

# COVID-19 and Review of Current Recommendations for Return to Athletic Play

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## ABSTRACT

In December 2019 a respiratory illness known as Coronavirus 2 (SARS-CoV-2, COVID-19) broke out in a region in China and rapidly spread to become a pandemic affecting all sporting events worldwide. The Summer Olympics scheduled to be held in Tokyo were postponed until 2021, and all professional leagues in the United States postponed or canceled events. As the United States has begun to open up, there remains uncertainty of when sporting events can safely be held. Many professional leagues and the National Collegiate Athletic Association have established guidelines and recommendations for their athletes to compete safely. In this article, we review the protocols that have been established to allow athletes to return to play, and we review briefly the effects COVID-19 infection may have on athletes.

## INTRODUCTION

In December 2019 a severe acute respiratory syndrome later known as Coronavirus 2 (SARS-CoV-2 or COVID-19) broke out in a region of Wuhan, Hubei Province, China.<sup>1</sup> The virus rapidly spread worldwide, and by March 2020 the World Health Organization (WHO) designated it a pandemic.<sup>2,3</sup> The global crisis affected every aspect of life, including sports. In an historic manner, major local and international sporting events were affected, including the Olympic Games in Tokyo, which were postponed until summer 2021.<sup>4</sup> In the United States, all professional, collegiate, and organized sporting events were postponed or canceled.<sup>17,18</sup> The effect on athletes has been devastating as all formal training and practices have been banned. As we begin to emerge from the effects of COVID-19, we enter a new uncertainty in the world of sports. As athletes gradually return to training and practices and eventually to games again, it will become important for trainers, team physicians and all providers to take the proper precautions and recommendations to ensure athletes may continue to participate and compete at high levels amidst the concern of virus spread. The purpose of this article is to review the current recommendations and models being developed to allow for a healthy and safe return to sport for all those involved and to briefly review COVID-19 infection in athletes.

## INITIAL COVID-19 RESPONSE

The risk of COVID-19 spread, or infectivity, appears to be very high.<sup>5</sup> Much like influenza, the coronavirus spreads from person-to-person in close contact by respiratory droplets.<sup>5,6</sup> Because of the high infectivity, significant measures were taken by countries, including suspending all immigration and travel and ordering mandatory quarantining and self-isolation.<sup>7,8</sup> As countries begin to reopen and as athletes return to training and practices, it is important to mitigate and limit the risk of spread of the virus. Each sport has its own unique risks to the spread of the virus, and this fact should be taken into account. Some sports, such as golfing and time trial cycling, can realistically socially distance throughout competition. Other sports, however, such as football and soccer, cannot practically socially distance.<sup>9</sup> A distinction should be made for those sports that are low risk and high risk for spreading the virus. Travel also increases the risk of viral spread.<sup>6,9</sup> Athletes that travel across the country have the potential to increase the spread, sometimes unknowingly, unless proper precautions are maintained. In regards to spectators or non-athletic participants, they are at risk of contracting or spreading the virus as well. One of the first documents to address the issue of risk and mitigating the risk of viral spread for mass gatherings was published by the WHO in March 2020.<sup>10</sup> In an effort to categorize the risk of mass gatherings for sporting events, the WHO added an addendum that included a tool that may be completed by organizers of events to assess accurately the overall risk of spread.<sup>15</sup> Those events with high to very high risk need to make significant efforts to mitigate the risk or consider postponing or canceling the event.<sup>9,15</sup> In the United States, professional sports and collegiate athletic organizations have developed their own safety and health protocols to limit the risk of viral spread.

## COLLEGIATE ATHLETICS

The National Collegiate Athletic Association (NCAA) recently released the third publication on “the Resocialization of Collegiate Sport” established by the NCAA COVID-19 Advisory Panel led by NCAA Chief Medical Officer Brian Hainline. The goal of the report is to provide new guidance to prevent community spread of COVID-19 in the athletics

setting.<sup>11</sup> The first publication provided guidance for phasing in sports and the second publication emphasized personal and institutional considerations to prevent spread of COVID-19.<sup>11,13,14</sup> The newest report emphasizes the point that the first two publications were written with the assumption that nationally we would see a decline in the rate of COVID-19 infection. Upon examining the data provided by the CDC, however, the 7-day moving average has continued to increase.<sup>12</sup> Despite the current trends we may be observing with COVID-19 cases, the third publication provides guidance and recommendations to help mitigate the risk of spread, including daily self-health checks, universal masking on all sidelines, and testing to be implemented for all athletic activities including pre-season, regular season and post-season.<sup>11</sup> The athletic season will certainly look different with the implementation of these recommendations, but it will help to reduce the risk of further spread of the virus among athletes.

Finally, the latest publication provided by the NCAA updates the risk assessment and risk categorization for each sport. Low contact risk sports include bowling, equestrian, golf, swimming, tennis and track and field. Medium contact risk sports include baseball, softball, cross country, and gymnastics, while high contact risk sports include basketball, football, ice hockey, lacrosse and volleyball<sup>11</sup>. Within this framework, the publication offers recommendations for testing strategies based on the risk. For instance, they recommend that for a high contact risk sport all student-athletes and “inner-bubble” personnel (coaches, medical staff, officials, other essential personnel) should be tested upon arrival to campus, every two weeks for surveillance during off-season and weekly PCR testing during in-season (pre-season, regular season, post-season).<sup>11</sup> In contrast, for low contact risk or medium contact risk sports, testing is recommended for student-athletes and inner-bubble personnel upon arrival to campus but no more than every two weeks for the off-season and in-season.<sup>11</sup> **Table 1** depicts the testing strategies recommended by the NCAA. Furthermore, the guidelines recommend that for high contact risk sports,

testing should be performed and results available within 72 hours of competition. If PCR testing cannot be performed within 72 hours the competition should be postponed or canceled.

Even with these guidelines and recommendations from the NCAA, individual conferences have developed their own ways to mitigate the risk of virus spread among their scholar athletes by planning to play a conference-only schedule<sup>19</sup> while other conferences have canceled all fall sports<sup>20,21</sup> and other conferences have delayed fall sports until the spring for possible competition at that time.<sup>28</sup> Ultimately, the decision about return to play will fall upon the individual institutions with guidance from their conferences, but with these recommendations and protocols, the NCAA has provided schools an opportunity to return to sports with ways to limit virus spread and mitigate risk. The team physician will play a vital role to ensure athletes can compete in a safe environment.

## PROFESSIONAL SPORTS

Professional sports will offer a unique look into the protocols and procedures used to help athletes return to play. In the United States, all professional leagues have provided guidelines for physicians, providers, and trainers to help limit the risk of COVID-19 spread. Some leagues have taken unique measures to protect their athletes that will be competing.

In June, the National Basketball Association (NBA) developed and released to teams a 113-page document detailing the procedures and protocols that will take place in the “bubble” in Orlando, Florida to complete the 2019-2020 season for 22 of the 30 teams. Very similar to the recommendations put forth by the NCAA and the WHO, it is expected for players to social distance as much as possible; however, the rules in Orlando are strict as people will be wearing a device that sets off an audible alarm if they are within 6 feet of other people for more than 5 seconds; players and personnel are also likely to be wearing monitors to assess body temperature and blood oxygen levels.<sup>16</sup> Testing

**Table 1.**

Scenario	High Contact Risk	Medium Contact Risk	Low Contact Risk
Arrival on Campus	All athletes and “inner bubble” personnel tested	All athletes and “inner bubble” personnel tested	All athletes and “inner bubble” personnel tested
Summer Athletic Activities (Voluntary)	Surveillance PCR testing	Surveillance PCR testing	Surveillance testing in accordance to university plan for all students
Summer Athletic Activities (Required)	Surveillance PCR testing	Surveillance PCR testing	Surveillance testing in accordance to university plan for all students
In-Season (Pre-season, Regular season, Post-season)	Weekly PCR testing	Surveillance PCR testing	Symptomatic testing
Out-of-Season Athletic Activities	Surveillance PCR testing	Surveillance PCR testing	Surveillance testing in accordance to university plan for all students

- Surveillance PCR testing = testing 25-50% athletes and inner bubble every two weeks if physical distancing, masking, and other protective features are not maintained
- Symptomatic and high contact risk individuals should have additional testing regardless of scenario or contact risk sport

will be implemented every other day through October 13th, and athletes who test positive must quarantine and likely leave the bubble.<sup>33</sup> Creating an isolated bubble will certainly lower the risk of COVID-19 spread, and as of now, the NBA appears to have the resources to provide players with all testing and monitors that they require. The approach taken by the NBA appears to be the most stringent requiring all games to be played in Orlando and all players to remain in the bubble for the duration of the season.

In similar fashion, the National Hockey League (NHL) has established guidelines to return to play with two “hub” cities to host 24 of the 31 teams: 12 from the Eastern Conference in Toronto and 12 from the Western conference in Edmonton.<sup>39</sup> League commissioner Gary Bettman and the Return to Play Committee established phases to its reopening: Phase 2 began on June 8 and allowed limited workouts at team facilities, Phase 3 began on July 13 and included training camp in the two hub cities, and Phase 4 began on August 1 for the Stanley Cup Qualifiers.<sup>38</sup> Players and personnel will undergo daily testing with results provided within 24 hours while in the hub cities; the NHL has also designated Secure Zones which include rinks, hotels, bars, restaurants, and entertainment options.<sup>40</sup> The models established by the NBA and NHL are unique and historic. Their guidelines and protocol may influence further practices from other leagues. At this time however, the other major professional leagues will allow their teams to travel, but they also have provided their own protocols and procedures to be followed to protect their athletes.

For Major League Baseball (MLB), COVID-19 interrupted spring training when commissioner Rob Manfred postponed the season on March 12 following increased concern and spread of the virus across the United States.<sup>34</sup> As he and medical personnel including Dr. Gary Green, the MLB Medical Director, began plans to return to the season, they considered establishing a bubble situation in a few cities much like the NBA and NHL, but MLB Senior Vice President and Deputy General Counsel Patrick Houlihan said that plan lacked practicality as housing for over 1,800 players and just as many staff would be difficult to obtain and players did not like the idea of the bubble for the entire 60-game season.<sup>35</sup> The NBA and NHL are both finishing a season that was well under way before the pandemic hit. With only a few months left to play, a bubble situation is feasible for these leagues while others have to handle the issue of travel and playing in multiple cities. At the time of this writing, following opening weekend, the Miami Marlins organization was found to have as many as 17 members, including 15 players, test positive for the virus.<sup>37</sup> That weekend the Marlins played in Philadelphia against the Phillies. The MLB has decided to revise the schedule and isolate the Marlins and Phillies for a period of time; other teams are continuing play.<sup>36</sup> The MLB is hit with its first major blow, and how they decide to

move forward might influence how other leagues handle an increase in COVID-19 spread among their athletes.

In the National Football League (NFL), players have begun reporting to training camps, and in preparation for their arrival, the NFLPA (Player’s Association) and league have agreed to protocols to manage and mitigate the risk of viral spread. Established by Dr. Allen Sills, the Chief Medical Officer of the NFL, and other providers, these recommendations and regulations include testing of all players before arriving to camp and testing every day for two weeks or testing until positive cases are below 5% league-wide.<sup>22</sup> Along with testing, the league recommends to continue social distancing, wearing masks, and maintaining healthy hygiene habits. With the update, Dr. Sills included a look at the adjustments made to the training facilities by teams to handle the new reality with COVID-19.<sup>23,24</sup>

In the recent Virtual AOSM 2020 Annual Meeting, President James Bradley, MD, spoke with both Dr. Sills and NFL Commissioner Roger Goodell. During the discussion, Dr. Sills made the point that the NFL’s protocols to mitigate risk of viral spread could help provide a template for other aspects of society to open including schools and businesses.<sup>44</sup> The data that they obtain will offer a glimpse into which procedures and protocols are most successful to limit community spread of the virus. All eyes will be on the NFL and other professional leagues as they begin to return to play to evaluate their successes or failures.

All professional leagues that have returned to play have done so without fans in the stands. It is unclear when we might see the return of fans at sporting events, but for now, this measure will help to reduce community spread. Dr. Anthony Fauci, the Director of the National Institute of Allergy and Infectious Diseases and lead member for the White House Coronavirus Task Force, spoke on this idea during an interview with the Wall Street Journal. As other countries are moving towards having fans return to sporting events, Dr. Fauci recommended for events in the US, “they should mandate...to have a mask on” for fans who want to enter the stadium, and they “should have a considerable degree of distancing.”<sup>45</sup> Obviously, competing without fans creates its own bubble among the players and essential personnel. This measure allows sports to continue without a direct threat to the community. However, in regards to collegiate sports, it does not appear that everyone has agreed with this practice, as some universities are considering 25% attendance at their college football games.<sup>46,47</sup> The other concern, regardless of fans in the stands, would be the tailgates and fraternity parties that will occur surrounding football games and other events.<sup>48</sup> All of these events are major risk factors for community spread in the fall. At this point, many questions still remain as to the best way to assimilate fans back into the sporting experience, both in and out of the stadium.

## YOUTH AND HIGH SCHOOL SPORTS

Specific recommendations and protocols for return to sport in youth leagues and high schools are lacking in the literature. This fact is likely due to the intrinsic nature of these sports to be regulated locally by the state, cities, and communities. In May 2020, the National Athletic Trainer's Association (NATA) released recommendations for communities that will begin returning to play with emphasis on establishing a COVID-19 response team, preparing athletes with detraining concerns to return to sport, and providing risk mitigation strategies.<sup>42</sup> These recommendations are very broad, however, and lack any comment on frequency of testing for athletes. Due to limited availability, testing among secondary school athletes will not occur at the frequency as it does at higher levels of competition. This is concerning as asymptomatic participants competing will increase the risk for community spread. Also in May 2020, the National Federation of State High School Associations (NFHS) under the Sports Medicine Advisory Committee (SMAC) provided recommendations to state associations for opening school activities and sports. They recognize that testing availability for high school sports will be limited but strongly encourage for each phase of opening that all students and coaches undergo screening including a temperature check before being allowed to participate.<sup>43</sup> They also include a categorization of risk for each sport, much like the NCAA's report on the Resocialization of Collegiate Sport. The SMAC acknowledges that local and state associations will be responsible for establishing the protocol and procedures to return to play.

In the United States, different regions have been more affected than others by COVID-19. Each community should consider the risk of spread based on their prevalence of the virus before returning to play. For event coordinators and athletic associations responsible for deciding guidelines in their communities, they should use objective criteria such as the WHO risk assessment tool for mass sports gatherings to help mitigate the risk of community spread. As stated, the NATA and SMAC have also provided guidelines which should be followed. It is understood that sports are a very important aspect of life, and we are at a time to begin returning to play, but the proper precautions must be taken to limit virus spread.

## THE NEW TRAINING ROOM WITH COVID-19

COVID-19 may change the interactions between athlete and provider, but the role of the training room to provide complete care to the athlete should not be altered. As we have seen in the NFL, strong measures have been put into effect to protect those entering training facilities.<sup>23,24</sup> The senior authors of this review are team physicians for NCAA collegiate teams in the Northeast region, and below we have included the protocols issued by our institutions and

conferences for interactions in the training room. Both the Ivy League and Atlantic-10 Conference have delayed fall sports for possible spring competition.

Education is the first step to help protect athletes and providers. All athletes should be aware of the signs and symptoms of COVID-19 infection. Many programs will begin their season with a brief review of COVID-19 and how it is spread. The sports physicians will likely be called upon to help educate the athletes.

Before any athlete or essential personnel enters the training room or training facility, a screening assessment should be performed. This evaluation should include a brief questionnaire and a temperature check. Any patient who screens positively for symptoms or who has a fever should be quarantined and tested for COVID-19. Isolating COVID-19-positive patients is the initial step to limit spread of the virus. If possible, programs should perform contact tracing as well for those that have interacted with COVID-19-positive athletes or personnel.

Inside the training room, everyone should wear masks. Appropriate personal protective equipment (PPE) should be provided. Seeing athletes at staggered times will help limit numbers and allow for appropriate social distancing. Lockers, supplies, and training beds need to be sanitized after each use. Disinfectants and sanitizers should be available. Programs need to take the initiative to develop these protocols with the recommendations provided by the NCAA and their respective conferences.

## COVID-19 IN THE ATHLETE

Finally, a review of COVID-19 and its effects on the athlete should be discussed. Although the majority of severe cases of COVID-19 appears to affect those adults greater than 60 years old with co-morbidities,<sup>25-27</sup> the sports physician should be cognizant to recognize those athletes or personnel that exhibit signs or symptoms concerning for complications related to the virus. Toresdahl et al. give a brief review on how to manage the athlete with COVID-19, including when in-home isolation can be discontinued and an emphasis on mental health support.<sup>41</sup> As athletes return to play, it is likely that an increase of cases will be seen by the sports physician and (s)he should be able to triage and manage non-severe cases.

Early research on COVID-19 revealed that angiotensin-converting enzyme 2 (ACE2) is a receptor for possible viral entry of the virus.<sup>29</sup> This association is significant, as ACE2 is found throughout the gastrointestinal system, the heart, the kidney, and type II alveolar cells in the lungs.<sup>30</sup> In regards to the athlete, physicians must be comprehensive in their evaluation for those that are infected and are looking to return to play following resolution of their infection. Specifically, athletes should have a thorough cardiovascular exam as patients with COVID-19 infection have shown increased



troponin levels above the 99th percentile, suggestive of significant myocardial damage.<sup>31</sup> The effects of having athletes return to play without proper cardiac clearance would be devastating and Baggish, et al. provided initial guidance for the cardiac evaluation of previously infected athletes.<sup>32</sup>

Though many athletes may test positive during the course of competition and even prove to be asymptomatic, it will take a multidisciplinary approach to ensure these athletes are safe enough to continue to compete at high levels. In a panel discussion led by Dr. Rick Wright at the Virtual AOSSM 2020 Annual Meeting, all participants agreed that athletes must come first.<sup>44</sup> COVID-19 has had an immeasurable effect on sports, including economic devastation, but we must remember that before returning to play we must provide a safe and healthy environment for all those competing.

## SUMMARY

COVID-19 has drastically changed the world of sports. In historic fashion, international events, including the 2020 Summer Olympic Games and all professional leagues worldwide, have been postponed or canceled. The risk of virus spread was unacceptably high for sporting events to continue until we knew more about the disease and how to limit risk of community spread. As more information has become available worldwide, society is beginning to reopen. In regards to sports, multiple guidelines and recommendations have been established with input from medical professionals involved in all professional leagues and medical directors at the CDC and WHO to help mitigate the risk of spread. For professional leagues, many people will be observing the successes or failures they may experience as their guidelines may offer the framework to allow other parts of society to reopen. The sports medicine doctor, athletic trainer, physical therapist and all providers will have very significant roles to ensure that all athletes are educated and healthy to compete when they return to play.

## References

- Zu ZY, Jiang MD, Xu PP, et al. Coronavirus Disease 2019 (COVID-19): A Perspective from China. *Radiology*. 2020;296(2):E15-E25.
- Coronavirus disease (COVID-19) outbreak. World Health Organization. March 2020. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
- Escher AR Jr. An Ounce of Prevention: Coronavirus (COVID-19) and Mass Gatherings. *Cureus*. 2020;12(3):e7345. Published 2020 Mar 20.
- Jukic I, Calleja-González J, Cos F, et al. Strategies and Solutions for Team Sports Athletes in Isolation due to COVID-19. *Sports (Basel)*. 2020;8(4):56. 24 Apr 2020.
- Hunter P. The spread of the COVID-19 coronavirus: Health agencies worldwide prepare for the seemingly inevitability of the COVID-19 coronavirus becoming endemic. *EMBO Rep*. 2020; 21(4):e50334.
- Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19) [published correction appears in *Int J Surg*. 2020 May;77:217]. *Int J Surg*. 2020;76:71-76.
- The White House. 2020. Proclamation on Suspension of Entry as Immigrants and Nonimmigrants of Persons Who Pose a Risk of Transmitting 2019 Novel Coronavirus. <https://www.whitehouse.gov/presidential-actions/proclamation-suspension-entry-immigrants-nonimmigrants-persons-pose-risk-transmitting-2019-novel-coronavirus/>
- BBC. Coronavirus: Britons on Wuhan Flights to Be Quarantined. 29 January 2020. <https://www.bbc.co.uk/news/uk-51292590>
- Carmody S, Murray A, Borodina M, Gouttebauge V, Massey A. When can professional sport recommence safely during the COVID-19 pandemic? Risk assessment and factors to consider [published online ahead of print, 2020 May 7]. *Br J Sports Med*. 2020;bjsports-2020-102539.
- McCloskey B, Zumla A, Ippolito G, et al. Mass gathering events and reducing further global spread of COVID-19: a political and public health dilemma. *Lancet* 2020;395:1096-9.
- Resocialization of Collegiate Sport: Developing Standards for Practice and Competition. Sport Science Institute NCAA.org - The Official Site of the NCAA. 23 July 2020. [www.ncaa.org/sport-science-institute/resocialization-collegiate-sport-developing-standards-practice-and-competition](http://www.ncaa.org/sport-science-institute/resocialization-collegiate-sport-developing-standards-practice-and-competition).
- Cdc.gov. 2020. CDC COVID Data Tracker. [online] Available at: <https://www.cdc.gov/covid-data-tracker/index.html#trends>. [Accessed 25 July 2020].
- Resocialization Of Collegiate Sport: Action Plan Considerations. Sport Science Institute NCAA.org - The Official Site of the NCAA. 2020. <http://www.ncaa.org/sport-science-institute/resocialization-collegiate-sport-action-plan-considerations>.
- Core Principles Of Resocialization Of Collegiate Sport. Sport Science Institute NCAA.org - The Office Site of the NCAA. 2020. <http://www.ncaa.org/sport-science-institute/coreprinciples-resocialization-collegiate-sport>.
- Guidance for the Use of the WHO Mass Gatherings Sports: Addendum Risk Assessment Tools in the Context of COVID-19. 17 Apr. 2020. World Health Organization Global. [www.who.int/publications/i/item/guidance-for-the-use-of-the-who-mass-gatherings-sportsaddendum-risk-assesment-tools-in-the-context-of-covid-19](http://www.who.int/publications/i/item/guidance-for-the-use-of-the-who-mass-gatherings-sportsaddendum-risk-assesment-tools-in-the-context-of-covid-19).
- Woike, Dan. NBA Unveils Elaborate COVID-19 Battle Plan for Season's Return. 17 June 2020. [www.latimes.com/sports/story/2020-06-17/nba-unveils-health-plan-for-combating-covid-19](http://www.latimes.com/sports/story/2020-06-17/nba-unveils-health-plan-for-combating-covid-19).
- McDonald, S. Sports Events Canceled Or Postponed By Coronavirus 2020. 3 April 2020. Newsweek. <https://www.newsweek.com/sports-events-canceled-postponed-coronavirus-2020-1496078>.
- Mather, V., 2020. Updates On Sports Canceled By Coronavirus. 13 March 2020. New York Times. <https://www.nytimes.com/2020/03/13/sports/sports-canceled-coronavirus.html>.
- Sallee, B. Big Ten To Play Conference-Only Football Schedule For 2020 Season Amid COVID-19 Pandemic. 9 July 2020. CBS Sports. <https://www.cbssports.com/college-football/news/big-ten-to-play-conference-only-football-schedule-for-2020-season-amid-covid-19-pandemic/>.
- Johnson, M. Ivy League Cancels Sports For The Fall Semester: Reports. 8 July 2020. The Hill. <https://thehill.com/homenews/news/506471-ivy-league-cancels-sports-for-the-fall-semester-reports>.
- Wagner, B. Patriot League Cancels Fall Sports Competitions; Army And Navy Exempt From Decision. 13 July 2020. Baltimore Sun. <https://www.baltimoresun.com/sports/college/ac-cs-patriot-league-fall-sports-20200713-fshyd6u2kvdvdlmxthls6fcgi-story.html>.
- Sills, Allen. COVID-19 Update: Testing Protocol & Adjusting Training Facilities. NFL. 27 July 2020.

23. Wyche, Steve. Exclusive Look at L.A. Rams' Health Protocols for 2020 Training Camp. NFL.com - Official Site of the National Football League. 27 July 2020. [www.nfl.com/news/exclusive-look-at-l-a-rams-health-protocols-for-2020-training-camp](http://www.nfl.com/news/exclusive-look-at-l-a-rams-health-protocols-for-2020-training-camp).
24. King, Peter. FMIA: Tour Of Vikings Complex Gives Insight Into NFL's New Normal In '20 - NBC Sports. ProFootballTalk, 20 July 2020. [profootballtalk.nbcsports.com/2020/07/20/minnesota-vikings-complex-tour-nfl-covid-peter-kingfmia/](http://profootballtalk.nbcsports.com/2020/07/20/minnesota-vikings-complex-tour-nfl-covid-peter-kingfmia/).
25. Harapan H, Itoh N, Yufika A, et al. Coronavirus disease 2019 (COVID-19): A literature review. *J Infect Public Health*. 2020;13(5):667-673.
26. Bai Y, Yao L, Wei T, et al. Presumed Asymptomatic Carrier Transmission of COVID-19 [published online ahead of print, 2020 Feb 21]. *JAMA*. 2020;323(14):1406-1407.
27. Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China [published online ahead of print, 2020 Feb 7]. *JAMA*. 2020;323(11):1061-1069.
28. Zagoria, Adam. Atlantic 10, America East Are Latest Leagues To Postpone Fall Sports. *Forbes*, Forbes Magazine, 17 July 2020. [www.forbes.com/sites/adamzagoria/2020/07/17/atlantic-10-america-east-are-latest-leagues-to-postpone-fall-sports/](http://www.forbes.com/sites/adamzagoria/2020/07/17/atlantic-10-america-east-are-latest-leagues-to-postpone-fall-sports/).
29. Zhou P, Yang XL, Wang XG, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579(7798):270-273.
30. Patel AB, Verma A. COVID-19 and Angiotensin-Converting Enzyme Inhibitors and Angiotensin Receptor Blockers: What Is the Evidence? [published online ahead of print, 2020 Mar 24]. *JAMA*. 2020;10.1001/jama.2020.4812.
31. Pelliccia A. Return to play after the COVID-19 pandemic: a commentary by the Editor in Chief. *J Sports Med Phys Fitness*. 2020;60(5):675-676.
32. Baggish A, Drezner JA, Kim J, Martinez M, Prutkin JM. Resurgence of sport in the wake of COVID-19: cardiac considerations in competitive athletes [published online ahead of print, 2020 Jun 19]. *Br J Sports Med*. 2020;bjsports-2020-102516.
33. Golden, Jessica. NBA Says It's Adding Coronavirus Testing Resources in Florida, Not Taking Them Away from the Community. *CNBC*. 15 July 2020. [www.cnn.com/2020/07/15/nba-adding-coronavirus-testing-resources-not-taking-them-away.html](http://www.cnn.com/2020/07/15/nba-adding-coronavirus-testing-resources-not-taking-them-away.html).
34. Feinsand, Mark. Opening Day Delayed; Spring Games Canceled. *MLB.com*. 12 Mar. 2020. [www.mlb.com/news/mlb-2020-season-delayed](http://www.mlb.com/news/mlb-2020-season-delayed).
35. Rupert, Mitch. MLB Has Taken Health, Safety Seriously. *The Express*. 22 July 2020. [www.lockhaven.com/sports/local-sports/2020/07/mlb-has-taken-health-safety-seriously/](http://www.lockhaven.com/sports/local-sports/2020/07/mlb-has-taken-health-safety-seriously/).
36. Axisa, Mike. MLB Shuts Down Marlins and Phillies, Revises Schedule for NL East, AL East Teams amid COVID-19 Outbreak. *CBSSports.com*. 28 July 2020. [www.cbssports.com/mlb/news/mlb-shuts-down-marlins-and-phillies-revises-schedule-for-nl-east-al-east-teams-amid-covid-19-outbreak/](http://www.cbssports.com/mlb/news/mlb-shuts-down-marlins-and-phillies-revises-schedule-for-nl-east-al-east-teams-amid-covid-19-outbreak/).
37. Anderson, R.J. Marlins COVID-19 Outbreak: Four Additional Players Test Positive; 17 Total Reported Cases among Team. *CBSSports.com*. 28 July 2020. [www.cbssports.com/mlb/news/marlins-covid-19-outbreak-four-additional-players-test-positive-17-total-reported-cases-among-team/](http://www.cbssports.com/mlb/news/marlins-covid-19-outbreak-four-additional-players-test-positive-17-total-reported-cases-among-team/).
38. Gulitti, Tom. NHL Plans to Return with 24 Teams Competing for Stanley Cup. *NHL.com*. 13 July 2020. [www.nhl.com/news/nhl-plans-to-return-with-24-team-stanley-cup-playoffs/c-317031010](http://www.nhl.com/news/nhl-plans-to-return-with-24-team-stanley-cup-playoffs/c-317031010).
39. Zeisberger, Mike. NHL Teams Get Ready to Reopen Rinks as Part of Phase 2. *NHL.com*. 7 June 2020. [www.nhl.com/news/nhl-prepared-ahead-of-return-to-play-phase-2/c-317107266](http://www.nhl.com/news/nhl-prepared-ahead-of-return-to-play-phase-2/c-317107266).
40. Pell, Samantha. Secure Zones, Regular Testing and Empty Arenas: NHL Details Life inside Its Hub Cities. *The Washington Post*. 25 July 2020. [www.washingtonpost.com/sports/2020/07/25/secure-zones-regular-testing-empty-arenas-nhl-details-life-inside-its-hub-cities/](http://www.washingtonpost.com/sports/2020/07/25/secure-zones-regular-testing-empty-arenas-nhl-details-life-inside-its-hub-cities/).
41. Toresdahl BG, Asif IM. Coronavirus Disease 2019 (COVID-19) Considerations for the Competitive Athlete. *Sports Health*. 2020;12(3):221-224.
42. COVID-19 Return-to-Sport Considerations for Secondary School Athletic Trainers. National Athletic Trainer's Association. May 2020.
43. Guidance for Opening Up High School Athletics and Activities. National Federation of State High School Associations. May 2020.
44. 2020 American Orthopedic Society for Sports Medicine Virtual Annual Meeting. 7-8 July 2020.
45. Cohen, Ben. We Had Sports Questions. Dr. Fauci Had Answers. *The Wall Street Journal*. 26 July 2020. [www.wsj.com/articles/we-had-sports-questions-dr-fauci-had-answers-11595772062](http://www.wsj.com/articles/we-had-sports-questions-dr-fauci-had-answers-11595772062).
46. Estes, Taylor. Texas Exploring 25 Percent Crowd Capacity for Football Games. *Horns247*. 29 July 2020. [247sports.com/college/texas/Article/Texas-Longhorns-football-explores-25-percent-50-percent-capacity-for-2020-football-games-COVID-19-149650909/](http://247sports.com/college/texas/Article/Texas-Longhorns-football-explores-25-percent-50-percent-capacity-for-2020-football-games-COVID-19-149650909/).
47. Bezjak, Lou. Potential Fan Capacity at Williams-Brice Coming into Focus, Ray Tanner Says. *The State*. 31 July 2020. [www.thestate.com/sports/college/university-of-south-carolina/usc-football/article244626517.html](http://www.thestate.com/sports/college/university-of-south-carolina/usc-football/article244626517.html).
48. Cannon, Jay. College Football Tailgates, Frat Parties Are "Major Risk Factors" for COVID-19 Spread This Fall, Experts Warn. *USA Today*. Gannett Satellite Information Network. 29 July 2020. [www.usatoday.com/story/news/education/2020/07/29/college-football-tailgates-frat-parties-may-mean-covid-super-spread/5489486002/](http://www.usatoday.com/story/news/education/2020/07/29/college-football-tailgates-frat-parties-may-mean-covid-super-spread/5489486002/).

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