

Cardiovascular Surgery Residency Program during COVID-19 pandemic:

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Abstract

In December 2019, the novel coronavirus disease 2019 (COVID-19) emerged in China and spread rapidly around the world, resulting in a pandemic declared by the World Health Organization in March 2020. The disease has affected more than 11 million people in Brazil, with more than 265.000 deaths to date, as we are now facing a second wave of infections. Regarding medical assistance and training, it turned out to be a great challenge, since - among other things - many residents were relocated to respiratory units to treat patients with COVID-19. Even though the residency programs situation has become chaotic all around the world and the activities in almost all specialties nearly stopped (especially in surgical specialties), the need to reinvent the way of teaching was the best concern. Worldwide the “webinars fever” was an impulse to try new strategies to fulfill the gaps of knowledge of these future specialists. It is crucial to call to the responsibility put on medical training institutions to prepare these new professionals according the principles of evidence-based medicine, surgical proficiency and patient safety.

Cardiovascular Surgery Residency Program during COVID-19 pandemic: learning opportunities during a crisis

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The development of the residency training system for medical specialization is credited to Dr. William Halsted after he started the first formal surgical residency training program in 1889. He believed that surgical trainees must live in the hospital for much of their training, allowing them to be truly committed in the learning of surgical skills and medical knowledge, as they gradually received increased responsibilities in patients treatment - differently from the European model for focusing on the resident. One year later, Dr. William Osler implemented a similar program in internal medicine at Johns Hopkins Hospital.¹

In Brazil, this method was first adopted in the middle 1940's at the Hospital das Clínicas of University of São Paulo Medical School with orthopedics trainees. Just like other new practices at the beginning, it was not well accepted by the medical community at the time, who thought this was not necessary to improve academic expertise. In the late 1960's, following the first "boom" of medical schools in Brazil, the number of medical residency programs also grew exponentially. Since then, several institutions were created to improve regulation of these programs distributed across the country, as the National Association of Medical Residents (1967) and the National Committee of Medical Residency (1977). This modality of training has been established as the gold standard to accomplish the highest expertise in medical specialties, based on the principle of "training in action" under a senior doctor supervision.²

Recently an unprecedented situation has come up, which forced both residents and supervisors to assimilate several changes in the training routine. In December 2019, the novel coronavirus disease 2019 (COVID-19) emerged in China and spread rapidly around the world, resulting in a pandemic declared by the World Health Organization in March 2020. The disease has affected more than 11 million people in Brazil, with more than 265.000 deaths to date, as we are now facing a second wave of infections.^{3,4}

Regarding medical assistance and training, it turned out to be a great challenge, since - among other things - many residents were relocated to respiratory units to treat patients with COVID-19. The Central Institute of the Hospital das Clínicas of University of Sao Paulo Medical School allocated all of its 900 beds for the exclusive treatment of COVID-19, becoming the largest hospital unit of the Latin America dedicated to this disease for almost five months. During this period, specific training in ones specialty was postponed to provide urgent medical care at the pandemic.^{5,6}

Even though the residency programs situation has become chaotic all around the world and the activities in almost all specialties nearly stopped (especially in surgical specialties), the need to reinvent the way of teaching was the best concern. Along with the imperative of social distancing measures, the possibilities of "hands-on" training was not feasible. Also, with the record amount of publications popping out everyday in an attempt to elucidate COVID-19 pathophysiology and treatment, the evidence-based medicine practice became even more necessary. Worldwide the "webinars fever" was an impulse to try new strategies to fulfill the gaps of knowledge of these future specialists.^{7,8,9}

In this scenario, the Cardiovascular Surgery Department of Heart Institute (University of São Paulo Medical School) developed three modalities to maintain active the residency program:

1. Cardiology and Cardiovascular Surgery Themes

Theoretical training was already well established in the program, however the institution's platform of online learning was still incipient. O'Doherty et al¹⁰ point out that cultural resistances as well as lack of technical and computer skills amongst staff may be a barrier to student engagement with technology-based education, in addition to the extra pressure on the overworked faculty that have to find sufficient time to manage teaching. Since the major skills involved in the digital literacy abilities were already widespread amongst staff and trainees, this adaptation happened quickly, facilitated by collaborative softwares and video conferencing tools that became popular during the pandemic. In our experience, it was found that this new condition has also encouraged the newcomers to question and study even more due to a more informal environment, which has stimulated them to be more participative and diminished the gaps among the residents of different years. The program content was structured from the basics of potential surgical patients diagnostic investigation

to the surgical treatment and its implications. Seniors cardiologists and cardiovascular surgeons performed the lectures based on scientific facts and living experiences.

2. Journal Club

The urgent necessity to better evaluate and judge new evidences in medicine brought the urgent need to improve the ability of critical reading and writing scientific papers. With that in mind, it was started the Journal Club, a versatile tool widely used in medical education.¹¹ The discussion was based on one article related to the specialty, previously read by all other residents, and presented by the junior residents, as if they were presenting in a scientific meeting, respecting specified time and rules of an academic discussion. After the presentation, the other colleagues critically evaluate the article in order to improve judgment on the most read publications and trending new topics in cardiology and cardiovascular surgery.

Many authors have already defined some features that are essential for a journal club, including the participation of all members in the presentation of papers at one time or another, having a engaged rather than passive audience and practices that reduce formalities for a more casual environment.¹² These keys points were gradually implemented in an effort to develop a consistent layout. Furthermore, changes that were already underway before the pandemic - towards the transition to an online interaction - were incorporated and contributed to flexibilize the scheduling of events and allowed more assiduous joining of participants from different locations at a video conferencing platform.

3. “Boot Camp”

Since “hands-on” activities were suspended because of social distancing and based on foreign countries experience with “theory behind the practice” training, we developed an “Online Surgical Boot Camp”. Surgical Boot Camps are a common practice in residency programs \soutall around the world, in which the trainees have its first contact with the procedures they will learn and later perform in the routine practice.^{13,14} As might be expected, it was not possible to actually perform the procedures, but it made the junior residents to at least see for the first time the day-by-day procedures they will be in touch during their career.

From the moment that traditional activities for training basic skills were temporarily suspended, such as the use of cadavers in practical classes, concerns are amplified that less time spent learning procedural skills can lead to a decrease in learner competence. Clearly, this experience is not the ideal model for a surgical residence program, whereas surgeons must practice the procedures to improve their surgical skills. Still, this could be a valuable educational strategy to prepare trainees’ transition to next stage of their training program.

This experience is easily reproducible in other centers and it meant to show that we must watch more closely the formation of young surgeons, especially in times of crisis, like the one we are living during the COVID-19 pandemic. It is crucial to call to the responsibility put on medical training institutions to prepare these new professionals according the principles of evidence-based medicine, surgical proficiency and patient safety.

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