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COVID-19

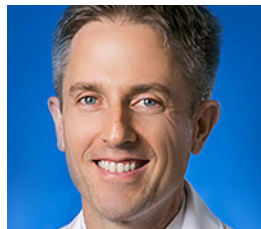


Return to
Sports
Playbook

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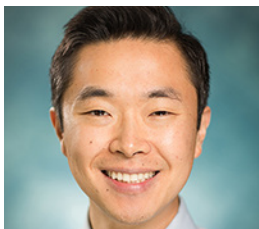
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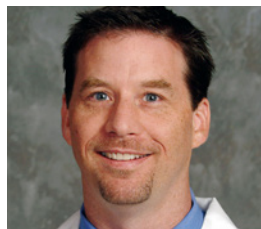
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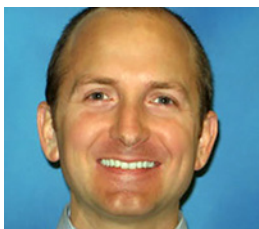
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Disclaimer

This playbook contains guidance for Kaiser Permanente regarding recommended practices in Northern California, based on information generally available as of June 25, 2020. The information and advice published or made available through this playbook is not intended to replace the services of a physician, nor does it constitute a doctor-patient relationship. Information in this playbook is provided for informational purposes only and is not a substitute for professional medical or public health advice.

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Introduction



The start of 2020 is certainly something no one will forget. Life changed quickly as the world was forced to battle a brand-new virus.¹ Everyone learned the definition of a “pandemic,” and it affected every part of life. School moved to the kitchen table, groceries were sometimes hard to find, gyms and parks closed, friends and family had to stay away, some parents lost jobs, and people everywhere felt stressed. Winter sports went from playoff races to being shut down. Spring sports barely had a chance to get started before being canceled.² Even Olympic athletes were told they would have to wait an extra year for their big moment to compete.³

Because this virus was so new at the time it was quickly spreading, even the most experienced experts were challenged to make predictions. While trying to figure out how to reopen different kinds of businesses and considering options for schools, deciding when sports could start back up became quite complicated.

Some good news is that athletes are used to preparing for the unexpected. Whether it is learning a new skill or how to change defensive strategies for a tough opponent, athletes are used to adapting. When they get behind or don’t perform as well as they know they can, they remain flexible and work to change the outcome. Athletes also know there are times when help is needed to make progress,

and this is certainly a time to remember that no one needs to go through this alone: Athletes can draw on their strengths of overcoming challenges and relying on teamwork.

This *Return to Sports Playbook* has been created to help youth, high school, and collegiate athletes during the unprecedented COVID-19 pandemic, as the world works through the safe return of sports.

It was developed by a team of The Permanente Medical Group (TPMG) sports medicine physicians who work in an integrated fashion with TPMG infectious disease and other specialists.

Evolving information about how viruses affect the immune system will influence what that might mean for individual athletes or even sports leagues. Strategies for phasing in different sports will continue to be complicated, and they will change over time because of concerns about spreading infection. To help athletes better understand some of the factors being taken into consideration, in the playbook we share the rationale for developing these strategies.^{4,5} For example, what happens in sports where athletes and coaches can maintain appropriate distancing will be different than close contact sports, and equipment involved in certain sports varies.

Strategies for phasing in different sports will continue to be complicated, and they will change over time because of concerns about spreading infection.



This playbook includes general information for athletes on preseason preparation, warm-up strategies, and recovery, as well as sections on sleep considerations for athletes and nutrition, with advice on how food can help them return “ready and healthy.” Sport-specific training tips are included for athletes having a difficult time staying engaged with their training. We also outline some exercises that may help decrease the chance of common injuries, once things are back in action.

The COVID-19 pandemic has affected people differently. Teammates and coaches may have been sick. They may have lost loved ones. Some families have been hit hard financially, some even losing jobs or businesses. Teammates might have had the stress at home of family members working in health care. People are feeling a new kind of loneliness. Many athletes have found it challenging to train when they can’t be in close contact with teammates, but they tried to make the most of it. The stress of being away from school and sports has been overwhelming for many athletes, and it has affected not only their energy or motivation to work out but also their daily lives. It is extremely important for athletes to recognize how the pandemic is affecting their mental health and well-being. Helpful information is included for recognizing mental health concerns in athletes, with an overview of coping strategies that anyone can try.

Every athlete can contribute to protecting their own health and that of their team. The Centers for Disease Control and Prevention (CDC) has repeatedly reminded us about the importance of handwashing. While handwashing is one of the best ways to prevent disease, athletes may still easily forget; sharing equipment, “high-fiving,” and other actions in sports have the potential to easily spread viruses and bacteria. This




playbook outlines simple recommendations from the CDC that go a long way toward protecting athletes.⁶ We also discuss how sports can adopt new ways of doing things to minimize future risks, while maintaining the fun and the competition.

Much has changed since the initial writing of the *Return to Sports Playbook*, and much is still not well understood about the new COVID-19 virus and how it will behave in the coming months and years. The playbook is intended to help athletes navigate what lies ahead, even if it is still changing and hard to predict. Athletes always face challenges, no matter the sport. By employing the tips and tools offered here, we hope that athletes can still find meaningful connection, achievement, and satisfaction in the unpredictable world of sports.

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Exercise and the immune system

The human immune system is remarkable! It protects our bodies from a variety of threats, including too many possible infections to count. As impressive as it is, it is easy to take our natural daily defense system for granted. The COVID-19 pandemic has sparked a renewed interest in how the human immune system works, how viruses can make people sick, and how infection defenses can be improved.

Just about everyone experiences minor viral illnesses on a regular basis throughout their life, including colds, the flu, ear infections, and coughs. The annual cold and flu season often comes and goes with little more than a passing thought beside the yearly reminder to get a flu vaccine as protection. Even when we feel terrible with a cold, we recover and get back to normal; this in turn builds confidence in the body's ability to recover. One of the immense challenges with COVID-19 is that this "novel" virus had not been studied and its impacts on human beings were poorly understood. Fortunately, scientists are working hard to learn as much as they can, as quickly as they can, to better understand how the virus works and identify strategies for optimizing public health and boosting our immune systems.

How the immune system works

Skin is the front line of defense against viruses. It acts as a protective barrier that resists entry of viruses, which won't let a respiratory virus

Skin is the front line defense against viruses. This is why frequent handwashing is so important.

like COVID-19 directly in. This is why frequent handwashing is so important, particularly before touching the face, where viruses can gain entry to the body. For viruses that make it past the skin — via the moist parts of the face such as the

eyes, nose, and mouth — a built-in ("innate") immune system is there to help. It is made up of monitoring cells that quickly react to potential invaders; these cells detect the threat and then help activate other defenses, which vary depending upon the invader (adaptive immunity). Unlike cells in the innate immune system, which is nonspecific to a target, adaptive immunity cells have selective

sensors (receptors) to defend against specific invaders that made it through the front lines. With these adaptive immunity cells present, the body can mount a selective response, and this response often provides defense against reinfection in the future. Vaccines work by prompting the adaptive immune system to develop selective cells that can ward off future infections, without requiring us to have been infected previously.¹ The immune system is complex, and there is overlap and communication between each component.

How viruses cause illness

Viruses are inactive in the environment. They hang around not doing much until they can get inside an animal or human cell and use the systems the cell has for normal operations. They can't do that on their own. COVID-19 attaches to docking



stations (receptors) on cells in the mouth, nose, and along the respiratory tract to the lungs, where it can then sneak in and hijack that cell to make copies of itself. As a result, the receptor cells are often destroyed, which along with body's response can result in the symptoms of disease.²

How exercise affects our immune systems, and how we can optimize our health through activity

Exercise has a significant impact on cells of the immune system. While nobody is exempt from the risks of contracting COVID-19, infectious disease experts suggest that “prior exercise training and high cardiovascular fitness are likely to be immune-protective in patients who contract SARS-Cov-2.”³

The body's ability to defend against infections can be enhanced through physical activity. This response follows a “J-shaped” curve. That means the effect of the exercise is different depending upon how intense it is. Moderate activity has a beneficial effect and can reduce the risk of respiratory tract illness by 30% to 40%. However, just as the “J” takes off sharply upward, prolonged intense activity (more than 90 minutes of vigorous exercise) can result in temporary immune suppression for about 72 hours.

That brief weakening of the body's defenses from intense exercise has been associated with a 2 to 6 times higher risk of developing respiratory-tract illnesses, and these risks appear to be greatest when athletes are exposed to other physical or mental stresses including nutritional deficiencies, long-haul travel, environmental stresses (very hot or very cold), sleep disturbances, and life stressors.

This J-shaped response among athletes who regularly exercise at high intensity is of particular importance in the era of COVID-19, when athletes may be experiencing additional physical and mental stress, such as nutritional deficiencies, travel, changes in environment and lifestyle conditions, and sleep disturbances.

Immune boost checklist for athletes

Athletes can adopt the following strategies to minimize the greater risk of infection from high-intensity workouts:^{4,5}

- Limit hand-to-face contact; wash hands regularly.
- Develop an individualized post-exertion recovery plan, including adequate sleep, nutrition, hydration, and psychological strategies.
- Sleep at least 7 hours per night.
- Embrace habits that promote high-quality sleep. Avoid sleep deficits.
- Consume a well-balanced diet, ensuring adequate carbohydrates (greater than 50% of daily calories), including fruits and vegetables (for immune boosting “polyphenols”).
- Avoid alcohol.
- Utilize mindfulness and stress management techniques to optimize mental health.
- Avoid unnecessary stressors.
- Minimize and avoid training in poorly ventilated or overcrowded environments, which may include many indoor fitness centers and gymnasiums.
- Closely monitor and modify training load, especially when environmental conditions such as heat, cold, and wind are at extremes.
- Avoid back-to-back intense training days. Consider more-frequent training sessions of shorter duration.
- Keep weekly changes in exercise intensity and duration to increases of 10% or less.
- Have a recovery plan that will begin immediately after the completion of more-intense training sessions.



See next chapter, “COVID-19 Recommendations for Athletes,” and the sports-specific chapters for more information on returning to sports after infection.

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Understanding COVID-19

Understanding how COVID-19 spreads¹

- The virus is thought to spread mainly from person to person:
 - › Between people who are in close contact with one another (within about 6 feet).
 - › Through respiratory droplets produced when an infected person coughs, sneezes, or talks.
 - › These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.
- COVID-19 may be spread by people who are not showing symptoms.
- The virus that causes COVID-19 is spreading easily and sustainably between people. Information from the ongoing COVID-19 pandemic suggest that this virus is spreading more efficiently than influenza but not as efficiently as measles, which is highly contagious.
- It may be possible to get COVID-19 by touching a surface or object that has the virus on it and then touching the mouth, nose, or possibly their eyes; this is not believed to be the main way the virus spreads, but more is being learned.
- Maintaining good physical distance (about 6 feet) is important in preventing the spread of COVID-19.
- Washing hands often with soap and water or using a hand sanitizer that contains at least 60% alcohol can limit the chance of inadvertently bringing the virus to the mouth, nose, and eyes.
- Spread may be limited by covering the mouth and nose when around others.

Symptoms of COVID-19²

- People with COVID-19 report a wide range of symptoms, ranging from mild symptoms to severe illness.
- Symptoms may appear 2 to 14 days after exposure to the virus.
- The following symptoms are most frequently reported by those ill with COVID-19:
 - › Fever or chills
 - › Cough
 - › Shortness of breath or difficulty breathing
 - › Fatigue
 - › Muscle or body aches
 - › Headache
 - › New loss of taste or smell
 - › Sore throat
 - › Congestion or runny nose
 - › Nausea or vomiting
 - › Diarrhea

Determining level of risk for developing severe illness:³ According to the CDC, risk factors for developing severe illness from COVID-19 include:

- People 65 years and older
- Chronic lung disease or moderate to severe asthma
- Serious heart conditions
- Severe obesity
- Diabetes, chronic kidney disease, liver disease
- HIV

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COVID-19 recommendations for athletes

Athletes in all sports must recognize the importance of staying home from practice when they are sick. Given the close quarters of practice facilities and the contact athletes have with teammates and coaches, keeping anyone ill away from others is extremely important. It will help to limit transmission of the virus not only on the team but also through their entire community.¹

Screening athletes for symptoms on a regular basis can help identify those who might need to isolate themselves. Athletes who have symptoms of a respiratory infection should contact their health care provider by phone or email; this allows them to obtain advice without going to a medical center and risking contact with other people. Most athletes can safely isolate at home until they are feeling better. Some may need to be seen or sent for further testing. Anyone experiencing the symptoms of more-severe, life-threatening illness, such as trouble breathing, should go to an emergency department.

Anyone who has been in contact with someone with COVID-19 should stay isolated at home watching for symptoms for 14 days after the exposure.

The vast majority of people infected with COVID-19 appear to recover well.² Younger athletes with no other medical problems seem to be at lower risk, though

CDC guidelines for those who may have COVID-19:²⁵

- Stay home except to get medical care.
- Practice self-care, such as rest and hydration.
- Separate from people and pets at home.
- Monitor symptoms.
- Call ahead before visiting the doctor.
- If sick, wear a cloth covering over the nose and mouth.
- Cover coughs and sneezes.
- Clean hands often (wash with soap and water for at least 20 seconds or use alcohol-based hand sanitizer with at least 60% alcohol).
- Avoid sharing personal household items.
- Clean all high-touch surfaces every day.



When you can be around others after you had or likely had COVID-19:²⁶

- Possible or known COVID-19 with symptoms:
 - › 10 days since the first symptoms appeared **and**
 - › After 24 hours with no fever without the use of fever-reducing medications **and**
 - › Other symptoms of COVID-19 are improving*
- Positive test for COVID-19 with no symptoms:
 - › 10 days after the test with no symptoms
 - › If a follow-up test is recommended, your healthcare provider will let you know when you can resume being around others
- Weakened immune system due to a health condition or medication:
 - › May need to stay home longer than 10 days
 - › If testing is recommended, your healthcare provider will let you know if you can resume being around other people
- House-hold contact or close contact with a person with COVID-19:
 - › Home isolation for 14 days after the exposure

Contact your physician or other health care provider before discontinuing isolation.

**Loss of taste and smell may persist for weeks or months after recovery and need not delay the end of isolation*

some may experience more-severe illnesses like pneumonia.³ It is not well understood if someone who has a COVID-19 infection might be able to get it again.⁴ How to test for antibodies and what they mean is under intense study.⁵ There is also increasing understanding on what potential longer term symptoms the virus may cause, even in athletes. Since the virus affects the lungs and sometimes the heart, athletes should resume exercise slowly and carefully^{6,7} and be mindful of possible long-term impacts before returning to high-level training.⁸

Phased approach for returning to sports

Over time, much more has been learned about the possible effects of COVID-19 on the body. A large number of patients (almost 1 in 5) hospitalized early on in the pandemic were found to have heart muscle damage.⁹ Exactly how and why that can happen is still not well understood, but it may be the result of an inflammatory response to the virus or a problem with blood clotting.¹⁰ Whether those problems could affect athletes with milder illness that did not need to be hospitalized is still not known. Long-term effects also remain unknown since this infection in people is still no new that it has not even been studied for a full year. For those reasons, recommendations continue to be refined for how to monitor those athletes returning to vigorous exercise and sports after COVID-19.

Several things need to be considered for individual athletes going back to sports after COVID-19 infection:¹¹

- How recent was the infection?
- How severe was the illness?
- What sport or activity is being considered?

Mask guidance for sports



Ongoing studies and data collection show that health care workers who wear proper personal protective equipment (PPE), including masks, have a significantly decreased risk of infection by coronaviruses.¹

Earlier on in the pandemic, it was unclear if masks could help protect against or slow the spread of COVID-19 in the community, but research has now shown that individuals sick with other coronavirus infections who wore masks did not spread the infections to close contacts.²

A review of how nations around the world have approached reducing the transmission of viruses during outbreaks and pandemics (including early on in our current crisis) suggests that physical distancing and wearing face masks and eye protection reduced transmission.³ A study in Asia found more clusters of COVID-19 outbreaks in recreational “masks-off” settings — such as dining and drinking in restaurants or bars, singing karaoke, and exercising in fitness clubs — than in workplaces where people wore masks.⁴

Early shortages of protective medical and surgical masks, and the need to preserve them for health care workers, led medical experts to explore other ways to cover the nose and mouth to help fight the spread of COVID-19 in communities. One analysis suggests that a medical-grade mask that is 100% effective at preventing transmission but only worn by 10% of the population has less impact than a mask that is 50% effective but worn by 95% of the population.⁵ Multilayer cloth masks that fit well around the face may provide reasonable protection, and those made with water-resistant fabric, with a high number of threads and finer weave, may be more protective.⁶

While investigations into how COVID-19 spreads continue, medical experts currently recommend that people wear masks outside their homes to help limit the spread of the virus. In August, the Centers for Disease Control and Protection (CDC) [recommended wearing masks in public settings around people who don't live together and when 6 feet of physical distancing is not possible.](#)

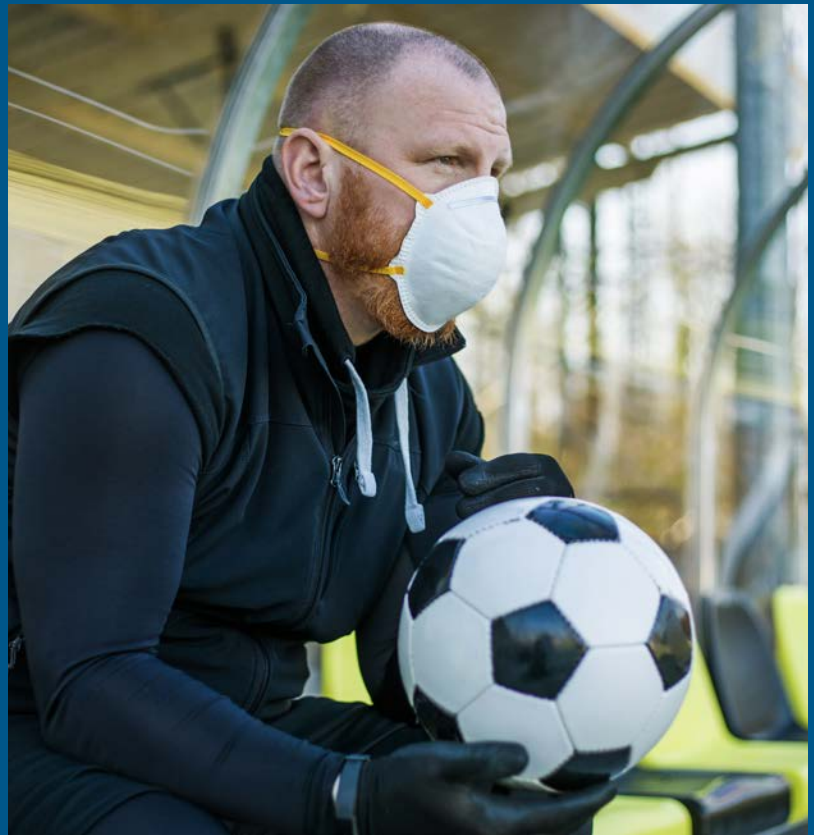
In September, the AAP (American Academy of Pediatrics) issued guidance on children and adolescents returning to sports.⁷ The AAP recommends masks for all coaches, officials, spectators, and volunteers; all athletes as they arrive at or depart a sporting venue; and all athletes on the sidelines, even when physically distanced.

The AAP recognizes situations in which masking may be more difficult for young athletes — such as high-intensity exercises or activities with an increased risk of heat injury — and encourages coaches to explore adaptations and alternatives to address these concerns.

The AAP also recommends not wearing masks while engaged in water sports or during activities in which a face mask could increase a chance of injury by catching on equipment or affecting vision (such as gymnastics or cheer).

Finally, the AAP recommends that children less than 2 years old shouldn't wear masks.

Even if athletes wear masks or face coverings, careful attention should still be paid to hand hygiene, and athletes should avoid touching their faces. Masks should be washed after use; the CDC provides [recommendations on washing them correctly.](#)



Stay alert: As we continue to study and learn more about how to protect against spread of the COVID-19, recommendations will likely change. In fact, on December 14, 2020, the California Department of Public Health released its [updated guidelines for youth and recreational adult sports during the COVID-19 pandemic.](#) It includes increasingly substantial recommendations for the use of masks and face coverings by participants, coaches, and spectators.

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Any previously hospitalized athlete or one with more severe COVID-19 symptoms should be followed closely by a cardiologist to see if there is any associated injury to the heart.¹² The type of inflammation in the heart (“myocarditis”) that is sometimes seen with other viruses and may be associated with cases of COVID-19¹³ is very concerning in athletes as it can be associated with significant symptoms or even sudden cardiac arrest or death.¹⁴ It can take athletes who develop myocarditis 3 to 6 months to return to training depending upon how symptoms resolve while different kinds of testing are monitored for a return to normal,¹⁵ though issues specific to COVID-19 myocarditis have never before been studied and will need to be handled carefully.

Thankfully, most younger athletes are considered lower risk for severe COVID-19 as conditions associated with inactivity, such as obesity, high blood pressure and type 2 diabetes, as well as being older in age have been identified as risk factors.¹⁶ Still, with mild-moderate symptoms from COVID-19 infection, athletes should follow their doctor’s recommendations regarding isolation and self-care and rest from training for 1–2 weeks from their symptoms resolving.^{17,18} We encourage everyone over age 12 to check-in with their physician prior to resumption of exercise, even in mild cases.

Prior to returning to sports, medical evaluation for written clearance is recommended.¹⁹ Things to be taken into account regarding clearance include the age of the athlete (those under 12 seem to be at lower risk), whether there are any remaining symptoms and if any further heart, blood or other testing is needed.²⁰ Even after returning to training, since it is still not well understood how vigorous exercise might affect the



heart of someone who had a prior COVID-19 infection, being cautious and closely monitoring for symptoms during or after exercise, especially those that athletes might otherwise ignore (such as fatigue, racing heart beats, trouble breathing, etc.), is wise.

As the medical community continues to learn more and more about this new virus, how it affects different people and what effects it may have on the human body long term, recommendations will likely continue to change. There are still questions about not only heart risks but also the lungs, nerves, brain tissue and blood clotting systems in people after COVID-19 infection²¹ with little yet known about these issues in athletes specifically. This will require continued surveillance and study. While there is still so much to understand, the hope of those involved in this process is to work together to get athletes back to sports as safely as possible.

The timing for resuming sporting events has been challenging and changing. The World Health Organization (WHO) reviewed how sports may be resumed safely around the world,²² and outlined 5 key factors to consider:

- How much active spread of COVID-19 is in the community?
- What type of sporting venues are involved?
- Where are participants traveling to or from?
- Are participants at higher risk of severe disease?
- Is the sport considered higher risk for spreading COVID-19, such as contact sports?²³



While this WHO guidance is for decisions regarding global sporting events such as the Olympics, these factors regarding the relative risks of resuming sports may be helpful to consider at the local level.

The U.S. Olympic and Paralympic Committee recommends a phased approach to resuming sports activities, based on public health recommendations and levels of risk.²⁴ The *Return to Sports Playbook* endorses this approach, which is easy to follow and is widely applicable to different communities while maintaining consistency with local health department guidelines.

Phase 1: Public health authorities require shelter-in-place, and public training facilities are closed.

Phase 2: Public health authorities lift shelter-in-place requirements but continue to prohibit group activities, and public training facilities remain closed.

Phase 3: Public health authorities allow small-group activities (less than 10 people), but public training facilities remain closed.

Phase 4: Public health authorities allow public training facilities to open and lift limitations on group size.

Phase 5: A vaccine or cure for COVID-19 is developed.

In each phase, athletes are recommended to closely self-monitor for symptoms and pay careful attention to handwashing and cleaning equipment. As the phases progress, athletes can move from virtual coaching and individual training to practicing with recommended physical distancing and eventually smaller group activities.

The time it takes for athletes to get back to full participation, particularly for higher risk contact sports, will depend on how the virus is spreading. For example, changes in the opening and closing of different facilities may occur. Travel must be managed carefully for athletes locally, regionally, and nationally. When spectators are permitted and other safety precautions may be needed will vary. Returning



to sports in the time of COVID-19 will continue to be challenging for all involved. With a thoughtful approach, sports and exercise can return to their place of importance in daily life that it is for so many.

Additionally, on December 14, 2020, the California Department of Public Health released its updated [guidelines for youth and recreational adult sports](#) during the COVID-19 pandemic. It also discusses relative risk of various sports based on degree of contact and ability to maintain physical distancing, and outlines safety considerations for practices outdoors versus indoors, cohorts, mask wearing, and decision-making around holding competitions based on the defined county tier (ranging from minimal to widespread).



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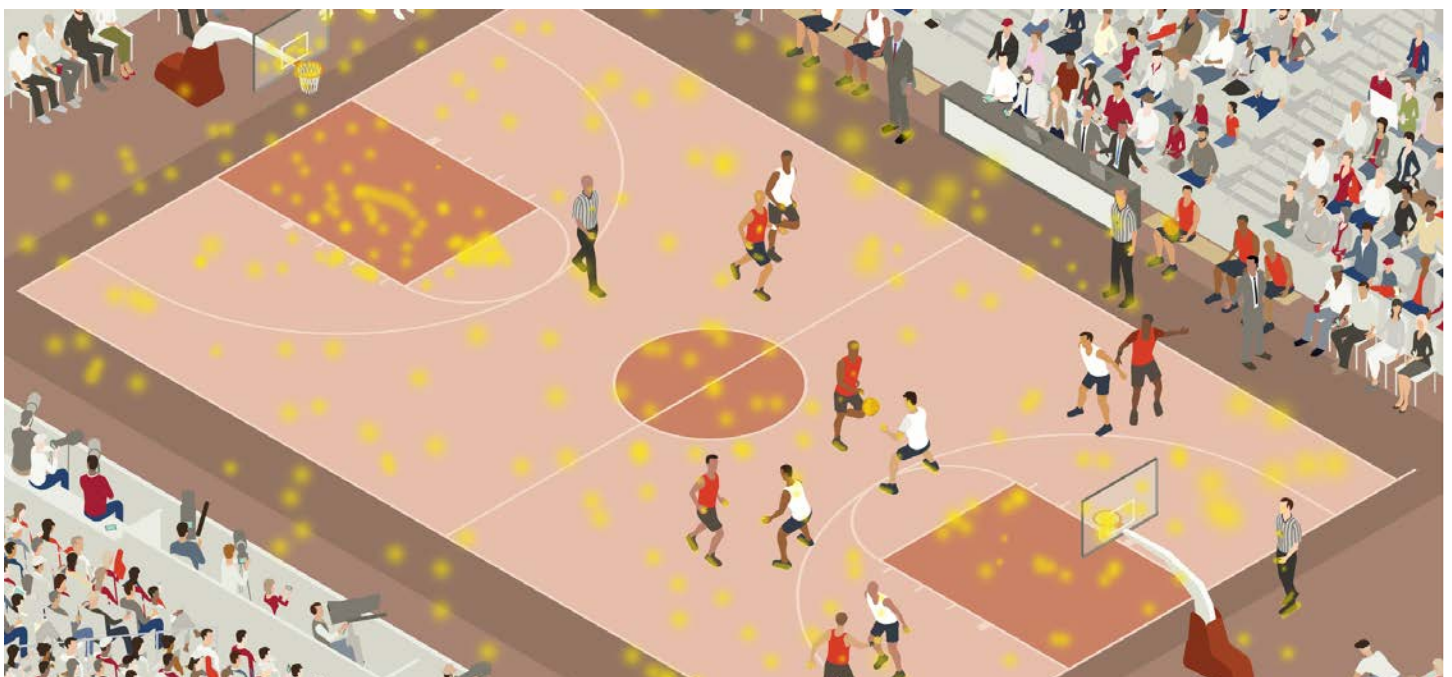
Hygiene and infection prevention in sports after COVID-19



Picture a basketball player going to the free-throw line at a clutch time. First the bottom of the shoes gets a quick wipe down from the hands. Then the hands get a rub on the front of the shorts. Just before the ball gets tossed from the official to the player, the hands get a quick lick of the tongue for better grip on the ball. The player holds the ball with both hands, takes a deep breath and shoots. The shot is made, of course, and teammates run in for high-fives. The official bounces the ball a few times, waiting to pass it back while the player

wipes sweat from the eyes and face. The ball goes back to the player, and the ritual repeats itself.

Now imagine that scenario if someone sprayed the ball with bright yellow paint right before the free throw. What would end up yellow? The ball, floor, hands, feet, faces, eyes, and clothes, to start. What if the yellow paint was like the virus? Where would it spread? Keeping things as clean as possible around the gym, weight rooms, practice fields, ball parks, stadiums, and locker rooms is key to avoiding spread





of not only COVID-19 but also other viruses and bacteria. Viruses that travel shorter distances through the air need help to spread, as they can only go about 6 feet on their own. For someone to get sick with that type of virus, it needs to contact a part of the body that will let it in, such as the face. The eyes, nose, and mouth are perfect entrances for the virus to set up an infection, since viruses like COVID-19 don't enter the body through the skin. However, if skin that touches the virus then touches eyes, nose, or mouth, it can cause an infection. Much like with the paint, if there is yellow on the hands, it may not be a big deal; but if the paint gets rubbed on the eyes, that is a different story.

Strategies endorsed by the CDC to reduce the spread of COVID-19 and other infections in daily habits¹ and school² can also be applied to sports.³ For example, postings signs around sporting facilities about limiting the spread of the virus is a good way to remind athletes and coaches about the best ways to keep everyone safe.^{4,5}

Just as keeping spray paint out of a gym can prevent paint from getting into someone's eyes, keeping those who might be infected with a virus away from others can keep people healthy. One simple measure that minimizes the risk of transmission is frequent handwashing. Ideally, this is at least a 20-second scrub with soap and water. When sinks and soap are hard to find, hand sanitizer (with at least 60% alcohol) can also be used. Covering coughs and sneezes also keeps viruses living in the nose or throat (even in people who do not appear ill) from spreading through the air and landing on other people or surfaces.

Physical distancing has been widely recommended during the COVID-19 pandemic. Even before the novel coronavirus came to be, the benefits

WASH YOUR HANDS



1. Wet your hands



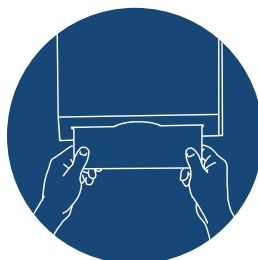
2. Get soap



3. Scrub for at least 20 seconds



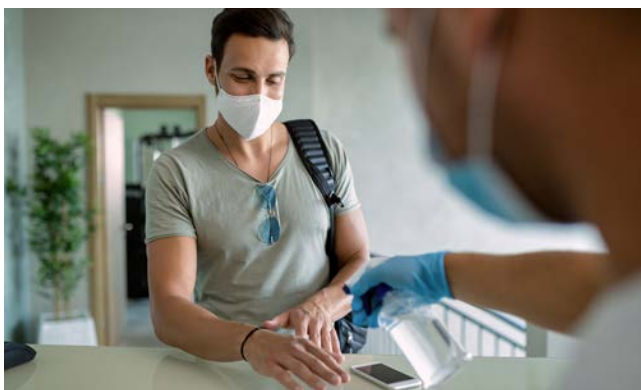
4. Rinse



5. Dry

...or use hand sanitizer





of keeping people far enough apart to limit the spread of disease less likely was recognized.⁶ Physical distancing may play a useful part even in sports where it is difficult to imagine how it would work. Specifically, indoor sports involving multiple people may increase the risk of transmission depending on air circulation/ventilation. This playbook offers strategies for getting athletes back to their sports even while staying apart for safety. When done in combination with the other measures, transmission of viral respiratory diseases such as COVID-19 can be reduced.

Equipment is required for most sports, and practice and training take place in spaces shared with others. Paying attention to the proper cleaning of things like basketballs and volleyballs is often overlooked, but it can help protect against the spread of infections. Taking care of mouthguards, gloves, and other personal equipment that can become contaminated is also important. Everyone plays a part in keep training spaces clean and disinfected. The U.S. Environmental Protection Agency provides recommendations for effective disinfecting and cleaning solutions.⁷

Athletes may need to wear cloth face coverings or masks.⁸ Masks are intended to keep people who may have been infected but are not yet sick from spreading it to others, particularly when they are in situations of close physical contact, such as sports. When using face coverings, follow the advice of local health officials, who closely follow the spread of disease in their communities. Since disease prevalence varies by time and by geography, recommendations regarding the wearing of face masks will likely change over time. If the number

of cases in an area increases, more protective measures may be needed. Sports organizations and teams should follow the guidelines of the local health department. Even while wearing a mask, it is still important to avoid regularly touching the face and eyes. If wearing a face covering is too difficult for the athletes, there may be some benefit to having coaches and officials wear one. If physical distancing guidelines are in effect, they must be followed even if face coverings are used.

Celebrations have always been a part of sports. It is natural to want to offer congratulations on a job well done or high-five a teammate, or console someone who fell short of a goal. One small study in professional athletes found that physical touch between players during games reflected the overall cooperation on a team and was even linked to improved performance.⁹ These are important human interactions for athletes, but during times like this it is wise to rethink how athletes and coaches can still support each other while minimizing transmission of the virus. Athletes around the world have found creative substitutes for handshakes and high-fives as they work to stay connected and safe.¹⁰

Athletes can help in the fight against COVID-19, and the joy of participation and competition need not be lost. The return to sports will be challenging, but the lessons learned and the protective measures being taken today will continue to keep athletes safe, which will only benefit the future of sports.

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Nutrition: Healthy food choices for return to sports

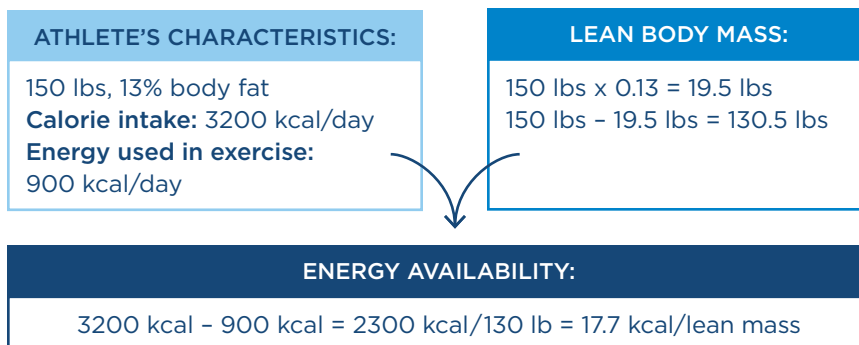


Making wise food and fluid choices allows athletes to maximize their potential by contributing to endurance, speed, and recovery. In this chapter we share tips on: optimizing the diet for returning to training and competition by ensuring a balance between energy (calorie) intake versus energy; dietary recommendations regarding carbohydrates, proteins, and micronutrients; hydration principles for exercise and sport; and nutrition tips to enhance immune function and aid in recovery.^{1,2,3,4,5}

Energy availability

The concept of energy availability was developed to monitor required calories, which is directly related to intake and output. Energy availability is amount of energy left for bodily functions after accounting for the energy used in training and competition – dietary energy intake minus energy expended in exercise. It can be likened to having enough fuel in the tank to drive home or stop by the grocery store after racing at the track. This is especially important for athletes who are increasing training and gearing up for competition, or in the case of the recent pandemic, gradually returning to organized sports.

Energy availability is calculated using the following formula:



Energy availability of less than 30 kilocalories per kilogram (0.35 ounces per pound) of lean body mass per day is considered low. Low energy availability can have an impact on a range of body systems and performance, including:

- Fatigue
- Prolonged recovery
- Poor athletic performance
- Bone disorders
- Abnormal menses
- Metabolic disruptions
- Reduced testosterone levels
- Abnormal reproductive functions
- Increased risk of illness and injuries

For athletes with low energy availability, especially due to a musculoskeletal injury, consultation with a sports medicine physician and registered dietitian may be recommended.



Carbohydrate

Carbohydrate is the main source of energy for exercising muscles. It is stored as glycogen in the liver and muscles. Glycogen is broken down into glucose, which is used as fuel by the body. Muscles rely on stores of glycogen for events lasting less than 30 minutes; beyond this, muscles begin to use blood glucose for energy. If carbohydrate consumption is inadequate during prolonged exertion, muscle glycogen levels will decrease and sudden bouts of effort during activity may be impaired. Furthermore, dropping blood glucose levels may result in the early onset of fatigue.

Maintaining blood glucose for longer training or competition:

Carbohydrate availability is the concept of matching carbohydrate intakes to meet individual fuel needs. This dietary strategy is preferred to recommended daily intakes of carbohydrate as a percentage of total calories per day. In endurance events such as marathons that are longer than 90 minutes, consuming 30 to 60 grams of carbohydrate per hour is crucial to maintain blood glucose levels and is often associated with improved performance. However, refueling methods must be balanced against potential gut issues.

Finally, carbohydrate intake is particularly important when participating in multiple training sessions or events in a single day, such as a tournament. It is recommended that athletes consume multiple small meals containing carbohydrates throughout the day to optimize carbohydrate availability.

Protein

Because intense exercise results in the breakdown of muscle tissue, protein intake during the recovery period is crucial for tissue repair and muscle protein synthesis. During the recovery phase, muscle protein gradually builds for at least 24 hours after activity; within the first hour after exercise, the ingestion of essential amino acids from high-quality protein is recommended. Most experts agree that both endurance and resistance athletes will benefit from consuming 10 to 20 grams of quality protein within the first hour after exercise. Table 1 lists foods that provide approximately 10 grams of protein.

In addition to focusing on the first hour after exercise, multiple meals containing 20 to 30 grams of protein throughout the day are vital to stimulate muscle protein synthesis. This is especially beneficial after a particularly strenuous workout. For athletes who want to maintain their weight, total protein intake of 0.6 to 0.8 grams of protein per pound of body weight per day is recommended.

High-quality protein refers to a food's essential amino acid profile; a type of amino acid called leucine, in combination with other branch-chained amino acids, plays a key role in stimulating muscle protein synthesis, which is how muscles maintain their structure and function using different proteins. Athletes should aim to consume at least 2 to 3 products per day (2 to 3 grams per day total) that have high concentrations of leucine (see Figure 1). Because plant-based proteins have less absorption into our system, vegetarian or vegan athletes should increase their overall protein intake by 10%.

Figure 1: Foods with approximately 10 grams protein

PLANT-BASED PROTEINS:	ANIMAL-BASED PROTEINS:
<ul style="list-style-type: none"> ½ cup tofu* 4 slices of bread 2 oz nuts ½ cup pumpkin seeds* 3 cups rice or 2 cups pasta ¾ cup cooked lentils* or kidney beans* 	<ul style="list-style-type: none"> 2 eggs* 1½ slices cheese 1¼ cups flavored milk ¾ cup yogurt 1.7 oz salmon or ½ can of tuna* 1.4 oz skinless, cooked chicken* 1.4 oz cooked lean beef, pork or lamb

* Foods with high leucine content



Figure 2

CARBOHYDRATE-PROTEIN RECOVERY SNACKS
1¼ cups milkshake or fruit smoothie
2½ cups low-fat flavored milk
8–10 oz liquid meal supplement (check label for specific content)
1–2 sports bars (check label for specific content)
1 large bowl (2 cups) breakfast cereal with milk
¾ cup baked beans on 2 slices of toast
1½ oz (bowl) fruit salad with ¾ cup fruit-flavored yogurt
Large baked potato + cottage cheese + glass of milk

Finally, to increase the efficiency of storing glycogen in muscles, ingesting protein and carbohydrates at the same time is recommended. Studies have shown that doing so was found to increase overall protein synthesis.⁴ Figure 2 provides a list of snacks that provide 50 grams of carbohydrate plus at least 10 grams of protein.

Micronutrients

Micronutrients such as iron and calcium assist in muscle repair and the release of energy from food. Certain athletes are at risk for inadequate micronutrient levels, including distance runners, gymnasts, swimmers, divers, wrestlers, and crew athletes.

Iron is a micronutrient that plays a central part in the optimal functioning of oxygen-carrying transport proteins called hemoglobin and myoglobin. As such, iron is crucial for maintaining overall health and enabling athletic performance. Athletes at risk for iron-deficiency anemia include female athletes and those who eat a vegetarian or vegan diet. These at-risk athletes should consume more than 18 milligrams (females) and more than 8 milligrams (males) per day. Eating iron-rich foods such as iron-fortified cereals along with foods high in vitamin C augments iron absorption.

Calcium is needed to form and maintain healthy bones. Female athletes who participate in sports emphasizing leanness are at risk for low calcium levels. The recommended daily intake of calcium for both genders is 1,300 milligrams per day for adolescent athletes and 1,000 milligrams per day for individuals ages 19 to 50 years.

Hydration

Athletes can lose large amounts of fluid during exertion, especially with high-intensity exercise and in hot or humid conditions. Dehydration is defined as a more than 2% decrease in body weight due to water loss. The consequences of dehydration include reduced athletic performance and potentially life-threatening problems such as heat illness or rhabdomyolysis (breakdown of muscle tissue resulting in harmful proteins and chemicals in the blood).

The main way that an exercising person loses fluid is by sweating. Sweating, including the amount and content of the sweat, not only varies widely by individual but is also influenced by factors such as body weight, metabolism, acclimatization, type and duration and intensity of exercise, and environmental conditions.

The “drink to thirst” motto is useful for situations when sweat loss is low and there are ample opportunities to drink. However, in situations when sweat loss is moderate to high, thirst is a late sign of dehydration and is not a reliable marker. To improve the accuracy of sweat volume monitoring, athletes should weigh themselves before and after exercise to guide how much water needs to be replaced.

A useful rule of thumb is: For every pound lost during exercise, the individual should drink 2 to 3 cups of fluid.

For events lasting for more than 60 minutes, a sports drink containing carbohydrate and electrolytes is recommended for hydration and to enhance performance.



NUTRITION

Foods to boost immunity and aid in recovery

Intense physical exercise causes a temporary depression of immune system function, which raises the risk of infection and illness. For instance, a study showed a high incidence of upper respiratory infection in marathon and ultramarathon runners; the risk was greater in faster runners and those with the highest training volumes.² One factor to reduce the incidence of illness (and injury) is avoiding sudden changes in training or excessively high training volumes. In addition, ensuring that the athlete has optimal intakes of protein, carbohydrate, essential fatty acids, and micronutrients can help combat exercise-related immunodepression.

Several studies have shown that a plant-based diet offers advantages for active individuals as well as those who are sedentary.¹ Exercising muscles produce free radicals, which can cause oxidative stress on the body; this can lead to muscle fatigue, reduced performance, and impaired recovery. Because a plant-based diet offers a greater proportion of energy from carbohydrates, including vegetables and fruits that are rich in antioxidants, one can more effectively reduce the damage to tissues and organs (see table 3). Finally, studies have shown that cruciferous vegetables, such as green cabbages and broccoli contribute to intestinal and immune system balance and health.⁵

Chronic inflammation in the body, such as that found in people with obesity and type 2 diabetes, may slow healing from an injury and be damaging to tissues. Acute bouts of heavy exertion can also cause an inflammatory response and contribute to the delayed onset of muscle soreness. This condition can be painful and impair muscle performance and recovery. The same plant-based diet that was shown to boost immunity can also assist in recovery from injury due to the intake of foods rich in antioxidants and omega-3 fatty acids.

Figure 3:
Foods with high antioxidant content

Blueberries Strawberries Cranberries	Walnuts Pistachios Pecans
Kidney beans Lentils Soy beans	Cloves Cinnamon Turmeric
Artichokes Beets Curly kale	Green tea Dark chocolate Dried apricots

Balancing calorie intake and exercise intensity

When preparing for either return to sport or increase in exercise participation, athletes must pay attention to maintaining caloric intake to prevent low energy availability. At the same time, matching caloric intake to the volume and intensity of exercise is key to preventing overweight. A smart and purposeful intake of carbohydrates and proteins during and after exercise can help improve performance, maximize protein synthesis, and repair muscles. Due to significant variations in sweat loss for individuals, pre- and post-exercise weight can be measured to guide adequate hydration. A plant-based diet that is high in omega-3 fatty acids and antioxidants may be beneficial to aid recovery and optimize immune system function.

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Sleep considerations for athletic competition and general health

It is no surprise that sleep is an important component to overall health and athletic performance. Approximately a third of a person's day is spent sleeping. Sleep allows the body time to repair and restructure DNA, improve and process memories, regulate metabolism and weight, decrease blood pressure, and boost immune function.¹ For an athlete, sleep is important for performance, recovery, physical development, and mental health. Getting a good night's sleep should be part of every athlete's daily agenda, but unfortunately research shows many do not get the recommended amount of sleep.^{2,3}

How much sleep do I need?

The American Academy of Sleep Medicine recommends 7 to 9 hours of sleep for adults and 8 to 10 hours for adolescents, for optimal performance and health.⁴ Athletes may require closer to 9 or 10 hours of sleep to allow for adequate recovery from injury, intense training, and competition.² Ten hours of sleep has been suggested for elite athletes who have long training days.⁵ The amount of sleep needed may vary widely between each person and can also vary from day to day.

Athletes may require closer to 9 or 10 hours of sleep to allow for adequate recovery from injury, intense training, and competition.

Sleep and athletic performance

Sleep affects different aspects of sport performance. The exact mechanisms responsible for the association between sleep and performance are not well defined but may vary depending on the sport and task.² Research on sleep and performance includes:

- **Endurance performance** — When deprived of sleep, runners on a treadmill ran less distance in 30 minutes than they did after a full night of sleep.⁶ One night of sleep restriction after heavy exercise was found to decrease the time-trial performance in cyclists.⁷
- **Sprint performance** — Stanford basketball players showed improved sprint times after extending their sleep by 2 hours.⁸ Track athletes showed slower sprint times after 2 days of sleep restriction.⁹
- **Accuracy and reaction time** — Tennis players showed a decrease in serving accuracy of up to 53% compared with serving after a normal night's sleep.¹⁰ College basketball players significantly improved their free-throw accuracy and 3-point field goal percentage after increasing their sleep by 2 hours.⁸
- **Learning and decision-making** — One night of sleep loss affected decision-making during competition, potentially resulting in mistakes.¹¹



Athlete sleep checklist¹⁴

- Make the room cool and dark. Use blackout curtains if needed. Use an eye mask or ear plugs if needed.
- Turn off the screens. Blue light from TVs and smartphones can suppress the melatonin levels that help to make people sleepy.
- Avoid exercise late at night. Workouts can raise cortisol levels, which impairs sleep. Exercising before bed can increase the time it takes to fall asleep.
- Avoid caffeine, alcohol, and food leading up to sleep.
- Get at least 7 hours of sleep a night.
- Take a nap. Naps can help you recover from a previous night of poor sleep or waking up early for a training session. Avoid a late afternoon nap; 30 minutes is plenty.
- If traveling to a different time zone, allow for 1 day in the destination before competition per time zone crossed to adjust properly. Adjusting training, sleep, and wake times before leaving to mimic the destination time zone.



Role of sleep in injury and illness

Sleep seems to be associated with the risk of injury. A study of middle and high school athletes showed that those who slept less than 8 hours per night on average were 70% more likely to report an injury than those who slept more than 8 hours.¹² When it comes to illness, decreased sleep has been shown to suppress the immune system, which can increase the risk of upper respiratory infections. In the era of COVID-19, keeping the immune system strong by getting good quality of sleep may decrease the risk of severe disease.

Athletes and napping

Naps can help athletes recover when they've had a poor night's sleep. Naps have been shown to decrease sleepiness, and they can be helpful when learning new skills or strategies. Naps should be less than 30 minutes and avoided late in the day, so they do not interfere with regular sleep.¹³ It is unclear if naps improve athletic performance.²


Prioritize sleep

Athletes spend many hours training and fueling their bodies with good nutrition. Sleep should also be recognized as the time for the body to recover and adapt to training loads. Establishing a regular routine and practicing good sleep hygiene will keep your body performing at a high level during training and competition.¹⁴



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Mood disorders in athletes during the pandemic

In mid-March 2020, all sports came to a screeching halt, and sporting teams from the elite to the recreational were forced to figure out how to operate in a COVID-19 pandemic world. For student athletes — those who play organized sports and identify themselves as athletes — this identity was abruptly stripped by the pandemic. The strong social support found in teams was no longer readily available. Colleges throughout the United States sent students home. Seniors were not able to play their final seasons. Athletes were unable to attend recruiting showcases. Sports seasons and tournaments were cancelled. Access to gyms, training facilities, and coaches was suspended. COVID-19 challenged athletes, from recreational to professional, to reassess their immediate sports goals and even search for new purpose. During such uncertain times, it is not unexpected that the mental health of some athletes may be at risk.

Prevalence of mood issues

Depression and anxiety are common mood disorders in both adults and adolescents. According to the National Institute of Mental Health (NIMH), in 2017 an estimated 3.2 million adolescents ages 12 to 17 years in the United States (13.3% of the U.S. population in this age range) had at least one major depressive episode. Females were at greater risk than males (20% to 6.8%), and the prevalence of major depressive episodes was highest among adolescents identifying as mixed race (16.9%).¹

It is important to talk about mental health issues and normalize them to reduce the stigma athletes may feel.

Among college students, anxiety and depression are the most common mental health diagnoses. In a 2018 survey of college students with over 85,000 respondents, 18% and 22% reported that they had been diagnosed or treated by a professional for depression and anxiety, respectively.²

While college student athletes were reported to have suffered less from depression and anxiety than their nonathlete counterparts, they did have mental health issues.³ Although sports participation can provide benefits that protect mental health, stressors unique to athletics are present. One study found that of student athletes participating in NCAA-sanctioned intercollegiate athletic programs, between 10% and 15% experienced mental health issues that warranted counselling.⁴

How has COVID-19 impacted mental health in the United States?

According to data from the Census Bureau and the CDC, in May 2020 nearly one third of adults reported symptoms of anxiety or depression that would normally require follow up, compared with 11% during the same time period in 2019. Certain groups were more likely to experience symptoms, including young people; nearly 46% of those between the ages of 18 to 29 reported symptoms.⁵



Signs and symptoms of mood disorders⁷

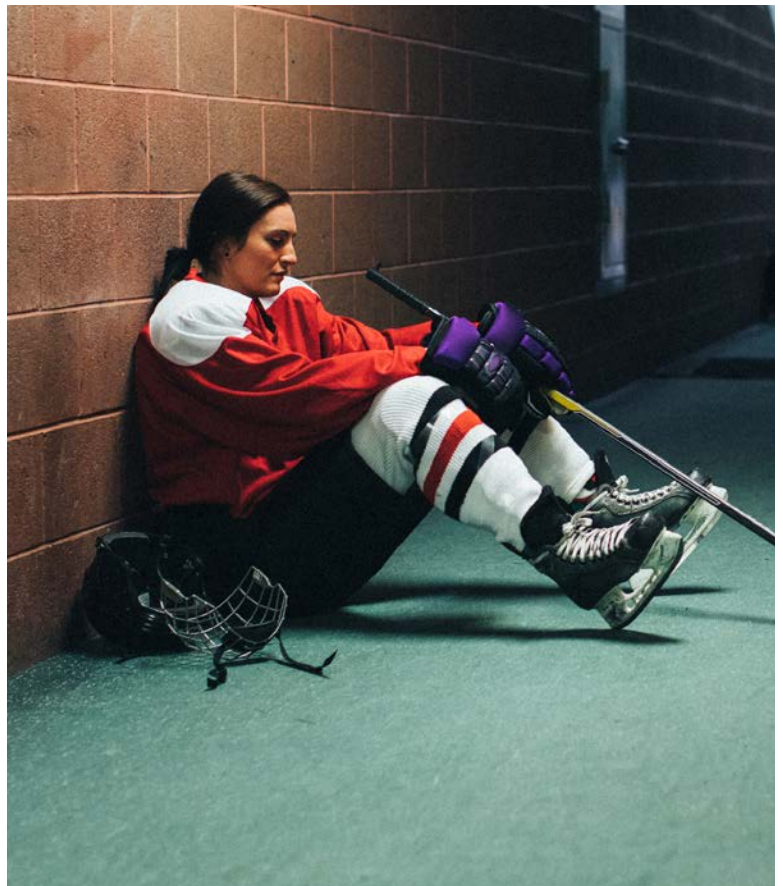
Depressive mood disorders symptoms:

- Lack of interest or pleasure in activities
- Feeling down
- Decreased motivation
- Fatigue
- Difficulty concentrating
- Disruptions in sleep and/or appetite
- Feelings of worthlessness
- Thoughts of wanting to harm or kill oneself

Anxiety disorders symptoms:

- Agitation
- Difficulty concentrating
- Irritability
- Physical distress
- Changes in sleep and/or appetite
- Panic attacks
- Phobias
- Constant worry

An NCAA survey revealed that the COVID-19 pandemic has impacted the mental health of student athletes.⁶ More than a quarter of those surveyed reported feeling sadness and a sense of loss, while 1 in 12 reported that their depression was interfering “constantly” or “most every day” with daily functioning. Over a third reported experiencing sleep difficulties. This represents a significant 150% to 250% increase over rates of mental health concerns previously reported by NCAA student-athletes in the American College Health Association’s National College Health Assessment. The rates of mental health concerns were highest among respondents of color, those whose families were facing economic hardship, and those living alone. In general, women tended to report higher rates than men. Mental health issues were also seen as a barrier to continued training, with over 40% citing a fear of exposure to COVID-19 and lack of motivation. Feelings of stress or anxiety were cited by 21%, with 13% citing sadness or depression (13%).





Next steps

As student athletes return to sports, it is important to focus on mental health issues that developed during the pandemic or were exacerbated by it. This is true for athletes at the youth, high school, and collegiate levels.

Coaches and athletic training staff can help by:

- Asking their athletes how they are.
- Talking about mental health issues and normalizing them to reduce the stigma, including sharing stories of professional athletes who have struggled.
- Providing educational materials about mental health distress.
- Discussing mental health resources available through the school and/or community.
- Inviting mental health professionals to talk with the team about topics such as stress management, sleep hygiene, substance use, coping with uncertainty, financial hardship, and loss from COVID-19.

Student athletes can help themselves by:

- Speaking with their parents, family, friends, physician, coaches, and athletic trainers.
- Seeking out mental health professionals through school, teams, or health care providers.
- Using apps for mindfulness, self-help for anxiety management, or mood tracking.
- Calling hotlines for help.



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Support Hotlines

Resources below are for emergency or ongoing help. Information is confidential except when someone is judged to be a danger to themselves or to the public. For people under the age of 18, different states have different ages at which they

can seek mental health services without informing parents. In most cases, a parent is involved when a minor receives psychotherapy services, though hotlines are confidential.

Emotional Support Helpline

Supports people experiencing anxiety or stress due to COVID-19.

- (866) 342-6892
- Staffed by trained mental health specialist
- Provided by Optum
- Open 24/7, for as long as necessary
- Free of charge
- Open to anyone

National Suicide Prevention

- (800) 273-8255
- suicidepreventionlifeline.org
for chat option

LGBTQ+ The Trevor Project

- (866) 488-7386
- thetrevorproject.org
text and chat options available

Trans Lifeline

- (877) 565-8860
- translifeline.org

Tele-Therapy Resources

Sign up and pay for sessions with a licensed counselor. Licensure varies by state. In CA, check licenses with the Board of Behavioral Services (BBS) <https://www.bbs.ca.gov/>.

Talkspace Online Therapy

Online counseling by text, audio, or video messaging

- talkspace.com

Better Help

Professional online counselors available 24/7 (private and affordable)

- betterhelp.com

Crisis Text Line

- Text HOME to 741741 to connect with crisis counselor for free texting chat
- crisistextline.org

Kaiser Permanente believes the mind and body are connected and thus offers a wide range of mental health services. The services are available for those struggling with myriad issues including depression and anxiety. Groups and classes that teach members how to manage stress, depression, anxiety, and other issues are available. Members do not need a referral from their primary care

doctor, although one's personal physician can often be helpful in connecting members to these available resources. The best place to start for more information on obtaining help can be found at <https://healthy.kaiserpermanente.org/get-care.html>. After selecting the region, the local number to call in each area is provided.

A photograph showing a person's feet standing on a white digital scale on a light-colored wooden floor. The person is wearing blue leggings. The image is partially obscured by a dark blue diagonal overlay on the left side of the page.

Mental health considerations

Disordered eating and eating disorders

Eating disorders can affect people of all genders, ages, races, ethnicities, religions, sexual orientations, weights, and body shapes. National surveys estimate that 20 million women and 10 million men in America will have an eating disorder at some point in their lives.¹ The prevalence of disordered eating is estimated to be as high as 27% in female athletes compared with 21% in the general population.² A study of Norwegian elite female athletes from 35 different sports found that 18% of athletes and 5% of controls (nonathletes) with disordered eating behaviors were diagnosed with clinical eating disorders.³ These results provide evidence that athletes may be at higher risk of developing disordered eating and eating disorders.

Participating in sports can result in healthier lifestyles and more disciplined choices for athletes. However, the physical and social environment of athletics can also increase the risk of developing disordered eating and eating disorders because of the pressure to maintain an ideal weight for physique or performance, as well as social pressure from coaches, peers, parents, and others.⁴ Athletes can display disordered eating patterns without meeting the criteria for eating disorders.

It is helpful to think of disordered eating and eating disorders along a continuum. Both describe

It is helpful to think of disordered eating and eating disorders along a continuum. Both describe irregular eating behaviors, but they are not the same.

individuals with irregular eating behaviors, but they are not the same. The difference boils down to the degree to which a person's life is impaired emotionally by behaviors around food, their level of obsessive thoughts related to body image, and the potential physical damage caused by their eating behaviors. Eating disorders include many of the elements of disordered eating and can significantly impair physical health and psychosocial functioning (see Eating Disorders Continuum, following page).

Eating disorders

Anorexia nervosa is characterized by persistent caloric intake restriction, fear of gaining weight or becoming fat, persistent behavior impeding weight gain, and disturbances in self-perceived weight or shape.

Bulimia nervosa is characterized by recurrent binge eating followed by recurrent inappropriate compensatory behaviors to prevent weight gain such as fasting, induced vomiting, and excessive exercise. With bulimia nervosa, self-evaluation is unduly influenced by shape and weight.

Binge eating disorder is characterized by recurrent episodes of binge eating (e.g., consuming a large amount of food in a short period of time, while feeling out of control) without compensatory behaviors, but with marked distress following the binge.



How sports can influence eating behaviors and patterns

Some sports emphasize a certain weight and size. Student athletes cannot avoid managing weight, reducing body fat, and some overeating — they are the nature of the beast. Some sports such as football and softball value weight as it confers strength, while other sports such as boxing and wrestling use weight classifications to divide competitor groups. This can encourage unhealthy weight control behaviors.

Coaches and peers can add additional pressure by focusing on weight control in sports where lower body fat can lead to better performance, and physical attractiveness is highly praised (e.g., in gymnastics, diving, and figure skating).

In some sports, revealing uniforms can increase body consciousness and body dissatisfaction. A study on female volleyball players showed that revealing uniforms contributed to decreased body esteem with distracting thoughts and feelings that impacted the players' on-court performance.⁵

Coaches can have considerable influence over their athletes. Some student athletes may perceive that their coaches want them to lose weight, which can heighten their internal pressure and increase the risk of disordered eating. Relationships between coaches and student athletes characterized by high conflict and low support have been associated with increased vulnerability to body image and eating problems.⁶

Eating disorder symptoms such as weight loss, excessive dieting, and excessive training may be misperceived as “normal” or desirable as “good athlete” traits. Societal expectations may extend to athletes in certain sports; distance runners, for example, are expected to be thin. Body stereotypes for particular sports can affect coaches' perceptions of athletes, and athletes who fit the stereotype of “thin” may be less likely to be diagnosed with an eating problem if their performance in the sport is good.

Eating disorders continuum





Tips for helping athletes maintain a healthy relationship with food:²⁷

MODEL HEALTHY BEHAVIORS	Be a good role model for athletes by having a healthy eating approach.
FOCUS ON FUNCTION OVER WEIGHT	Focus on the importance of getting proper nutrients for optimal performance.
CREATE A HEALTHY CULTURE	Foster a team environment in which all body types are celebrated, and where success is measured by health and performance instead of weight and appearance.
EDUCATE	Teach athletes that drastic changes in eating behaviors can have short- and long-term effects on the body.
DO YOUR HOMEWORK	If a teammate has disordered eating or an eating disorder, encourage peers to let them know others care and that effective resources are available.

Substance use in sport

Upon returning to play after a hiatus — such as after an injury or when COVID-19 restrictions are eased — athletes may encounter a variety of stressors, including learning to reengage with their sport while juggling demands of school, family, and social life.

Student athletes may experience anger, sadness, and even grief over postponements and cancellations of competitions. Some may grieve the loss of the opportunities they had for coaches or scouts to observe the skills they worked so hard to develop. Others may feel that sheltering in place derailed their dreams and goals, which can cause a deep sense of loss or add extra pressure to perform to make up for lost time.

With the combination of stress and mounting pressure to perform, some athletes may use substances to help them cope. Some may use prescription painkillers (with or without a prescription) to mask injuries; others may use enhancement substances to boost mood, metabolism, endurance, or performance.⁷ Research shows an interplay between substance use and stress,⁸ and athletes are not immune. Student athletes are more susceptible to substance abuse and using substances at higher levels than nonathletes.⁹ Research focusing on differences

in usage, showed that males student athletes are more likely than female student athletes to drink heavily and frequently.^{10,11,12,13} Additionally, male student athletes are more likely to use smokeless tobacco¹⁴ and performance-enhancing drugs, including nutritional supplements and anabolic steroids.¹⁵ Male and female student athletes use cannabis at about the same rate.^{15,16,17}

Self-reported cannabis use is lower among student female (25%) and male (37%) athletes compared with male (50%) and female (48%) nonathletes.¹⁸ Furthermore, cannabis use is higher among student athletes living in states where it is legal for recreational or medical use (39%) versus states where it's illegal (26%).¹⁹

Although athletes may use substances, not all who do so have substance use problems. However, substance use and misuse can lead to many serious consequences such as injuries, driving under the influence, health complications, and relationship problems. Paying attention to student athletes' physical presentations, behaviors, and moods can help teammates, parents, and coaches understand if substance use may be impacting their daily functioning or sports performance.



Consequences of substance use

Alcohol is a central nervous system depressant. It decreases attention, concentration, coordination, reaction time, strength, power, and endurance. The effects of heavy alcohol consumption can last for days.

Stimulant-type substances (amphetamines, cocaine, ephedrine, and stimulant medication for ADD and ADHD) can cause nervousness and jittery feelings, which can negatively affect skills requiring fine motor coordination or concentration. Performance can also be negatively affected by increases in heart rate, blood pressure, heat production, and body temperature.

Cannabis effects sport performance in a similar way as alcohol. It can slow reaction time, impair motor and hand-eye coordination, and affect time perception.²⁰

Student athletes with substance-related difficulties may be less receptive to assistance because they:

- Use the substance to cope with personal problems.
- Use the substance to enhance their performance.
- Are dependent on their substance use.
- Are in denial that they have substance use problem.
- Fear the stigma associated with admitting a substance use problem.
- Fear punishment for illegal activities.
- Fear losing sport scholarships or a position on the team.



What can you do?

The NCAA 2012 Student-Athlete Social Environmental Study showed that of 21,000 student athletes surveyed across all divisions and sports, those willing to seek support from parents and teammates were also willing to help their peers. Student athletes of both genders said they would turn to parents first when seeking help, advice, or support for substance use. Eighty-nine percent of student athletes reported that coaches or others in the athletic department had talked to them about expectations regarding drinking and substance use, yet a quarter of men and a third of women surveyed said they would prefer to talk to their team. Eighty-five percent of men and 93% of women would be likely or extremely likely to accompany a teammate home if he or she had a lot to drink. Seventy-nine percent of men and 93% of women would be likely or extremely likely to stop a teammate from drinking and driving.

Approaching student athletes with substance use problems can be difficult, as they may deny the problem or resist attempts to assist them. It is best not to argue with an athlete about substance misuse or try to convince them that there is a problem. It is more effective to state your concerns and help the athlete get evaluated by a medical professional. As an alternative, a teammate should tell the athlete that they are concerned and that the only way to know for sure if there is a problem is to be evaluated by a professional with expertise in substance abuse.



Healthy coping mechanisms

These self-care and stress management techniques and tools were shown to be effective for managing common psychological symptoms, creating mental fitness, and enhancing play and performance.

Mindfulness

Mindfulness is being aware of the present moment and accepting things as they are, without judgment. It is noticing or watching experiences come and go rather than latching on to the feelings or thoughts associated with those experiences and overthinking them. Mindfulness can be practiced frequently, when eating, walking, or running — really, at any moment.

How to practice:

- Pause.
- Take a deep breath in.
- Become aware of whatever is coming to mind, including feelings or thoughts.
- If any unhelpful thoughts or feelings come to mind, accept them without judgment.

Why it works: Athletes learn to intentionally shift their focus to their performance rather than on distracting and unhelpful thoughts or feelings. Athletes can learn that they are not their thoughts.

Breathing control

How to do it:

- Inhale for 4 seconds.
- Exhale deeply for 4 seconds.
- Allow the belly to rise with the inhale and fall with the exhale.
- Try to imagine a balloon in the belly that inflates on inhale and deflates on exhale.
- Repeat this process 10 times.

Why it works: This technique can slow down breathing, initiate a relaxation response, slow heart rate, and increase oxygen delivery to the muscles and brain, which reduces muscle tension and improves focus.

Progressive relaxation and body scan

How to do it:

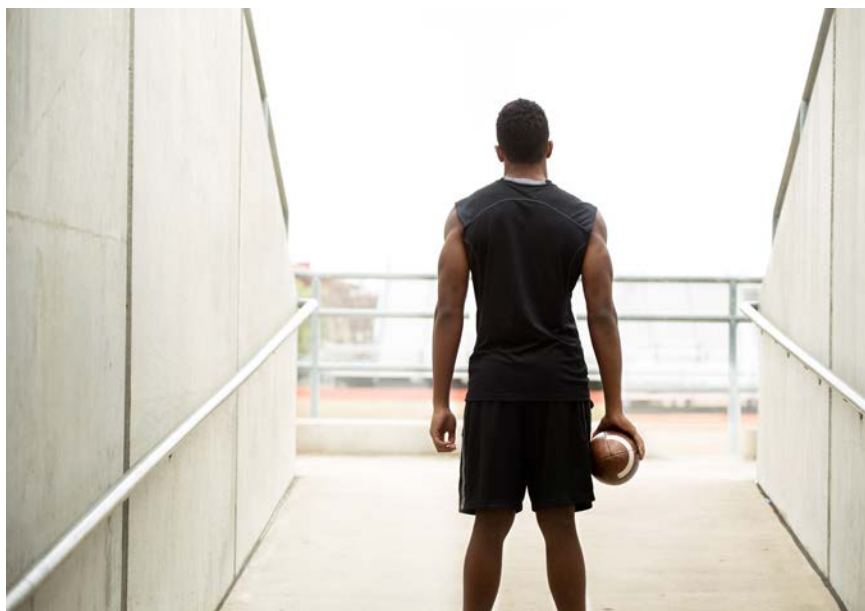
- Practice tensing and relaxing muscle groups in the body.
- Start at the top with the muscles in the head and neck and work down to the toes.
- Tense focused muscles for about 5 seconds.
- Then relax them for 30 seconds.
- Repeat the process, working through different muscle groups.

Why it works: The process of tensing and relaxing muscles can help with feeling relaxed. By becoming more aware of where tension is held, one can learn to let go of it.²¹ This type of relaxation may take some time to learn. With practice, athletes can use it to relax during training and competition.

Guided imagery or visualization

How it works: Athletes mentally rehearse their performance until it becomes habituated in their mind. This visualization can be a pregame walk-through where they execute a play in their mind. For example, athletes try to focus on what they see, hear, feel, smell, and taste as they engage in the image of walking up to the free-throw line, dribbling the ball twice before taking a deep breath, and then lifting their arms to position for the shot. Athletes often have their own personal rituals that can be incorporated into their visualization.

Why it works: Practiced frequently, guided imagery or visualization can decrease fear and reduce anxiety and arousal by imagining a previous poor response to a negative situation and then replacing it with a more positive behavior.



Growth mindset versus fixed mindset

Mindset refers to whether an individual believes that qualities such as intelligence and talent are fixed or changeable. Mindset plays a critical role in how people cope with life challenges. Learning to adapt a growth mindset calls for first understanding that talents and abilities are things that can be developed. A growth mindset is more resilient when facing challenges and setbacks.^{22,23,24,25,26} Athletes can learn to embrace challenges, persist after setbacks, see effort as a path to mastery, and learn from criticism. They can also focus on learning to praise effort rather than solely results.

Maintain virtual communication

Human beings are hardwired to connect. During the shelter-in-place, it is important to maintain support and connection from family, friends, teammates, coaches, and others. Virtual communication through phone calls, texts, virtual platforms, and social media can help maintain connection during times of physical distancing and improve one's general sense of well-being.

Exercise

Regular physical activity has extensive benefits for physical and mental health. Exercising can improve mood, promote better sleep, and be fun! While the usual routines of athletes are disrupted — such as with the closure of gyms and training facilities — creative alternatives can help with staying physically active. When exercising at home, athletes can use stairs, chairs, and books to replace weights. Trusted and reliable online resources and apps can be used for workout plans. If athletes decide to go outside to engage in physical activity, they must respect public health orders and recommendations for physical distancing and masking.

Additional Resources

COVID-19 wellness tips

Kaiser Permanente offers a number of resources to help individuals [cope with the stresses of COVID-19](#).

Substance abuse

Learn more about [substance abuse problems](#).

Or find [related resources at the NCAA](#).

Healthy Coping Mechanisms

There are a number of [self-care apps](#) that are easily accessible.

Additional [tips for manage stress](#).

Mindfulness:

Some [guided mindfulness exercises](#) and activities.

Maintain a routine

Although sport activities are postponed and school has turned into online learning, maintaining a daily routine can help athletes feel and see that they have control over their lives. It is important to take minibreaks, maintain grooming and hygiene, and structure breaks for meals, school, and hanging out with friends and family.



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Dynamic warm-up

The importance of stretching has been recognized for as long as athletes have been training. Joints and muscles need flexibility to perform sports movements well through an appropriate range of motion. However, static stretching, where positions are held without moving to create tension on the muscles, is actually not the best way to warm up for exercise. Flexibility and stretching are important for athletes as a part of an overall training program, but intense periods of static stretching prior to exercise has not been shown to improve athletic performance.¹ In fact, pre-exercise static stretching can decrease strength and power.²

Instead, moving the body slowly and steadily to wake up the areas that will be exercised is much better for injury prevention and performance. It is kind of like taking a rubber band out of the freezer and stretching it all the way out quickly, which more often than not will break the rubber band. Gently moving the rubber band to help it thaw out allows it to warm up and move with lower risk of breaking.

The dynamic warm-up exercises included here should be done slowly, smoothly, and with good form prior to any training. These movements help blood flow to muscles and tissues and prepares the whole body for more intense exercise. Anyone returning to sports after an injury should consider adding additional stretches and movements as a part of their treatment for the injury.



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Each of the following exercises should be done for 10–15 seconds.

High-knee grab



Forward lunge, hands overhead



Lateral lunge, groin stretch



Lateral leg swings





Single leg quad stretch, arm overhead



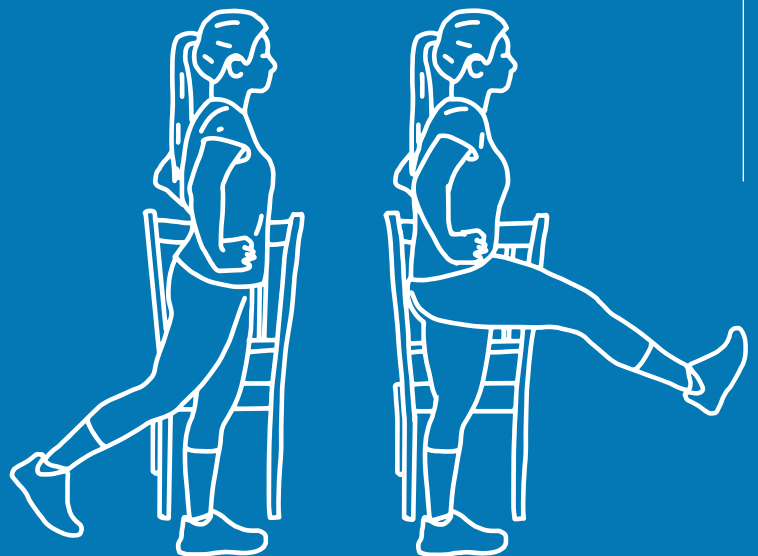
Hamstring sweep-throughs



Hamstring hurdle kicks



Forward hip swings



Running



Athletes in track and field are often attracted to the sport because of the variety of physical challenges required, as well as year-round competition and training. Cross-country is a team sport that typically centers on preseason training in summer and competition in the fall, but most athletes remain active throughout the year. Whether a cross-country athlete trains to finish as part of the scoring team or a sprinter trains to beat a qualifying time, running can put a lot of stress on the musculoskeletal system because it is more repetitive and higher impact than other activities.

These tips can help runners to prevent injury, especially while sheltering in place and/or increasing training intensity:

- Strengthening, conditioning, and flexibility can help prevent injuries
- Take at least 1 to 2 days off each week for cross-training, such as biking, swimming, yoga, or weight training
- Divide training into distinct periods (periodization)
- Increase mileage by no more than 30% per week
- Change running shoes every 300 to 500 miles
- Maintain a healthy body weight to reduce stress on joints and bones

Strengthening and conditioning

Stronger muscles enhance joint support, shock absorption, and power. In track and field and cross-country, sport-specific training is crucial; for example, endurance athletes should focus on slow-twitch muscle fibers while sprinters should train fast-twitch fibers. Athletes specializing in shot put, javelin, discus, and hammer, should focus on stabilizing the shoulder blades and strengthening the rotator cuff. The entire range of motion must be used for strength training. Finally, because the knee is the main shock absorber, runners should optimize biomechanics by focusing on buttock (gluteal) and hip muscle strengthening to prevent overuse injuries of the lower extremities.



Flexibility and dynamic warm-up

Sports medicine providers often find that athletes don't engage in a regular flexibility program. Flexibility is also a key component in treating muscle strains. First, athletes should warm up before workouts. Warm-up can include brisk walking or light jogging for several minutes. After exercise, large muscle groups should be stretched first, followed by smaller ones, with stretches held for 30 seconds.

Flexibility training should also be a part of strength-building, to improve strength throughout the full range of motion. Ballistic stretching involving quick, bouncing movements should be avoided to prevent muscle or tendon injury.

Periodization

Because most athletes train year-round, periodization is recommended to prevent overtraining. Periodization is defined as dividing training into cycles, each working toward specific goals. For example, in-season training may be specific to the requirements of a particular event, while off-season training can include cross-training, strength-building, and active recovery. Taking break from running and cross-training can be helpful. Even during the season, runners should take a few days off each week from running for other activities such as swimming, biking, weight training, or yoga. Preseason training can include slow progression of mileage, aiming to optimize endurance.

Return to running

Warming up the muscles before a run can improve performance and lessen the risk of injury. Any low-intensity cardio exercise performed for about 5 minutes that increases in intensity is considered a warm-up. A dynamic stretching routine following the warm-up is more functional, whereas cooldown stretching can be static because the muscles are still warm and pliable.

A gradual progression of mileage is recommended, as abrupt changes in the duration, frequency, or intensity of training can increase the risk of overuse injuries such as stress fractures. For individuals recovering from an injury, returning to running, or starting to run, we recommend this program of 2 to 3 workouts per week:

Week 1: Jog 1 min, walk 1 min x 10-20 min total
Week 2: Jog 2 min, walk 1 min x 10-20 min total

Week 3: Jog 3 min, walk 1 min x 10-20 min total
Week 4: Jog 4 min, walk 1 min x 10-20 min total

Week 5: Jog 5 min, walk 1 min x 10-20 min total
Week 6: Jog throughout, 20 min total

For others who have maintained running distance and are ready to ramp-up, we recommend increasing mileage by no more than 30% per week each week due to the increased risk of injury.¹ Studies show that previous running injury is one of the most important risk factors for having another one, so prevention is crucial. Finally, because athletic footwear is designed to reduce impact and provide stability, runners should change shoes every 300 to 500 miles.



Guidance on hosting events after COVID-19

These logistical recommendations for organizing events are adapted from the USA Track and Field's (USATF) website.² Public health authorities recommend implementing whichever regulations (state or local versus USATF) are stricter.

Phase 1: Shelter-in-place

- Training only at home with personal equipment.
- Virtual coaching.

Phase 2: Group activities prohibited

- No competitive events of any type permitted.
- Any USATF sanction issued will be void if a location projected to be in Phase 3 or higher by the date of event continues to be or reverts to Phase 1 or 2 as of the event date.

Phase 3: Small-group activities, typically 10 people or less

- Public training facilities are closed.
- “Micro-events” consisting of no more than 10 people including officials can be considered for sanction.
- Must meet “Low Risk stratification” on USATF website, including:
 - › Enforced social distancing for all athletes and officials.
 - › For high jump and pole vault, pits covered by tarp and removed and disinfected after each athlete.
 - › Sprint and hurdle events use every other lane.
 - › Road and trail races with staggered start and course has minimum 6-foot width throughout for safe passing.

Phase 4: Public training facilities can open with no limitations on group size. Competition can be considered for sanction.

Phase 5: Vaccine or cure for COVID-19 is available. Meets sanctioned, guided by normal USATF protocols.

Maintaining flexibility to aid performance

Improving the dynamic stability of joints by strengthening muscles and enhancing flexibility can help reduce risk of injury. Those training and competing year-round should have distinct training cycles with specific goals, which includes rest from running. When returning to running, factors that lessen risk of injury and help to achieve goals include avoiding sudden changes in training and replacing shoes regularly. Finally, USA Track and Field provides guidance for minimizing risk when resuming competitive events. If there is a discrepancy between local and USATF guidelines, follow the regulations that are more restrictive.^{2,3,4,5,6}

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Suggested strengthening exercises

Clamshell with resistance

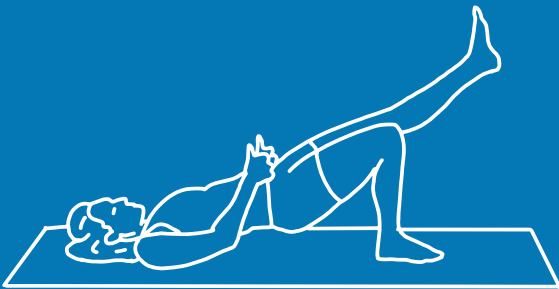


Begin by lying on your side with your knees bent 90 degrees, hips and shoulders stacked, and a resistance loop secured around your legs.

Raise your top knee away from the bottom one, then slowly return to the starting position.

Make sure not to roll your hips forward or backward during the exercise.

Alternating single-leg bridge

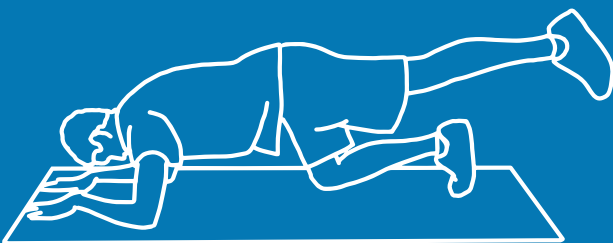


Begin lying on your back with your knees bent, feet on the floor, and your elbows resting on the ground. Then place your fists on your hips, thumbs pointing up.

Tighten your abdominals and slowly lift your hips off the floor into a bridge position. Hold this position as you straighten one leg, then bring it back down. Repeat with your other leg.

Make sure to maintain your balance during the exercise and do not let your hips rotate to either side as you lift your legs. Use your thumbs to monitor the movement of your hips.

Quadruped hip extension, leg straight



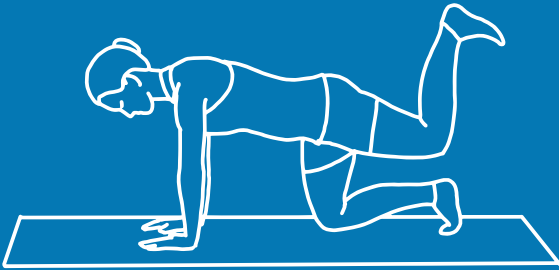
Begin on all fours, with your forearms flat on the ground and your elbows directly below your shoulders.

Straighten one leg. Engage your abdominal muscles, then slowly lift your leg up, hold briefly, then relax and repeat.

Make sure to keep your core engaged and your leg straight during the exercise. Do not let your back arch or pelvis rotate.



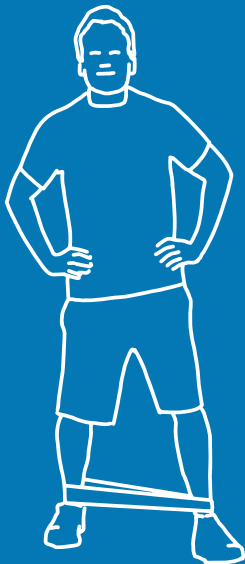
Quadruped hip extension, knee bent



Begin on all fours. Tighten your abdominals and then lift one leg upward, keeping your knee bent. Lower it back down, then repeat.

Think of pushing your foot toward the ceiling. Make sure to keep your abdominals tight and hips level during the exercise.

Monster walks, forward



Begin in a standing upright position with a resistance band looped around your ankles.

Slightly bend your knees into a mini squat position. Step diagonally forward with one foot, then slowly bring your feet together. Repeat in the opposite direction.

Make sure to keep your chest upright and do not bend your knees forward past your toes.

Monster walks, side-step



Begin standing upright with a resistance band looped around either the thighs or the ankles. Bend your knees slightly so you are in a mini squat position.

Slowly step sideways, maintaining tension in the band. Make sure to keep your feet pointing straight forward and do not let your knees collapse inward during the exercise.

Contact and collision sports



Team sports such as football, hockey, rugby, and lacrosse that involve close contact and/or collision have specific challenges for safely resuming during the COVID-19 pandemic. Much of the conditioning for these sports can be safely carried out individually in the early stages, but physical distancing measures are more problematic when training progresses from individual activities to offense and defense interactions. Position-specific drills can be designed to minimize contact between players, and frequent sanitizing of hands and balls is recommended. When possible, physical distancing measures should be followed for small groups and team meetings. For tackling and checking sports, it is wise to gradually ramp up contact based on how much time was spent apart, while focusing on proper technique and rule enforcement to limit injury.

Because of the risk of injury in the early phases of reconditioning, a gradual and progressive approach is recommended.

In the early phases of reconditioning or “getting back into game shape,” there is considerable risk of injury. A phased reconditioning program emphasizing flexibility, core strength, and dynamic pre-practice warm-up is essential.

The risk of noncontact injury is significantly greater after periods of inactivity. For this reason, training workloads and recovery strategies need to be adjusted to reflect reduced levels of fitness. An estimated 60% of noncontact injuries occur during periods when an athlete is transitioning back into training following a period of inactivity. The risk of serious injury and death after periods of inactivity is well documented and was addressed in



the 2012 Inter-Association Task Force’s best practice recommendations: “Conditioning periods should be phased in gradually and progressively to encourage proper exercise acclimatization and to minimize the risk of adverse effects on health.”^{1,2}



Resources

The following suggestions are for training to return to contact sports. Individual workouts may vary depending on the position and sport.

- National Strength and Conditioning Association (NSCA) guidelines for the [safe return to formal training](#) after a period of inactivity. These include tips on avoiding exertional heat illness and rhabdomyolysis, as well as a graded progression for resuming weight training, plyometrics, and sprinting activities.
- Guidelines from the National Strength and Conditioning Association for [safe return to weight training](#) and weight rooms.^{3,4}
- USA Hockey^{5,6} and US Lacrosse⁷ provided outlines for the safely returning to sports (see pages 49-51).
- The National Federation of State High School Associations⁸ provides approved recommendations for the [return of high school football](#) (see page 52).

References

1. Casa DJ et al., "The Inter-Association Task Force for Preventing Sudden Death in Collegiate Conditioning Sessions: Best Practices Recommendations," *Journal of Athletic Training*, 2012;47:477-80.
2. Caterisano A et al., "[CSCCa and NSCA Joint Consensus Guidelines for Transition Periods](#)," *Strength & Conditioning Journal*, June 2019;41(3):1-23.
3. Haff G, Triplett T, *Essentials of Strength Training and Conditioning, 4th Ed.*, National Strength and Conditioning Association, 2004.
4. Coburn JW, Mahlek MW (eds.), *Essentials of Personal Training, 2nd Ed.*, National Strength and Conditioning Association, 2004.
5. USA Hockey, "[Returning to the Rinks](#)," Oct. 2020
6. USA Hockey, "[Mitigating Risk](#)," Dec. 9, 2020
7. US Lacrosse, "[Return-to-Play Recommendations for LaCrosse](#)," July 1, 2020.
8. National Federation of State High School Associations, "[Guidance for Opening Up High School Athletics and Activities](#)," May 15, 2020.

Public health phases and considerations for return to **contact sports**

Phase 1: Shelter-in-place

- Train at home with personal equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment such as balls, gloves, sticks, and cones.
- Lift with personal equipment.
- Virtual coaching.
- Follow public health recommendations.

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Consistent groups to better track contacts and limit cross-contamination.
- Coach on site.
- Avoid sharing equipment.
- Take care of mouthguards and helmets to avoid contamination.
- Complete cleaning of equipment before switching users (e.g., wipe down pads, gloves, and balls).
- Maintain social distancing and avoid contact; run warm-ups and specific position drills appropriately spaced (e.g., passing routes, pitch handoffs, shuttle drills).
- No more than 1 person per location doing a drill.
- Clean hands during breaks from drills.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment such as towels, equipment, gloves, pads, and balls.
- Avoid sharing water bottles.
- Ensure proper cleaning of equipment before another athlete uses it.
- When appropriate, space athletes to minimize transmission.
- If the 6-foot distancing recommendation has been lifted, consider adding drills and limited contact practice to reacclimate. From there, full practice activities can ramp back up to normal levels.

US Lacrosse phases and considerations for return to **lacrosse**



Stage 1

- At-home individual training.

Stage 2

- Small-group, modified lacrosse activity in practice setting.

Stage 3

- Medium-group, modified intra-squad scrimmages/practices with limited closeness and contact.

Stage 4

- Medium-group, local competition/practices from teams within same locale, with limited closeness and contact.

Stage 5

- Unrestricted gatherings and full competition resumption with multiple teams from varied geographic areas.

US Hockey guidelines for return to **hockey**

Follow local regulations and CDC guidelines. Remind players to always stay at least 6 feet apart. Only use personal water bottle, do not gather at a white board for instruction or form lines of

players. These exercises are not drawn quite to scale. Combine activities to fit the available space spreading out as much as possible.

Screening

- **Stay home** if you are sick or have been exposed to an infected individual
- Set up a station at the rink entrance check body temperature and ask:
 - › Have you or anyone in your household had a sore throat, cough, chills, body aches, shortness of breath, loss of smell, loss of taste, fever at or greater than 100 degrees Fahrenheit in the last 21 days?
 - › Have you or anyone in your household been tested for COVID-19?
 - › To the best of your knowledge have you been in close proximity to any individual who tested positive for COVID-19?
- Any individual answering “yes” or having a temperature above 100.4 should follow their physician’s recommendations for when it is safe to return to activity.

Personal hygiene

- Wash hands frequently, for at least 20 seconds with soap and water or use hand sanitizer with at least 60% alcohol.
- Do not touch your face.
- Cough or sneeze into a tissue or the bend of your elbow, dispose of the tissue and wash/sanitize hands immediately.
- Do not share water bottles, towels or other equipment. Mark them clearly so you know which one is yours.
- Clean/disinfect equipment after each use.

Social Distancing

- Maintain social distancing measures (6 ft. apart) whenever possible off the ice.
- Consider dressing at home to avoid locker rooms; only use locker rooms if social distancing can be maintained.
- Limit group discussions so players are not in close proximity for extended periods of time.
- Do not use benches unless social distancing can be maintained.
- Coaches, parents and spectators should follow social distancing measures.
- Discourage unnecessary physical contact, such as high fives, handshakes, fist bumps, or hugs.
- Consider alternative programming:
 - › Maximize ice space by utilizing stations.
 - › Play games, if allowed, 3v3 or 4v4 with smaller team rosters to allow for more space on the ice, within the player benches, and locker rooms.

US Hockey guidelines for return to **hockey** continued



Personal Protective Equipment

- Your helmet facemask is a personal choice, but a **full, clear polycarbonate shield or clear shield cage combination may provide a higher level of protection.**
- Wear a face covering/mask when entering/exiting the facility and within the facility when not on the ice.
- Coaches, parents and spectators should all wear a face covering/mask while indoors.
- Wearing a face covering/mask during on-ice practice or games is a personal choice. However, participants must wear a face covering/mask for on-ice practices and games where they are required by local and state government order and/or your ice rink facility.

National Federation of State High School Associations guidelines for return to **football**

Phase 1

Pre-workout screening:

- Screen all coaches and students for signs and symptoms of COVID-19 prior to a workout, including a temperature check. Record responses to screening questions.
- Do not allow any person with positive symptoms to take part in workouts, and contact a health care provider.
- No vulnerable individuals can oversee or participate in any workouts.

Limitations on gatherings:

- No gathering of more than 10 people at a time (inside or outside).
- Do not utilize locker rooms. Students report to workouts in proper gear and immediately return home to shower at end of the workout.
- Conduct workouts in pods of students with the same 5 to 10 students always working out together. Smaller pods can be utilized for weight training.
- Maintain a minimum distance of 6 feet between each individual at all times. If this is not possible indoors, then reduce the number of individuals in the room to achieve proper social distancing.

Facilities cleaning:

- Create and maintain adequate cleaning schedules.
- Prior to athletes entering a facility, wipe down hard surfaces and sanitize all rooms and furniture, such as chairs, meeting rooms, locker rooms, weight room equipment, bathrooms, and athletic training room tables.
- Individuals should wash their hands for a minimum of 20 seconds with warm water and soap before touching any surfaces or participating in workouts.

- Hand sanitizer should be plentiful and available to individuals as they transfer from place to place.
- Wipe down weight equipment thoroughly before and after each use.
- Wear appropriate clothing and shoes at all times in the weight room to minimize sweat from transmitting onto equipment and surfaces.
- Cover any equipment such as weight benches and athletic pads that have holes with exposed foam.
- Encourage students to shower and wash workout clothing immediately upon returning to home.

Physical activity and athletic equipment:

- Students should not share clothing, towels, or shoes.
- Wash and clean individual clothing and towels after every workout.
- Clean all athletic equipment, including balls, after each use and prior to the next workout.
- Individual drills requiring the use of athletic equipment are permissible, but the equipment should be cleaned prior to use by the next individual.
- Emphasize resistance training such as body weight, submaximal lifts, and use of resistance bands.
- Free weight exercises requiring a spotter cannot be conducted in Phase 1.

Hydration:

- All students bring their own water bottle. Water bottles must not be shared.
- Hydration stations, such as water cows, water trough, and water fountains, should not be utilized.

NFHS guidelines for return to **football** continued

Phase 2

Pre-workout screening:

- Continue with pre-workout screenings and temperature checks.
- Any person with positive symptoms should not be allowed to take part in workouts and contact a health care provider.
- Vulnerable individuals should not oversee or participate in any workouts.

Limitations on gatherings:

- No gathering of more than 10 people at a time inside. Up to 50 individuals may gather outdoors for workouts.
- If locker rooms or meeting rooms are used, maintain a minimum distance of 6 feet between each individual at all times.
- Continue workouts in pods of 5 to 10 students with the same students always working out together. Smaller pods can be utilized for weight training.
- Maintain a minimum distance of 6 feet between each individual at all times. If this is not possible indoors, then reduce the number of individuals in the room to achieve proper social distancing.
- Maintain appropriate social distancing on sidelines and benches during practices. Consider using tape or paint as a guide for students and coaches.

Facilities cleaning:

- Maintain all cleaning and handwashing protocols as described in Phase 1.

Physical activity and athletic equipment:

- Lower-risk sports practices and competitions may resume. Modified practices may begin for moderate-risk sports.
- Students should not share clothing, towels, or shoes.
- Clean all athletic equipment, including balls, intermittently during practices and contests.
- Hand sanitizer should be plentiful at all contests and practices.
- Maximum lifts should be limited, and power cages used for squats and bench presses. Spotters stand at each end of the bar.

Hydration:

- Continue individual hydration protocols as described in Phase 1.



NFHS guidelines for return to **football** continued

Phase 3

Pre-workout screening:

- Continue with pre-workout screenings and temperature checks.
- Vulnerable individuals can resume public interactions, but should practice physical distancing, minimizing exposure to social settings where distancing may not be practical, unless precautionary measures are observed.

Limitations on gatherings:

- Gathering sizes of up to 50 individuals allowed indoors or outdoors.
- When not directly participating in practices or contests, maintain a minimum distance of 3 to 6 feet between each individual. Consider using tape or paint as a guide for students and coaches.

Facilities cleaning:

- Maintain all cleaning and handwashing protocols as described in Phase 1.

Physical activity and athletic equipment:

- Moderate-risk sports practices and competitions may begin.
- Students should not share clothing, towels, or shoes.
- Hand sanitizer should be plentiful at all contests and practices.
- Athletic equipment such as football helmets, pads, gloves, and eyewear may be worn by only one individual and not shared.
- Maximum lifts should be limited, and power cages used for squats and bench presses. Spotters stand at each end of the bar.
- Modified practices may begin for higher risk sports:
 - › Continue pre-practice screening as in Phases 1 and 2. Shower immediately after practices and contests.
 - › Reassess epidemiology data and experiences in other states and other levels of competition to determine when higher risk sports competition may resume.

Hydration:

- Continue individual hydration protocols as described in Phase 1.

National Strength and Conditioning Association (NSCA) recommendations for return to training



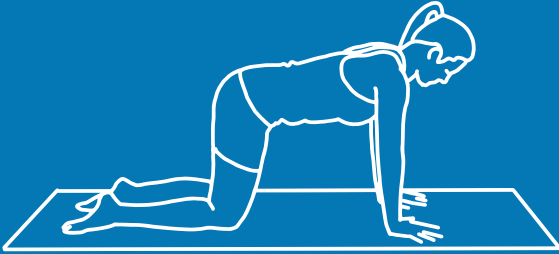
- Clean all weight room surfaces and equipment regularly with germicidal (antifungal, antibacterial, and antiviral) cleaner.
- Strength and conditioning coaches adhere to specific cleaning schedules outlined in the [NSCA's Guidance on Safe Return to Training for Athletes](#).
- Provide appropriate cleaning and sanitation supplies in the weight room:
 - › Disinfectant (germicide)
 - › Hand sanitizer (60% alcohol)
 - › Specialty cleaners (e.g., wood, walls, upholstery, and glass)
 - › Paper towels
 - › Disinfectant wipes
 - › Spray bottles
 - › Cloth towels and rags: should not be shared and should be laundered after each use using sanitary measures
 - › Sponges
 - › Brooms and dust pans
 - › Vacuum cleaner
 - › Mop supplies
- Extend cleaning and sanitation procedures to restrooms, locker rooms, carpet and flooring, exercise mats, water fountains, athlete nutrition fueling stations, and commonly shared pieces of equipment.
- Emphasize fresh air circulation, ventilation, and sunlight (if possible).
- To prevent bacterial and microbial growth, the relative humidity should not exceed 60%.



Suggested dynamic warm-up exercises

Downward dog

7x/week, 2 reps



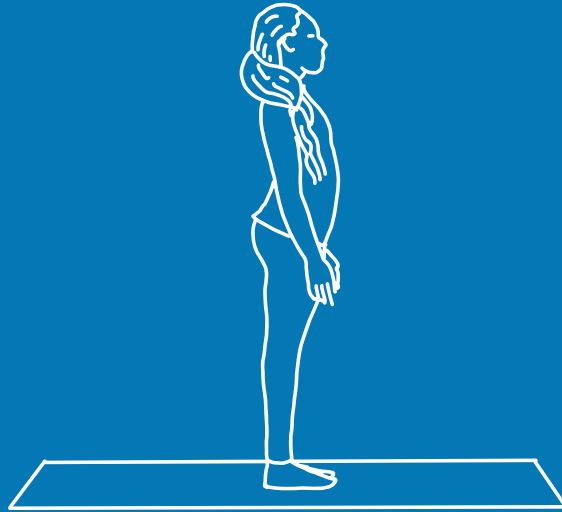
Setup: Begin on all fours.

Movement: Prop your feet up on your toes, then push your body up into an inverted V position with your elbows and knees straight. Hold this position, feeling a stretch through your back and legs.

Tip: Make sure to keep your shoulders down, as well as your hands and feet flat on the floor during the stretch.

Forward fold with feet together and straight legs

7x/week, 10 reps



Setup: Begin standing with your feet together.

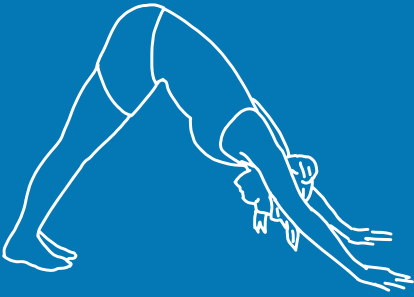
Movement: Fold forward with straight legs. Place your hands on either side of your feet with palms flat to the floor. If possible, line up your fingertips with your toe tips. Bring your head toward your knees.

Tip: Actively pull your chest and legs toward each other. Pushing down through your heels may help you with balance. Allow the back of your neck to be long so that you can pull your forehead toward your knees.



Warrior I

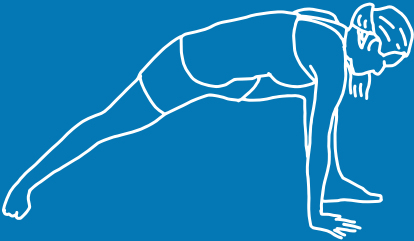
7x/week, 2 reps



Setup: Begin in a downward dog position, with your hands and feet flat on the floor.

Movement: Place one foot on the ground between your hands, rotate your back foot 90 degrees, then raise your arms toward the ceiling, keeping your front leg bent and back leg straight. Hold this position.

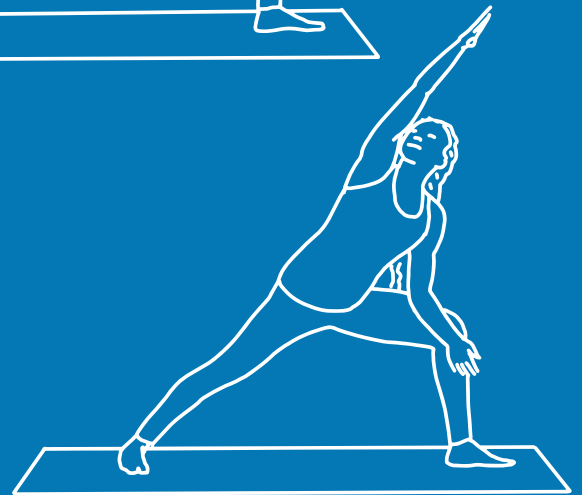
Tip: Make sure to perform these movements slowly and maintain your balance during the exercise. Reverse the movement to return to the starting position.





Warrior II to extended side angle

7x/week, 2 reps



Setup: Begin standing on your mat with your legs wide.

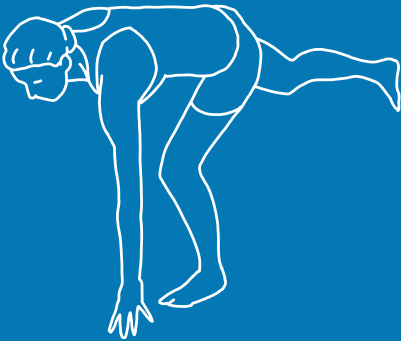
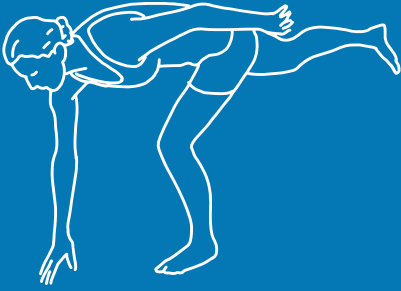
Movement: Turn your back foot in 15 degrees. Turn your front foot out 90 degrees. Bend your front knee toward 90 degrees, and place your arms parallel to the floor. Cut your front hip back to lean forward and place your front arm on your thigh. Reach your back arm overhead so that it makes a straight line from finger tips to back heel. Twist the chest gently upward toward the ceiling.

Tip: The hips are not square to the side of the mat (this places too much strain on your hips and front knee for most people). Keep some lift under your torso so that you avoid collapsing onto your front shoulder and thigh. The back leg should be strongly energized and lengthening. Take care that the front knee stays aligned with the second toe to keep the knee safe.



Single-leg balance with alternating floor reaches

7x/week, 2 sets, 10 reps each hand



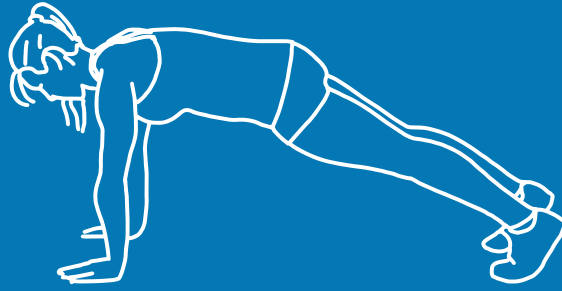
Setup: Begin in a standing upright position.

Movement: Bend forward at your hips, lifting one leg straight behind you, and reach toward the ground with one hand at the same time. Return back to the starting position and repeat with your other arm.

Tip: Make sure to maintain your balance and keep your back straight as you bend forward.

Mountain climbers fast

7x/week, 2 sets, 30 seconds each



Setup: Begin on all fours. Raise yourself into a push-up position.

Movement: Quickly alternate bringing your knees to your chest.

Tip: Make sure to keep your abdominals tight, back straight, and shoulders over your hands.



Lateral single-leg lunge jumps

7x/week, 2 sets, 30 seconds



Setup: Begin in a standing upright position.

Movement: Alternate taking small hops from one foot to the other, then continue increasing the distance of each hop until they are jumps, landing on each leg in a lunge position.

Tip: Make sure to keep your weight in your heels, focus on making your landings as soft as possible, and maintain control during the exercise. Do not let your knee move forward past your toe as you land.

Squat jumps

7x/week, 2 sets, 10 reps



Setup: Begin in a standing upright position with your feet slightly wider than shoulder-width apart.

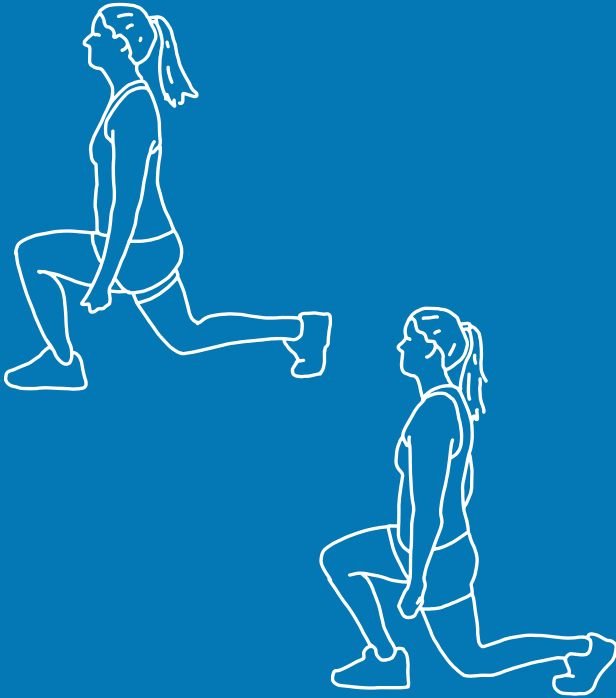
Movement: Lower yourself into a squatting position with your arms straight, then jump up, moving your arms back as you do. Land in a squat and repeat the movement.

Tip: Make sure your knees do not collapse inward or move forward past your toes as you land and try not to over arch your back.



Jump lunges

7x/week, 2 sets, 10 reps each leg



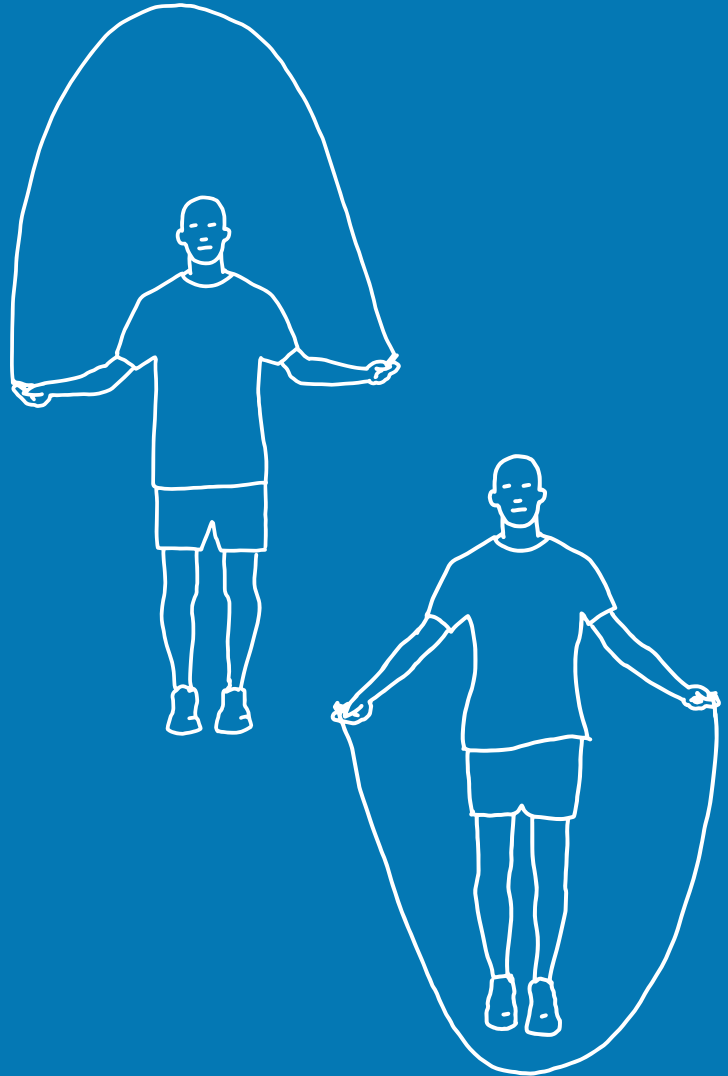
Setup: Begin in a lunge position.

Movement: Jump straight upward and switch the position of your legs, landing back in a lunge position. Continue these jumps, alternating your legs each time.

Tip: Make sure to keep your back straight and do not let your knees collapse inward or move forward past your toes as you land in the lunge.

Jumping rope

7x/week, 2-5 minutes



Setup: Begin in a standing upright position holding both ends of a jump rope.

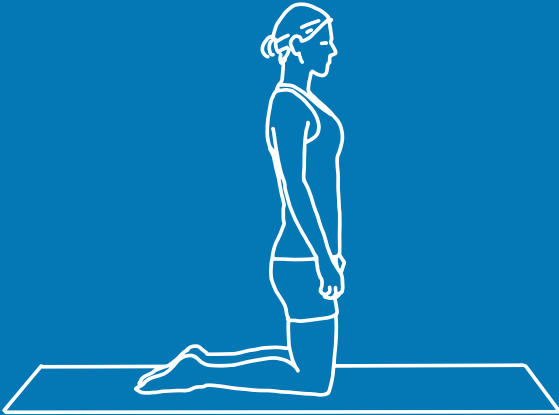
Movement: Swing the rope overhead then under your feet, jumping with both feet as it travels under you. Repeat these movements.

Tip: Make sure to keep your landings soft as you jump and maintain a consistent tempo. Alternate legs, double jumps, and tempo, as tolerated.



Heel sits

7x/week, 2 sets, 30-second hold



Setup: Begin in a tall kneeling position on the floor.

Movement: Slowly bend your knees until you are sitting on your heels. Hold, and then return to the tall kneeling position and repeat.

Tip: Make sure to perform this motion slowly and only move through a pain-free range of motion.

Soccer



When athletes play sports, their bodies adjust to being active and moving, and their tendons, muscles, ligaments, and brains adapt to certain types of movements. During prolonged periods of immobility or being away from sports, bodies tend to lose muscle strength, endurance, balance, and memory for skill movement patterns. Athletes who were not able to keep up with the right level of training during shelter-in-place orders may be at increased risk for injury upon returning to sports such as soccer.

Musculoskeletal injuries are common in soccer players. In a study of college athletes, the most common injury type was lower extremity strains.¹ Other common injuries in soccer players are knee and ankle sprains, concussions, and muscle contusions (bruises). Female soccer players are more at risk of tearing the anterior cruciate ligament (ACL), an important stabilizer of the knee for cutting types of movements.² Most ACL injuries are noncontact and happen from improper landing or pivoting. ACL tears often require surgery and result in a long road to recovery in a sport like soccer.

Multiple programs have been developed to prevent injury in soccer players. Injury prevention programs play an important role in helping athletes to prepare their bodies for high-level athletic competition. Building these types of exercises into a return-to-training program can help reduce

the risk of injury, and the ramp-up period during the COVID-19 pandemic may be a good time to incorporate them if that hasn't been done already.

The FIFA 11+ is a widely used injury prevention programs that was released in 2009 by Federation International de Football Association (FIFA). It has been studied in multiple countries and continents, and research shows that teams doing this program twice per week had a 20% to 50% reduction in injuries during the regular season.³ The program takes about 20 minutes and should be used as a warm-up during the regular season. It is not known if these exercises provide specific support for the body and immune system during the COVID-19 pandemic, but they are helpful in preparing to return to a high level of athletic activity. It is best to start slowly, paying careful attention to technique.

[A complete guide](#) to correct performance of the FIFA 11+ is available online.

Much of the conditioning that soccer players need can be done independently. Even when physical distancing is recommended, running, body weight exercises, and foot skills can be practiced individually. Returning to small-group training and practice activities will take more care, but they can be carried out while still following local public health recommendations and safety guidelines.

In a study of college athletes, the most common injury type was lower extremity strains.

Public health phases and considerations for return to **soccer**

Phase 1: Shelter-in-place

- Train at home with personal equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment (use own balls and nets).
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations.

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Keep groups consistent to better track contacts and limit cross-contamination.
- Coach on site, but maintain physical distancing.
- Avoid sharing equipment (e.g., goalie gloves, scrimmage vests, repeating throw in or goalie drills with multiple players).
- Complete cleaning of equipment should be done before switching users (e.g., wipe down all balls and goalie gloves).
- Maintain physical distance — no full contact.
- Spread players out across the field more than 6 feet.
- Restrict showering in a common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment if possible (e.g., towels, scrimmage vests, goalie gloves).
- If necessary, ensure proper cleaning of equipment before another athlete uses it.
- Avoid sharing water bottles.
- When appropriate, still space athletes across the field.
- When direct contact allowed — full practices with scrimmages, drills, etc., still maintaining attention to hygiene avoiding hands to the face.



References

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2. Mufty S et al., "Injuries in Male Versus Female Soccer Players: Epidemiology of a Nationwide Study," *Acta Orthopaedica Belgica*, 2015;81(2):289-95.
3. Al Attar WSA et al., "How Effective are F-MARC Injury Prevention Programs for Soccer Players? A Systematic Review and Meta-analysis," *Sports Medicine*, 2016;46(2):205-17.

Basketball and volleyball



Although basketball and volleyball are team sports, their athletes can do a lot of drills and conditioning on their own. Conditioning should include both aerobic (cardio) training and strength or resistance training, since both sports require a lot of vertical, jumping, and landing movements. The strength training should focus primarily on the lower body, given the high rate of ankle and knee injuries in both sports.^{1,2}

Side-to-side (lateral) movement exercises should also be included with aerobic and strength training to help with balance and stability of the legs. Good core stability can also decrease the risk of certain types of injuries. Upper-body strength is important in general, and volleyball hitters should follow the training recommended for overhead athletes. (See also overhead athletes chapter.)

As public health guidelines for group activities ease, more drills can be carried out. Individual drills come

first, with small-group drills to follow. Certain volleyball practice drills may allow for better physical distancing and can start sooner than basketball drills requiring player-to-player contact. Considerations for return to play are outlined on the following pages, with other specific exercise and training recommendations for these sports.

Because volleyball and basketball are sports where the ball is shared between players, contact can occur during a typical practice so close attention must be paid to cleaning balls, equipment, and surfaces. Every effort should be made for all athletes wash their hands immediately before and after practice. Athletes should be reminded not to touch teammates, lick fingers, or touch the face, eyes, and mouth during training and practice. Water bottles or towels should not be shared. Hand sanitizer should be readily available and used frequently.

Because volleyball and basketball are sports where the ball is shared between players, contact can occur during a typical practice so close attention must be paid to cleaning balls, equipment, and surfaces.

Public health phases and considerations for return to **basketball** and **volleyball**



Phase 1: Shelter-in-place

- Train at home with personal equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment such as balls, hoops, and cones.
- Lift with personal equipment.
- Virtual coaching.
- Follow public health recommendations.

Public health phases and considerations for return to **basketball** and **volleyball** continued

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Consistent groups to better track contacts and limit cross-contamination.
- Coach on site.
- Avoid sharing equipment. Consider having each player bring his/her own basketball/volleyball for drills.
- Clean equipment before switching users (wipe down basketball/volleyball).
- Stick to one basketball/volleyball for team drills and make sure the ball is cleaned after each possession/drill completion.
- Players should clean hands between drills.
- Maintain social distancing and avoid contact. If a 6-foot distancing recommendation applies, with basketball, passing/offensive drills could be conducted with players 6 feet apart, no defense. For volleyball, small-group work on passing or bump/set/spike drills forces the players to stay over 6 feet apart. Serve/return and dig drills also keep players 6 feet apart. Spike drills can be done with one setter and one spiker, keeping the two 6 feet apart. Do not use blockers on spikes since it would be less than 6 feet between spiker and blocker.
- Consider marking off the floor so 6 feet can be kept between positions/players on the court while doing 6-on-6 or 5-on-5 scrimmage. Each player is responsible for a part of the floor boxed out by tape.
- Players should clean hands at a break from the drill, and balls should be wiped down between drills.
- No more than 1 person per location doing a drill. For example, no lining up for layup or hitting drills. Depending on court size, space players out 6 feet apart during a drill and rotate positions. Focus attention on court movement, motion offense, set-ups, etc.
- Restrict showering in a common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment like towels and balls.
- Avoid sharing water bottles.
- Ensure proper cleaning of equipment before another athlete uses it.
- When appropriate, space athletes to minimize transmission.
- If the 6-foot distancing recommendation has been lifted, consider adding drills and scrimmage situations without screens or physical contact in basketball initially. When physical play is reintroduced, continue to remind players to avoid touching their faces, eyes, and mouth before, during, or after practice. Have hand sanitizer readily available and encourage frequent use.



Aerobic/cardio training

- May want to consider 2 types of training: sprint and distance.
- With distance, start with consideration about how much running you are currently doing. Start with warm up for 5 minutes first (walk/jog gradually), then aim for getting to your target heart rate for 20 to 25 minutes. Cool down for 5 minutes after (walk at the end).
- A simple way to do target heart rate is first get your maximum heart rate: 220 minus your age. Then calculate 70% to 75% of that number — that's a good gauge for what your heart rate should be during the run.
- Use the “talk test” — you should be able to say a sentence during running before taking a breath. If you can't, you are working too hard. If you can say many sentences, the workout is too easy.
- Slowly build up the frequency of your workout to 4 to 5 days a week over a 6 to 8 week period.
- When running for distance feels comfortable, add in sprint workouts during your run. Once you're running at a typical pace (a good initial goal is 10 minutes per mile), try to jog for 5 minutes, then sprint for 30 seconds, then return to jogging for 5 more minutes. Increase your sprint intervals to 1 minute once current level feels easy. Progressively increase this training until you can run for 4 minutes and sprint for 1 minute in continuous succession.



- **Defensive slide drills:** Simulate sliding up and down the court. Start with a series until you get fatigued, then rest 30 seconds to 1 minute, and then do again. Work up to doing this exercise 2 to 3 days a week, with a few days off in-between. As you progress, monitor the line between comfortable and challenging.
- Consider doing sprint drills independent of distance running. Jog for 5 minutes as warm-up, then sprint distance of basketball court (100 feet or about 30 yards).
- Set up cones and agility ladders to make courses for jumping and step-through exercises that help you work on form and explosion. L-cuts and V-cuts can be added, first without a ball, then later with a ball. An obstacle course can challenge you and help develop your dribbling drills.
- Stretching can be done every day.



Strength training and flexibility

(See following pages for exercises.)

- Strengthening of individual muscle groups should be included 2 to 3 days a week. Add rest days in between sessions for each muscle group.³
- Low back, hip flexor, and hamstring stretches are important, particularly if you have been sitting a lot due to COVID-19.
- Strengthening the legs and core is important for jumping, landing, and lateral movement. A lot of different programs are available.
- **Band walks (hip abduction and adduction):** Use bands or ankle weights, making sure the knees stay centered over the feet and do not buckle inward.
- **Ankle strengthening with bands or ankle weights:** Inversion and eversion. Resistance bands are a good choice and can be purchased online. Varying the resistance levels will allow for progression over time, much like increasing weights at the gym.
- **Push-ups, biceps, and triceps weight work as well as rows for general arm strengthening.** Biceps curls and overhead triceps extensions can be done with objects around the house that approximate a hand weight. With attention paid to good form, start with a lighter weight and progress as strength slowly improves. Attempt 3 sets of 15 to 20 reps, or — if a light weight is being used — continue until fatigued.
- **Plyometrics:** Improve explosive movements and jumping. Before beginning plyometrics, make sure you have made timely progress through general lower body strengthening. Avoid these exercises while you are injured.
- For volleyball, a good rotator-cuff and shoulder blade strengthening program is an important addition; see rotator-cuff program exercises on the following pages. Do these exercises 2 to 3 times a week; a good routine is 3 sets with 10 to 12 repetitions. (See also Overhead athletes chapter.)



Other sport-specific drills

Basketball

- **Shooting:** With a hoop at home, do free throws, set shots from different spots, post moves, and layups; work both hands. With no hoop at home — lay on a bed and make a practice shooting motion with each hand, watching for the flight of the ball, and working on it being straight with a smooth release.
- **Ball handling:** Stationary drills to start, starting with one ball and then two. Practicing looking up, not at the ground. Toss a small ball (for example, a tennis ball) against a wall and catch with one hand while dribbling with other hand to help develop hand-eye coordination. Add a fast-hands drill with ball barely off ground, crossovers, and jump/stop drills working both hands. Practice dribbling forward and backward, changing direction and diagonals, working on ball pressure (change speed of dribble and weakside/strongside drives). Set up obstacle courses with cones and chairs to act as defenders.
- **Passing:** Practice chest, bounce, overhead, and basketball passes by throwing into a net or off a wall. Work on emphasizing your form with arc throws and then progress to more flat, hard passes at same distance. Once flat passes at short distances are going well, progress to further distances.
- **Defense:** Set up a virtual defender (such as a bucket, chair, or cone) and practice close outs and signaling “ball ball ball” or “I have help.”
- **Mental preparation:** Review offense or defense sets including the responsibilities of each player on the play. Mentally walk through each position to know where teammates are to help improve ball movement and team play.

Volleyball

- **Sets and bumps:** See how many you can do in a row. Add bumps against a wall, aiming for targets. Depending upon the space available, establish targets higher up to practice setting the ball at the proper height and angle for spikers.
- **Spiking:** Start with tossing the ball up as a set and practice hitting toward a target. Vary the target to practice hitting to different parts of the court. Practice taps over blockers in the same manner.
- **Serving:** Try hitting into a net that’s set at a proper height (a few inches above net height). Work on bump, overhand, and jump serves this way.



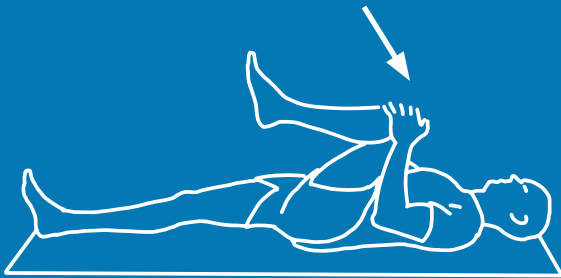
References

1. Conway J, McGuire DT, “Basketball.” In: Madden CC et al. (eds.), *Netter’s Sports Medicine, 2nd Ed.*, 2018, p 570-4.
2. Eerkes K, “Volleyball.” In: Madden CC et al. (eds.), *Netter’s Sports Medicine, 2nd Ed.*, 2018, p 575-9.
3. American College of Sports Medicine, “Resistance Training Program Design” (Ch. 12), *Foundations of Strength Training and Conditioning*, 2012, p 214.



Suggested dynamic warm-up exercises

Back and hip stretching



Lie on your back with your legs straight.

Using your hands, slowly pull one knee toward your chest until you feel a gentle stretch in your lower back.

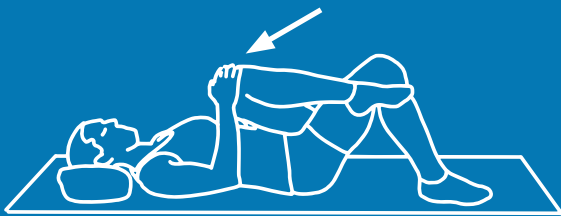
Make sure to keep your back relaxed and flat on the ground during the stretch.



Lie on your back with your knees bent and feet resting on the floor.

Keeping your back flat, slowly rotate your knees down toward the floor until you feel a stretch in your trunk and hold.

Make sure that your back and shoulders stay in contact with the floor.



Lie on your back with both knees bent and feet resting flat on the ground. Cross one leg over the other so your foot is resting on your knee.

Grab your leg just below the knee and slowly draw it toward your opposite shoulder until you feel a stretch in your buttocks.

Don't allow your back to twist or bend excessively during the stretch.



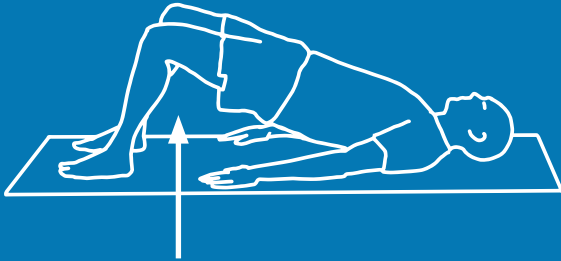
Begin sitting upright with one leg straight forward and your heel resting on the ground.

Bend your trunk forward, hinging at your hips until you feel a stretch in the back of your leg. Hold this position.

Make sure to keep your knee straight during the stretch and do not let your back arch or slump.



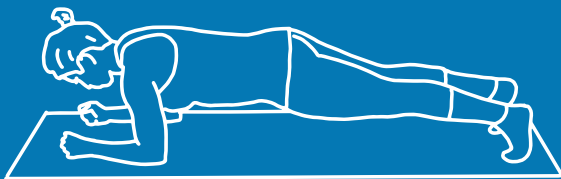
Core-strengthening exercises



Lie on your back with your arms resting at your sides, your legs bent at the knees and your feet flat on the ground.

Tighten your abdominals and slowly lift your hips off the floor into a bridge position, keeping your back straight.

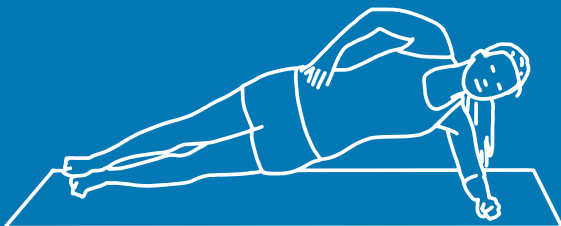
Make sure to keep your trunk stiff throughout the exercise and your arms flat on the floor.



Lie on your front, propped up on your elbows.

Engage your abdominal muscles and lift your hips and legs up into a plank position, keeping your elbows directly under your shoulders. Hold this position.

Make sure to keep your back straight and maintain a gentle chin tuck during the exercise.



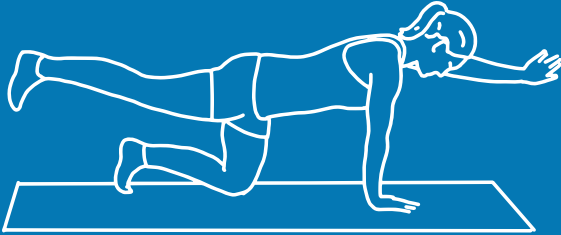
Lie on your side with your feet stacked, resting on your elbow.

Lift your hips off the floor so your body is in a straight line and your hips and shoulders are facing forward. Hold this position.

Make sure to keep your head in line with your trunk, do not let your hips drop toward the floor, and do not roll forward or backward during the exercise.



Core-strengthening exercises continued



Begin on all fours, with your arms positioned directly under your shoulders.

Straighten one arm and the opposite leg at the same time, until they are parallel to the floor. Hold briefly, then return to the starting position. Repeat with other arm and leg.

Make sure to keep your abdominals tight and hips level during the exercise.



Lie on your back with your knees bent, feet resting on the floor, and your fingers resting on your stomach just above your hip.

Tighten your abdominals, pulling your navel in toward your spine and up. You should feel your muscles contract under your fingers. Hold this position, then relax and repeat.

Make sure to keep your back flat against the floor and do not hold your breath as you tighten your muscles.



Lie on your side with your feet stacked, resting on your elbow.

Lift your hips off the floor so your body is in a straight line and your hips and shoulders are facing forward. Hold this position.

Make sure to keep your head in line with your trunk, do not let your hips drop toward the floor, and do not roll forward or backward during the exercise.



Lateral band walks

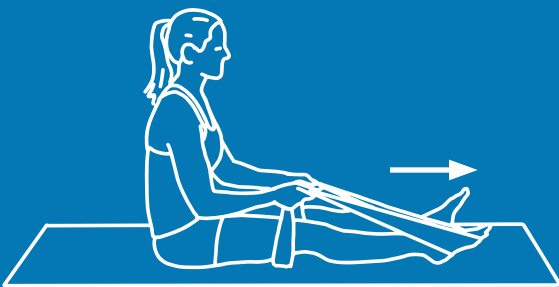


Stand upright with a resistance band looped around your ankles.

Bend your knees slightly so you are in a mini squat position. Slowly step sideways, maintaining tension in the band.

Make sure to keep your feet pointing straight forward and do not let your knees collapse inward during the exercise.

Ankle strengthening



Sit upright on the floor with your legs straight and a resistance band secured around one foot. Make sure the band is looped around the bottom of your foot and hold the end in your hand.

Bend your foot away from your body, creating further tension in the band.

Make sure to keep your toes relaxed and maintain good sitting posture.



Sit upright on the floor with a resistance band secured around one foot. Make sure the band is looped around the bottom of your foot and hold the end in your hand.

Move the foot with the resistance band away from the other foot by rotating your ankle outward, then slowly return to the starting position and repeat.

Make sure to avoid any hip movement.



Ankle strengthening continued



Sit upright on the floor with your legs crossed and a resistance band secured around one foot. Make sure the band is looped around the bottom of your foot and hold the end in your hand.

Move the foot with the resistance band away from the other foot by rotating your ankle inward, then slowly return to the starting position and repeat.

Make sure to avoid any hip movement.

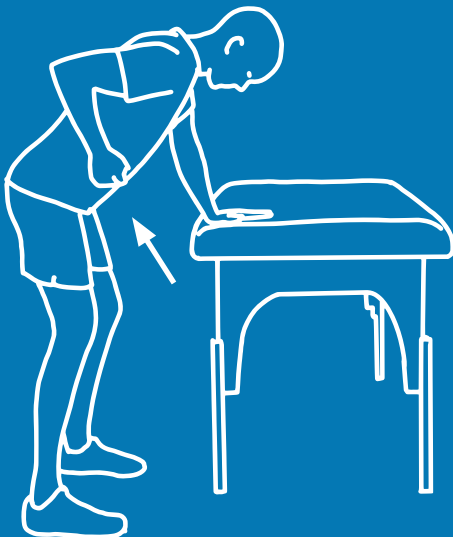


Sit upright on the floor with your legs straight and a resistance band secured around one foot. You should be facing the anchor point.

Pull the top of your foot toward your body, creating more tension in the band.

Make sure to keep your toes relaxed and maintain good sitting posture.

Upright row



Stand next to a table. Bend your trunk forward and rest one hand on the table for support. Your other arm should be hanging toward the ground.

Make a sawing motion with your arm — pull your elbow upward, lower it back down, and repeat.

Make sure to keep your back straight during the exercise and do not shrug your shoulder.



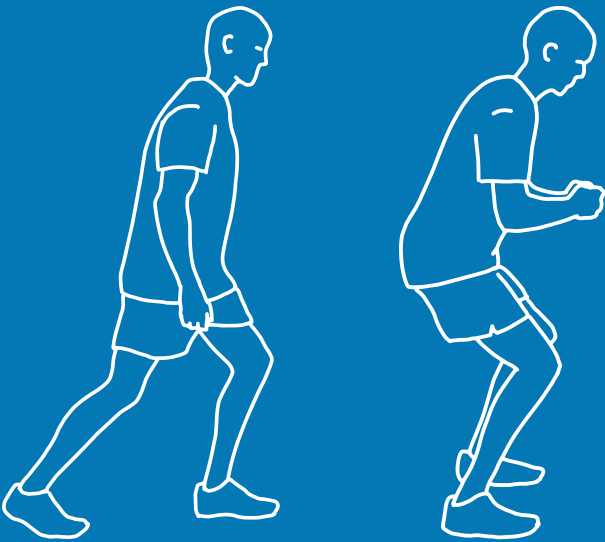
Plyometric exercises



Take a staggered stance position before a wall. Place your forearms or hands in front of you on the wall.

Lift your back leg, bringing your knee toward your chest, and raise the heel of your standing leg at the same time. Return to the starting position and repeat.

Make sure to keep your abdominals tight and maintain your balance during the exercise. Do not arch your back as you lift your leg.



Stand in an upright position.

Step forward with one foot, then lightly hop forward off that foot and land solidly on both feet.

Make sure to stick your landing, and do not let your knees collapse inward when you land from the jump.



Plyometric exercises continued



Begin in a standing, upright position.

Jump up off both feet and land on one. Briefly hold to regain your balance, then return to the starting position and repeat.

Make sure not to let your knee collapse inward as you land from the jump.

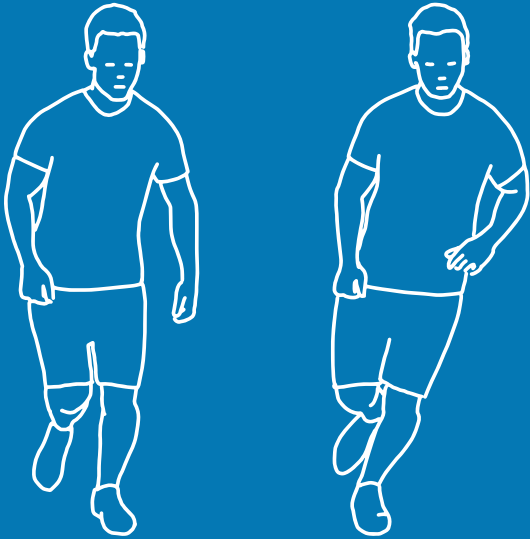


Begin in a standing, upright position.

Alternate taking small hops from one foot to the other, then continue increasing the distance of each hop until they are jumps, landing on each leg in a lunge position. Make sure to keep your weight in your heels, and focus on making your landings as soft as possible, and maintain control during the exercise. Do not let your knee move forward past your toe as you land.



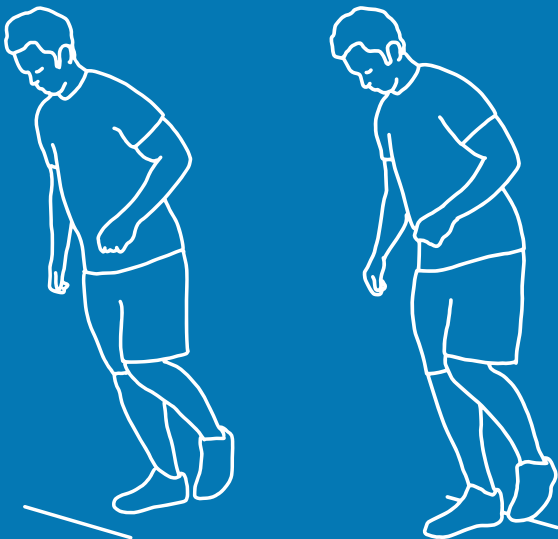
Plyometric exercises continued



Begin in a standing, upright position with a vertical line directly to your side, standing on one foot.

Jump over to the other side of the line, landing on the same foot, then jump back without pausing.

Make sure not to let your knee collapse inward as you land from each jump, and keep your foot facing forward.



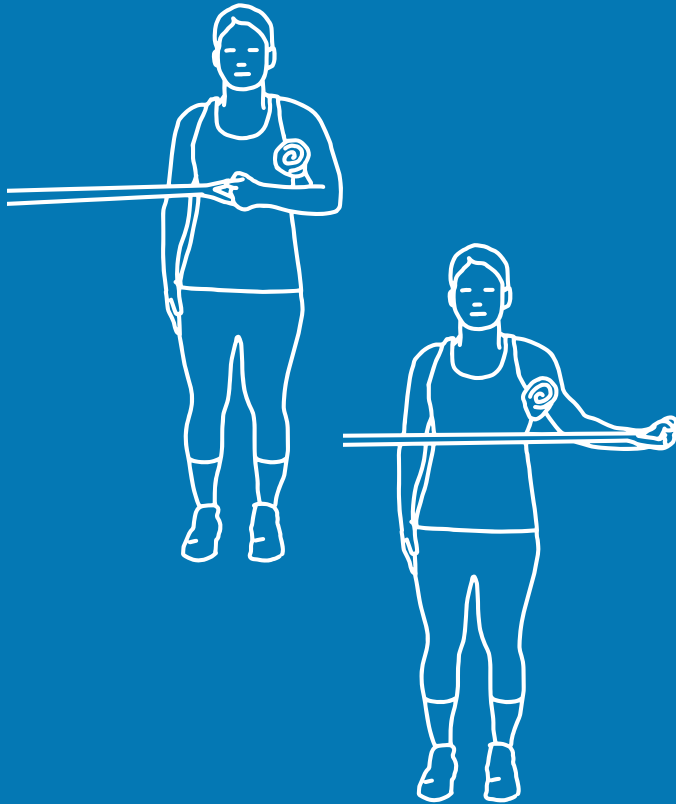
Begin in a standing, upright position, balancing on one foot, with a line on the ground in front of you.

Jump forward across the line with the same foot, then jump back and repeat

Make sure not to let your knee collapse inward as you land from each jump, and keep your foot facing forward.



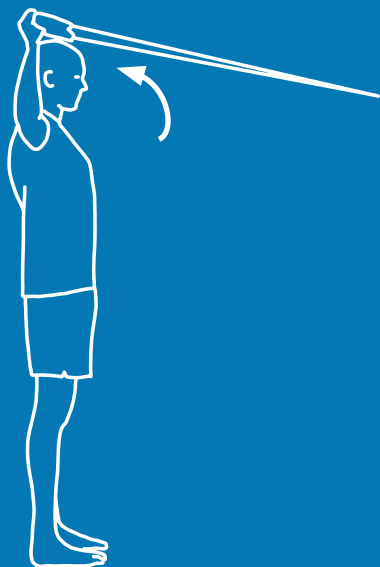
Rotator-cuff and shoulder blade program



Begin standing upright with your elbow bent at 90 degrees and a towel roll tucked under your arm, holding a resistance band that is anchored out to your opposite side.

Rotate your arm out to your side, pulling against the resistance, then slowly return to the starting position and repeat.

Make sure to keep your hips and shoulders facing forward and maintain a gentle chin tuck. Do not shrug your shoulders during the exercise.



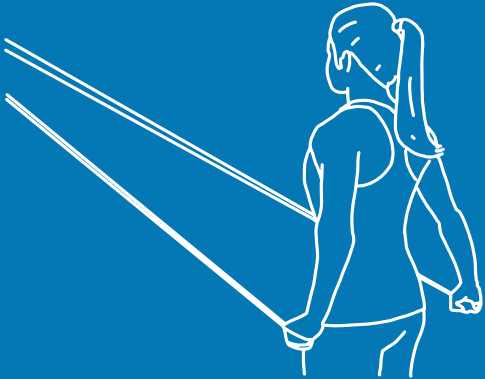
Begin in a standing, upright position with one arm out to the side and your elbows bent 90 degrees with your palm facing the floor.

Slowly rotate your arm upward until your palm is facing forward and hold.

Make sure not to let your elbow drop as you rotate your arms and maintain a gentle chin tuck throughout the exercise.



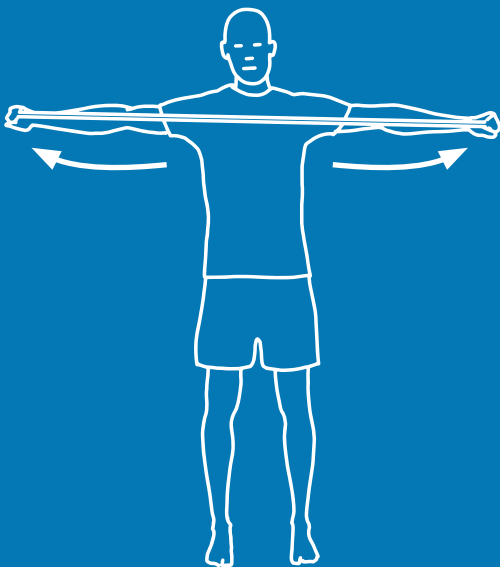
Rotator-cuff and shoulder blade program continued



Begin standing, upright with your arms straight forward and palms facing inward, holding the ends of a resistance band that is anchored overhead in front of you.

Pull your arms down to your sides, squeezing your shoulder blades together. Then bring them back up to the starting position and repeat.

Make sure to keep your elbows and back straight, and do not shrug your shoulders during the exercise.



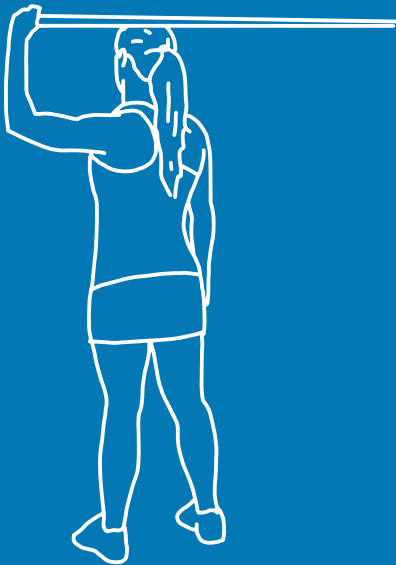
Begin in a standing, position holding a resistance band in each hand with your arms straight in front of your body and fists facing the floor.

Pull your hands apart until they are directly to your sides, then return to the starting position and repeat.

Make sure to keep your arms level and think of squeezing your shoulder blades together as you pull the band. Maintain good posture during the exercise and avoid shrugging your shoulders.



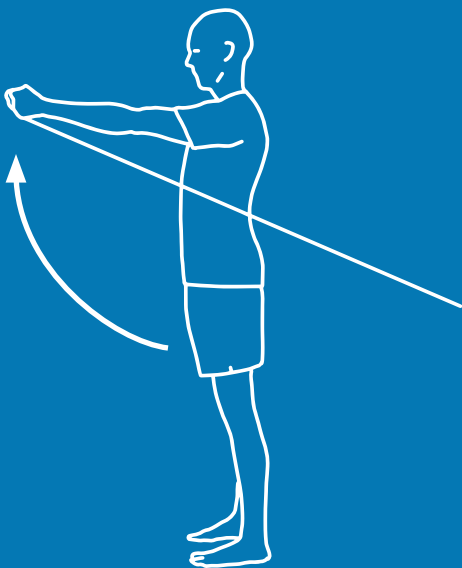
Rotator-cuff and shoulder blade program continued



Begin in a standing, upright position with your arm out to the side, bent at 90 degrees, holding a resistance band anchored behind you at shoulder height

Rotate your arm forward, without letting your elbow drop, then slowly return to the starting position and repeat.

Make sure to keep your back straight and do not shrug your shoulder during the exercise.



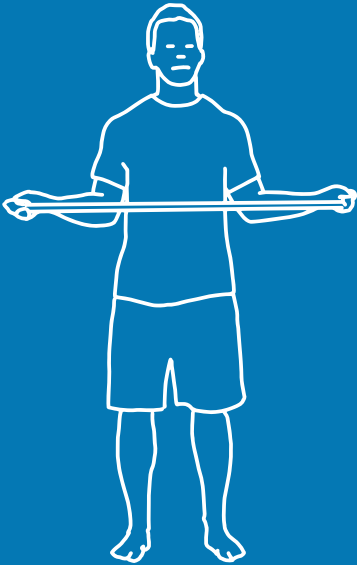
Begin in a standing, position holding one end of a resistance band with your arm at your side. You should be facing away from the anchor point.

Leading with your thumb, pull against the resistance band, lifting your arm straight in front of your body, then return to start and repeat.

Make sure to keep your elbow straight and do not shrug your shoulder during the exercise.



Rotator-cuff and shoulder blade program continued



Begin in an upright, standing position with your arms by your sides, holding a resistance band in both hands. Bend your elbows to approximately 90 degrees with your palms up.

Slowly rotate your forearms out to the side. As you do so, pinch your shoulder blades down and back together. Pause briefly, then return to the starting position.

Make sure that you keep the bend in your elbows as you rotate your arms. Avoid shrugging your shoulders.



Begin sitting in an upright position.

Gently squeeze your shoulder blades together, relax, and then repeat.

Make sure to maintain good posture during the exercise.

Overhead sports (baseball, softball, swimming, water polo, volleyball)



As sports start picking up, it is important to consider the risks and rewards of returning to sports after a long rest period. Overhead sports carry a high risk of overuse and stress injuries to the shoulder and elbow, especially in younger athletes. It is exciting to get back to sports, but advancing anything too quickly increases the risk of injury, especially stress injuries. Major League Baseball, for example, spends almost 2 months of spring training before the baseball season starts. Other athletes are no less fragile than these high-level athletes. Gradually returning to play program is a great way to revisit skills such as glove work and swing form and prevent injuries that can occur from ramping up activity to high intensity too quickly. The following exercises and training suggestions can help athletes get ready for baseball, softball, swimming, water polo, and volleyball, and facilitate the transition from individual training to small groups and ultimately team practices.

Baseball and softball

Throwing: All athletes returning to throwing, especially after time off, should consider a throwing program to prepare for high-level use over time.

- Start with no more than 45 feet of throws (30 feet for softball/little league).
- All throws should have just enough power to reach the target with some arc; no flat/overpowered throws for this portion.
- Progress to 60, 75, 90, 120, 150, and 180 feet every 3 to 4 days for position players (45, 60, 75, 90, 120, and 150 feet for softball/little league players). Throw every other day with 2 rounds of throwing per distance and 50 and 75 throws total in each round (e.g., 50 for round 1, 75 for round 2).

Sample progression:

- **Day 1:** 45 feet – 25 throws, rest, 25 throws – stop
- **Day 3:** 45 feet – 25 throws, rest, 25 throws, rest, 25 throws – stop
- **Day 5:** 60 feet (warm-up at shorter distance first) – then 25 throws, rest, 25 throws – stop
- **Day 7:** 60 feet (warm-up first) – then 25 throws, rest, 25 throws, rest, 25 throws – stop

We recommend at least 1 day off from throwing to allow recovery from the stress of throwing the day prior. Some athletes may need 2 to 3 days of rest at first if the arm is feeling sore for more than 1 day after throwing.



If soreness occurs at any point in this progression, the athlete should rest for an extra day. If the pain is more than just soreness, they should stop for at least 1 to 2 days and return at a lower number or intensity than the level that caused pain. If pain persists, seek medical help. Soreness is not uncommon and can be a sign of muscle recovery. If an athlete continues to push through soreness too many times in a row, tissue may break down faster than it can recover, and more significant injury can result.

Pitching:

- Start after progressing to 120 feet using the sample progression on page 84.
- Pitching should have a program of throwing 1 day followed by 2 days off.
- Start with fastball only. Highly recommend 4-seam fastballs, if the pitcher throws this with the goal of throwing with 50% effort for first 2 rounds, 75% for 2nd 2 rounds, and 90% for 3rd 2 rounds.
- Start fastball with some live pitching or batting practice. Goal should still not be 100% throwing speed but rather to work on ball placement and fastballs only. Start 15 throws day 1 of live hitting, then 30, 45, and 60.
- Add off-speed pitches starting with pitches that the player is familiar and consistent with, then build on more complicated pitches.
- Live pitching and advancement to full effort pitching may start. Count pitches and consider stresses placed on the arm with each off-speed and high-effort fastball.
- At each phase, some soreness (pain described as no more than 2 out of 10) is okay and sometimes expected, but anything beyond 2 should be a concern and warrant another day off or a move back to the previous step. If pain persists for over a week or with any attempt to get past a step, a physician should be consulted.

Catching:

- As with pitching progression, throw downs can start after reaching 120 feet on the general throwing program.
- Start with working on squat position, catching balls, and blocking drills.
- Start with 25 to 50 balls on day 1.
- Progress by about 10 balls per day.
- When at 100 balls with blocking and receiving, start working on the leg shift to practice throws and bringing arm into the cocking stage with an actual throw. Goal here is to concentrate on leg work to either pop up into a throw or shift hip and weight to make a throw.
- Then work on throw downs, first with simple throws that need at least 1 hop to 2nd base (about a 70% effort).
- As this improves, effort to throw the ball can increase by 10% every other day with 1-day break.
- Progression generally completed over 4 to 6 weeks.

Hitting:

- May need a slower progression if an athlete has not been active for an extended period away from practice to decrease the risk of injury.
- Consider starting with simple tee work focusing on swing form and consistency without worrying about power.
- Add soft toss or other similar hitting that creates adjustments to different ball position, still focusing on swing form and not power.
- Start back to cage work, live whiffle, and drills that focus on adding more power into swing form and increase use of accessory muscles prone to strain like the obliques (muscles on the side that aid in rotation through a swing).
- Progress to live hitting with fastballs only.
- Progress to live hitting with fastballs and off-speed pitches.

Public health phases and considerations for return to **overhead sports**



Phase 1: Shelter-in-place

- Train at home with personal equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment (use own balls, nets, and tees).
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations.

Public health phases and considerations for return to **overhead sports** continued

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Keep groups consistent to better track contacts and limit cross-contamination.
- Coach on site, but maintain physical distancing.
- Avoid sharing equipment (e.g., playing catch, using same catcher equipment).
- Completely clean equipment before switching users (use one bucket of balls per person, then wipe down all baseballs, softballs, volleyballs before changing users).
- Anyone using a ball should use alone in a designated area. The area should be cleaned before another uses it (in volleyball, a hitter can hit from one side of the net, but nobody else should touch the ball, retrieve the ball, etc., and that ball and floor space should be wiped afterward.)
- Maintain physical distance — no full contact.
- No more than 1 person per location doing a drill (no lining up athletes to hit from the same spot in volleyball).
- Restrict showering in common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment if possible (e.g., water bottle, towel, catcher gear). If necessary, ensure proper cleaning of equipment before another athlete uses it (e.g., catching equipment, baseball/softball bat).
- When appropriate, still space athletes (e.g., avoid large groups in dugout).
- When direct contact allowed, resume full practices with scrimmages, drills, etc.



Volleyball

Hitting/serving/passing: Once volleyball players are ready to start hitting, follow a progression to get the body used to the hitting process:

- **Week 1:** Start with bumping and setting. Work from 20 hits each on day 1 and progress by 10 hits each day or up to 20 hits every other day.
- **Week 2:** Start overhead hitting and serving without jumping. Work on a controlled motion and getting the arm into a consistent arm slot. Same progression of 20 hits on day 1 and progress by 10 hits daily or 20 hits every other day.
- **Week 3:** Start overhead hitting and serving (when serving this way) with jumping. Now work on coordinating the set/toss up, arm slot, and coordinating the jump again. Work on form as the primary goal. Since overhead work is already established, start at 50 hits on day 1 of this week. Then progress by 10 hits more per day or up to 20 hits every other day.

In other overhead sports, if soreness or pain develops during this progression the athlete should rest for an appropriate amount of time to recover and seek medical help as needed.



Swimming and water polo

Follow local public health guidelines regarding access to community pools. Before they open, establish a dryland program to build strength and reduce the risk of injury. A similar progression as described for throwing in water polo can be adapted for swimming.

- **Week 1:** Start with simple strokes working on form and focusing on kickboard work.
- **Week 2:** Progress laps and distance, not focusing on speed. Continue to develop form and progress to more work on form such as diving and kick turns.
- **Week 3:** Continue to build on distance, endurance, and efficiency of the stroke.
- **Week 4:** Work on building up speed and start adding true speed and time-based training.

Throwing: Follow the same progression as swimming, with additional work on building up strength for effective throwing in the water. As strength improves, throwing may progress.

- **Week 1:** Start with dryland throwing, focusing on short distances. Throws should be enough to get the ball the intended distance with an arc.
- **Week 2:** Work on a combination of advancing distance on dryland and doing simple throws in the water (e.g., coordinating the kick and throw).
- **Week 3:** Progress overhead throwing effort and distance as appropriate to skill levels of the athletes. This may take another 1 to 2 weeks or up to 2 to 4 weeks depending on the individual and how much work they were doing to keep the arm in a throwing program while not in the water.

If soreness develops at any point in these progressions, the athlete should rest for an extra day. If pain develops that feels like more than short-term soreness, the athlete should rest for at least 1 to 2 days and return at a lower effort level than the one associated with the pain. If pain persists, the athlete should seek medical help. Soreness is not uncommon and can be a sign of muscle recovery. However, if an athlete continues to push through soreness too many times in a row, it may cause a breakdown of the tissue faster than it can recover and result in a more significant injury.

Public health phases and considerations for return to **swimming**

Phase 1: Shelter-in-place

- Train at home with personal equipment/pools.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations.

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Keep groups consistent to better track contacts and limit cross-contamination.
- Coach on site, but maintain physical distancing.
- Avoid sharing equipment (e.g., kickboards, fins, towels) or completely clean the equipment before switching user (e.g., scrub with soap and water, wipe, and completely dry).
- Maintain physical distance — no full contact.
- Allow no more than 1 person per lane, although evidence suggests that water like that in a pool has a low likelihood of transmission, so multiple athletes swimming at same time is reasonable.
- Restrict showering in common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment if possible (e.g., water bottles, towels, goggles).
- If necessary, ensure proper cleaning of equipment before another athlete uses it (e.g., kickboard, fins).
- When direct contact allowed more than 1 person can swim per lane and social distancing requirements may be relaxed.

Public health phases and considerations for return to **waterpolo**



Phase 1: Shelter-in-place

- Train at home with personal equipment/pools.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations.

Public health phases and considerations for return to **waterpolo** continued

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Keep groups consistent to better track contacts and limit cross-contamination.
- Coach on site, but maintain physical distancing.
- Avoid sharing equipment (e.g., use own ball, wipe down all gym equipment between athletes).
- Complete cleaning of equipment should be done before switching users.
- Dryland practice should have only one user of the ball.
- In water, may be safer to have 1-2 contacts of ball, but still limit number of users of ball.
- Maintain physical distance — no full contact.
- No more than 1 person per location doing a drill and maintain appropriate distancing when practicing (e.g., no scrimmages, no games).
- Swimming in water polo may occur as in swimming section.
- Restrict showering in common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment if possible (e.g., water bottles, towels, goggles).
- If necessary, ensure proper cleaning of equipment before another athlete uses it (e.g., kickboard, fins).
- When direct contact allowed more than 1 person can swim per lane and social distancing requirements may be relaxed.





Suggested exercises

Overhead athletes are encouraged to start a home program that focuses on a Thrower's 10 program to start training the shoulder and other important supporting structures. Players should also work on a good foundation of leg work and core exercises.

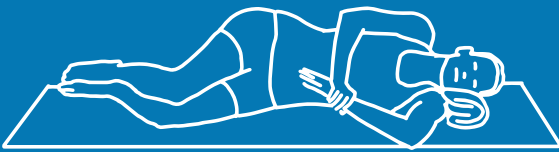
Sleeper stretch



Begin by lying on your side with your bottom arm bent upward at a 90-degree angle.

With your other arm, apply a gentle downward pressure until you feel a stretch in your shoulder.

Make sure not to let your body roll forward or backward during the exercise.

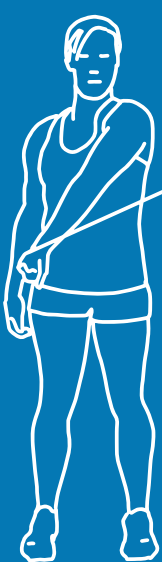




Thrower's 10 exercise program

The Thrower's 10 program is designed to exercise all the major muscles necessary for throwing, in an organized and concise way. All exercises here are specific to the thrower and are designed to improve the strength, power, and endurance of the shoulder complex musculature.

1. Diagonal pattern

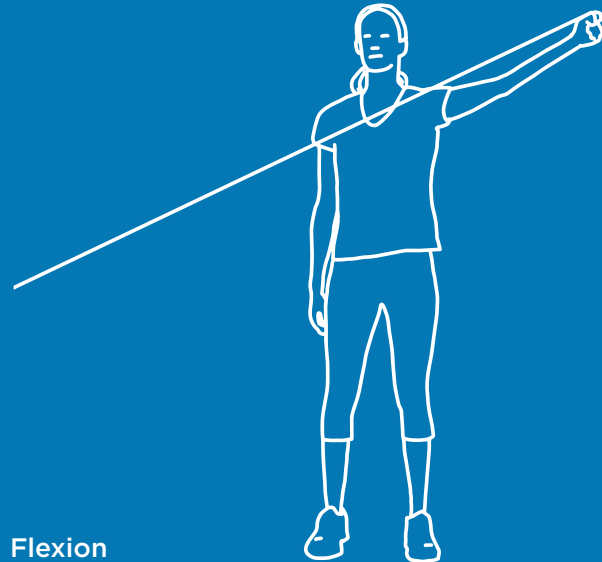


Extension

Involved hand will grip tubing handle overhead and out to the side. Pull tubing down and across your body to the opposite side of leg. During the motion lead with your thumb.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



Flexion

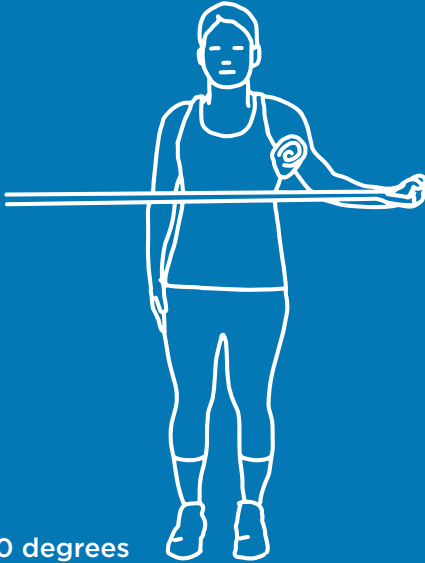
Gripping tubing handle in hand of involved arm, begin with arm out from side 45 degrees and palm facing backward. After turning palm forward, proceed to flex elbow and bring arm up and over uninvolved shoulder. Turn palm down and reverse to take arm to starting position. Exercise should be performed in controlled manner.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



2. Rotation

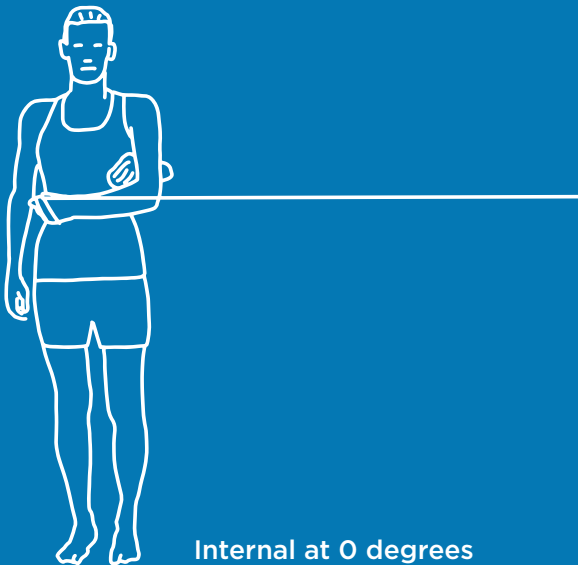


External at 0 degrees

Abduction: Stand with involved elbow fixed at side, elbow at 90 degrees and involved arm across front of body. Grip tubing handle while the other end of tubing is fixed. Pull out with arm, keeping elbow at side. Return tubing slowly and controlled.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



Internal at 0 degrees

Abduction: Standing with elbow at side fixed at 90 degrees and shoulder rotated out. Grip tubing handle while other end of tubing is fixed. Pull arm across body keeping elbow at side. Return tubing slowly and controlled.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



2. Rotation continued

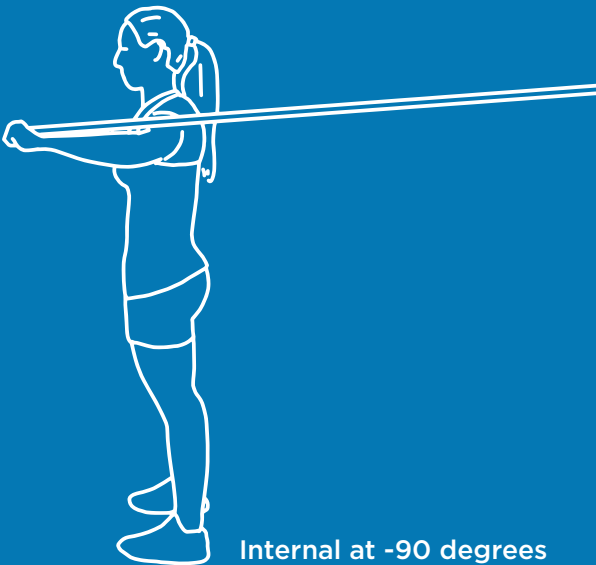


External at -90 degrees

Abduction: Stand with shoulder abducted 90 degrees and elbow flexed 90 degrees. Grip tubing handle while the other end is fixed straight ahead, slightly lower than the shoulder. Keeping shoulder abducted, rotate shoulder back keeping elbow at 90 degrees. Return tubing and hand to start position.

Slow speed sets: (slow and controlled): Perform 1 set of 15-20 repetitions 2 days/week

Fast speed sets: Perform 1 set of 20 repetitions 1 day/week



Internal at -90 degrees

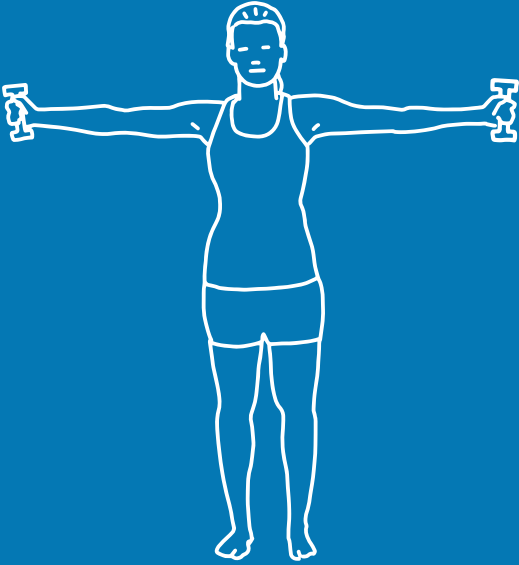
Abduction: Stand with shoulder abducted to 90 degrees, externally rotated 90 degrees, and elbow bent to 90 degrees. Keeping shoulder abducted, rotate shoulder forward, keeping elbow bent at -90 degrees. Return tubing and hand to start position.

Slow speed sets: (slow and controlled): Perform 1 set of 15-20 repetitions 2 days/week

Fast speed sets: Perform 1 sets of 20 repetitions 1 day/week



3. Shoulder abduction to 90 degrees



Begin in a standing upright position with your arms resting at your sides, holding a dumbbell in each hand.

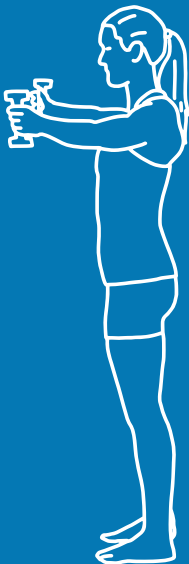
Keeping your elbows straight, raise both arms directly out to your sides with your thumbs up, then lower them back down and repeat.

Make sure to keep your back straight and do not shrug your shoulders during the exercise.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week

4. Scaption with dumbbells



Begin in a standing upright position with your arms resting at your side, grasping lightweight dumbbells

Slowly raise your arms diagonally at roughly a 30-degree angle from your body, then lower your arms back to your sides.

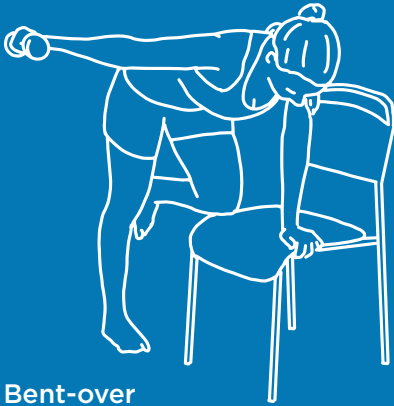
Make sure to keep your elbows straight and avoid shrugging your shoulders.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



5. Horizontal shoulder abduction



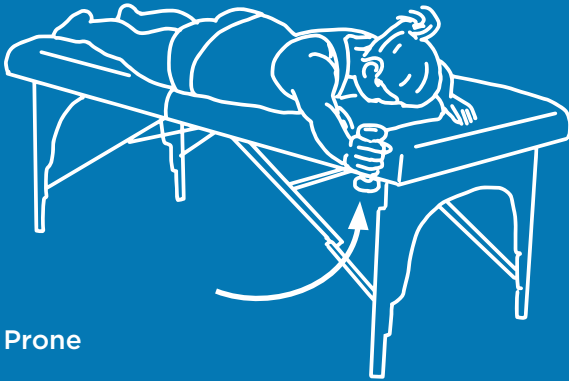
Bent-over

Neutral: Begin kneeling over a chair with one foot on the ground, holding a dumbbell in your hand, palm facing inward.

Raise your arm directly to your side with your elbow straight, then lower it back down and repeat.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



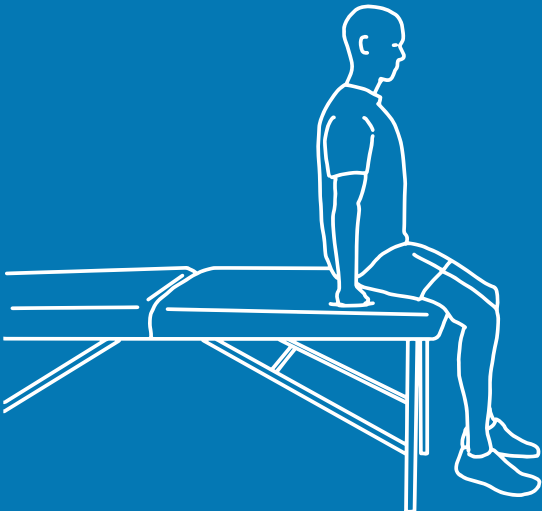
Prone

Full external rotation, 100 degrees of abduction: Lie on table, face down, with involved arm hanging straight to the floor, and thumb rotated up (hitchhiker). Raise arm out to the side with arm slightly in front of shoulder, parallel to the floor. Hold 2 seconds and lower slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week

6. Press-ups



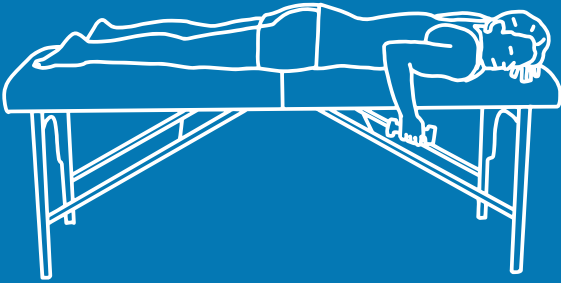
Seated on a chair or on a table, place both hands firmly on the sides of the chair or table, palm down and fingers pointed outward. Hands should be placed equal with shoulders. Slowly push downward through the hands to elevate your body. Hold the elevated position for 2 seconds and lower body slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



7. Prone rowing



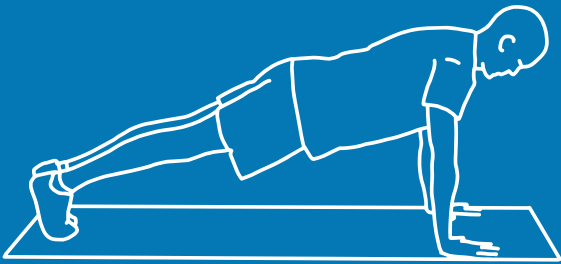
Lie on your stomach with your involved arm hanging over the side of the table, dumbbell in hand, and elbow straight. Slowly raise arm, bending elbow, and bring dumbbell as high as possible. Hold at the top for 2 seconds, then slowly lower.

Make sure to keep your back straight and do not shrug your shoulders during the exercise.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week

8. Push-ups



Start in the down position with arms in a comfortable position. Place hands no more than shoulder width apart. Push-up as high as possible, rolling shoulders forward after elbows are straight. Start with a push-up into wall. Gradually progress to tabletop and eventually to floor as tolerable.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



9. Elbows

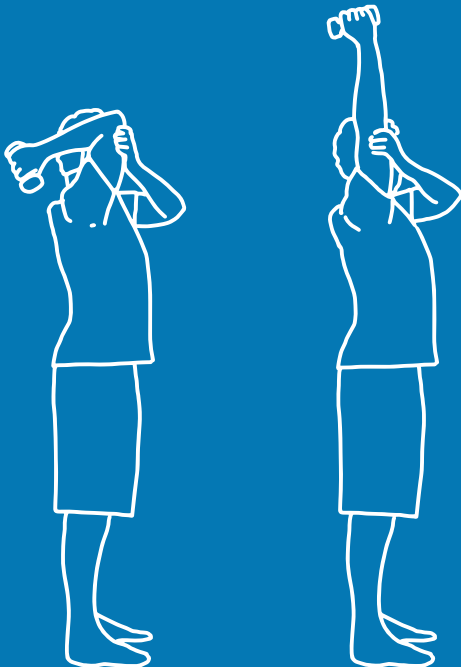


Flexion

Standing with arm against side and palm facing inward, bend elbow upward turning palm up as you progress. Hold 2 seconds and lower slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



Extension

Raise involved arm overhead. Provide support at elbow from uninvolved hand. Straighten arm overhead. Hold 2 seconds and lower slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



10. Wrists



Extension

Supporting the forearm and with palm facing downward, raise weight in hand as far as possible. Hold 2 seconds and lower slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week

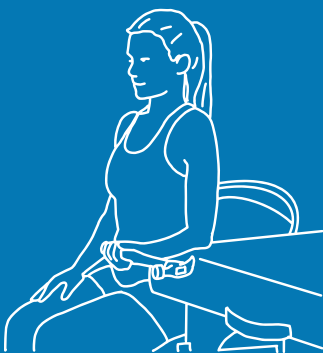


Flexion

Supporting the forearm and with palm facing upward, lower a weight in hand as far as possible and then curl it up as high as possible. Hold for 2 seconds and lower slowly.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week

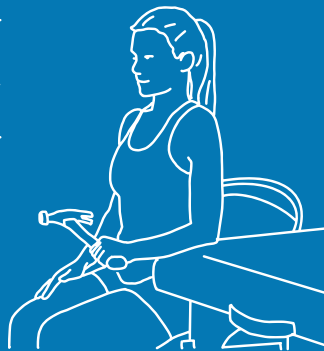


Supination

With forearm supported on table and wrist in neutral position, using a weight or hammer, roll wrist taking palm up. Hold for a 2 count and return to starting position.

In season: 1 set of 10 repetitions 1–2 days/week

Out of season: 2 sets of 10 repetitions 2–3 days/week



Pronation



Core/lower-body exercises:

In addition to the Thrower's 10 program, include a core program to establish a good foundation for overhead athletes. Whether you are on dry ground or in the water, these exercises are key to both strength and skill for throwers and swimmers to succeed.

Dead bug

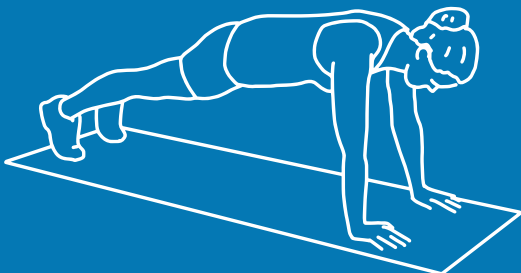


Setup: Begin lying on your back with your legs bent.

Move: Lift your legs and arms off the ground, keeping your knees bent. Lower one arm to the ground and lower your opposite leg at the same time. Repeat with your opposite arm and leg, then continue this movement.

Tip: Make sure to keep your abdominals stiff as you lower your arm and leg, and do not let your low back arch off the ground.

Front plank



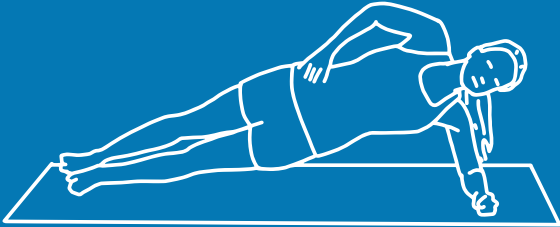
Setup: Begin on all fours with your arms directly underneath your shoulders and extend your legs backward so your body is in a plank position and hold.

Tip: Make sure to keep your back straight, abdominals tight, and maintain a gentle chin tuck throughout the exercise.

Alternative: hold plank while on elbows.



Side plank

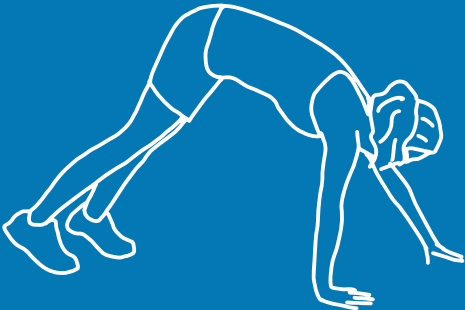


Setup: Begin lying on your side with your feet stacked, resting on your elbow.

Move: Lift your hips off the floor so your body is in a straight line and your hips and shoulders are facing forward. Hold this position.

Tip: Make sure to keep your head in line with your trunk, do not let your hips drop toward the floor, and do not roll forward or backward during the exercise.

Bear crawl

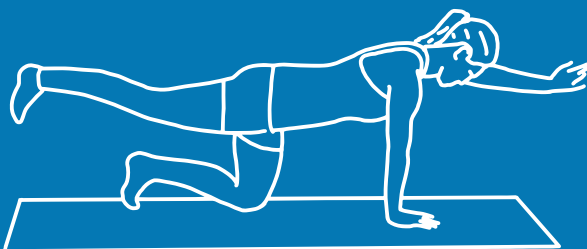


Setup: Begin on all fours with your legs straight.

Move: Walk forward, keeping your legs straight and moving your opposite arm and leg at the same time.

Tip: Make sure to look down toward the ground during the exercise.

Bird dog



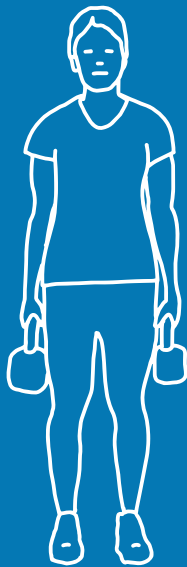
Setup: Begin on all fours, with your arms positioned directly under your shoulders.

Move: Straighten one arm and your opposite leg at the same time, until they are parallel to the floor. Hold briefly, then return to the starting position.

Tip: Make sure to keep your abdominals tight and hips level during the exercise.



Farmer's carry



Setup: Begin standing in a flat open space with two kettlebells on the ground at your sides. Lunge down to pick up a kettlebell in each hand.

Move: Walk forward, keeping your stomach muscles engaged, torso upright, and shoulders down and back.

Tip: Make sure to keep your core engaged and maintain your balance as you walk. Do not shrug your shoulders or let your trunk lean forward, backward, or sideways during the exercise.

Wrestling



Returning to a close contact sport like wrestling after COVID-19 poses unique challenges. Wrestling relies heavily on direct physical contact for practice and skill mastery. Beyond the strength and endurance that a wrestler builds by running, jumping rope, and doing resistance training, it requires specific conditioning to hold positions and attempt escapes.

Stabilizing the body by generating the force needed not to be moved by an opponent (isometric strength) often involves intense energy expenditures, even without any movement. This type of training can be much harder without the actual direct force the wrestler is trying to oppose or redirect. Because of limitations on what wrestlers can practice on their own, a gradual progression of drills should be used once contact practice resumes.

Weight management is another consideration for wrestlers after a prolonged time away from training. Governing bodies of high school and collegiate wrestling in the United States have developed programs to discourage excessive weight loss or fluctuations in weight. Wrestlers may not be paying attention to their weight during the COVID-19 shutdowns as they did during their seasons.

Before competition returns, wrestlers would benefit from considering how far off they are from their

target weight and instituting changes slowly over time. The National Collegiate Athletic Association (NCAA) and the National Federation of State High School Associations (NFHS) recommend no more than 1.5% body mass loss per week.¹ Starting a healthy eating program in advance of the return of team practices can allow athletes to reach their goal weights safely and effectively.

Another consideration for wrestlers after a prolonged time away from training is weight management.

Acute injuries in wrestlers are common and can happen to any part of the body. In high school, the most commonly injured body parts in practice and competition are the head and face, and shoulder and collarbone, whereas for college wrestlers it is the knee and then the head and face.²

Head protection is an important part of preventing injury, and extra care must be taken to properly clean head protection when training resumes. While ramping up training, wrestlers should focus on a balanced strength, aerobic, and flexibility program to meet their sport's demands on the entire body.

In earlier phases of shelter-in-place public health recommendations, strengthening and aerobic conditioning can be done with little equipment or access to facilities. Finding suitable drills or simulations that can be done while physical distancing as recommended is more of a challenge. Nonetheless, even before wrestlers are able to resume traditional contact practice, they can still maintain strength, speed, endurance and agility.



USA Wrestling released Return-to-the-Mat Guidelines in May 2020,³ which are similar in format to those of the U.S. Olympic and Paralympic Committee. Local health recommendations should be used to guide progression through the different phases. Among the recommendations for progressing to contact activities is to live in the training location for 14 days prior to starting group training, such as at an Olympic training facility. That isolation period is not possible for wrestlers who live at home and have contact with the rest of their family and community. Even on college campuses maintaining enough isolation to avoid spread of the virus can be challenging as athletes encounter many individuals who are also still in contact with their local communities and not living in isolation.

The challenge is that few wrestlers outside of Olympic training centers would have access to such a tightly controlled environment. Living in the same neighborhood or going to the same school will not meet the requirement, as each wrestler would be exposed daily to others in their house or area who have themselves been in contact with others. This would not limit the potential exposure to and spread of COVID-19. The challenge will be finding ways for wrestlers to progress their skill training when they can't live at a special training facility.

Suggested exercises

Wrestlers can adapt the USA Wrestling Plus warm-up program while training at home individually (see following pages).⁴ In the early phases of training, these full-body exercises can be done with things around the house as a substitute for a partner. For example, paired stretching can be done on the wall instead of leaning on another wrestler. Pulling exercises can be done with a fixed handrailing, and push-ups can be done on the ground or with the feet securely up on a step. Once contact is permitted, partner drills can resume.

In the early phases while gyms and training facilities remain closed, resistance training will vary depending on the type of equipment that wrestlers have at home. If dumbbells are not available, body weight exercises can help athletes maintain strength. The American College of Sports Medicine's Foundations of Strength Training and Conditioning program can be introduced and modified depending on which equipment is available at different phases of training.⁵ Given the stress wrestling places on the body, strength and resistance training is important to protect the joints before returning to practice.

References

1. Kiningham R, Monseau A, "Wrestling." In: Madden CC et al. (eds.), *Netter's Sports Medicine, 2nd Ed.*, 2018, p 670-6.
2. Kroshus E et al., "The First Decade of Web-Based Sports Injury Surveillance: Descriptive Epidemiology of Injuries in US High School Boys' Wrestling (2005-2006 Through 2013-2014) and National Collegiate Athletic Association Men's Wrestling (2004-2005 through 2013-2014)," *Journal of Athletic Training*, 2018(Dec);53(12):1143-55.
3. USA Wrestling, "[Return to the Mat Guidelines.](#)" as of June 11, 2020.
4. USA Wrestling, United World Wrestling, Dutch Wrestling, "[Wrestling Plus: Warm Up Program.](#)"
5. Ratamess N, *Foundations of Strength Training and Conditioning*, American College of Sports Medicine, 2020, p 442.

Public health phases and considerations for return to **wrestling**



Phase 1: Shelter-in-place

- Train at home with personal equipment.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside on a suitable surface if available (e.g., personal mat).
- Lift with personal equipment.
- Virtual coaching.
- Follow public health recommendations.

Public health phases and considerations for return to **wrestling** continued

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Consistent groups to better track contacts and limit cross-contamination.
- Coach on site, but continue to maintain physical distancing and recommend wearing a face covering.
- Coaches should not demonstrate technique on the wrestlers or other coaches.
- Avoid sharing equipment.
- Take care of mouthguards and helmets to avoid contamination.
- Pay special attention to frequent mat cleaning.
- Participants should use their own equipment and avoid touching each other with their hands.
- Maintain physical distancing and avoid contact.
- Add noncontact wrestling drills without a partner.
- If a dummy is being used for drills, make sure only one athlete is using one specific dummy at a time. The dummy needs to be cleaned using a disinfectant solution before any other coach or wrestler uses the dummy to prevent transmission.
- Clean hands frequently.
- Restrict showering in common locker room.
- Discourage sharing of shampoo, conditioner, and other personal products.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on site.
- Limit sharing of equipment such as towels and balls.
- Avoid sharing water bottles.
- Ensure proper cleaning of equipment before another athlete uses it.
- When appropriate, space athletes to minimize transmission.
- When the 6-foot distancing recommendation has been lifted, add contact drills avoiding mixing of partners to limit exposure.
- Slowly build back up to full training loads.
- Gradually increase practice group sizes from Phase 3 versus having the whole team practice together at first practice.
- When physical play is reintroduced, continue to remind players to avoid touching their faces, eyes and mouth before, during or after practice. Have hand sanitizer readily available and encourage frequent use.



Suggested exercises: The Wrestling Plus Warm-Up Program

Note that until Phase 4 or when the physical distancing recommendation has been lifted, athletes should not use partners, but instead stay distant from one another and improvise by exercising against a wall or using a secure railing.

Shoulder rotations

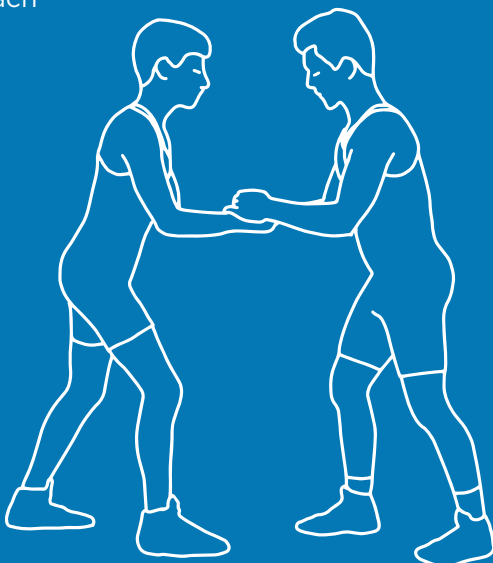
45 seconds total



Jog in place while rotating the shoulders forward and backward.

Grips

45 seconds each

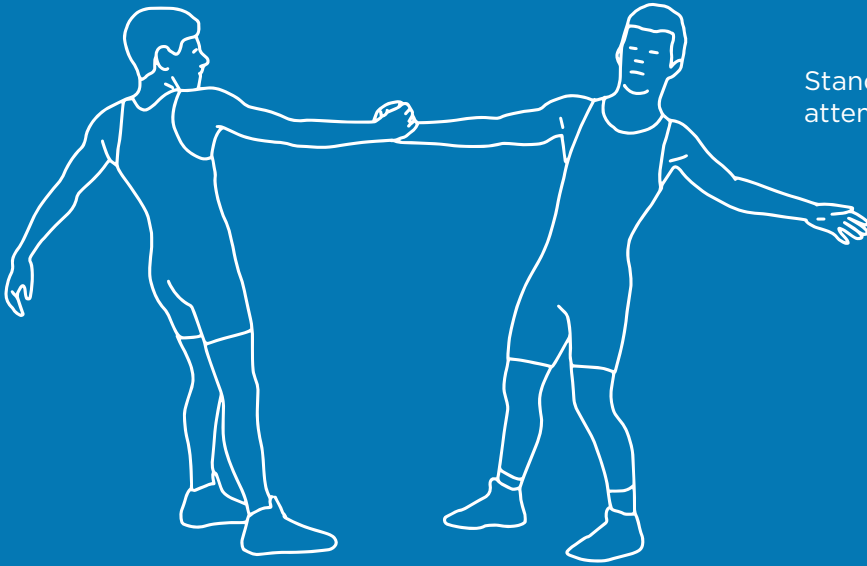


Stand facing each other. Pull your partner's hands up and down.



Pull each other

45 seconds each hand



Stand facing each other. Grasp hands and attempt to pull each other.

Shoving hands alternately

1 minute



Stand facing each other. Press against each other having one elbow flex and the other extended.



Neck

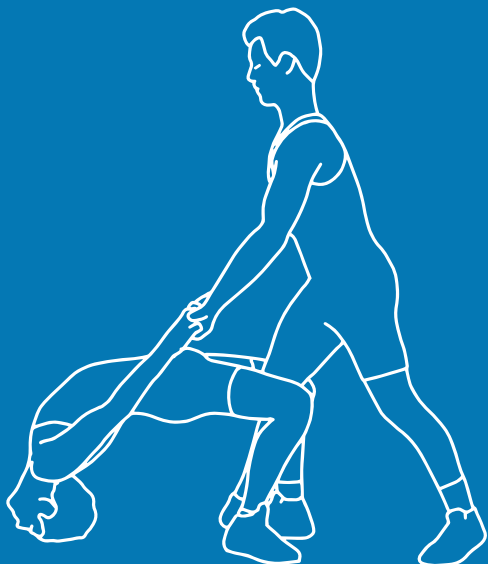
20 seconds each movement



Sit on the back of your partner and force the neck in different directions, down and up and side to side.

Bridge

45 seconds each

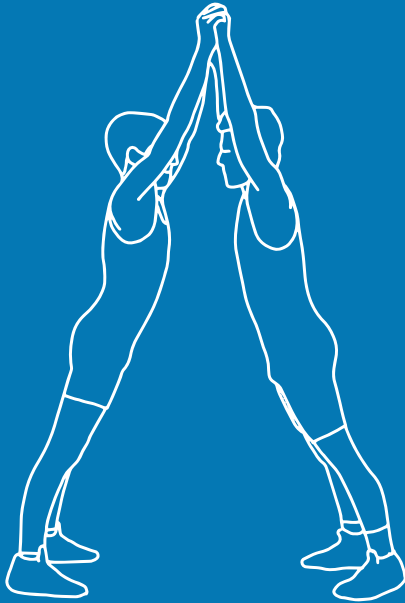


Stand facing each other. One athlete drops back to bridge position with their partner's support.



Shoving hands

2 sets, 1 minute each



The athletes grasp hands with arms bent. Both try to shove the hands of the other, extending their wrists over their heads.

Shoving hands in squatting position

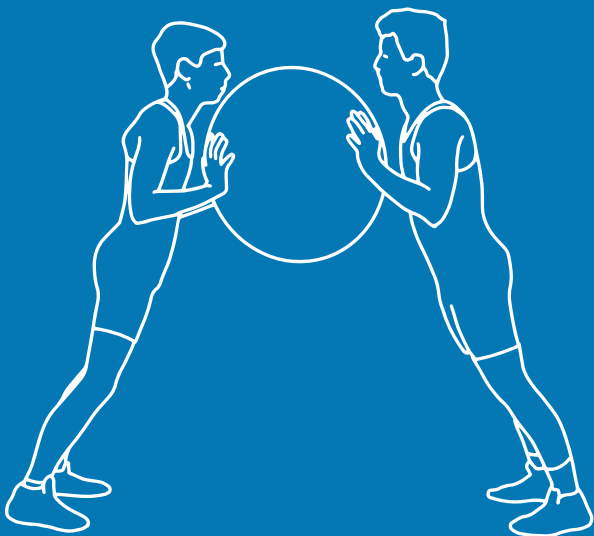
2 sets, 1 minute each



The athletes try to shove the hands of the other while both bend knees and extend shoulders.

Shoving fit-ball

2 sets, 1 minute each

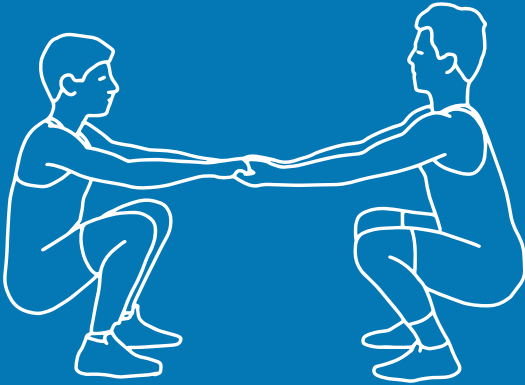


Try to shove the fit-ball, extending wrists overhead.



Pulling

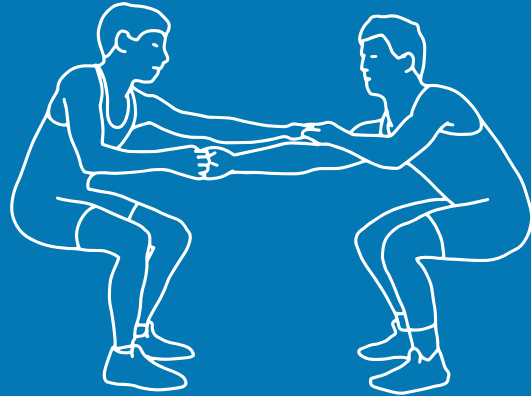
2 sets, 1 minute each



Grasp hands with arms extended and knees flexed 90 degrees. Try to flex knees more and return to original position.

Pulling alternately

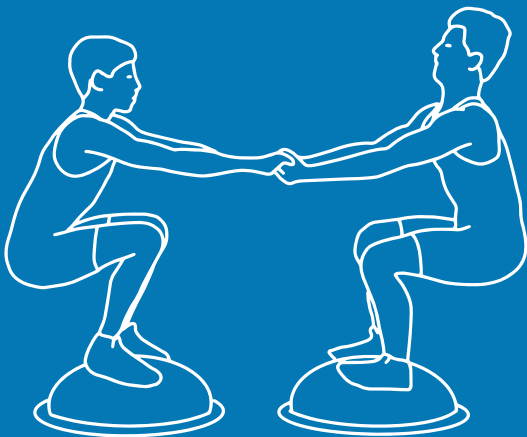
2 sets, 1 minute each



Grasp hands. Both athletes alternately extend and flex the elbow.

Pulling on Bosu

2 sets, 1 minute each

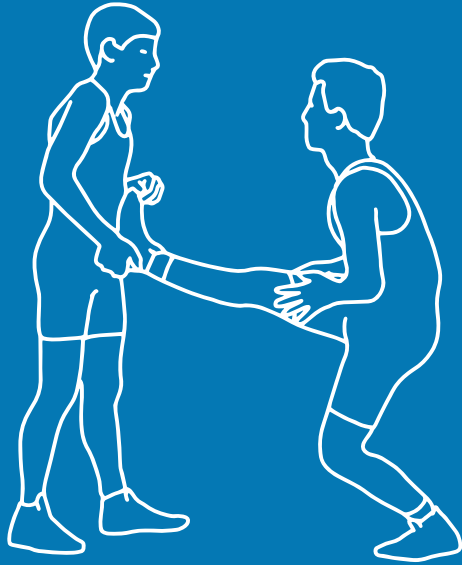


The athletes stand on Bosu and grasp each other's hands with arms extended and knees flexed 90 degrees.



One-leg stance

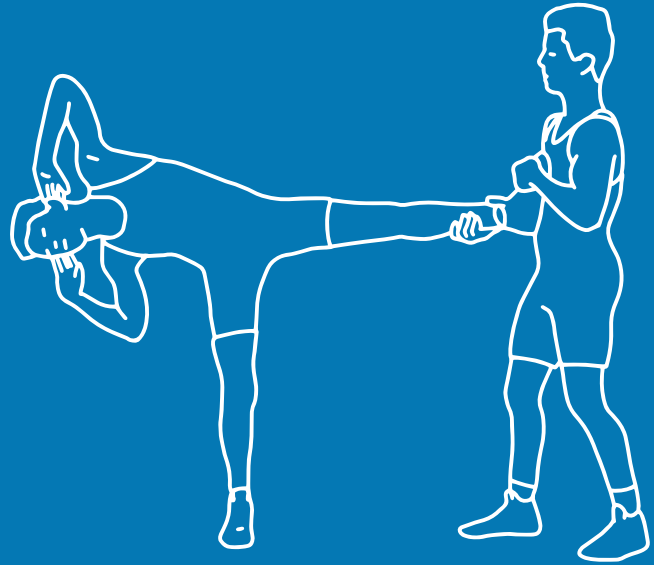
30 seconds, each leg



Hold one of your partner's legs straight while they try to squat and straighten the other.

One leg, side rotation

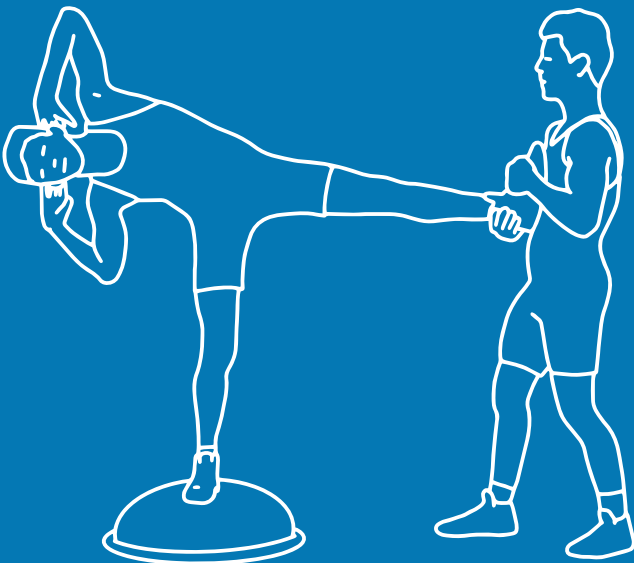
30 seconds, each leg



Rotate the standing leg to the side. Try to keep both legs straight while turning the body laterally.

One leg, side rotation on Bosu

30 seconds, each leg

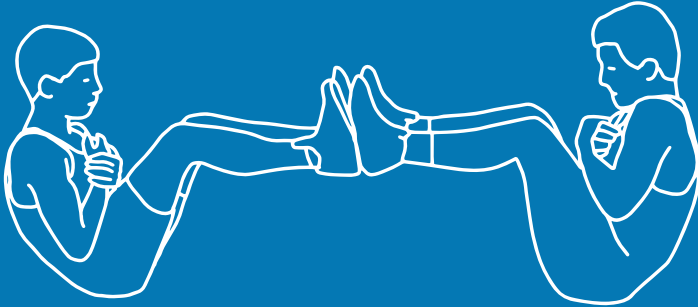


With one athlete standing on Bosu and the other holding their leg, rotate the standing leg to the side. Try to keep both legs straight while turning the body laterally.



Combat with raised legs

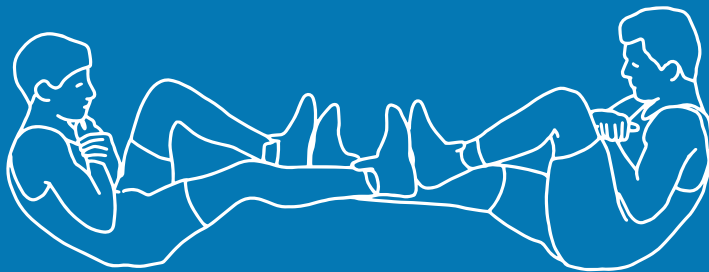
2 sets, 30 seconds each



The athletes sit with legs slightly bent, soles touching. Push the other partner.

Combat with raised legs alternately

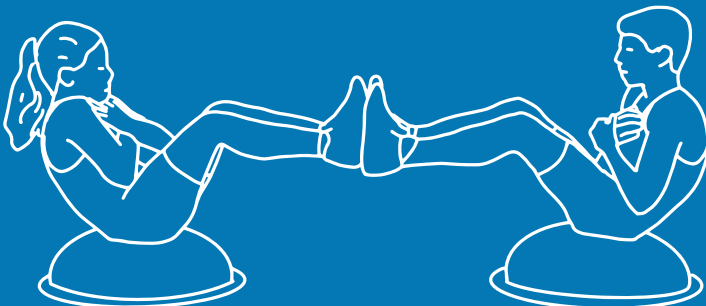
2 sets, 30 seconds each



Push the other partner and alternately try to extend and flex the knees.

Combat with raised legs on Bosu

2 sets, 30 seconds each

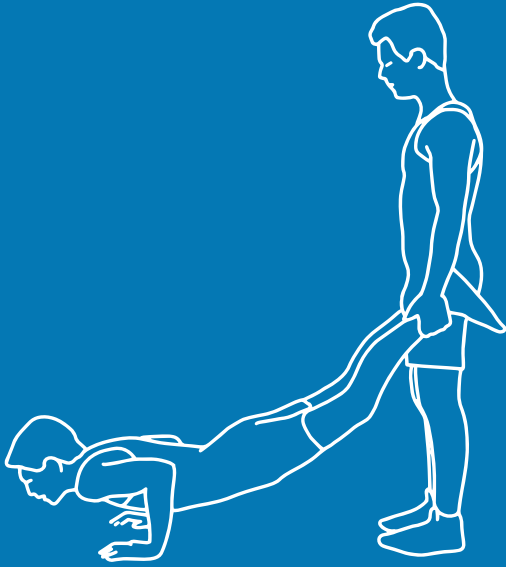


The athletes sit on Bosu. Their legs should be slightly bent, soles touching. Push the other partner.



Push-ups

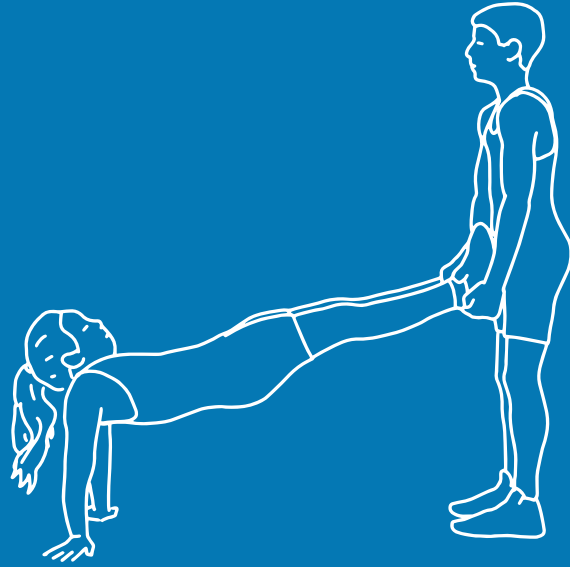
45 seconds each



The athlete does push-ups while the other partner holds their feet in the air.

Push-ups, supine

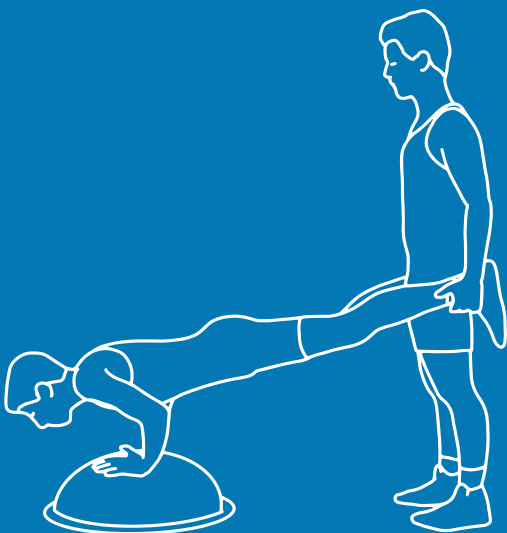
45 seconds each



The athlete does push-ups in supine position while the other partner holds their feet in the air.

Push-ups on Bosu

45 seconds each

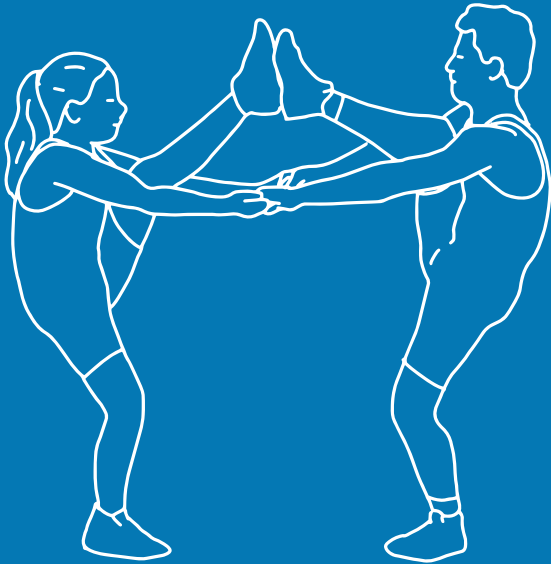


The athlete does push-ups on Bosu while the other partner holds their feet in the air.



One-leg extension

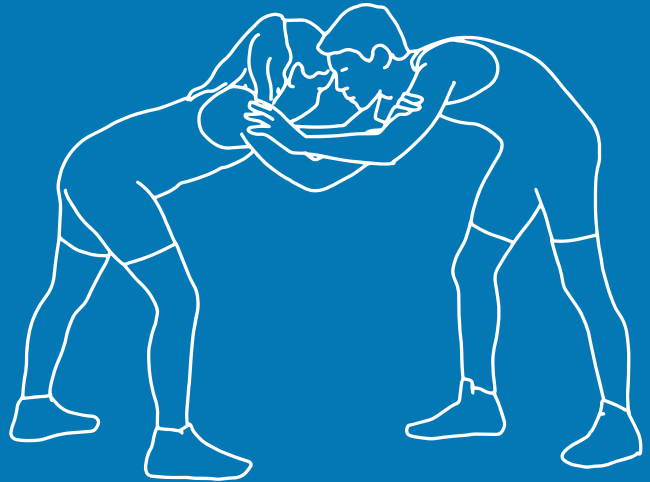
30 seconds, each leg



With 1-leg stance and soles of feet together, try to extend the leg upward.

Standing wrestling

1 minute total



Athletes stand facing each other and make wrestling movements (pummel, fakes, hand fighting, etc.)

Pushing wrestling

30 seconds, each athlete



The athlete stands behind the other partner and pushes while the athlete in front works to maintain position (stance).



Sample exercises for a 15-week periodized strengthening program for wrestlers

Monday

- Hang clean (progressing to power clean)
- Bench press
- Close-grip bench press
- Shoulder press
- Pull-up progressions: wide grip, towel, weighted or unilateral
- Internal/external rotations
- Medicine ball Russian twist
- Stability ball crunches
- Manual resistance — neck

Wednesday

- Back squat
- Overhead squat
- Front squat
- Unilateral leg press
- Split squat/lunge
- Stiff-leg deadlift
- Back extensions
- Calf raise
- Thick bar deadlift
- Plyometric leg raise
- Trunk stabilization (plank)

Friday

- Power snatch
- Bent-over barbell row
- Close-grip lateral pull-down
- Weighted dips
- Pullovers
- Push-up progression: basic, stability ball, medicine ball plyo push-ups
- Partner plate pass (following local health department phase recommendations)
- Weighted curl-ups
- Wrist and reverse curls

Source: ACSM's Foundations of Strength Training and Conditioning, by Nicholas Ratamess. 2012; American College of Sports Medicine: p442

Racquet sports



With shelter-in-place restrictions slowly being lifting, athletes are preparing to return to hard courts. Tennis, racquetball, badminton, and pickleball are all great ways to get cardiovascular exercise. These sports can be played while keeping a 6-foot distance from others, but proper precautions are still necessary for safe and responsible play.

In May 2020, the United States Tennis Association (USTA) released recommendations for preparing and returning to playing tennis safely.¹ While these recommendations are specifically for tennis, the principles can be applied to all racket sports.

As athletes prepare to return to play, it's vital to slowly ramp-up activity and adequately warm up to prevent injuries. The USTA recommends at least 3 weeks of on-court and off-court conditioning before returning to competitive play.

The most common injuries seen in racquet sports are:

- Lateral epicondylitis (tennis elbow)
- Medial epicondylitis (golfer's elbow)
- Wrist tendinitis
- Rotator-cuff strains and tears
- Calf strains and tears
- Achilles strains and tears
- Hamstring injuries
- Knee meniscus tears

An ounce of prevention is worth a pound of cure. Spending the time to strengthen muscles, regain flexibility, and improve hand-eye coordination can help to prevent injury. These suggested exercises target the most commonly affected joints in racquet sports including the wrist, elbow, and shoulder.

The USTA recommends at least 3 weeks of on-court and off-court conditioning before returning to competitive play.

References

1. U.S. Tennis Association (USTA), "[COVID-19: Playing Tennis Safely; Player Tips and Recommendations.](#)" 2020.

Public health phases and considerations for return to **racquet sports**

Phase 1: Shelter-in-place

- Train at home with personal equipment/racquet.
- Lift with personal equipment.
- Virtual coaching.
- Continue following public health recommendations in the shelter-in-place order, including proper use of personal protective equipment (PPE), only going out for essential needs, and maintaining physical distancing.

Phase 2: Shelter-in-place lifted, but group activities still restricted

- Train in home and outside, still using own equipment.
- Lift with personal equipment.
- Virtual coaching
- Work on form/stroke by hitting against a wall.
- Follow public health recommendations.

Phase 3: Small-group activities allowed (less than 10 people at a time)

- Consistent groups to better track contacts and limit cross-contamination.
- Coach on-site but with physical social distancing.
- Wash hands thoroughly before going on the court as well as after leaving.
- No sharing of equipment (e.g., racquets, grips, towels) and wipe down/clean all equipment.
- Maintain physical distancing.
- Try to use 4-6 balls from a fresh can.
- Play with members of the same household or singles play only in which each ball is touched only by a single tennis player. This can be achieved by numbering balls and touching only your balls. Use racquet/foot to hit opponent's balls to them.
- Avoid touching the face.
- Remain apart when taking a break.

Phase 4: Large groups allowed, no limitations on group size

- Coaching on-site.
- Continue to limit sharing of equipment if possible.
- May play doubles.





Suggested warm-up exercises

In addition to these important stretching and strengthening exercises, it's important to work on fine motor/coordination drills to regain your skills.

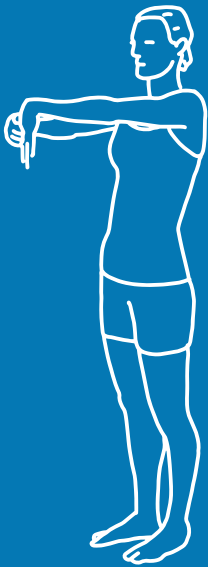
Resources

[Net Generation's great website](#) has instructional videos and skills challenges for players of all levels.

The wrist/elbow

Stretches and range of motion exercises

Standing wrist flexion

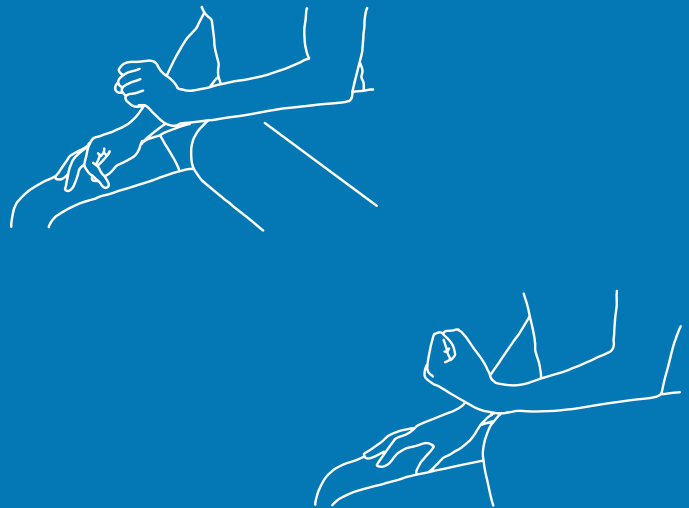


Begin in a standing upright position with one arm in front of your body, palm facing the floor.

With your other hand, bend your wrist downward until you feel a stretch.

Make sure to keep your elbow straight and try not to apply too much pressure; this should be a gentle stretch.

Wrist extension active range of motion



Begin sitting with your elbow bent and your forearm resting on a table. Your palm should be facing down.

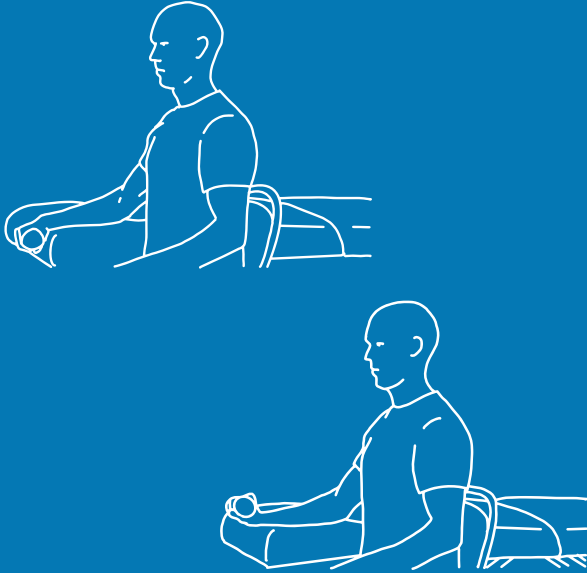
Slowly bend your wrist backward as far as is comfortable, then return to the starting position and repeat.

Make sure not to rotate your forearm during this movement.



Strengthening

Seated wrist extension with dumbbell

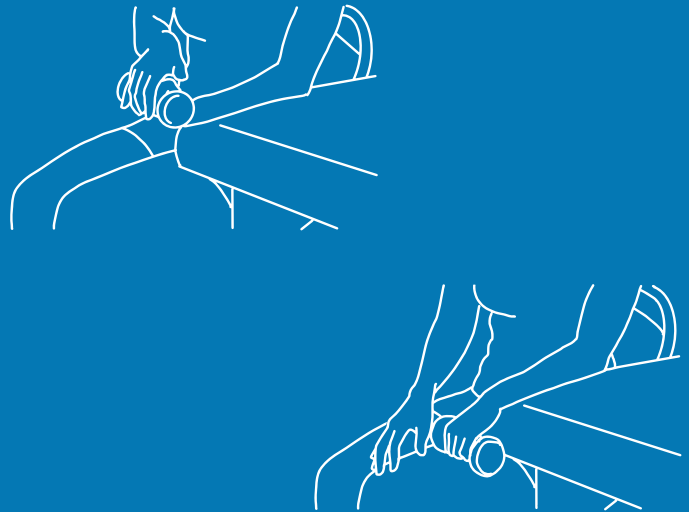


Sit with one arm resting on a table, grasping a lightweight dumbbell and palm facing downward.

Bend your wrist backwards toward your body, then slowly return to the starting position.

Make sure to only move your wrist and avoid any forearm or shoulder movement during the exercise.

Seated wrist extension with dumbbell



Begin sitting in an upright position with one arm resting on a table, holding a dumbbell with your hand hanging off the edge, palm face down.

Use your other hand to curl your wrist up, then slowly lower it back down, and repeat.

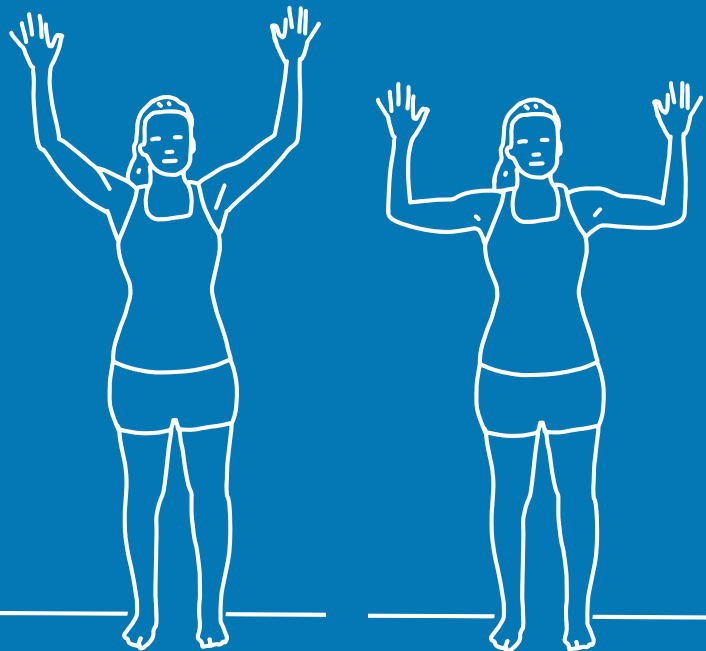
Make sure not to rotate your wrist and do as little work as possible as your other hand assists in bending your wrist upward.



The shoulder

Stretches and range of motion exercises.
Perform stretches 3-5 times a day, holding each stretch for 20 seconds.

Wall angles

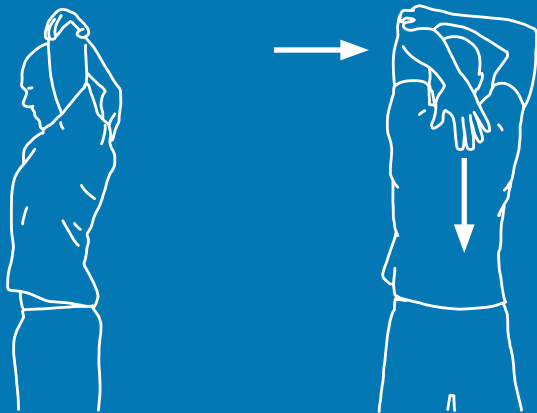


Begin in a standing upright position with your back against a wall.

Raise your arms out to the side with your elbows bent to 90 degrees and rest them against the wall. Slowly slide your arms straight up the wall, then lower them back to the starting position and repeat.

Make sure to keep your back and arms in contact with the wall, and do not shrug your shoulders or arch your lower back during the exercise. Only raise your arms as far as you can without causing pain.

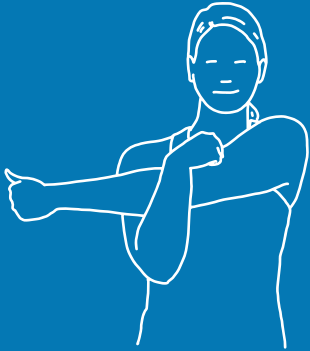
Standing overhead triceps stretch



Lift one arm straight overhead, then bend your elbow as far as possible behind your head. With your other hand, apply gentle pressure to your elbow until you feel a stretch in your triceps. Hold this position.

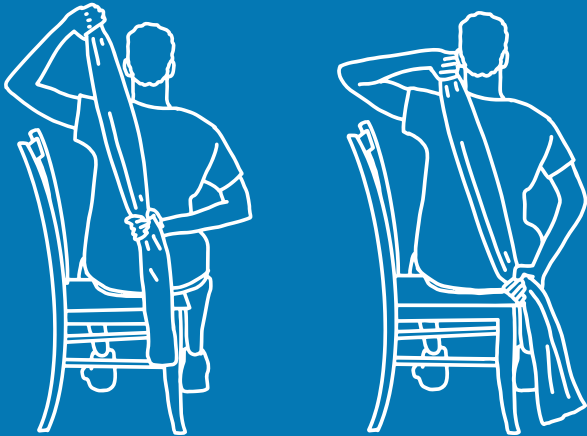


Standing crossover triceps stretch



Raise one arm in front of your body, with your thumb pointing up. Grasp the outside of your arm with your other arm and apply a gentle pressure until you feel a stretch.

Seated overhead shoulder external rotation stretch with towel



Begin sitting upright, holding the ends of a towel in each hand, with one arm behind your head and the other behind your back.

Slowly straighten your bottom arm, gently pulling downward on the towel until you feel a stretch in your top arm. Hold this position.

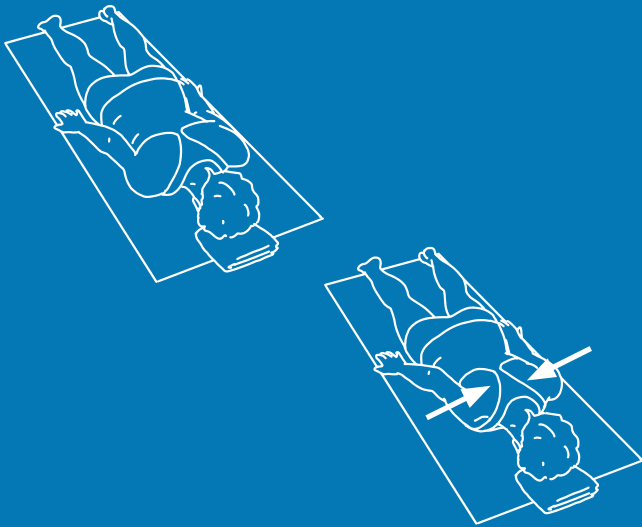
Make sure to keep an upright posture and keep your neck relaxed during the exercise.



Strengthening

Perform exercises 3–5 times a week, 3 sets of 10 reps.

Prone scapular retraction

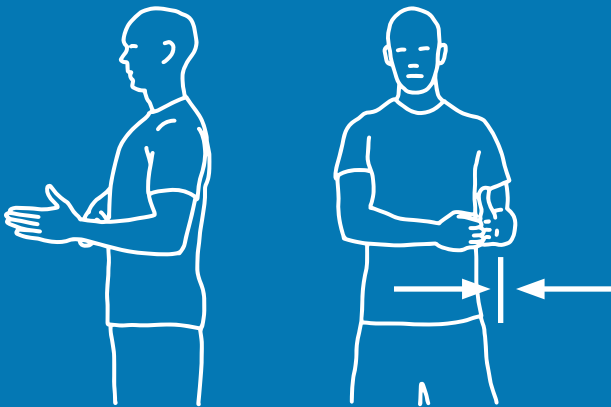


Begin lying face down with your arms resting to either side of your body.

Gently squeeze your shoulder blades together, then relax them and repeat.

Make sure to keep your back relaxed and do not shrug your shoulders

Isometric shoulder internal rotation



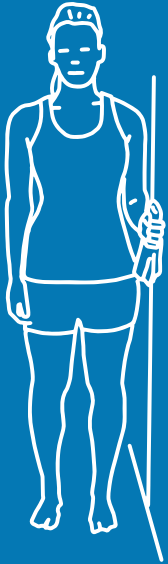
Begin in a standing upright position with one elbow bent at 90 degrees, and your other arm holding on to the inside of your hand.

With your bent arm, apply pressure sideways into your hand.

Do not let your arm move during the exercise.



Isometric shoulder external rotation at wall

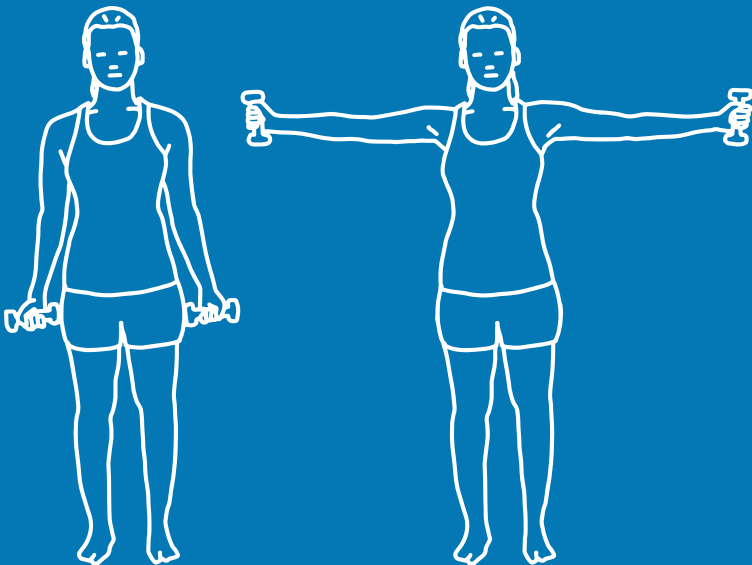


Begin in a standing upright position with your elbow bent 90 degrees, and a towel between your wrist and a wall.

Push your arm into the wall as if you were rotating your forearm outward, keeping your elbow tucked at your side, then relax and repeat.

Make sure to keep your back straight during the exercise. There should be little to no movement.

Shoulder abduction with dumbbells



Begin in a standing upright position with your arms resting at your sides, holding a dumbbell in each hand.

Keeping your elbows straight, raise both arms directly out to your sides with your thumbs up, then lower them back down and repeat.

Make sure to keep your back straight and do not shrug your shoulders during the exercise.

Cycling



The COVID-19 pandemic has significantly disrupted how all athletes approach their sports. Cycling provides a unique opportunity for exercise. It is a sport that many have turned to during periods of quarantine due to the inherent ability to maintain social distancing, cardiovascular fitness, and mental health by spending time outdoors. A range of cyclists are enjoying riding — from low-intensity solo rides to competitive cyclists who had previously participated in racing events such as road, mountain, cyclocross, gravel, and track racing. Cycling can be performed across a broad age range, from young children to octogenarians. Before the pandemic, high school mountain-bike racing saw an explosion in participation across the United States and was gaining momentum as a highly desired athletic activity for students.

Cycling provides a unique opportunity for exercise. It is a sport that many have turned to during periods of quarantine due to the inherent ability to maintain social distancing.

All persons considering engaging in cycling during and after the COVID-19 pandemic must also consider the potential reduction of immune system function when engaging in excessive vigorous exercise, which may limit the ability to stay healthy and virus-free.

The following information is adapted from the USA Cycling website's COVID-19 Event Resources tab.¹

Considerations prior to engaging in cycling

- What type of terrain does the cyclist desire to ride on?
- Is the cyclist's equipment in good repair to enhance safety?
- Does the cyclist have the appropriate safety equipment that is properly fitted (such as a helmet and gloves)?
- Are there any local restrictions or additional safety precautions for the areas where riding is planned?
- If cycling for the first time, are there any underlying health issues that should be reviewed with a physician prior to engaging in exercise?
- Is the bicycle being used appropriately fit to the rider?
- Are there any conditioning exercises that should be considered prior to engaging in cycling for the first time?
- If a competitive cyclist, how will periods of isolation and/or quarantine potentially disrupt training and the planned racing calendar?



Changes in behavior to make the ride safer during surges or future outbreaks:²

- Each rider has 2 responsibilities: Assume that both the rider and other riders have the virus.
- Wear a cloth mask to prevent droplet spread and to prevent touching the mouth, nose, face, or eyes.
- Reduce droplets: If you have a cough or sneeze, or need to blow your nose, drop back and ensure that no one is in the slip stream.
- Ride side by side or no more than 20 feet behind.
- Avoid passing of water bottles, food, and other items.
- Clean hands before eating or touching the face.
- Clean equipment after the ride.

Indoor cycling can be an excellent form of exercise, providing the opportunity to maintain conditioning during periods of strict isolation:

- Options for riding indoors include use of an indoor trainer, smart trainer, or rollers.
- Temperature control is vital to prevent overheating during intense indoor exercise.
- Explore virtual training platforms, which may offer competitive events.
- Overtraining may occur when cyclists engage in vigorous virtual training and racing before attaining necessary conditioning.

Conditioning exercises for the cyclist

USA Cycling resources for the competitive cyclist: USA Cycling, the governing body of cycling in the United States, has [extensive resources relating to COVID-19](#) and the sport of cycling on their website.¹

Club and team advice:³ Before participating in any club or team-related group riding and training, the following should be considered:

- Self-monitor for signs and symptoms of COVID-19 and be clear of these for the previous 14 days.
- Self-conduct a temperature check before participating.
- Not have traveled extensively, or to an area with a high incidence of COVID-19.
- Not be in a group that is at high risk if exposed to COVID-19, or in regular contact with anyone who is.
- Carry and/or wear a face covering depending on the type of ride, prevalence of local community spread, weather conditions, and size of the group.
- Carry hand sanitizer.
- Come prepared to be self-sufficient with food and drink, as well as tools, equipment, and clothing needed to avoid sharing.
- Consider ride types that limit the need to draft, such as mountain bike and gravel.
- Limit stops to resupply. When stopping respect physical distancing, wear a face covering and wash hands.
- Meet any required group size requirements as set by your local community.
- Meet in areas that lessen exposure to others.
- Bring all necessary supplies such as tubes, CO²/bike pump, and tire levels to fix or support the ride, and do not handle another rider's equipment while helping to fix mechanical issues.
- Dial back the intensity of the ride so that exertion levels reduce risk of transmission.



Group-ride scenarios: An excellent overview of several possible group riding scenarios and their overall risk can be found on the USA Cycling website.⁴

Group ride guidance²

Key principles:

- The virus that causes COVID-19 is easily spread, but also controllable.
- The virus is similar to influenza, not measles or chickenpox.
- The virus is primarily spread through direct contact and droplets.
- Aerosolized spread may be possible but is much more likely in enclosed spaces.
- On-bike outdoor activities probably lower the risk of infection, so be especially careful with off-bike and indoor activities.



Are group rides safe?

- Solo rides are safer than group rides.
- Small-group rides with close contacts are likely safe.
- Small-group rides with individuals other than close contacts can be risky, but that risk can be mitigated with simple behavioral changes.
- Large-group rides with unfamiliar people are not currently recommended.

How can training and small-group rides be made safer?

- All riders should be symptom free for 14 days.
- The days of being a “tough person” and going to work or the group ride when feeling sick are over. Stay home, train solo.
- All riders should be free of risk factors for contracting the virus, such as travel to areas of spread and contact with known or suspected COVID-19 patients.

Event guidelines: A complete summary and outline of [safe approaches to participating in competitive cycling](#) events can be found on the USA Cycling website.⁵

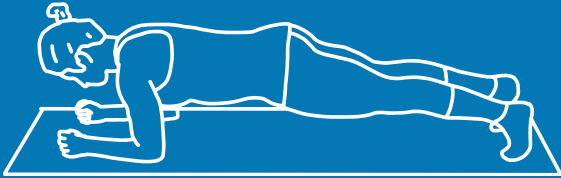
References

1. USA Cycling, [“COVID-19 Event Resources,”](#) 2020.
2. USA Cycling, [“Group Ride Recommendations,”](#) revised June 12, 2020.
3. USA Cycling, [“Team/Club Guidelines to Consider,”](#) revised June 12, 2020.
4. USA Cycling, [“Group Ride Scenarios,”](#) revised May 21, 2020.
5. USA Cycling, [“Returning to Riding & Racing,”](#) revised May 17, 2020.



Suggested warm-up exercises

Planks

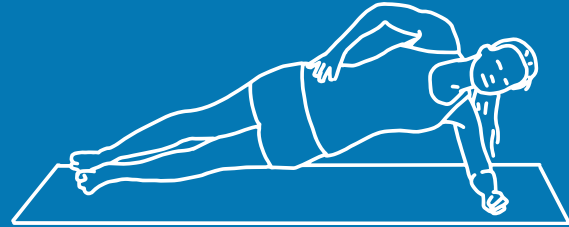


Begin lying on your front, propped up on your elbows.

Engage your abdominal muscles and lift your hips and legs up into a plank position, keeping your elbows directly under your shoulders. Hold this position.

Make sure to keep your back straight and maintain a gentle chin tuck during the exercise.

Side plank

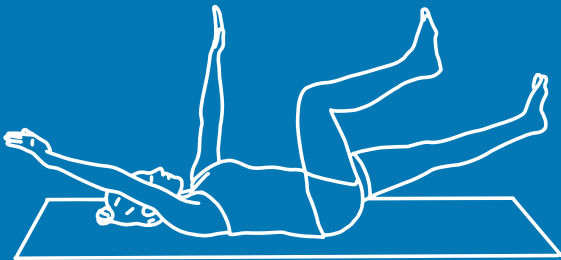


Begin lying on your side with your feet stacked, resting on your elbow.

Lift your hips off the floor so your body is in a straight line and your hips and shoulders are facing forward. Hold this position.

Make sure to keep your head in line with your trunk, do not let your hips drop toward the floor, and do not roll forward or backward during the exercise.

Supine dead bug with leg extension

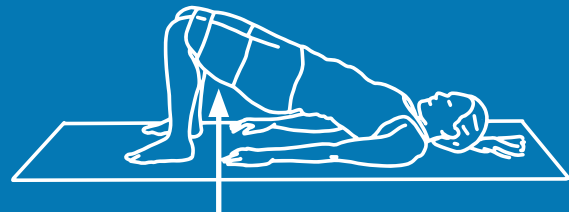


Begin lying on your back with your knees bent and feet flat on the floor.

Tighten your abdominals, lift both legs to a 90-degree angle and your arms up toward the ceiling. Slowly lower one arm overhead and you straighten your opposite leg at the same time. Return to the starting position and repeat with your other arm and leg.

Make sure to keep your abdominals tight and back flat on the floor during the exercise.

Supine bridge with resistance band



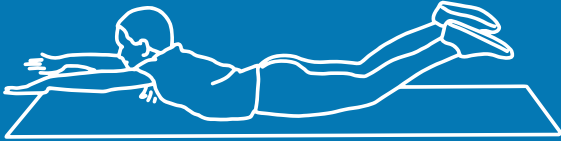
Begin lying on your back with your arms laying at your sides, your legs bent at the knees and your feet flat on the ground, with a resistance band secured around your legs.

Maintaining tension in the resistance band, tighten your abdominals and slowly lift your hips off the floor into a bridge position, keeping your back straight.

Make sure to keep your trunk stiff throughout the exercise and your arms flat on the floor.



Superpersons



Begin lying on your front on the floor with your arms straight overhead.

Engaging your back and core muscles, slowly raise your arms, upper body, and legs off the surface. Hold briefly, then relax and repeat.

Make sure to keep your core engaged and avoid excess tension in your neck and shoulders during the exercise.

Clamshell with resistance



Begin by lying on your side with your knees bent 90 degrees, hips and shoulders stacked, and a resistance loop secured around your legs.

Raise your top knee away from the bottom one, then slowly return to the starting position.

Make sure not to roll your hips forward or backward during the exercise.

Fire hydrant with resistance

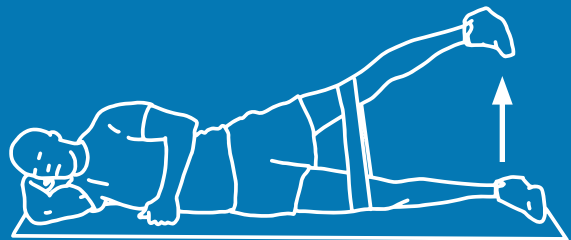


Begin on all fours with your arms directly under your shoulders and a resistance loop around your legs.

Raise one leg straight to your side, keeping your knee bent. Slowly bring it back to the starting position and repeat.

Make sure to keep your abdominals tight so your trunk does not rotate as you lift your leg.

Sidelying hip abduction with resistance at thighs



Begin by lying on your side with a resistance loop secured around your thighs just above your knees.

Extend your leg slightly backward until your toes are at the level of your bottom heel. Raise your leg toward the ceiling, keeping your knee and foot straight.

Make sure not to roll forward or backward during the exercise.



Squats



Begin standing, upright with your feet slightly wider than shoulder width apart.

Bending at your knees and hips, squat down until your knees are close to a 90-degree angle, then straighten your legs and repeat.

Make sure to keep your back straight and do not let your knees bend forward past your toes.

Monster walks



Begin standing upright with a resistance band looped around your ankles. Bend your knees slightly so you are in a mini squat position.

Slowly walk forward, one foot at a time.

Make sure to maintain constant tension in the band and keep your toes pointing forward. Do not drag your feet on the ground or let your knees collapse inward during the exercise.

Lateral Lunge



Begin in a standing upright position with your feet shoulder width apart and arms resting at your side.

Step to the side with one leg, lowering your body into a lunge position, then carefully return to the starting position.

Make sure not to let your knees collapse inward during the exercise.



Hip hinge

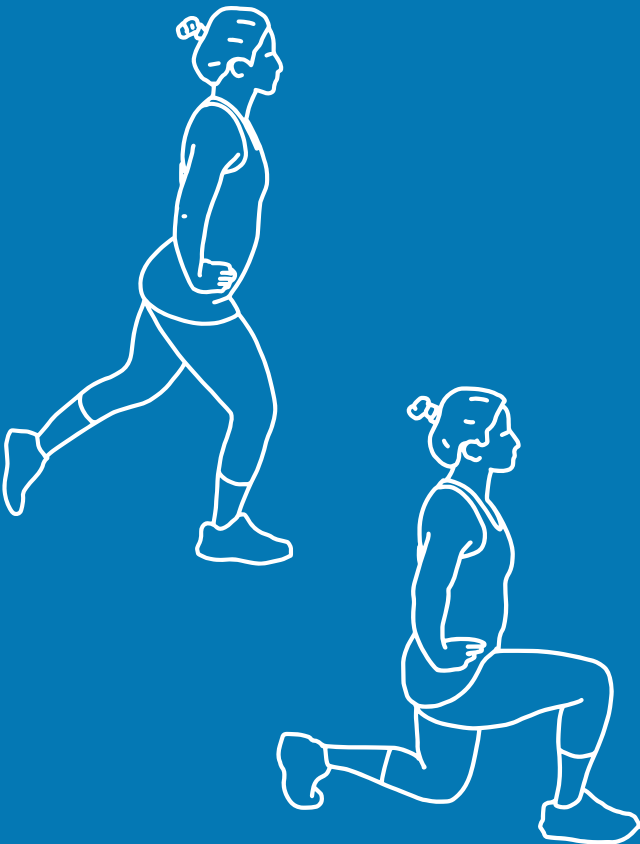


Begin in a standing upright position with your hands on your hips.

Slowly bend forward at your hips.

Make sure to keep your back straight and knees soft but not bent during the exercise. Only bend at your hips.

Reverse lunge



Begin standing upright with your hands resting on your hips and your feet shoulder width apart.

Keeping your trunk upright, step backward and lower your body toward the ground into a lunge position, then carefully return to the starting position. Repeat with the other leg.

Make sure to keep your trunk steady. Do not let your front knee collapse inward or move forward past your toes as you lunge.

Challenge: Add in dumbbells or a single-leg stance at beginning stance.



Single-leg squat with chair touch



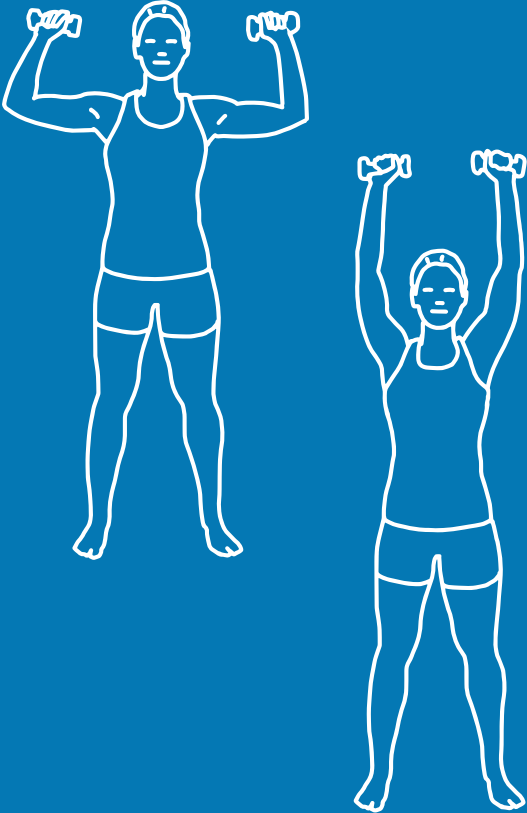
Begin in a standing upright position in front of a chair.

Lift one leg off the ground and lower yourself into a squatting position, bending at your hips and knees until you lightly touch the chair. Return to a standing position and repeat.

Make sure to maintain your balance during the exercise and do not let your knee bend forward past your toes.

Challenge: Add dumbbells

Shoulder overhead press with dumbbells



Begin in a standing upright position holding a dumbbell in each hand, with your arms bent at 90-degree angles at your sides and your palms facing forward.

Press your hands straight up overhead. Then slowly lower them back down and repeat.

Make sure to keep your back straight and do not to shrug your shoulders during the exercise.



Half-kneeling hip flexor stretch



Begin in a half kneeling position with one knee bent in front of your body.

Tighten your abdominals, tilt your pelvis backward, and gently push your hips forward. You should feel a stretch in the front of your hip.

Make sure to keep your hips facing forward and back straight during the exercise.

Supine twist

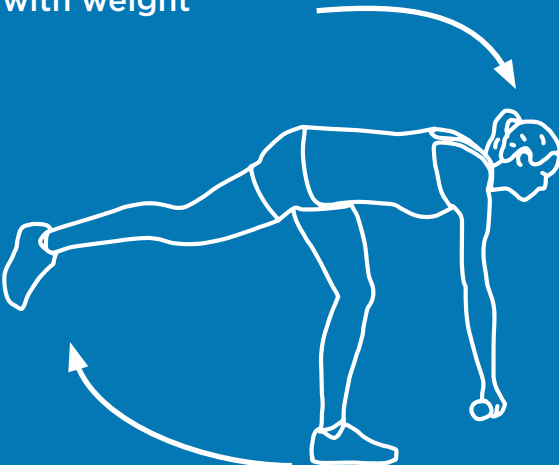


Begin lying on your back with your legs straight and arms to your sides.

Bring one knee toward your chest, then lower it to the ground on one side of your body and hold. You should feel a stretch in your lower back and hip.

Make sure to keep your upper body on the floor.

Single-leg Romanian deadlift with weight



Begin in a standing, upright position, balancing on one leg and holding a dumbbell in your opposite arm.

Bend at your hips and, extend your other leg backward while slowly lowering the dumbbell to the floor. Return to a standing position with your nonbalancing leg bent to 90 degrees. Carefully return to the starting position and repeat.

Make sure to keep your back straight during the entire exercise.



Standing bent-over alternating row with weight



Begin in a standing position with your trunk bent forward and arms hanging toward the floor, holding a dumbbell in each hand.

Pull one arm upward, bending at your elbow and squeezing your shoulder blades together. Lower it back down and repeat with your other arm.

Make sure to keep your back straight and maintain a gentle chin-tuck during the exercise.

Posterior chain stretch



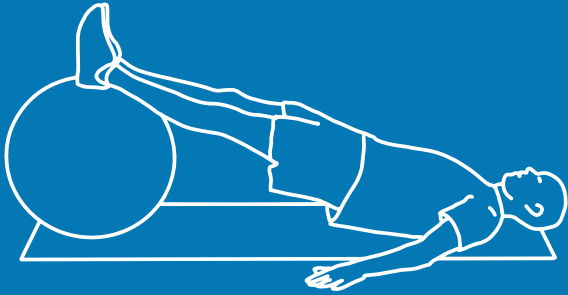
Begin sitting with your knees at 90-degree angles, one leg in front of you, and one out to your side.

Rotate your trunk toward the side of your forward leg and place both hands in front of you on the ground.

Make sure your trunk is rotated as far as you can so that you are feeling a stretch. Continue to breathe evenly.



Supine hamstring curl on fit-ball



Begin lying on your back with your legs straight and feet resting on a fit-ball.

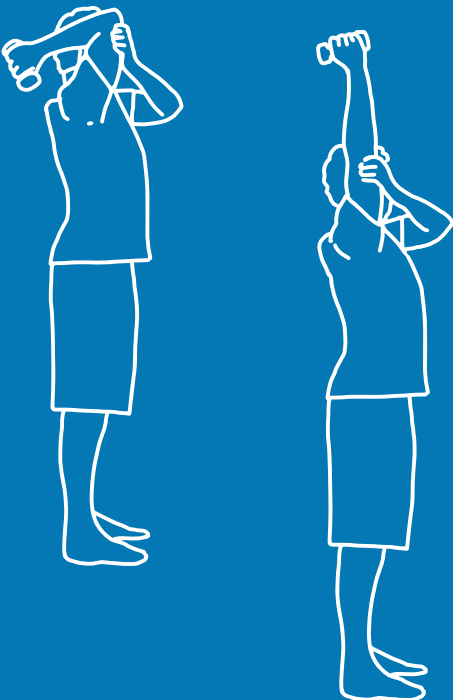
Lift your hips off the floor into a bridge position. Roll the ball toward you with your heels while maintaining the bridge position, then straighten your legs and repeat.

Make sure to keep your back straight and do not let your hips fall to the ground.

Challenge: Try with single leg curl.



Overhead triceps extension



Begin in a standing upright position holding a dumbbell in one hand. Raise your arm straight upward with your elbow bent by your head, stabilized by your other hand.

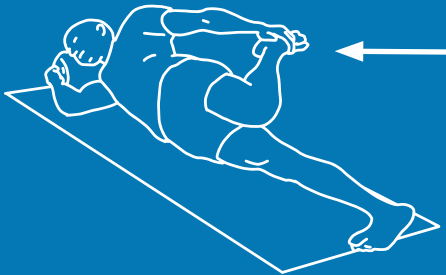
Slowly straighten your arm up toward the ceiling, then lower it back down and repeat.

Make sure to keep your back straight and do not let your arm fall forward during the exercise.

Challenge: Complete exercise while maintaining single leg balance stance.



Sidelying quadriceps stretch



Begin lying on your side with your legs straight.

Bend your upper leg, and grab hold of your foot to pull it toward your buttocks until you feel a stretch in the front of your thigh and hold.

Make sure not to let your hips tilt forward or backward.

Figure 4 stretch

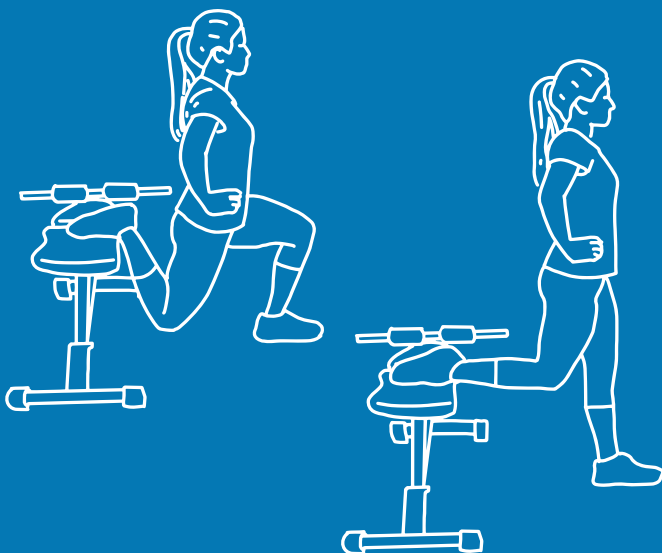


Begin lying on your back with your legs straight.

Cross one leg over the other, resting your ankle on your opposite knee. Bend the knee of your bottom leg toward your body until you feel a stretch in your hip and hold.

Make sure to keep your hip relaxed and your back flat against the ground.

Bulgarian split-squat



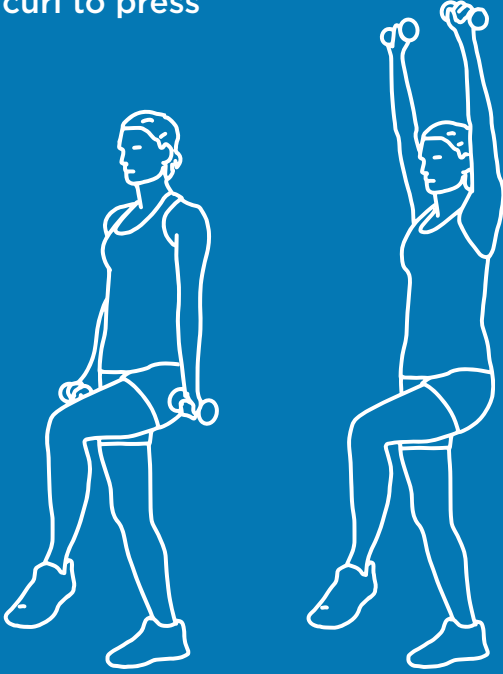
Begin in a wide staggered stance position with your back foot resting on a bench.

Bend your front knee, lowering your body into a lunge position, then return to standing and repeat.

Make sure to keep your abdominals tight and do not let your knee move forward past your toe or collapse inward during the exercise.



Single-leg balance at 90 degrees curl to press

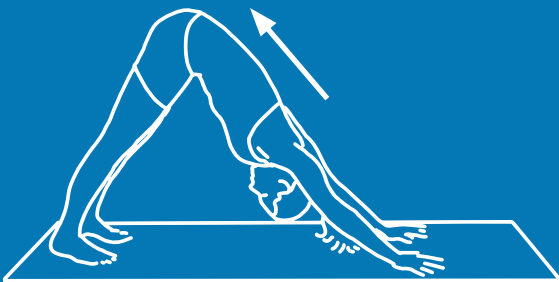


Begin in a standing upright position holding one dumbbell in each hand. Lift one leg to a 90-degree angle.

Bending at the elbow, curl your arms toward your body. At the top of the curl, rotate your hands outward and press the dumbbells overhead. Carefully return to the starting position and repeat.

Make sure not to overarch your back when pressing the weights overhead and try to keep your leg in the same position throughout the exercise.

Downward dog



Setup: Begin on all fours.

Movement: Prop your feet up on your toes, then push your body up into an inverted V position with your elbows and knees straight. Hold this position, feeling a stretch through your back and legs.

Tip: Make sure to keep your shoulders down, as well as your hands and feet flat on the floor during the stretch.

Pigeon pose



Begin on all fours.

Bring one knee up toward your arms and rest the outside of that leg on the ground, with your other leg straight behind you. Bring your trunk forward, with your arms straight on the ground, until you feel a stretch.

Make sure to perform this exercise slowly and keep your back straight.



Return to sports following a concussion

Athletes recovering from concussions during the COVID-19 pandemic face unique challenges with advantages and disadvantages. One of the most difficult things for athletes with any type of injury is not being allowed to participate in their sport. Concussed athletes who would not have been ready to play at the time sports were postponed may feel less pressure and even some relief at not being expected to return to sport too soon. However, athletes also face the challenge of doing schoolwork online, receiving treatment virtually, and resuming exercise without the benefit of gyms or organized practices.

While a concussion is the mildest form of a traumatic brain injury, the term can be confusing. “Mild” does not reflect how severe the injury is but rather the absence of major structural damage to the brain. That is why when athletes suffer a concussion, they may feel symptoms that they wouldn’t consider “mild.” Concussions are diagnosed when an athlete develops typical symptoms shortly after a direct or indirect hit or blow to the head or body. The most common immediate symptoms include headache, dizziness, nausea, and fatigue. As athletes recover, they frequently develop problems that affect the ability to fully engage in school, such as trouble reading or with other academic subjects due to blurred vision, worsening headaches,

Although most athletes will fully recover from a concussion within 2 to 4 weeks, a sizable minority will take months or even years to recover, especially if the concussion is not managed properly.

sensitivity to light and noise, difficulty staying focused, seeing words moving on a page, dizziness, nausea, and fatigue.

Recovery from concussion

Although most athletes will fully recover from a concussion within 2 to 4 weeks,¹ a sizeable minority will take months or even years to recover, especially if the concussion is not properly managed. It has been suggested that up to 30% of individuals do not recover within a month from the injury.² Nearly all student athletes with concussions will benefit from school accommodations during recovery. Examples of beneficial accommodations during distance learning include waiving most work and tests during the first week of recovery, followed by extending the time for assignments and reducing workloads, depending on the severity of the symptoms. Taking breaks is also important, especially if the screen is causing symptoms. Allowing student athletes to print out materials, take pictures of work, and send it back, as well as limiting time on computer assignments or classes can all help alleviate symptoms and improve recovery.

Although rest has been touted as the most important treatment for concussion, recent research suggests that brief rest may be beneficial but too much rest or activity restriction can actually



worsen symptoms.^{3,4} Instead, recent guidelines suggest that engaging in activities that are not significantly worsening symptoms or putting the head at risk for reinjury is beneficial.⁵

It is easy to be sedentary while at home all day during distance learning. Concussed student athletes should not lay in bed and rest all day but rather go for walks and participate in mild physical activity as tolerated.⁶ If a home gym is available, it's okay to lift light weights or ride a stationary bicycle. Sticking to a schedule is also particularly helpful during concussion recovery but can be more difficult during the less-structured days of distance learning and fewer organized activities. Going to sleep and getting up at the same time every day is recommended. Many concussed athletes experience sleep difficulties, but napping and variable sleep schedules can increase headaches and other symptoms.

If symptoms continue to be provoked by computers, academic work, and/or physical activity after 2 weeks, further treatment or rehabilitation may be needed. This may involve treatment by a physical therapist who specializes in vestibular issues having to do with the visual and balance systems of the brain and body. In the time of COVID-19, it may be more challenging to deliver this type of treatment virtually.

Concussed athletes with persistent symptoms often have increased stress and other mood issues. This is particularly true if the athlete has a history of mood or anxiety issues.⁷ Many mood symptoms overlap with concussion symptoms, including irritability, sleep disturbance, focus or concentration issues, headache, and sleep issues. In fact, 16% to 25% of student athletes who have not sustained a concussion meet the criteria for post-concussion syndrome.^{8,9} Working with a sports or



behavioral medicine psychologist can be helpful to address these issues. Social support is also important but can be harder to receive when screens provoke symptoms and the ability to see friends is limited due to distance learning and other physical distancing recommendations.

Return to full activity

Concussed student athletes should complete a progressive return-to-play protocol before fully returning to their sport. This is more challenging as sports adopt different structures during the COVID-19 pandemic and normal practices have become virtually nonexistent. A stepwise return to play protocol should be completed, even when feeling better, to ensure that the student athlete has truly recovered and there is no recurrence of symptoms when engaging in activity.

A return of symptoms generally indicates incomplete recovery and may put the athlete at risk for sustaining another concussion with less force. Sometimes an incomplete recovery means the athlete needs more time, and other times it indicates the need for treatment such as a program that follows a target heart rate or vestibular issues. The regional protocol most commonly used in California is the Interscholastic Federation's Return to Play (RTP) protocols (see next page).¹⁰

The concussed athlete moves through each stage of activity, with a minimum of 24 hours between stages. The stages range from light to heavier exercise, then complex noncontact skills, and finally light contact. The initial stage should be started when the treating health care professional advises, and the daily progression should be done under close supervision. Once the stages are completed, contact practice may resume and game play may be reintroduced. Be sure to talk to treating medical professionals about the recommended progression and relay the plan to coaches.

RETURNING POST-CONCUSSION



California Interscholastic Federation (CIF) Return to Play Protocol¹⁰

You must have written physician (MD/DO) clearance to begin and progress through the following Stages as outlined below, or as otherwise directed by your physician. Minimum of 6 days to pass Stages I and II.

Stage	Activity	Exercise example	Objective of the stage
I	Limited physical activity that does not exacerbate symptoms for at least 2 days	<ul style="list-style-type: none"> Untimed walking okay No activities requiring exertion (weight lifting, jogging, P.E. classes) 	<ul style="list-style-type: none"> Recovery and reduction/elimination of symptoms
II-A	Light aerobic activity	<ul style="list-style-type: none"> 10-15 minutes (min) of brisk walking or stationary biking Must be performed under direct supervision by designated individual 	<ul style="list-style-type: none"> Increase heart rate to \leq 50% of perceived maximum (max) exertion (e.g., < 100 beats per min) Monitor for symptom return
II-B	Moderate aerobic activity (Light resistance training)	<ul style="list-style-type: none"> 20-30 min jogging or stationary biking Body weight exercises (squats, planks, push-ups), max 1 set of 10, \leq 10 min total 	<ul style="list-style-type: none"> Increase heart rate to 50 - 75% max exertion (e.g., 100 - 150 bpm) Monitor for symptom return
II-C	Strenuous aerobic activity (Moderate resistance training)	<ul style="list-style-type: none"> 30 - 45 min running or stationary biking Weight lifting \leq 50% of max weight 	<ul style="list-style-type: none"> Increase heart rate to > 75% max exertion Monitor for symptom return
II-D	Non-contact training with sport-specific drills (No restrictions for weightlifting)	<ul style="list-style-type: none"> Non-contact drills, sport-specific activities (cutting, jumping, sprinting) No contact with people, padding or the floor/mat 	<ul style="list-style-type: none"> Add total body movement Monitor for symptom return

Prior to beginning Stage III, please make sure that written physician (MD/DO) clearance for return to play, after successful completion of Stages I and II, has been given to your school's concussion monitor. You must be symptom-free prior to beginning Stage III.

III	Limited contact practice	<ul style="list-style-type: none"> Controlled contact drills allowed (no scrimmaging) 	<ul style="list-style-type: none"> Increase acceleration, deceleration and rotational forces Restore confidence, assess readiness for return to play Monitor for symptom return
	Full contact practice Full unrestricted practice	<ul style="list-style-type: none"> Return to normal training, with contact Return to normal unrestricted training 	

MANDATORY: You must complete at least ONE contact practice before return to competition, or if non-contact sport, ONE unrestricted practice

(If contact sport, highly recommend that Stage III be divided into 2 contact practice days as outlined above.)

IV	Return to play (competition)	<ul style="list-style-type: none"> Normal game play (competitive event) 	<ul style="list-style-type: none"> Return to full sports activity without restrictions
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Concussion prevention

There are currently no effective ways to prevent concussions. Rule enforcement and smart play can help to reduce head contact in certain sports and thus may reduce the risk of concussions.¹¹ Helmets were designed to help prevent skull fractures and other more serious head injuries, like bleeding in or around the brain. However, even though helmets and head gear may reduce some head impact, there are still forces, particularly rotational ones, that current helmets do not stop from being transmitted to the brain, and a concussion results. More research needs to be done about how to make helmets and head gear that can truly prevent concussions,¹¹ especially in younger athletes with developing brains.

It is also important to recognize that certain things can be done to reduce the risk of a prolonged recovery. If an athlete is returning to sports after COVID-19, they should be aware of how to minimize the risk of a protracted concussion recovery. While it is normal for a concussion to take up to 1 month for full recovery, a subset of individuals may take longer. Recent research found that athletes who stop playing immediately after an injury are significantly less likely to experience a prolonged recovery than those who continue to play.¹²

In addition, there appears to be a dose response, with recovery occurring faster in those who are removed immediately from the sport compared with those who continue to play for 15 minutes, or more than 15 minutes. The sooner athletes were removed from play, the faster they recovered from a concussion. Those who continued to play for 15 minutes or more than 15 minutes were 5 and 11 times more likely, respectively, to have a protracted recovery versus the group that was immediately removed.¹²

Athletes with suspected concussions should be clinically evaluated as soon as possible, and by someone with knowledge about sport-related concussion. Recent research has demonstrated that individuals who sustain a concussion and are seen within the first week versus those who

wait for longer than a week are more likely to recover sooner. Of those seen early, 52% recovered within 30 days versus only 19% of those who waited to initiate treatment.^{13,14} Seeking advice from knowledgeable neuropsychologists and sports medicine professionals can help manage concussions and get student athletes back to play safely.

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