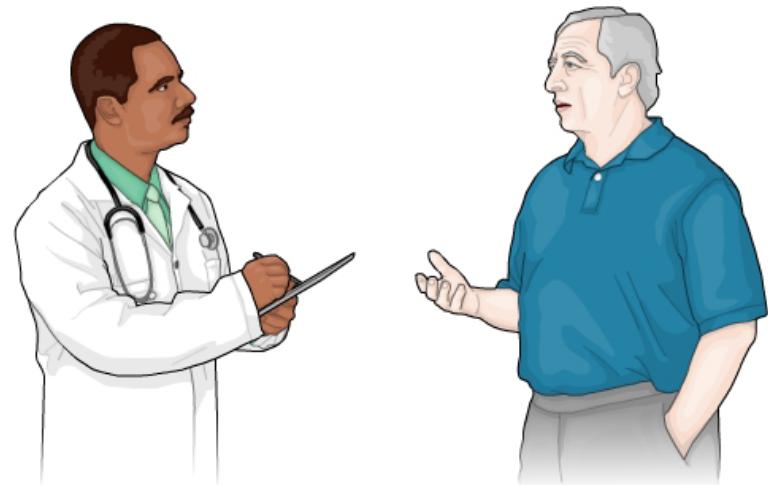
- [Randomized controlled trial of remote ischaemic conditioning in ST-elevation myocardial infarction as adjuvant to primary angioplasty \(RIC-STEMI\).](#)
1. Gaspar A, Lourenco AP, Pereira MÁ, Azevedo P, Roncon-Albuquerque R Jr., Marques J, Leite-Moreira AF. Basic Res Cardiol. 2018 Mar 7;113(3):14. doi: 10.1007/s00395-018-0672-3. PMID: 29516192
- [Coronary Artery Fistulae: Anatomy, Diagnosis and Management Strategies.](#)
2. Bucccheri D, Chirico PR, Geraci S, Caramanno G, Cortese B. Heart Lung Circ. 2018 Feb 9. pii: S1443-9506(18)30029-5. doi: 10.1016/j.hlc.2017.07.014. [Epub ahead of print] Review. PMID: 29503240
- [Imaging to Assess Ischemic Heart Disease in Women.](#)
3. Sivanesan K, Al'Aref SJ, Min JK, Peña JM, Lin F, Jones EC. Curr Atheroscler Rep. 2018 Mar 2;20(3):16. doi: 10.1007/s11883-018-0714-1. Review.

Base de dados científicos:

https://en.wikipedia.org/wiki/List_of_academic_databases_and_search_engines

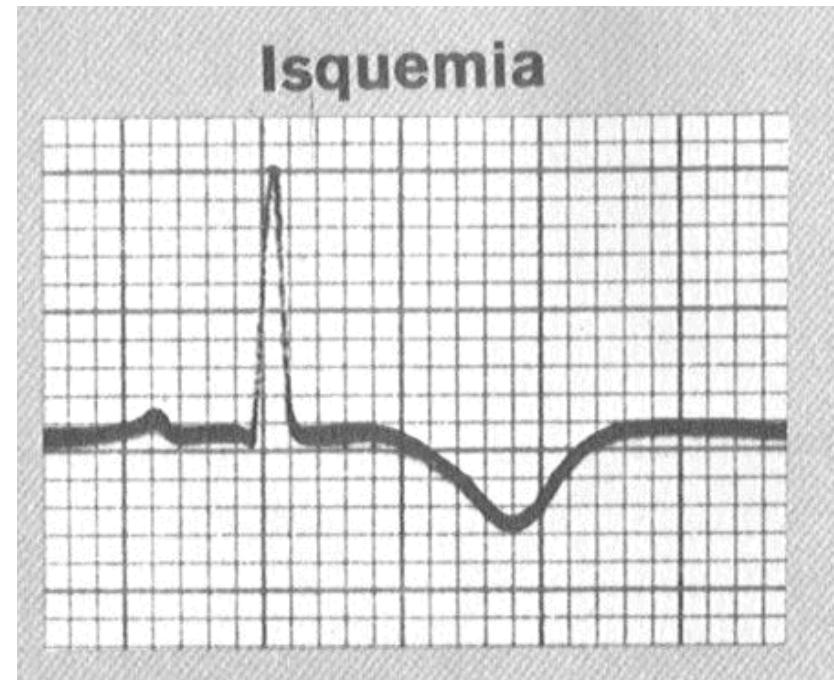
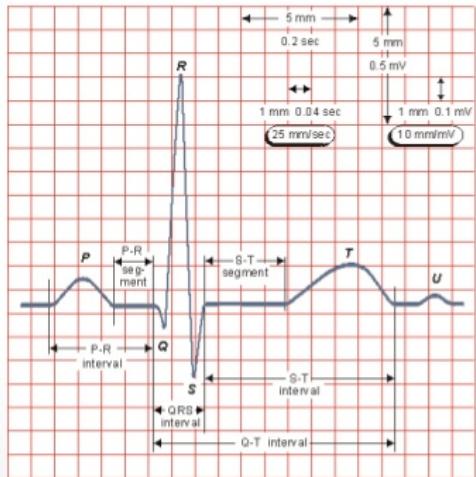
Diagnóstico

- Exames complementares:
 - ECG
 - Dosagem de colesterol e triglicérides
 - Cateterismo



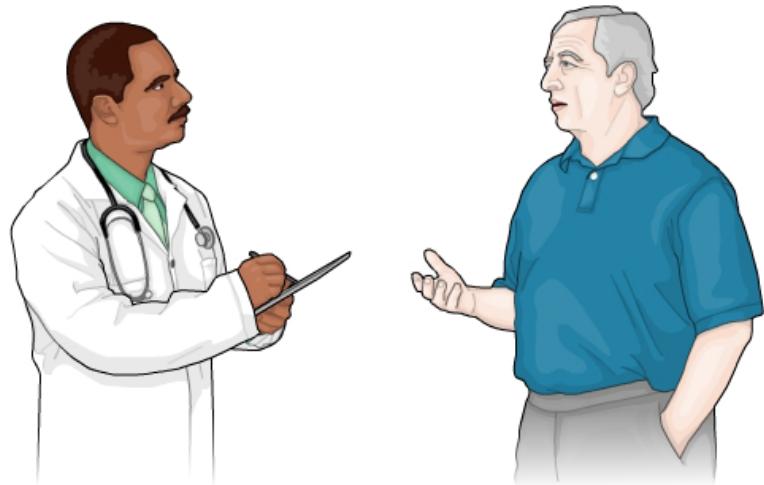
Diagnóstico - ECG

Electrocardiografía Básica ECG Normal

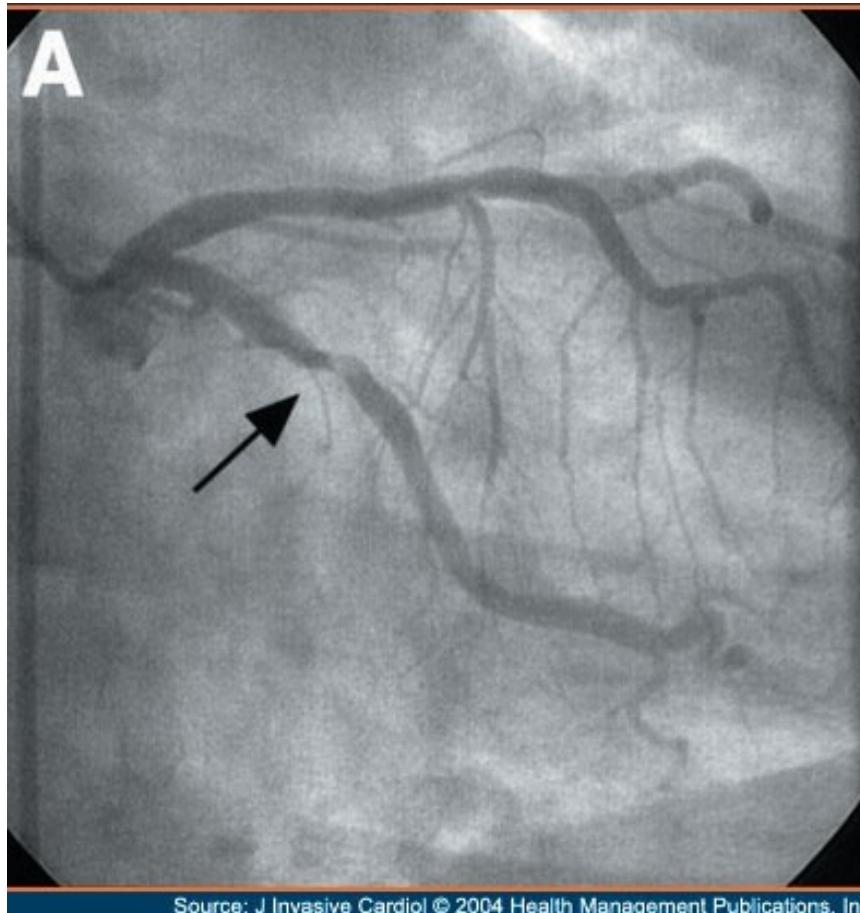


Diagnóstico - dislipidemia

- Colesterol e triglicérides elevados no sangue



Diagnóstico – obstrução parcial da coronária



Source: J Invasive Cardiol © 2004 Health Management Publications, Inc.

Base científica?

PubMed

Format: Summary ▾ Sort by: Most Recent ▾ Per page: 20 ▾

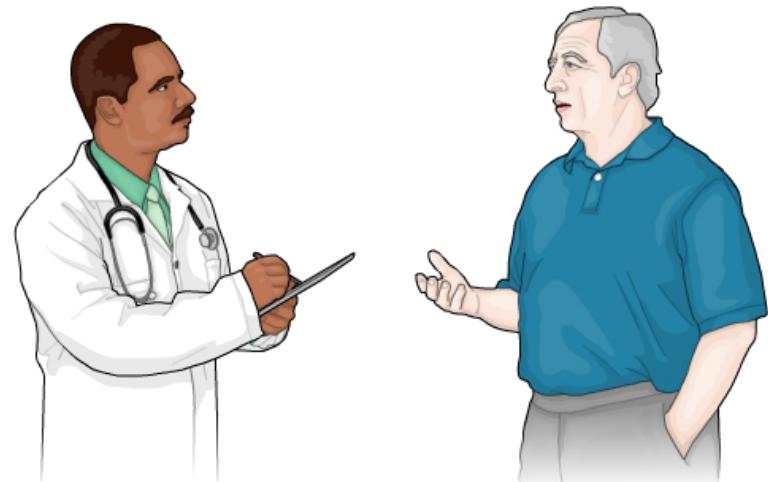
Search results

Items: 1 to 20 of 4522

- [Association of Preoperatively Diagnosed Patent Foramen Ovale With Perioperative Ischemic Stroke.](#)
1. Ng PY, Ng AK, Subramanian B, Burns SM, Herisson F, Timm FP, Med C, Rudolph MI, Med C, Scheffenbichler F, Med C, Friedrich S, Med C, Houle TT, Bhatt DL, Eikermann M.
JAMA. 2018 Feb 6;319(5):462-462. doi: 10.1001/jama.2017.21899.
PMID: 29411032
- [Toll-Like Receptors 2 and 4 Predict New-Onset Atrial Fibrillation in Acute Myocardial Infarction Patients.](#)
2. Zhang P, Shao L, Ma J.
Int Heart J. 2018;59(1):64-70. doi: 10.1536/ihj.17-084.
PMID: 29375116 [Free Article](#)
- [Aberrant regulation of autophagy in mammalian diseases.](#)
3. Xie W, Zhou J.
Biol Lett. 2018 Jan;14(1). pii: 20170540. doi: 10.1098/rsbl.2017.0540. Review.
PMID: 29321247
- [How is cardiac troponin released from injured myocardium?](#)
4. Mair J, Lindahl B, Hammarsten O, Müller C, Giannitis E, Huber K, Möckel M, Plebani M, Thygesen K, Jaffe AS; European Society of Cardiology (ESC) Study Group on Biomarkers in Cardiology of the Acute Cardiovascular Care Association (ACCA).
Eur Heart J Acute Cardiovasc Care. 2017 Dec 1:2048872617748553. doi: 10.1177/2048872617748553. [Epub ahead of print]
PMID: 29278915
- [Hemispherical photoacoustic imaging of myocardial infarction: in vivo detection and monitoring.](#)
5. Lv J, Peng Y, Li S, Guo Z, Zhao Q, Zhang X, Nie L.
Eur Radiol. 2017 Dec 21. doi: 10.1007/s00330-017-5209-x. [Epub ahead of print]
PMID: 29270643
- [Estradiol mediates the long-lasting lung inflammation induced by intestinal ischemia and reperfusion.](#)
6. Fantozzi ET, Breithaupt-Faloppa AC, Ricardo-da-Silva FY, Rodrigues-Garbin S, Romero DC, da Silva Rodrigues A, Riffó-Vasquez Y, Tavares-de-Lima W.
J Surg Res. 2018 Jan;221:1-7. doi: 10.1016/j.jss.2017.07.038.
PMID: 29229114
- [Cardiac troponins and NT-proBNP in the forensic setting: Overview of sampling site, postmortem interval, cardiopulmonary resuscitation, and review of the literature.](#)
7. Palmiere C, Tettamanti C, Bonsignore A, De Stefano F, Vanhaebost J, Rousseau G, Scarpelli MP, Bardy D.
Forensic Sci Int. 2018 Jan;282:211-218. doi: 10.1016/j.forsciint.2017.11.034. Epub 2017 Nov 27.
PMID: 29227899
- [Perioperative Myocardial Injury After Noncardiac Surgery: Incidence, Mortality, and Characterization.](#)

Tratamento e prevenção

- Colocação de um *stent*
- Dieta
- Uso de medicação para redução do colesterol - estatina



Base científica

- Tratamento de isquemia cardíaca
 - 42.984 artigos
- Prevenção de isquemia cardíaca
 - 12.711 artigos

Medicina alternativa – zona de conflicto



Media centre

New WHO guidelines to promote proper use of alternative medicines

Adverse drug reactions to alternative medicines have more than doubled in three years

22 JUNE 2004 | GENEVA - Since traditional, complementary and alternative medicines remain largely unregulated, consumers worldwide need to be informed and given the tools to access appropriate, safe and effective treatment. To help address this issue, the World Health Organization (WHO) today releases a new set of guidelines for national health authorities to develop context specific and reliable information for consumer use of alternative medicines.



Stall selling herbal and traditional remedies

Up to 80% of developing country populations rely on traditional medicine for their primary health care, due to cultural tradition or lack of alternatives. In wealthy countries, many people seek out various types of natural remedies on the assumption that natural means safe.

However, as the use of traditional or alternative medicines increases, so do reports of adverse reactions. In China, a country where traditional therapies and products are widely used in parallel with conventional medicine, there were 9 854 known reported cases of adverse drug reactions in 2002 alone, up from 4 000 between 1990 and 1999.

Many traditional/alternative medicine products are sold over the counter. In a WHO survey of 142 countries, 99 responded that most of these products could be bought without prescription. In 39 countries, many traditional remedies were used for self-medication, bought or prepared by friends, acquaintances or the patient. These trends raise concerns over the quality of the products used, their therapeutic appropriateness for a given condition, and the lack of medical follow-up.

"WHO supports traditional and alternative medicines when these have demonstrated benefits for the patient and minimal risks," said Dr LEE Jong-wook, Director-General of WHO. "But as more people use these medicines, governments should have the tools to ensure all stakeholders have the best information about their benefit and their risks."

Accessible, easy to understand information is key to guiding consumers in their choices. The guidelines provide simple, easy to follow tips on issues to look out for and a brief checklist of basic questions which may be used to help facilitate proper use of traditional and alternative medicine.

Advice is provided to government authorities on preparing easy-to-access information and on working with the mass media to sensitize and educate the population. In addition, suggestions are given for several health system structures and processes needed to promote proper use of traditional and alternative medicines.

While the guidelines cannot compensate for poor products or inappropriate practices, they can help governments educate consumers on how to maximize the benefits and minimize the risks of traditional medicines.

Alternative therapies - documented benefits and risks

Empirical and scientific evidence exists to support the benefits of acupuncture, manual therapies and several medicinal plants for chronic or mild conditions. For instance, the effectiveness of acupuncture, a popular treatment for relieving pain, has been demonstrated both through numerous clinical trials and laboratory experiments. As a result, 30% of pain clinics in the United Kingdom and 70% in Germany include acupuncture as a form of treatment. Equally, some medicinal plants have shown efficacy for life-threatening conditions; medicine combinations containing the Chinese herb *Artemisia annua* are now considered amongst the most effective remedies against malaria.

However, there have been many cases of consumers unknowingly using suspect or counterfeit products; choosing inappropriate therapies in self-care; as well as several reports of unintentional overdose.

Similarly, there have been reports of consumers being injured by unqualified practitioners. For example, a study performed by the National Research Institute on Complementary and Alternative Medicine in Norway reported cases of pneumothorax caused by unqualified acupuncturists. In addition, there have been reports of paralysis caused by unqualified manual therapists.

Another potential risk is that patients do not inform their doctors about their use of traditional and complementary medicines. For instance, *Ginkgo biloba* is a popularly used herbal medicine worldwide whose main function is to prevent vascular disease and to increase blood circulation. The WHO Uppsala Monitoring Centre reported some cases of excess bleeding during a surgical operation. If the patient had informed the doctor about the use of the medicine this could have been avoided.

The development of the guidelines was carried out with the financial and technical support of the Regional Government of Lombardy, in collaboration with the State University of Milan. The guidelines are based on evidence and experiences collected from 102 countries representing all WHO regions.

Related links

- [WHO Guidelines: Developing Information on Proper Use of Traditional, Complementary and Alternative Medicine \[pdf 3.1Mb\]](#)
- [Traditional medicine](#)

Como saber se um procedimento médico tem fundamentação científica?



Lifestyle, Diabetes, and Cardiovascular Risk Factors 10 Years after Bariatric Surgery

Lars Sjöström, M.D., Ph.D., Anna-Karin Lindroos, Ph.D., Markku Peltonen, Ph.D., Jarl Torgerson, M.D., Ph.D., Claude Bouchard, Ph.D., Björn Carlsson, M.D., Ph.D., Sven Dahlgren, M.D., Ph.D., Bo Larsson, M.D., Ph.D., Kristina Narbro, Ph.D., Carl David Sjöström, M.D., Ph.D., Marianne Sullivan, Ph.D., and Hans Wedel, Ph.D., for the Swedish Obese Subjects Study Scientific Group*

ABSTRACT

BACKGROUND

Weight loss is associated with short-term amelioration and prevention of metabolic and cardiovascular risk, but whether these benefits persist over time is unknown.

METHODS

The prospective, controlled Swedish Obese Subjects study involved obese subjects who underwent gastric surgery and contemporaneously matched, conventionally treated obese control subjects. We now report follow-up data for subjects (mean age, 48 years; mean body-mass index, 41) who had been enrolled for at least 2 years (4047 subjects) or 10 years (1703 subjects) before the analysis (January 1, 2004). The follow-up rate for laboratory examinations was 86.6 percent at 2 years and 74.5 percent at 10 years.

RESULTS

After 10 years, the weight had increased by 0.1 percent in the control group and had decreased by 23.4 percent in the surgery group ($P<0.001$). After 10 years, the weight had increased by 1.6 percent and decreased by 16.1 percent, respectively ($P<0.001$). Energy intake was lower and the proportion of physically active subjects higher in the surgery group than in the control group throughout the observation period. Two- and 10-year rates of recovery from diabetes, hypertriglyceridemia, low levels of high-density lipoprotein cholesterol, hypertension, and hyperuricemia were more favorable in the surgery group than in the control group, whereas recovery from hypercholesterolemia did not differ between the groups. The surgery group had lower 2- and 10-year incidence rates of diabetes, hypertriglyceridemia, and hyperuricemia than the control group; differences between the groups in the incidence of hypercholesterolemia and hypertension were undetectable.

CONCLUSIONS

As compared with conventional therapy, bariatric surgery appears to be a viable option for the treatment of severe obesity resulting in long-term weight loss, improved lifestyle, and, except for hypercholesterolemia, amelioration in risk factors that were elevated at baseline.

• Sabendo:

- Buscar
- Ler
- Interpretar
- Aplicar

Artigos Científicos

Questões mais importantes para o futuro da medicina

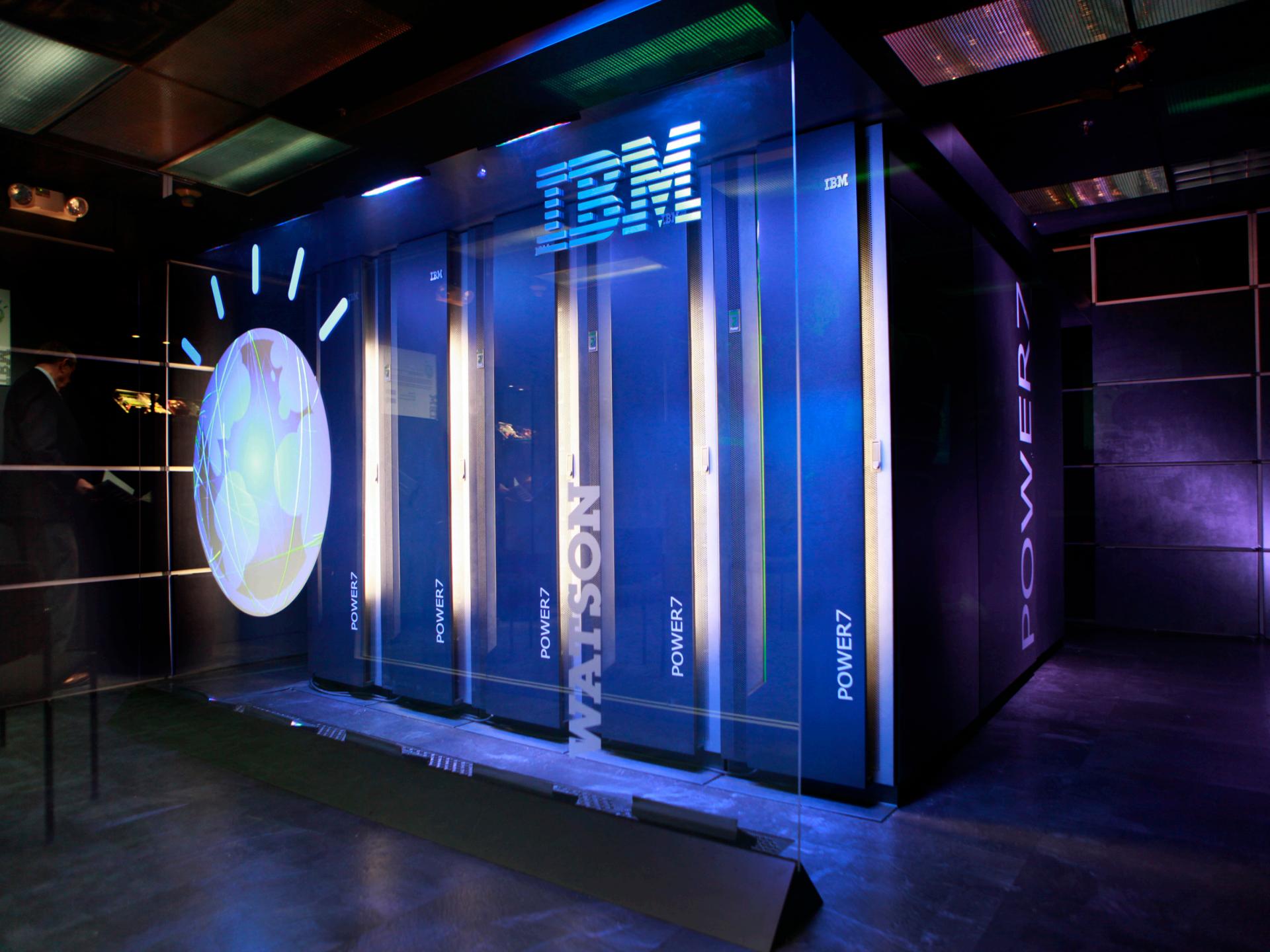
- Saúde de qualidade para todos
 - Medico para todos?
[https://www.who.int/gho/health workforce/
physicians density/en/](https://www.who.int/gho/health_workforce/physicians_density/en/)

Questões mais importantes para o futuro da medicina

- Saúde de qualidade para todos
 - Médicos para todos?
 - Densidade ideal 30:10.000
 - Custo médio da mão de obra de médicos: R\$ 12.000,00/mês
- Brasil 210 milhões de habitantes
 - 630.000 médicos
 - 90 trilhões de reais por ano

Questões mais importantes para o futuro da medicina

- Saúde de qualidade para todos
 - Medicina virtual: Algoritmos capazes de:
 - Obter dados clínicos
 - Formular hipóteses
 - Indicar exames
 - Interpretar exames
 - Fazer diagnósticos
 - Prescrever tratamentos



IBM Watson

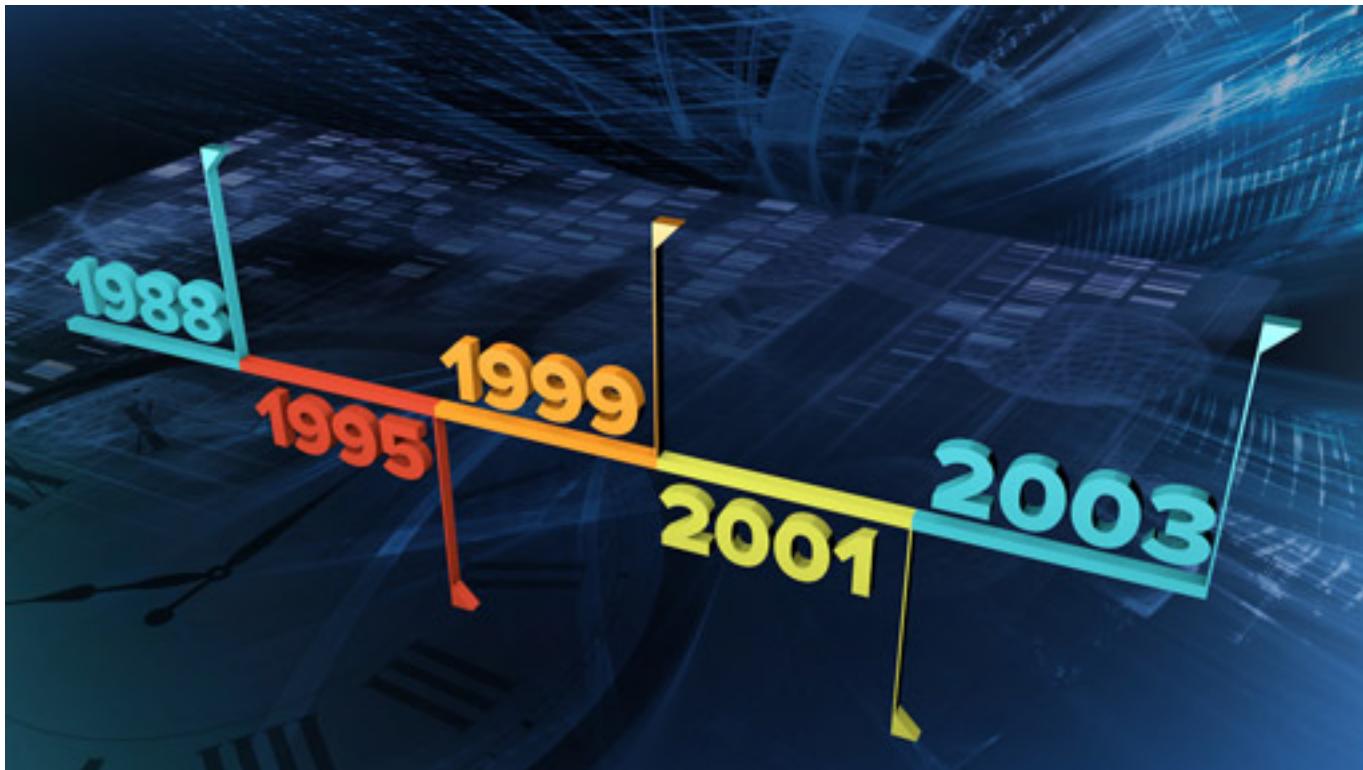
Problemas potencias com medicina virtual

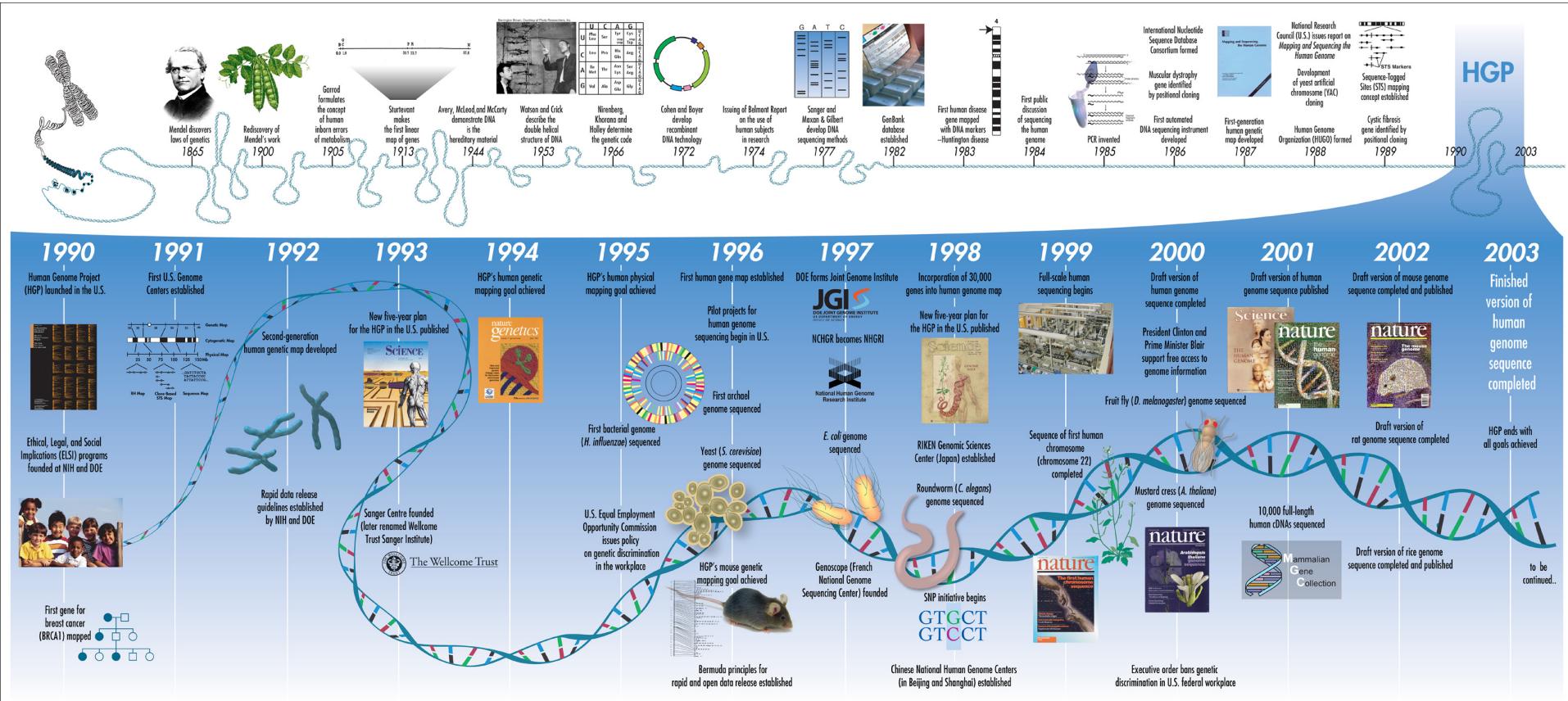
- Distúrbios do comportamento
- Contato interpessoal
- Aconselhamento
- Empatia
- CUSTO (Watson cloud – U\$ 6,000/mes)

Questões mais importantes para o futuro da medicina

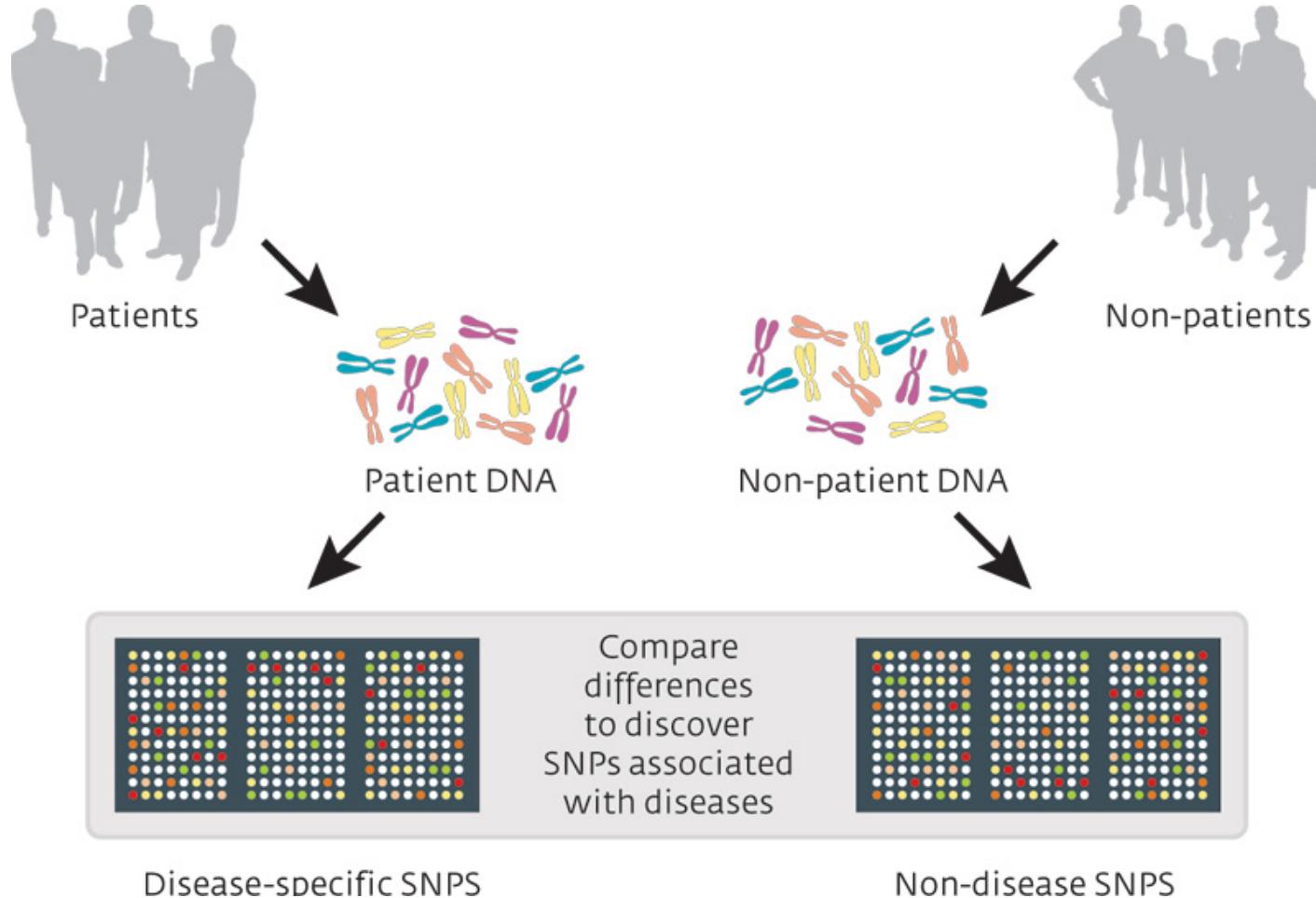
- Diagnóstico personalizado – tratamento personalizado
 - Doença: genética & ambiente

Human genome project

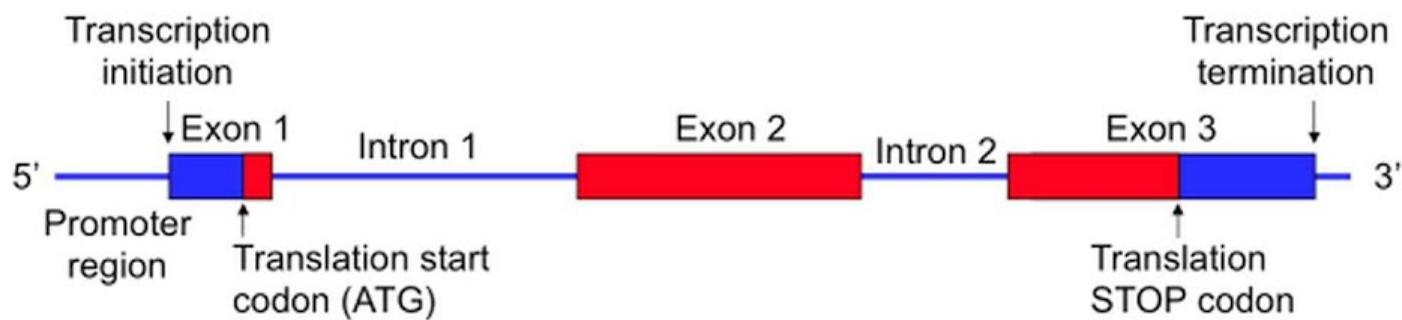




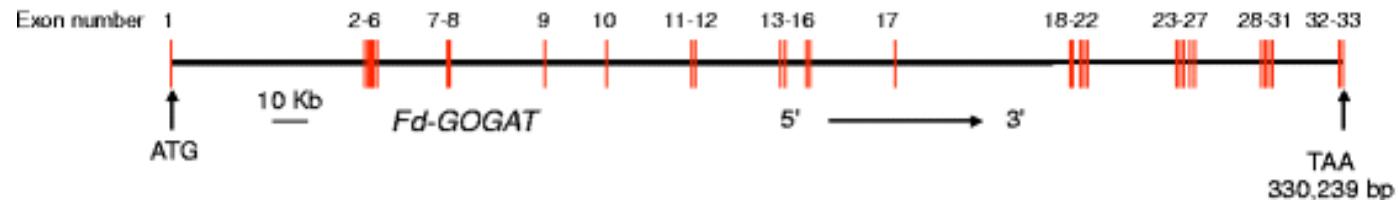
GWAS – genome wide association study



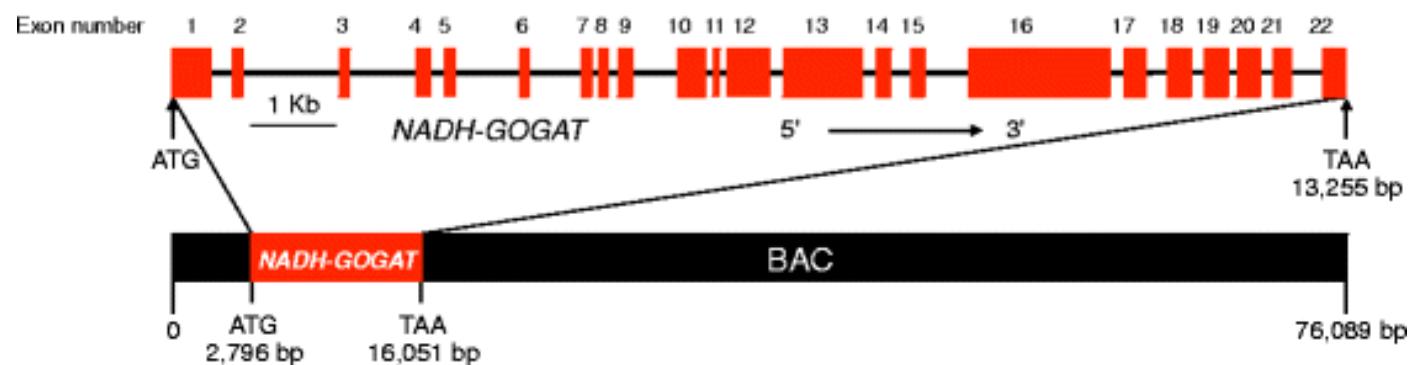
Gene Structure



a

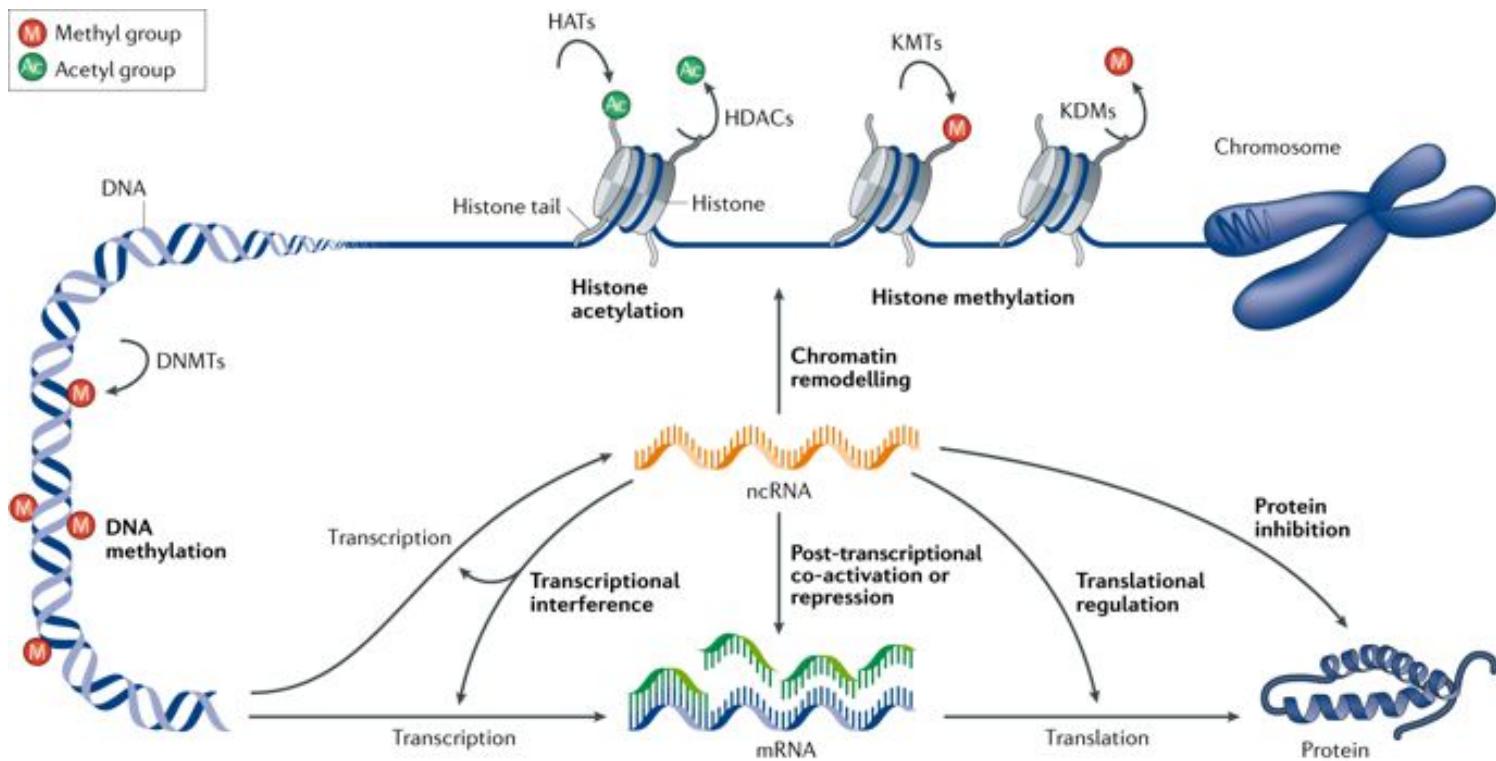


b

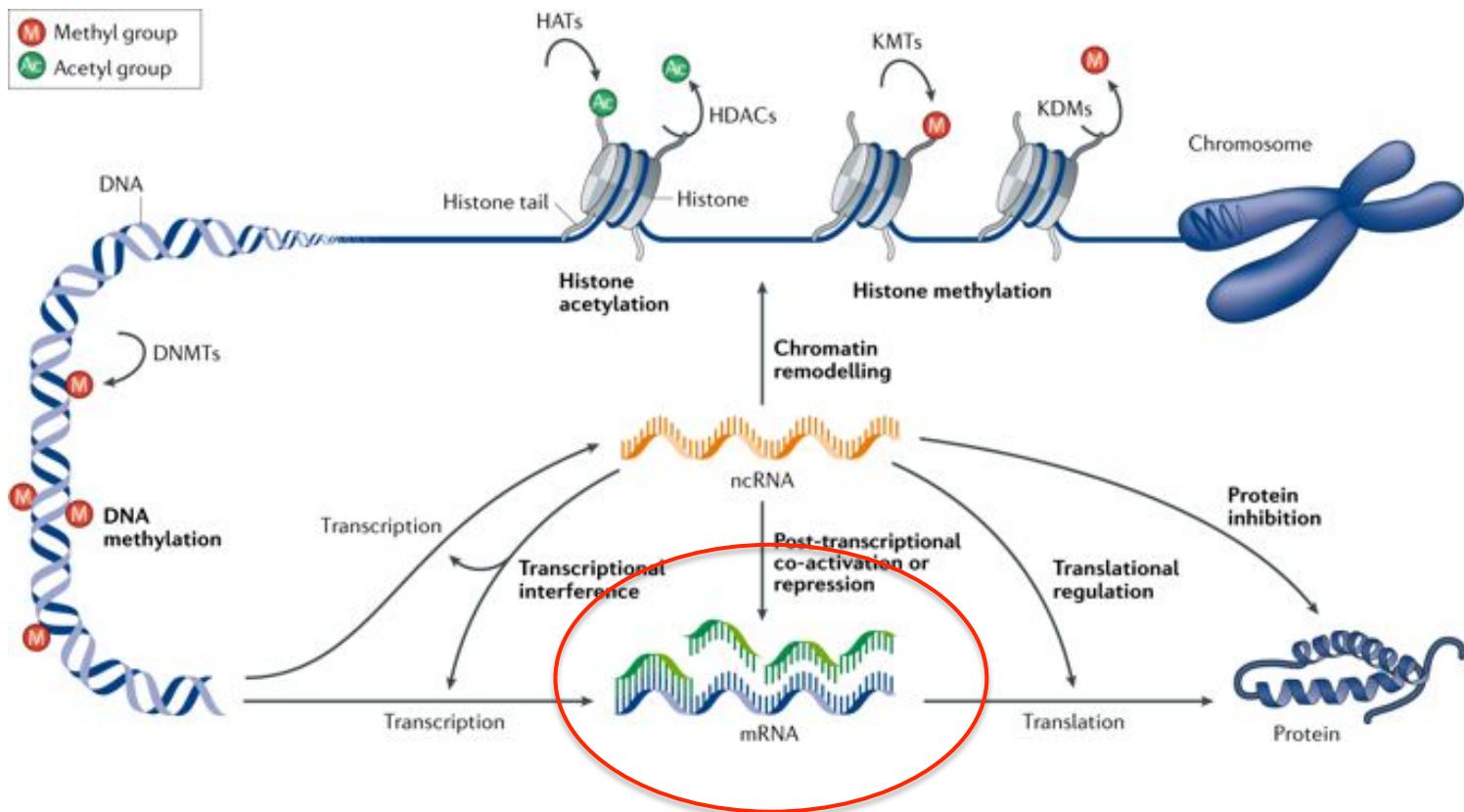


>90% sequencias intrónicas

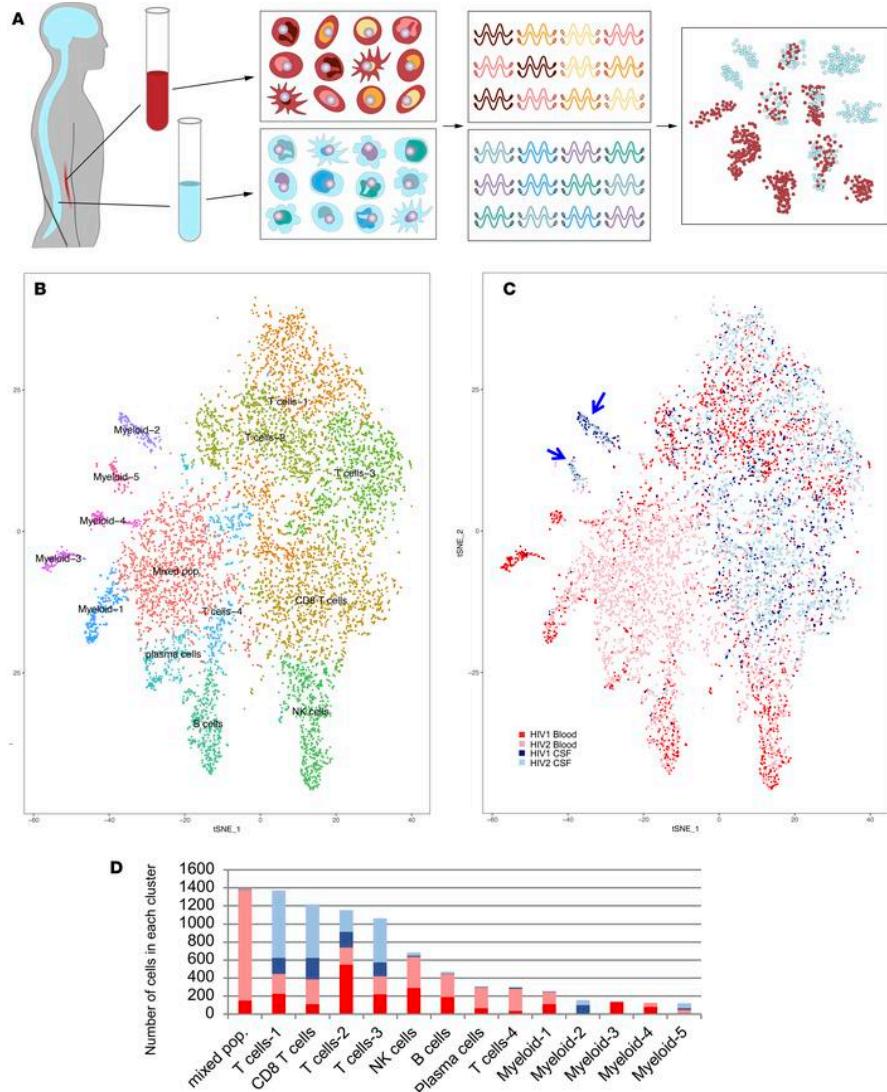
Epigenética

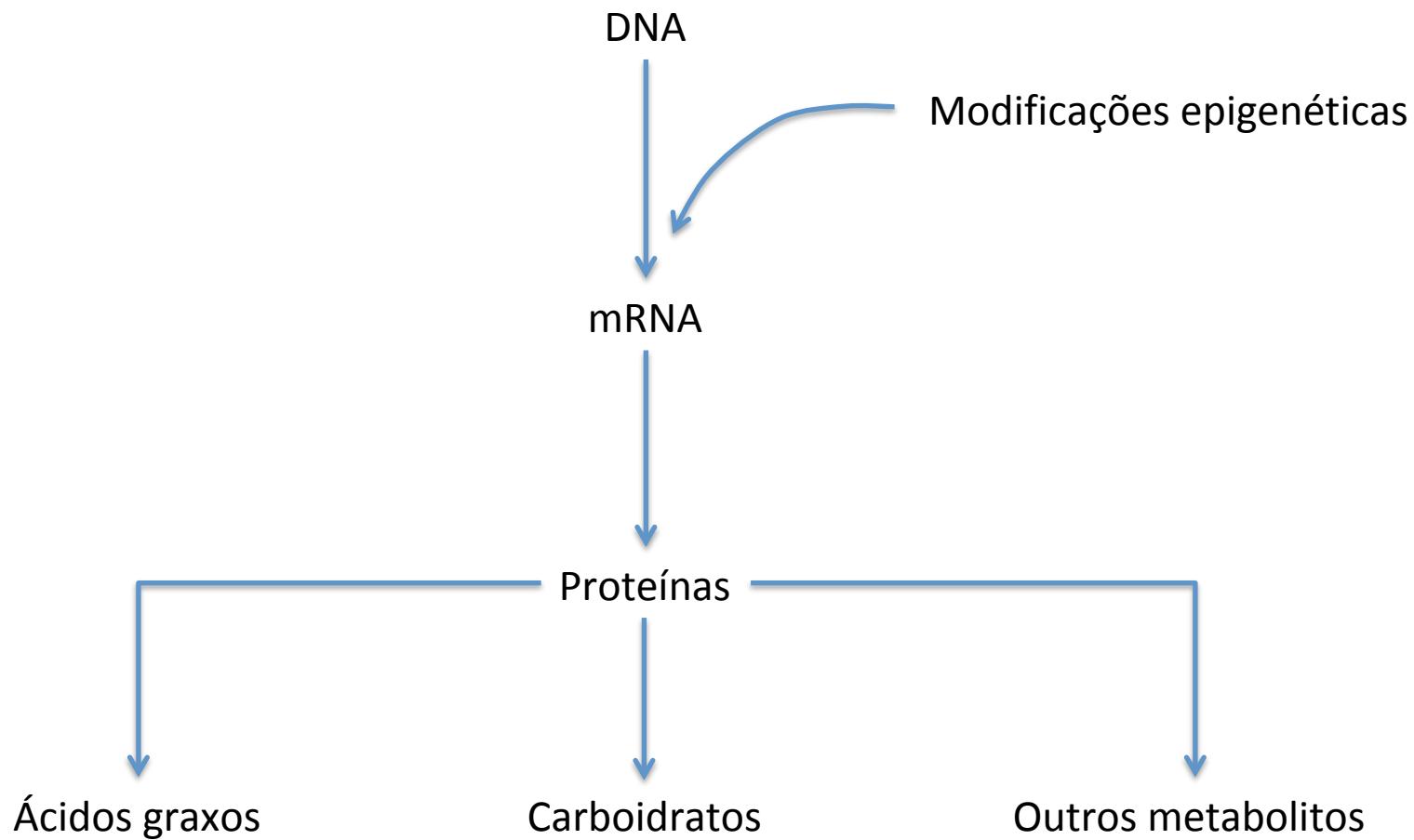


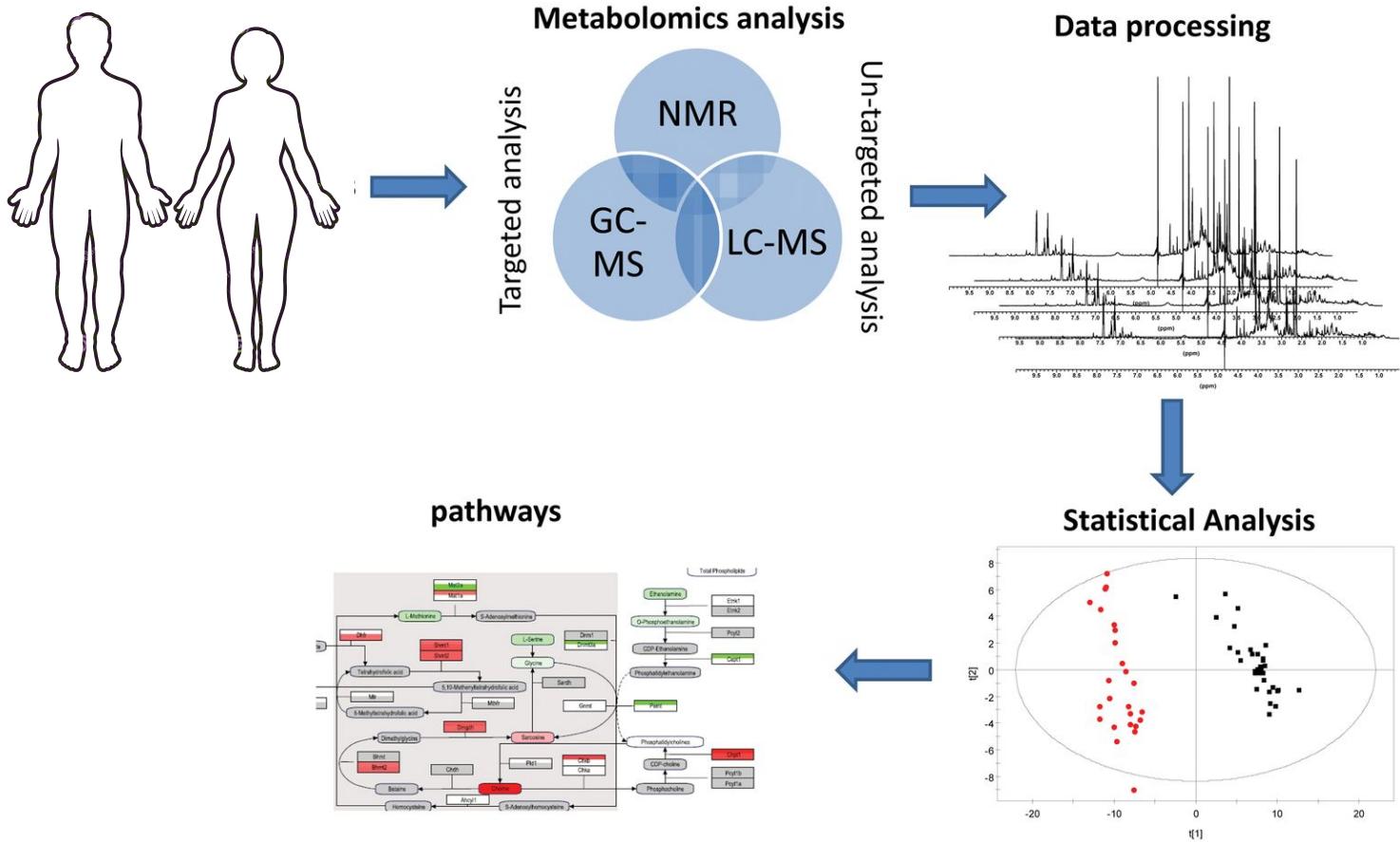
Epigenética

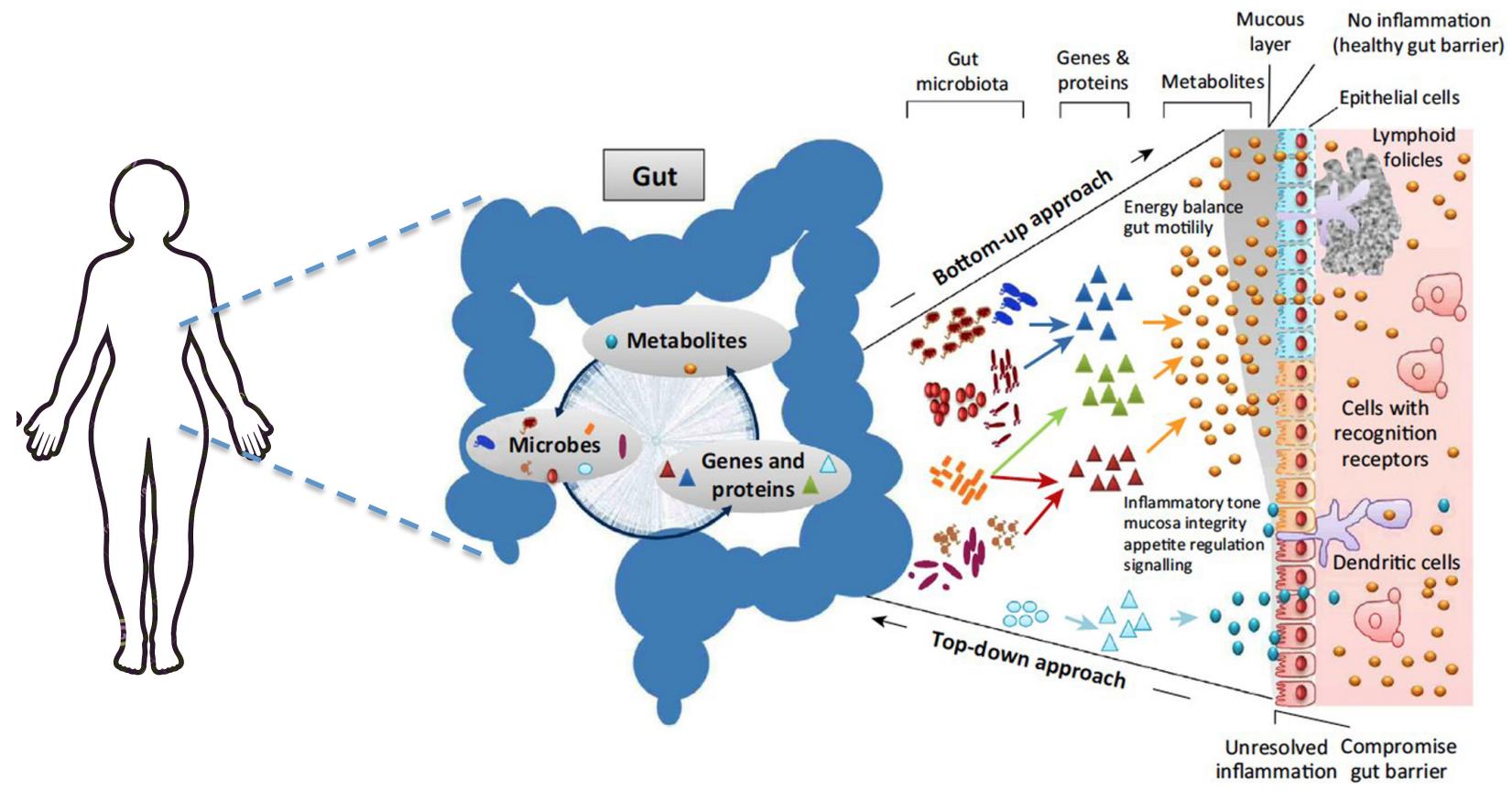


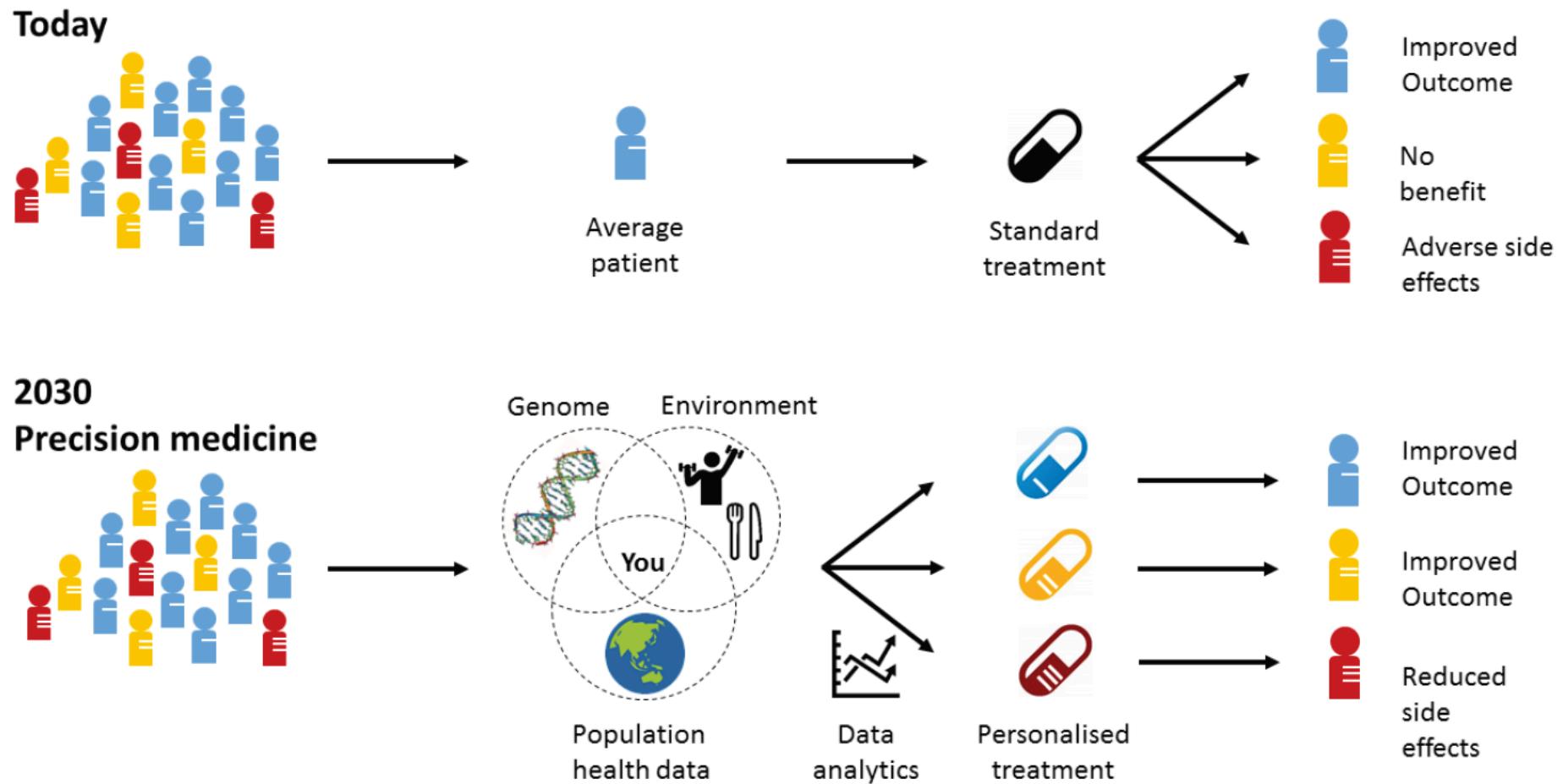
Single-cell RNA sequencing

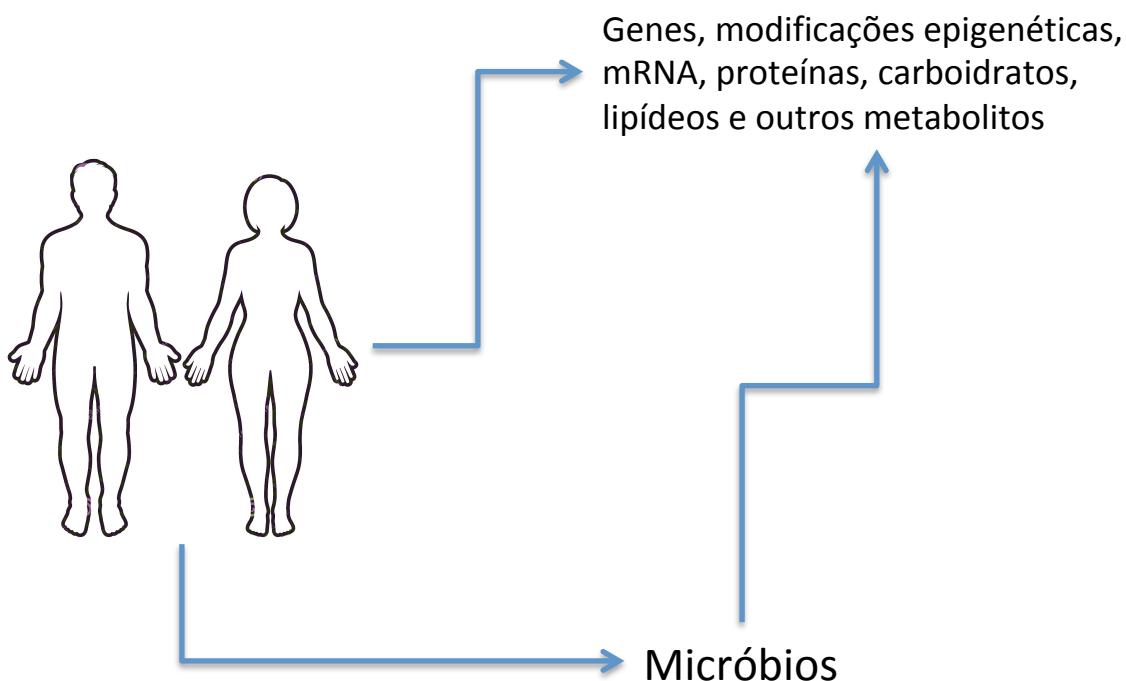


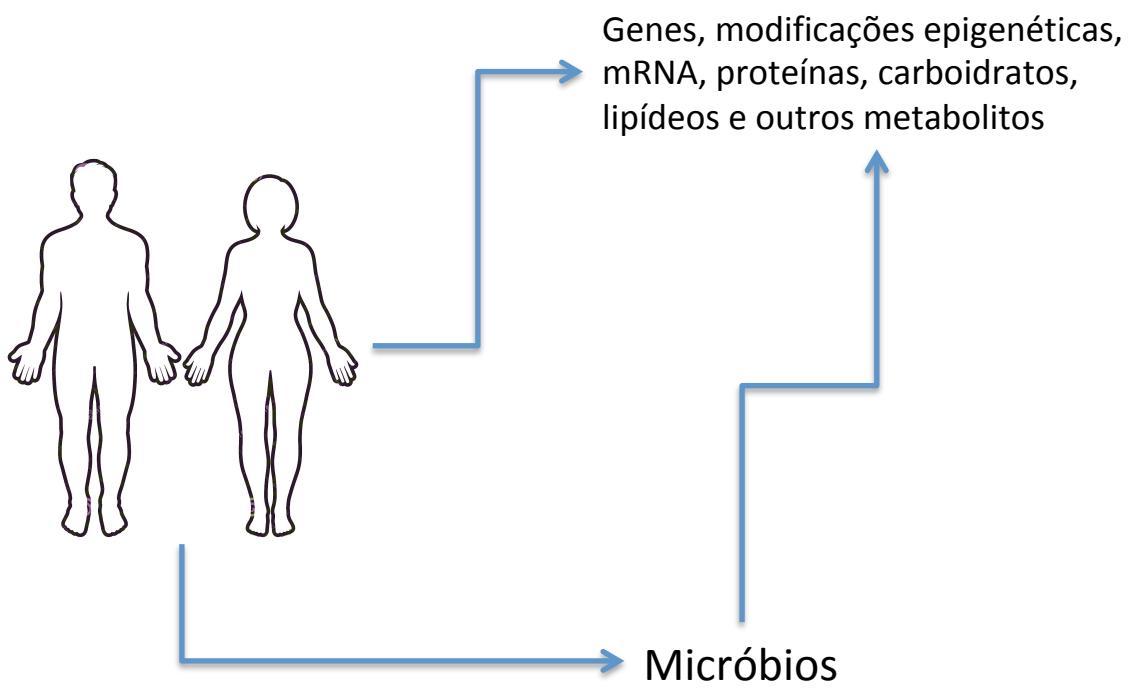




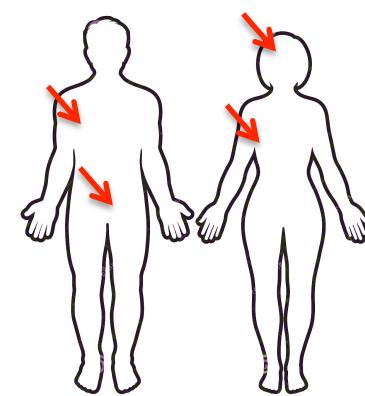








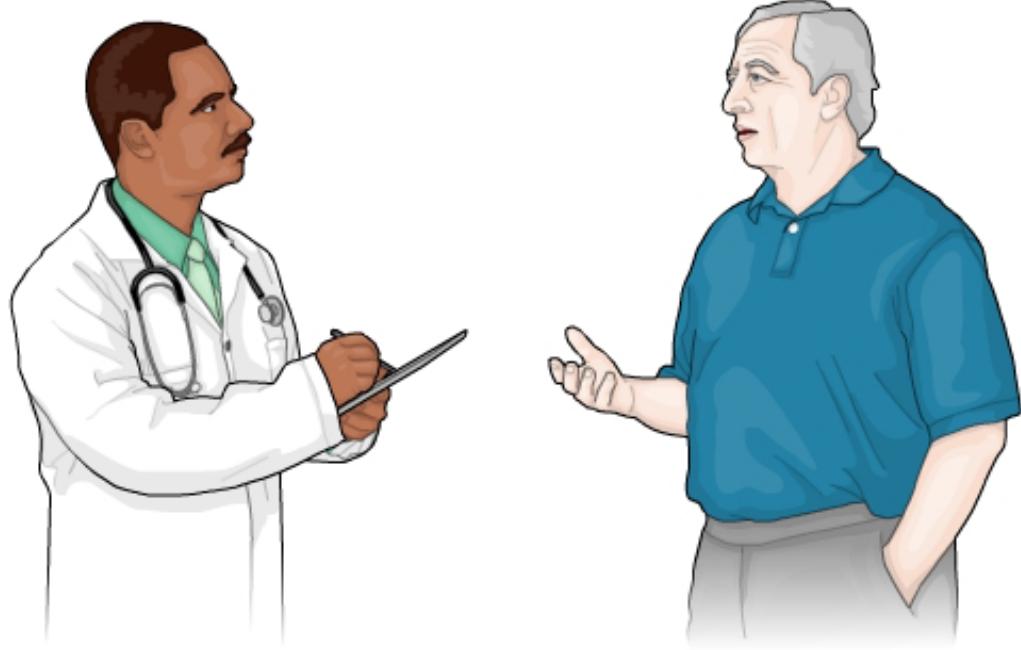
Onde está o problema?





Avancos esperados para imagem em medicina

- Melhorar definição
- Uso de biomarcadores para rastrear doença
- Associação com IA
- 3D
- Equipamentos portáteis para diagnóstico por imagem





Obrigado!