

## BOOK REVIEWS

Translated version

### IS THE FUTURE OF MEDICINE VIRTUAL?

#### THE PATIENT WILL SEE YOU NOW. The future of medicine is in your hands.

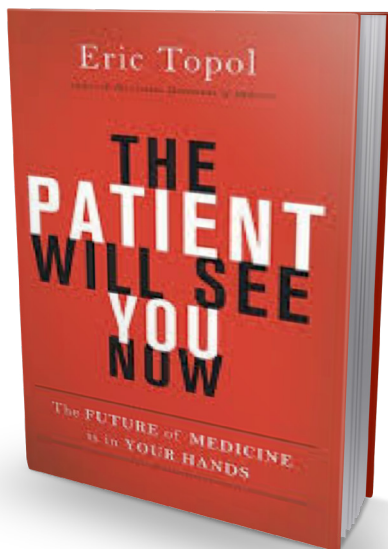
Eric Topol. New York, USA: Basic Books, 2015. 364 p.

A new phase in the doctor-patient relationship has been inaugurated, even though a good part of the academy and the market is resistant to accepting it. Recent examples that demonstrate this reality demand attention on the part of industry leaders, which justifies the review of this book. Eric Topol, a cardiologist, is considered an authority regarding the future of medicine; he presents his vision in this work divided into three sections, the first comprising four chapters, the second five, and the third six. The primary themes of the text are the democratization of access to health care and the revolution of the doctor-patient relationship through the empowerment of the patient using technology. The author analyzes the forms of healthcare in the United States and how technology can modify them.

In the first section, Topol points to the rapid spread of smartphones, which resulted in the above-mentioned empowerment or, as mentioned in the book, “the rise of smart patients.” This change in the doctor-patient relationship is considered by the author the greatest evolution since the invention of the printing press, allowing the democratization of access to information and putting at stake the paternalistic training of doctors, which, according to the author, still persists despite all the discourse to the contrary.

The author cites various applications for mobile phones that can perform several tests, providing results with great speed. He also brings creativity to the discussion, which simplifies and reduces costs related to a series of ancillary tests for diagnoses of questionable necessity. The first section ends with a narrative of the case of Angelina Jolie and her determination to use the available technical-scientific knowledge to decide, as a patient, if she wanted to undergo a surgical procedure to avoid the risk of developing breast cancer due to a genetic mutation.

In the second section, the author discusses the sequencing of the genome and its patentability, exploring the possibility of creating a system that would allow the combination of all available information about a particular human being, as if it were a geographic information system (GIS). Topol stresses that the genetic sequencing of fetuses to assess important chromosomal alterations is already underway and that this procedure will allow a better understanding of the inter-relationships between genes, impacting the prevention of diseases and providing the diagnosis for a series of conditions that remain unclassified in addition to providing treatment for others.



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The advancement of technology will allow diagnosis and interventions at molecular levels, by modifying the activity of medical knowledge and economic actors. Several tests currently performed in diagnostic centers can be made by smartphones, with daily mapping. The author presents the history of the company called Theranos, which aims to allow, through nanotechnology, a series of tests with only a drop of blood, for a substantially lower price, guaranteeing patient access to the results (note - Theranos appeared in the business media in 2015 as unable to deliver the results it promised).

Topol believes that, in the near future, nanochips will be inserted into the human body, generating a series of information to be interpreted in microseconds by our own smartphones. This would reallocate the position of the medical team from centerpiece to subsidiary components in diagnoses and treatments. The greater the amount of data generated, the greater the need for it to be interlinked, providing a general and specific overview. This would reduce the effect of the information asymmetry that exists today, working in favor of the patient who currently seeks several physicians of distinct specialties, who usually act in isolation without analyzing the whole picture, and whose diversified prescriptions can generate unwanted drug interactions.

The eighth chapter of the book is devoted exclusively to the discussion of the costs of the medical system as a whole and, especially, in the North American reality. The author compares prices, demonstrating the large variation observed between medications and tests, depending on the market, although the price of inputs is similar. Topol states that the system operates on the logic of fee for service, rather than motivating prevention. The current model leads to wastage of one-third of all resources spent on health in the country, which is equivalent to six percent of the total of its (high) gross domestic product.

The costs of various inputs, as a rule, are not known by doctors, due to confidentiality agreements signed between companies operating in the industry and hospitals, rendering the transparency desired in the 21st century unviable. In addition, faculties fail to demonstrate the importance of young residents knowing costs, blocking their access to an important criterion for the financial sustainability of health systems.

The last chapter of the second section conveys the role of virtual medicine (telehealth), which has been reducing the number of visits of patients to doctors, despite the increase

in longevity and chronic diseases. It is evident how this model can be exploited to increase access to information and reduce costs.

The third and final section of the book begins with a discussion about the sustainability of hospitals given the technology and the lack of transparency of these institutions, especially regarding medical errors and other safety problems, which impairs accountability. The first chapter of the section discusses whether, in the future, there will be hospitals that operate in the current model. The new proposal (which already exists in other countries, such as Brazil) can be the transfer of a number of services to the citizen's residence, as a paradigm of access to health care.

Further ahead, the author discusses the still fictitious possibility of creating a database with all the information of patients who suffered and/or suffer from the same condition, the treatments given, and the results achieved. This possibility would allow scientific breakthrough, outlining the best treatments for each type of disease and genetic profile of the patient, in addition to enabling new discoveries with the exchange of knowledge and data. The data would further predict when, how, and why a particular person would develop a certain disease. Among the concerns outlined in the book, one is based on the real possibility that the vast personal information of patients generated by technology could be accessed by hackers, who could use such data to achieve some profit.

Another existing tension pointed out by the author is between the democratization of access to health care and the individualization of treatments. Today these are opposed, given that democratization presupposes cost reduction, while the individualization of treatments is based on its possible increase, given the reduction in economies of scale.

The book reviewed is innovative, bringing possibilities that, if they occur, will change the roles of health professionals and patients, bringing breakthrough medicine and the best treatments to all citizens. However, the interests imposed by the economic-financial market, the prevailing paternalistic culture in medicine, the low or almost no access to the internet in many regions of the globe, the regulatory bureaucracy and the capture by its agents, besides the risks inherent in the violation of information security, can be obstacles to the implementation of the democratization of health, which may maintain, for many, the reality suggested in the field of science fiction.