

# Have we been doing it all wrong? The role of “super-especialists” doctors in COVID-19 pandemic and Medicine 4.0 era.

GUSTAVO GUERREIRO<sup>1</sup>, Valdano Manuel<sup>2</sup>, and Lucas Figueredo Cardoso<sup>1</sup>

<sup>1</sup>University of Sao Paulo Heart Institute

<sup>2</sup>Clinica Girassol

March 23, 2021

## Abstract

During the COVID-19 pandemic, many specialists doctors found themselves in a situation that they had not faced for a long time: treating patients out of their subarea of expertise. The possibilities of teaching and learning through the modalities of webinars brought to these days the urgent necessity for teamwork and interdisciplinary approach, taking advantage of different areas of expertise to the same patient. With the amount of papers published and the speed at which data are accessed, and analyzed it is impossible to be aware of new findings in all medical areas. The lesson that the COVID-19 pandemic brought to us was the urgent need for the interdisciplinary approach to treating better our patients, and not only each disease they present with. We must review our traditional approach to medical students, residents, colleagues, and patients in which we became stuck to distance and time obstacles. We must use the technology on our behalf to offer the best treatment and follow-up for patients. We live now in the Medicine 4.0 era. As Darwin a long time ago proved: we must evolve!

Have we been doing it all wrong? The role of “super-especialists” doctors in COVID-19 pandemic and Medicine 4.0 era.

Gustavo Pampolha Guerreiro MD, Valdano Manuel MD, Lucas Figueredo Cardoso MD

Department of Cardiovascular Surgery, Instituto do Coração do Hospital das Clínicas da Faculdade de Medicina da Universidade de Sao Paulo (InCor-HCFMUSP) - Sao Paulo, Brazil.

Corresponding author: Gustavo Pampolha Guerreiro - Heart Institute (Incor), Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil, Av. Dr Enéas de Carvalho Aguiar, 44 – Pinheiros, Sao Paulo - Brazil.

Email: [gustavo.guerreiro@hotmail.com](mailto:gustavo.guerreiro@hotmail.com)

Telephone: +5511998347107

Conflicts of interest: None declared

Funding: None

Word count: 1014

Keywords: COVID-19; Medicine 4.0; Pandemic.5

Since the beginning of the teaching process in modern medical schools, the evolution of medicine brought up the need for medical education to also evolve. We passed through the ages of the theaters where surgeries and lectures were performed and the teachers were the main source of knowledge until today with technology, simulation-learning, and evidenced-based medicine when information comes from multiple sources so it is important is to filter to achieve reliable conclusions.<sup>1-3</sup>

Medicine evolution also allowed us to confirm and refute hypotheses, discover new drugs and technologies, understanding better the pathophysiology, and consequently adequate treatment of many diseases. Thus the knowledge has been increased in all medical areas, and it required doctors to study more specific subjects to better understand its implications. That way, traditionally recognized areas in medicine originated subareas of knowledge capable of generating more hypothesis and developing higher quality evidence.<sup>4,5</sup>

As so, the referral of patients to specialized doctors in subareas of medicine became the gold standard of patient care. However, most of the time, one patient needs an approach from different specialized doctors, who - unfortunately - do not interchange their expertise to individualize one's treatment and therefore do not give the best care to the patients.<sup>6</sup>

Furthermore, globalization has affected medicine and health care systems to a great degree. While in the past centuries it could took almost one year for an infectious disease spread across continents - as seen in the influenza epidemic -, we have recently seen the outbreak of Coronavirus Disease 2019 (COVID-19) escalate to a pandemic within five months hitting over 212 countries.<sup>4</sup> Suddenly many specialist doctors found themselves in a situation they had not faced for a long time: having to treat patients out of their subarea of expertise. The possibilities of teaching and learning through the modality of webinars brought to these days the urgent need for teamwork and interdisciplinary approach for patient care, taking advantage of multiple areas of knowledge.<sup>7,8</sup>

The question is: have we been doing it all wrong when we have become “super-specialists”? We think not! With the exponential increase in the quantity of available information and the speed at which data can be accessed and analyzed, it is impossible to be aware of every new content in all medical areas. The lesson that COVID-19 pandemic brought to us was the urgent need for the interdisciplinary approach to treating better our patients, and not only each individual disease that they present. Even though this concept is not new, in the current era, it became difficult to find teamwork in medicine. The Heart Team (multidisciplinary approach for cardiovascular disease patients) is a great example regarding this issue. Experts have been proposing teamwork as the gold standard to establish a better strategy to treat a complex cardiovascular disease patient, however, the effective Heart Team implantation around the world remains a challenge.<sup>9,10</sup>

Telemedicine during the COVID-19 era taught us so much. We must review our traditional approach to medical students, residents, colleagues, and patients in which we became stuck to distance and time obstacles. We must use the technology on our behalf to offer the best treatment and follow-up for patients. We live now in the Medicine 4.0 era.<sup>12</sup> As Darwin a long time ago proved: we must evolve!

## References

- Gourevitch D. The history of medical teaching. *Lancet*. 1999 Dec;354 Suppl:SIV33. doi: 10.1016/s0140-6736(99)90376-8.
- Rosen KR. The history of medical simulation. *J Crit Care*. 2008 Jun;23(2):157-66. doi: 10.1016/j.jcrc.2007.12.004.
- Khan KS, Coomarasamy A. A hierarchy of effective teaching and learning to acquire competence in evidenced-based medicine. *BMC Med Educ*. 2006 Dec 15;6:59. doi: 10.1186/1472-6920-6-59.
- Boudoulas KD, Triposkiadis F, Stefanadis C, Boudoulas H. The endlessness evolution of medicine, continuous increase in life expectancy and constant role of the physician. *Hellenic J Cardiol*. 2017 Sep-Oct;58(5):322-330. doi: 10.1016/j.hjc.2017.05.001.
- Patel A. From super-specialist to generalist? The way forward. *J Midlife Health*. 2011 Jan;2(1):1-2. doi: 10.4103/0976-7800.83249.
- Misseri G, Cortegiani A, Gregoretti C. How to communicate between surgeon and intensivist? *Curr Opin Anaesthesiol*. 2020 Apr;33(2):170-176. doi: 10.1097/ACO.0000000000000808.
- Temesgen ZM, DeSimone DC, Mahmood M, Libertin CR, Varatharaj Palraj BR, Berbari EF. *Health Care*

After the COVID-19 Pandemic and the Influence of Telemedicine. *Mayo Clin Proc.* 2020 Sep;95(9S):S66-S68. doi: 10.1016/j.mayocp.2020.06.052.

Ohannessian R, Duong TA, Odone A. Global Telemedicine Implementation and Integration Within Health Systems to Fight the COVID-19 Pandemic: A Call to Action. *JMIR Public Health Surveill.* 2020 Apr 2;6(2):e18810. doi: 10.2196/18810.

Bruckel JT, Gurm HS, Seth M, Prager RL, Jensen A, Nallamotheu BK. Use of a heart team in decision-making for patients with complex coronary disease at hospitals in Michigan prior to guideline endorsement. *PLoS One.* 2014 Nov 21;9(11):e113241. doi: 10.1371/journal.pone.0113241.

Nallamotheu BK, Cohen DJ. No "i" in Heart Team: incentivizing multidisciplinary care in cardiovascular medicine. *Circ Cardiovasc Qual Outcomes.* 2012 May;5(3):410-3. doi: 10.1161/CIRCOUTCOMES.112.966101.

Chen C, Loh EW, Kuo KN, Tam KW. The Times they Are a-Changin' - Healthcare 4.0 Is Coming! *J Med Syst.* 2019 Dec 23;44(2):40. doi: 10.1007/s10916-019-1513-0.