

## Physical Activity, Exercise and Sports and Covid-19: What Really Matters

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The ability to move is essential for an independent life. It is widely recognized that those who spend the most time either lying down or sitting and are physically inactive tend to have limited autonomy, poor health-related quality of life, and adverse prognosis of outcomes.<sup>1</sup>

This editorial will briefly discuss the relationship between COVID-19 and physical movement. To better address this important relationship and for sake of clarity, some concepts should be defined first. In sport and exercise sciences, “physical activity” is defined as any bodily movement produced by skeletal muscles that results in energy expenditure, “exercise” is a subset of physical activity that is planned, structured, and repetitive<sup>2</sup> and “sport” is an activity that most often, but not always, involves exercise and predetermined rules and participation in games or races or competitions.

In this context, Araújo & Scharhag<sup>3</sup> proposed four criteria for defining an individual as “an active athlete”: 1) to be training in sports to improve performance/results, 2) to be actively participating in sports competitions, 3) to be formally registered in a local, regional or national sports federation and 4) to have sport training and competition as his/her way of living or focus of interest, devoting several hours in all or most of the days to these activities, exceeding the time allocated to other professional or leisure activities. As a simple example, in a road marathon race, the few runners placed in the very first rows at starting line are the actual athletes, whereas the hundreds or thousands of runners behind these athletes may better be called exercisers. Of note,

competitive sports are primarily related to entertainment and business rather than to health.

On the other hand, an important term in sports science is “physical fitness” that can be defined as the ability to perform different forms of physical activities as expected for an individual’s age group, sex and physical dimensions, that favor health maintenance, survival and functionality.<sup>4</sup> Physical fitness can be divided into aerobic and non-aerobic components (strength/power muscle strength, flexibility, balance and body composition).<sup>4</sup> It is worthy to mention that although regular exercises and cardiorespiratory or aerobic physical fitness are well related, in terms of outcomes such as cardiovascular and all-cause mortalities, aerobic and non-aerobic physical fitness are much more influential than the amount or pattern of regular physical activity and/or exercise.<sup>5,6</sup> Having these preliminary concepts and thoughts in mind, it is time to address how physical activity, exercise and sports have been impacted by the COVID-19 pandemic.

Starting from the beginning of 2020, COVID-19 has had a tremendous impact on the life of most individuals in the world. The number of infected cases and deaths has continuously increased in almost all countries, which will sadly continue until a combination of sanitary measures and wide vaccination and immunization coverage rates are achieved. Of course, in this prolonged and dramatic public health crisis, the “stay at home” and “keep physical distancing” messages have been widely advocated, and the opportunities to outdoor physical activities, exercises and sports have been substantially diminished or even completely abolished. Consequently, a physical inactivity pandemic has been generated, with potential adverse effects to physical and mental health, as well as to physical fitness on large scale. To minimize the undesirable effects of the restrictions to all forms of outdoor movement, the WHO and other institutional documents and papers have been published,<sup>7,8</sup> providing and encouraging various alternatives of “at home” exercises. This has become

### Keywords

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particularly important for chronic diseases patients, the elderly, and for debilitated patients for whom there are also interesting proposals based on mobile technology.<sup>9,10</sup>

Despite these recommendations, for different reasons, many individuals have been exercising or practicing sports in the gyms, pools, courts, tracks, fields, clinics or hospitals, or simply outdoors. To minimize the risks for COVID-19 infection and transmission, these individuals should follow strict and proper medical advice, including the following recommendations: 1) to stay two meters away from other people; 2) to limit face-to-face contact with other people who are not from the same household, even if asymptomatic for COVID-19; 3) to wear a properly fitted mask, if viable, all the time, even considering that it might impair ventilation and, perhaps, physical performance;<sup>11</sup> it is also a clear sign to the others that you are being respectful and careful regarding COVID-19 (even if you had already been infected or vaccinated); 4) to wear sunglasses whenever possible; 5) if meeting other exercise or sports partners, to avoid touching others' cell phones, shaking hands, kissing and hugging, and sharing sports gadgets/bottles/clothes; 6) when returning home, to strictly follow recommendations for sanitation of hands, face, clothes and materials; 6) to keep in mind that, the COVID-19 pandemic is not likely the right time to achieve an individual's best mark or a personal record in exercise or sports; 7) in case of any abnormal signs of symptoms, related or not to COVID-19, avoid exercising or sports practice and seriously consider seeking medical advice.

Last but not least, it is worth to comment on the issue on returning to physical activity after being diagnosed with COVID-19. There are several documents and opinion papers on this issue, ranging from very liberal<sup>12</sup> to very conservative recommendations.<sup>13</sup> In a real-world perspective, fortunately, most individuals (especially the younger ones) infected by COVID-19 will have a relatively benign and short-living disease. Nevertheless, and very sadly, a relatively small percentage of COVID-19 infected people will have severe complications that may

lead to long-term sequelae or death. However, it should be clearly stated that even this small percentage meant almost two million of deaths in the beginning of 2021.

There are some potential late cardiac complications of COVID-19 that should be considered in returning to exercise after COVID-19, including myocarditis, due to the risk of malignant arrhythmias and sudden death. Notwithstanding, two recent elegant studies showed that myocarditis is, indeed, a rare finding in the course of COVID-19. Halushka et al.<sup>14</sup> identified only four cases in 277 autopsies performed in COVID-19 patients and Linschoten et al.<sup>15</sup> analyzed data from 3,111 patients from the CAPACITY-COVID registry and found only three cases or 0.1%. So, it does not seem reasonable to recommend mandatory medical consultation, resting 12-lead electrocardiogram or other complementary tests for all the millions of men and women of all ages that had uncomplicated forms of COVID-19 before returning to physical activity and/or exercise, as it was proposed in a recent institutional document.<sup>13</sup>

Taking in account the public health perspective, two important, and somewhat antagonist variables should be balanced: 1) the importance of achieving and maintaining good physical fitness, most likely by regular exercising, and 2) minimizing the chances of COVID-19 late complications when returning to physical activity, exercise and/or sports. Table 1 presents some practical tips for return to exercise and sports after COVID-19.

In conclusion, the relationship of physical activity, exercise and sport to COVID-19 is, frankly, really simple. Until the pandemic is over, population should try to keep themselves safe and healthy and, ideally, as aerobic/non-aerobic physically fit as possible. To achieve this, the major exercise components, that is, frequency, time, intensity, and type should be tailored to individual health status and possibilities. Simple "take-home" key messages are presented in Table 2. To end, it is appropriate to wish all a good, pleasant and safe physical activity and/or exercise and/or sports.

**Table 1 – Post-Covid-19: Returning to Exercise & Sports**

Practical and important tips:

Return to exercise after a couple of weeks free of symptoms;

- The more severe the COVID-19, the slower and later the return to the usual volume / intensity of exercise and/or sports;
  - Listen and read the body response;
- To observe resting and exercising heart rate and perception of exercise intensity, for example, by using a 0 to 10 BORG scale
- Symptoms (particular attention with more intense and prolonged fatigue than usual)
  - Alert for "worsening" or new abnormal symptoms/signs
  - When in doubt, seek qualified medical advice

**Table 2 – Physical Activity, Exercise and Sport & Covid-19: Key Messages**

- Sanitary measures are essential to control COVID-19 infection and transmission, and should be followed by all exercisers and athletes, even by those who had already been diagnosed with COVID-19;
- For the vast majority of cases of COVID-19, no relevant cardiac sequelae should be presumed or expected;
- For those who were asymptomatic or had mild COVID-19 symptoms, after one to two weeks without symptoms, the gradual return to the usual pattern of physical activity, exercise or sports seems to be safe and does not require medical evaluation, especially in a context of high demands on health services;
- More complex cases (more severe or prolonged) of COVID-19, and athletes competing in sport modalities with high aerobic demands could benefit from qualified medical advice;
- The concept that it is more dangerous and harmful to your health to be sedentary than to exercise or play sports regularly remains extremely valid.

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