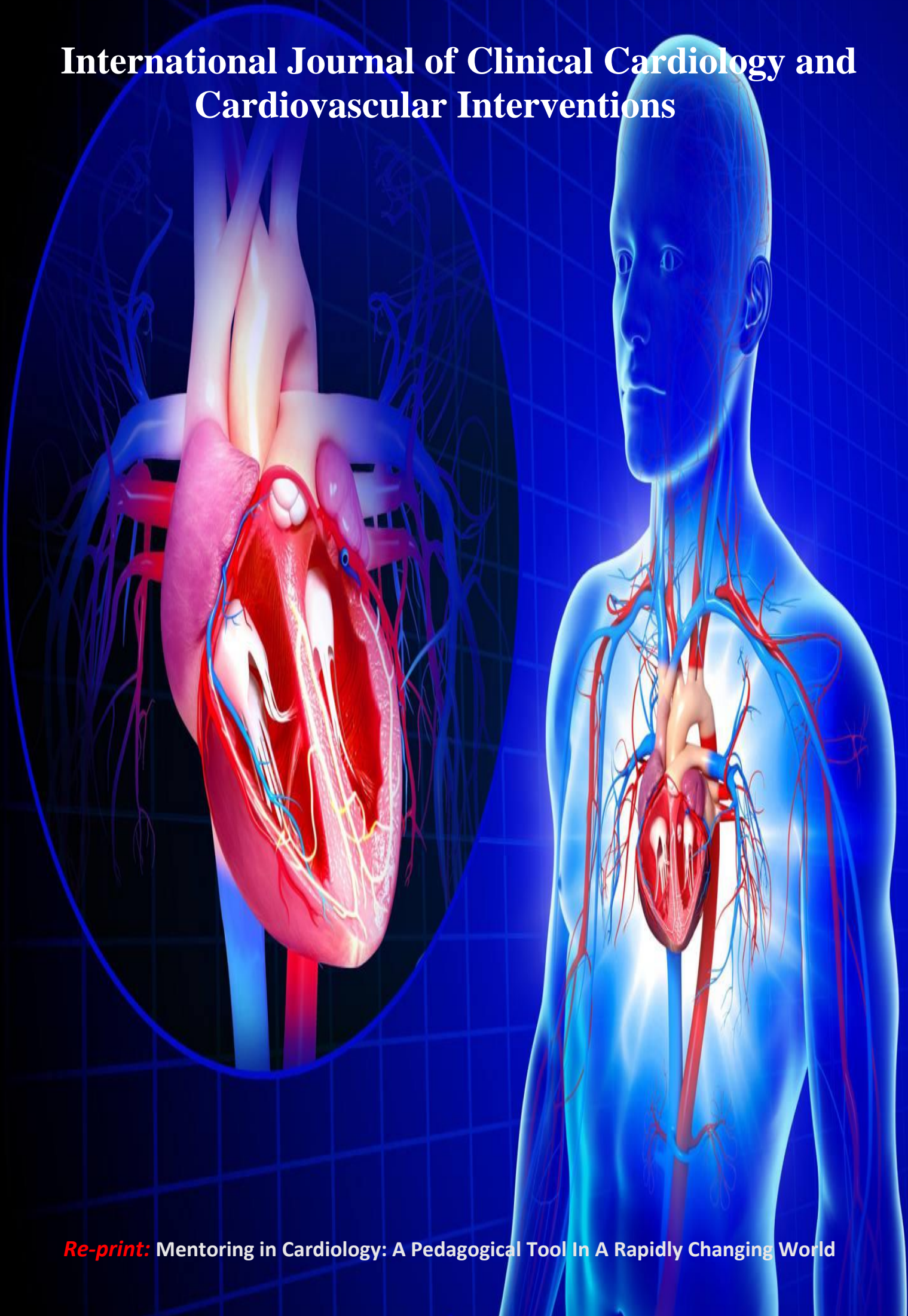


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## Re-print: Mentoring in Cardiology: A Pedagogical Tool in A Rapidly Changing World

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### Abstract

This is an article aimed at showing the mentoring role in a fast-changing society, particularly during and after the pandemic by COVID-19. The intense flow of information, feelings and new knowledge changes every day, making it necessary for medical education to be updated to keep up with social and professional dynamics, according to health requirements and new demands on subjects still not widely known. The mentoring program is a development process in which the mentor promotes the professional and personal evolution of mentoring, from the exchange of visions and experiences that allow to expand the repertoire of solutions, especially in the instability that a pandemic imposes. The mentor and mentee are challenged to exchange the traditional environment for the virtual, in order to respect the distance required and the development on digital medicine and distance learning.

**Keywords:** mentors; mentoring, tutoring; cardiology

### Article Motivation

This article was motivated by the experience with the project implemented by the Society of Cardiology of Rio de Janeiro (SOCERJ). This project, which began at the SOCERJ-2018 congress, aims to provide experienced medical professionals and teachers as mentors of medical students and young doctors. In addition, the COVID-19 pandemic was another important motivating factor for this study, since at this crucial moment for health in Brazil and worldwide, the development of leadership and the digital technologies use makes a difference in a insecurities and uncertainties scenario.

### Historical context / Historical Background

The concept of mentoring originated from the famous work "Homer's Odyssey". In the epic poem, Odysseus, Ithaca's King, entrusted Mentor with the great challenge of preparing his son, Telemachus, to replace his father in charge of his lands, when he left for the Trojan War. Mentor was responsible not only for the tutelage of Telemachus, but for guiding and contributing to better develop and prepare him so he could face future responsibilities. In 1750, the word "mentor" was incorporated into English and French dictionaries as synonymous with an advisor, advisor, friend, tutor, teacher and wise man (1).

### Some pedagogical strategies used in Brazil's Colleges

In Brazil, the mentoring process is known as "mentoria", but there are differences, being more restricted and limited to technical knowledge. Both the first process and the second (mentorina) fall within the movement of changing medical teaching. Curriculum guidelines changes are being established in order to form mentoring and, to a lesser extent, mentoring programs (2).



In order to have a more active training, some colleges in Brazil use methods that help in this process, which, even not based on the mentoring format, makes the teaching-learning process more dynamic. The Marília Medical College, which has always sought to pioneer medical learning through the active methodology of problem-based teaching (PBL), started in 1997 its program of mentoring in the medicine course. The Rio Grande do Norte Medical College implemented in 2015 a mentoring program with integrative activities between students and professors of the university. The objective is to contribute to the development of mental, professional and academic health of students (3). The University of São Paulo State has incorporated mentoring into the support and development program format, where students have the opportunity to meet monthly with experienced doctors who encourage them to evaluate the profession and support them during their undergraduate studies (4). More recently, the Instituto Israelita Albert Einstein created its medical course with a new teaching dynamic during undergraduate, team-based learning (Team Based Learning) with the aim of training leading physicians who can cope with the complexities of a constantly changing society (5).

### Importance of mentoring

Medical academics and young doctors have seen increasing challenges in terms of the number of information, concepts, professional opportunities and the speed of technology development. In this context, mentoring becomes a valuable tool for career development and preservation of physical and mental health (6). According to Agarwal et al, a good mentor makes you not only a more qualified professional, but a better human being (7).

In recent years, medical societies, in Brazil and abroad, have been creating mentoring programs in order to develop technical and personal skills to consequently have a better academic performance. Such a scenario can be observed in the contact of young students with senior professionals, who, during discussions of cases and technical medical procedures, allow students to acquire important skills for the profession. In addition to this relevant theoretical background, it has been demonstrated that mentoring has allowed an increase in career satisfaction and stimulated the presence of more professionals involved in mentoring projects (8).

The new national curriculum guidelines of the undergraduate medical course point out that among doctor skills and competences there are four pillars in which the mentoring process can have great impact. Among them there are: 1) continuing education, 2) communication, 3) management and 4) medical leadership, all present in the mentoring mentor-mentee binomial process (9).

In addition to mentoring provide the development of several pillars of curriculum guidelines, another concern of mentoring programs is the increasing number of "Burnout Syndrome" in students. This condition was recently made official by the World Health Organization (WHO) as a chronic syndrome, which will be included in the new International Classification of Diseases (ICD-11). This incorporation into the ICD-11 is due to the number of "Burnout" cases having increased among secondary physicians to technological changes in the work environment, increased bureaucracy and imbalance between personal and professional life. This context has resulted in an increase in chemical abuse,

depression and suicide rates (10).

### The mentoring

Regarding the current physicians training, it's known there is great priority in the development of technical skills to the detriment of several other formations also important for the apprentice. Among them, the knowledge of cognitive skills and postures in professional training is of great relevance. In this sense, the mentor has a role of fundamental importance in the trajectory of mentoring so that he develops skills that allow him good resourcefulness in the professional environment and psychoemotional control. (10)

#### • The mentor

There are no strict rules to finding a mentor. Often the mentor-apprentice relationship begins as a boss and subordinate or as a teacher-student connection, which evolves over time into a mentoring relationship. One reason it can be difficult to choose the ideal mentor is the dynamic nature of the mentor and apprentice relationship, which depends on both parties' personality, aptitude and attitude (7).

#### • Types of mentor

Currently, some authors believe that throughout a person's life there must be more than one mentor or the same one may present more than one characteristic, as exemplified in Chart 1. Such a situation is based on rapid changes in technology, organizational structure and global health market dynamics (7). According to Janasz et al, as more information is available, it is difficult for an individual mentor to process all the knowledge required by the mentee, making it necessary to support the mentor's network (11).

Given this scenario, we can infer that it would be of great importance that medical schools and medical societies, aiming at a more holistic development of students and professionals, analyze the possibility of offering, progressively, greater means of training for the mentoring process. Thus, in addition to aiming for a more complete development of students and professionals, it would also allow measuring the results of this tool in the development of the medical professional.

Level	Type of Mentor	Mentee's benefits
I.	Educator	Promotes the advancement of apprenticeship education, including medical knowledge, technical proficiency, and procedural and digital skills.
II.	Defiant	It encourages his mentee in order to make him contribute to the dedicated work and achieve high levels of excellence.
III.	Moderate	Establishes questions that make the mentor examine his actions in order to generate continuous learning and change of values.
IV.	Planner	It stimulates career planning and time management, considering the mentee's skills and the mentor's experience.
V.	Connector	The mentor uses his influence and his network of contacts for the mentee to participate in projects



		or enter the labour-market.
VI.	Hybrid model	Creates a model that combines the 5 profiles mentioned, throughout the development of the mentoring process.

Source: Adapted from JANASZ et al (2003)

Table 1 - The five main mentor profiles

**Mentoring in practice**

The process of acting in medicine requires results of excellence, satisfaction, quality of care and good safety practices for the patient. The increasing complexity of new doctors training, imposed by the health environment transformation, most often becomes deficient (12). Thus, in order to complement the training gaps, the mentor functions are determinant for the complete professional development (12), as shown in Chart 2.

AREAS	DUTIES	DESCRIPTION
Professional	Support	The mentor supports mentee, helping to obtain opportunities in area of operation.
	Development	The mentor creates opportunity for the mentee to demonstrate competence and improve their performance.
	Coaching	The mentor teaches mentee through sharing ideas and feedback, suggests work strategies and tactics, and guides on career aspects.
	Challenges	The mentor supports the development of specific mentoring skills by providing challenges and jobs that encourage learning, such as digital mentoring and entrepreneurship.
Personal	Role modeling	The mentor serves as an example, admiration and respect for mentee. It helps mentors to manage groups and tensions in the work environment and family.
	Acceptance and confirmation	The mentor provides support and encouragement to the mentee. It makes it possible to experiment with new behaviors.
	Counselling	The mentor listens to the mentee and supports him on personal concerns, anxieties and fears that can affect his performance.
	Friendship	The mentor enables social interaction inside and outside the organization, resulting in the exchange of information in a more informal environment and with a mutual understanding. It promotes the sharing of personal experiences.

Source: Adapted from Kram (1983; 1985).

Chart 2 – Mentor’s duties (Duty é mais atrelado à funções, deveres, tarefas)

**Reverse mentoring and intergenerational aspects**

The medical work environment goes through a process of transformation never seen before, having in the increase of life expectancy an important pillar for the changes. This transition can be observed in the work environment, where 80-90-year-old professionals share space with younger generations, which highlights challenges of coexistence, adjustments, disruption and respect to the characteristics of each time (13).

In view of the traits of each generation, technological advances have striking importance among them and founded the idea of the "Generation Theory", represented by Figure 1. This theory shows that individuals exhibit similar behaviors as a function of the period in which they were born (13).

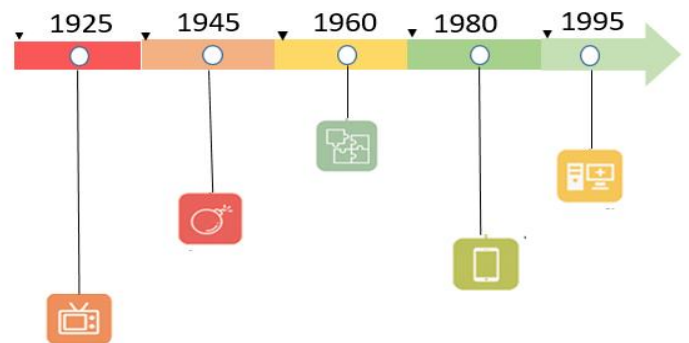


Figure 1: Each icon represents one of the described generations. In order, from left to right: Traditional, Baby Boomers, Generation X, Generation Y and Generation Z. Source: Authorial image.

**Traditionals (T):** This is the generation of individuals born between 1925 and 1945 (13).

**Baby boomers (BB):** People over 50 years old. They value a steady and stable job, taking into account the experience (13).

**Generation X:** in professional life, this generation values positions, salaries and functions. They remain long periods in the same company (13-15).

**Generation Y:** in a short time of life witnessed the greatest advances in technology and electronic communication. It does not value the hierarchy so much and believes that working together offers great results (14, 15).

**Generation Z:** in the Internet era, they are known as "digital natives" with high levels of creativity, expressiveness and individuality. Connected to mobile devices and other technological features, they are "native speakers" of digital language (16).

Given all these diversities, the intergenerational aspects must be taken into account so that the work environment becomes productive and harmonious. Thinking about it, a new concept was created called "Reverse Mentoring", in which the mentee is not the only one to learn and benefit from this relationship, since the new generations are connected, technological, creative and are open to the logic of transition that health has had over the last few years (17).

In this process, the relationships established in the mentoring



process can create a favorable environment for mentor-mentee mutual growth. For the mentor, it can be a challenging and rewarding experience, helping him to develop in areas such as information technology, offering new perspectives, ideas, feedback in professional life and, mainly, self-assessment on their technical and personal conduct in the face of the most diverse situations. Building a synergistic relationship generates an environment of respect and friendship, making the two-way flow of learning and growth for both parties (17).

### Mentoring and digital medicine aspects

Digital medicine has been increasingly incorporated with health workers. As an example, we have a training matrix built by Dr. Eric Topol, one of the most influential cardiologists in the world, with the aim of training English healthcare professionals. This training showed that mentors with digital mindset were important for the development of young leaders. Extending to a post-pandemic world by COVID-19, these skills and mindset become of fundamental relevance to patient care, since it will increasingly have an environment with electronic medical records, robotic tools, teleorienting, teleconsultation and telemonitoring (16, 18, 19).

Given this new perspective, the skills development related to digital medicine will allow the health care model incorporation different from the one known before the pandemic. With this, we will have another chapter in the history of humanity in which the outbreak of a certain disease alters the dynamics of health, functioning as a path for the humanistic development of professionals in the area (20).

### Mentoring in the cardiologist training context

The American Heart Association (AHA) and the American College of Cardiology (ACC) use the mentoring process to train physicians, researchers and cardiovascular scientists, aiming to accelerate the teaching and learning process of young professionals. ACC pioneered the development of a structured mentoring process for cardiovascular professionals and scientists. Even having edited an important publication: the "Mentoring Handbook", which is in the 3rd publication (20). This manual aims to promote the mentoring relationship between clinicians and senior researchers. Written for physicians and basic science researchers in a wide range of disciplines, this popular handbook is a practical guide to promoting successful mentoring relationships between clinicians and senior and early-career scientists. In addition, it includes updated lists of mentoring resources and funding opportunities for young researchers and sites of great relevance for updating (20).

The Brazilian Society of Cardiology (SBC) implemented from 2008-2009 an institutional program, in conjunction with the University of Duke, in order to create a partnership in clinical research (5). Collaboration between SBC and Duke University resulted in increased productivity in cardiovascular research centers (21).

SOCERJ started, since 2018, a mentoring project at its 35<sup>o</sup> congress, which is in the 3<sup>o</sup> edition. Over the years, there has been substantial growth in demand for the programme. The objective is to provide medical mentors and professors of excellence in the field of cardiology to follow for a year medical academics and young doctors to manage their careers assertively,

develop scientific initiation projects, guide on master's degree, Phd, MD-Ph programs. D and developing personal skills (21).

### ● SOCERJ 2019-2020 mentoring program Experience

The Program had a great impact on the career of some participants in this edition. Some of the mentees got into the master's degree program, managed to organize the curriculum to try residency in the United States, developed and submitted the first scientific papers and, mainly, they got feedback on the skills that needed to be developed to achieve their goals. The opportunity to have access, through mentoring, to doctors and teachers with successful careers, allows mentees to raise their requirement level to become professionals of excellence.

The mentoring meetings of SOCERJ take place according to the availability of the mentor and the demand of the project they are developing. Among the mentoring reports, one of the academics holds weekly and face-to-face meetings with his mentor to prepare his first scientific articles. Faced with the pandemic by COVID-19, the meetings began to be online, maintaining the same objective and constancy so that the projects in progress did not have their dates changed.

### A mentor's opinion in the context of new medical skills in the chronic cardiovascular diseases context

Advances in the diagnosis and treatment of cardiovascular diseases allowed a great increase in survival and quality of life for patients. In this new context, the doctor maintains a routine of follow-up of the patient that lasts for many years. Diseases such as heart failure, atherosclerotic arterial disease, atrial fibrillation, systemic arterial hypertension and cardiometabolic conditions have come to fit the profile of chronic diseases, in an increasingly elderly population with multiple comorbidities and different levels of frailty.

The training of young doctors and cardiologists of the 20th century followed a teaching model in which they should act in isolation, maintain a certain distance, deciding alone the direction of care and treatment of the patient. In recent decades, the multidisciplinary work and the formation of cardiological team within care institutions has favored the complex health system, which increasingly requires professionals to develop teamwork skills, interdependence management, leadership attributes and active clinical governance.

This new perspective will increasingly count on the support of different specialists such as family doctors, hospitalists, paliactivists, intensivists, rehabilitation professionals and multidisciplinary team. Care models and clinical management have become fundamental in the competence matrix of the cardiologist of the 21st century, as well as the mastery of new areas such as telemedicine, nanomedicine and genetics/genomics as important tools for diagnosis and treatment.

In this way, a new relationship is established based on the doctor-patient-family triad, in which there is a strengthening of the bonds of trust and shared decision-making. Thus, a space is opened for the patient to become participative in the choices of treatment and procedures to be performed, in addition to assuming their self-care. In this way, choices are aligned with your preferences, values and beliefs.

In this health dynamic, the cardiopathy becomes an active



individual in the consumption of information about his disease and no longer feels satisfied with the physician who limits himself to prescribing and guidelines. Expects empathy, welcome and a professional who knows how to adapt the therapeutic approaches and who respects its complexity as a biopsychosocial spiritual being (22).

## Conclusion

The mentoring process in cardiology begins to be developed as a tool of broad and fundamental use in the formation of human capital. Young cardiologists and seniors will face a growing challenge throughout their professional life, working in an environment of uncertainty, regulatory changes, health, epidemiological and mainly with the new format of well informed and participatory patients with regard to their care. Therefore, the multiple mentoring model and digital mindset is imperative in the training process, and should be led by educational organizations and cardiology societies.

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