



THE FOOTBALL PLAYERS  
**HEALTH STUDY**  
AT HARVARD UNIVERSITY

# Maximizing the Health of Former NFL Players:

## Research, Results, and Action Steps

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[www.footballplayershealth.harvard.edu](http://www.footballplayershealth.harvard.edu)

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## INTRODUCTION

# WHAT IS THE FOOTBALL PLAYERS HEALTH STUDY AT HARVARD UNIVERSITY?

When we launched the Football Players Health Study at Harvard University, we met with former professional players like you to learn about your most pressing health concerns. In response to what we learned, we built a comprehensive research program dedicated to addressing the health and wellbeing of former NFL players. We assembled a multidisciplinary team that drew upon the University's faculty and researchers with expertise in neurology, cardiology, sports medicine, rehabilitation medicine, chronic pain, public health, and more. The Study's specific goals are to:

- Better understand the benefits and risks of playing professional football.
- Identify health conditions that may be reversible or preventable.
- Develop ways to improve health and wellbeing.
- Emphasize health equity and partner with the former player community in all aspects of research.

Former players have been invited to fill out two Health and Wellness Questionnaires. More than 4,100 former players have completed the first one. Approximately two years following this initial questionnaire, former players are invited to complete the Second Health and Wellness Questionnaire which helps our researchers understand how playing experiences may affect player health over time. The questions specifically examine cardiovascular health, neurocognitive health, pain, and other health conditions that commonly affect former players. Another study, In-Person Assessments, brings former players to Harvard-affiliated hospitals for a series of cutting-edge, research-based clinical evaluations. In total, more than 20 studies provide promising developments and solutions to specific health areas identified by you and your teammates as important.

The Football Players Health Study sets itself apart in the following ways:

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## **We listen:**

- The FPHS team works closely with former players to ensure that their feedback on high-priority problems shapes all aspects of the Study.

## **We take a comprehensive approach:**

- Our focus is the whole player over his lifetime. Player health is complex and cannot be reduced to a single condition or injury. That is why we study the many areas of health that may be influenced by a professional football career over time.

## **We share information you can use:**

- We provide results and insights that equip former players to be proactive and make future informed health decisions.

## **We are independent:**

- This Study is not directed or influenced by any external agencies; we will always remain committed to academic rigor, independence, and reporting scientific facts.

This Player Health Guide\* was created for you to learn more about our work on player health and is divided into these sections: Gameplan for Your Health, Major Findings, Forthcoming Results, and Resources for Players. To learn more, view our list of [open studies](#) in which former players can participate, and check out our [active](#) and [past projects](#). Your participation in these studies is vital to our mission to better understand and improve former player health. We look forward to your feedback and continued involvement as we collectively strive to improve the health and lives of former NFL players. Our contact info is: [players@footballplayershealth.harvard.edu](mailto:players@footballplayershealth.harvard.edu)

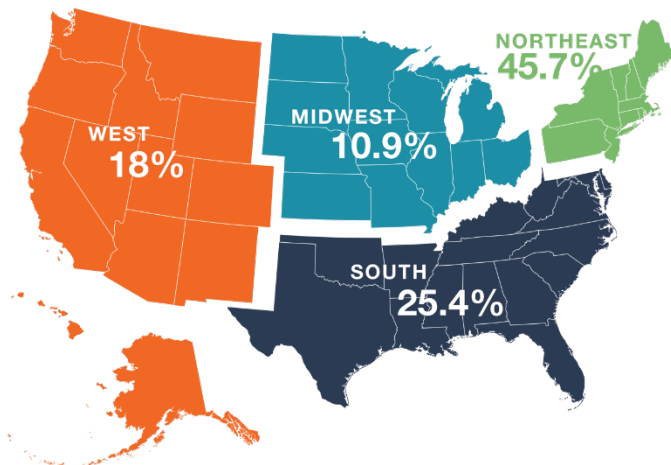
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*\*Due to recent rule and equipment changes, some results may not capture professional football's risks and benefits for younger former players.*

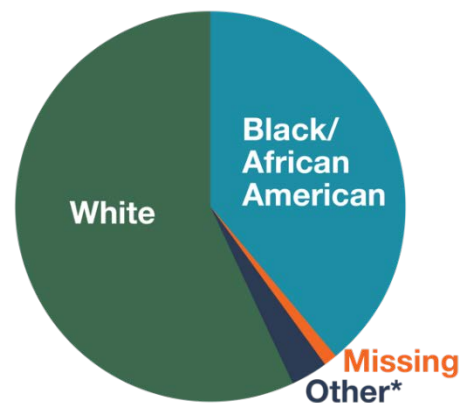
# WHO HAS JOINED THE FOOTBALL PLAYERS HEALTH STUDY?

Launched in 2014, the Football Players Health Study is the largest study ever conducted of living former players and represents a diverse population by geography, self-reported race/ethnicity, playing position, and eras of participation in modern American professional football.

## Geographic Region

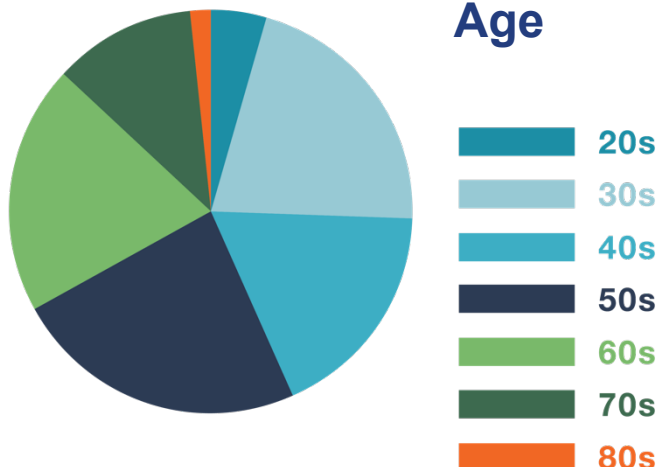


## Race/Ethnicity

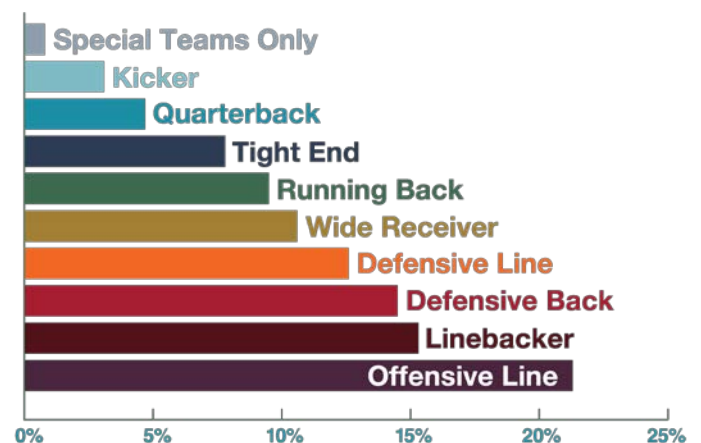


\* Other Includes: Native Hawaiians/Pacific Islander, Latino, American Indian/Alaskan Native, Asian, etc.)

## Age



## Position





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# Make a Gameplan for your health

**Consider using our research-based tips to be proactive about your current and future health:**

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## Blood Pressure Screening

Former players should regularly have their blood pressure measured. This can be done at your doctor's office or by using at-home blood pressure cuffs.



## Sleep

All former players should regularly get screened for sleep apnea, which can impact memory and concentration, as well as metabolic health.



## Cardiovascular disease

Former players should request regular cardiovascular health screening, such as an EKG or a stress test.



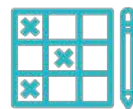
## Exercise

Ask your physician to recommend specific exercises known to provide cardiovascular benefit while protecting your joints. Low-impact exercises can include swimming, yoga, cycling, and others.



## Cognitive health

Talk to your doctor to request regular cognitive health assessments such as the Mini-Cog, or the Mini-Mental State Exam (MMSE).



## Cognitive Exercise

Try a different walking route around your neighborhood or pick up a new hobby like Sudoku to keep your brain sharp. Cognitive exercises can help improve concentration and memory and reduce stress.



## Social Networks

Maintaining a healthy social life has been shown to improve cognitive function, physical health, and even extend the lifespan. Stay connected with long-distance family and friends through Zoom or FaceTime.



## Connect with a doctor

If you do not have a PCP, try reaching out to friends and family for recommendations, or a local community health center. Your health insurance company will also have a list of in-network physicians.



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## MAJOR FINDINGS

# CONCUSSION AND LONG-TERM HEALTH

Our analysis of 3,500 former NFL players looked at individuals' current cognitive and mental health alongside the specific NFL career exposures using the self-reported health and playing data.

### What the Science Says

Former players who reported more concussion symptoms during their NFL playing years (loss of consciousness, disorientation, nausea, etc.) were significantly more likely to report having cognitive impairment, depression, and anxiety later in life.

- In comparison to men who played positions with the lowest concussion risk (kicker, punter, and quarterback), **running backs, linebackers, and special teams** were twice as likely to report having cognitive impairment and 40% more likely to report depression. **Wide receivers, defensive backs, linemen, and tight ends** were 70% more likely to report cognitive impairment and 40% more likely to report depression when compared to the lowest risk group.
- **Having a longer NFL career significantly increased risk of cognitive impairment and depression later in life.** With each additional 5 years of play, the risk for self-reported cognitive impairment increased by 20%, while risk for depression rose by 9%.

Our results suggest certain playing positions for longer careers in football may increase risk for cognitive impairments, anxiety and depression.

**While these findings are concerning, note that most players did not report these impairments including those 84% of former players who participated 7 years or longer.** More research is needed on this topic before reaching any definitive conclusions.

## Action Items for Former Players

Although you cannot change your NFL playing experience, there are things you can do to be proactive about your cognitive and mental health now:

- **Depression and anxiety are common and treatable health conditions that can negatively impact cognitive function.**

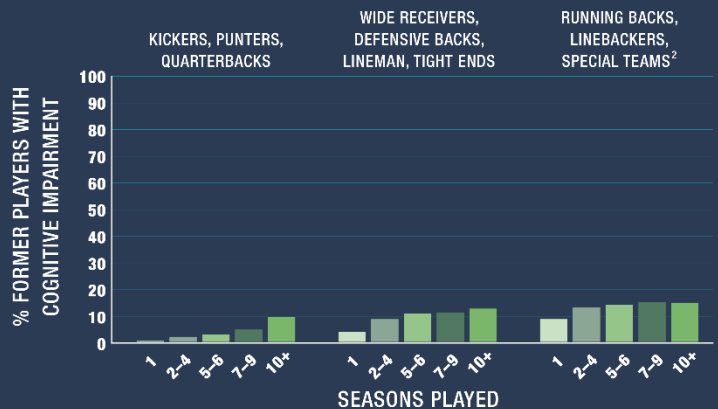
If you think you may be

experiencing depression or anxiety, talk to your doctor or a trusted friend.

- **If you think you may be experiencing symptoms of cognitive impairment, talk to your doctor about getting a comprehensive neurocognitive evaluation.** With proper diagnosis and management, people with cognitive impairment can live happy and fulfilling lives. There are ways to improve your cognitive health. Many relate to lifestyle, including good-quality sleep and regular exercise, as well as maintaining a healthy diet and weight. These behaviors may also help you control blood pressure, another factor that influences cognitive function. Continually challenging your brain to stay active and learn new skills is also known to improve cognitive health. Cognitive function and mental health can be negatively affected by certain physical conditions that disproportionately impact former players, such as sleep apnea and heart disease. Talk with your doctor about getting a comprehensive health evaluation, so that you can be evaluated for any conditions that may be impacting these and other important areas of your health.
- **If you need to speak with someone immediately or need help finding a doctor, contact the NFL Life Line, described in the Resources section at the end of this report (p.29 – 35).**

[Link to original paper](#)

## Percentage of Former Players with Cognitive Impairment<sup>1</sup> by Position and Career Length



<sup>1</sup> IN THIS STUDY, COGNITIVE IMPAIRMENT WAS DEFINED AS FREQUENT AND REGULAR PROBLEMS WITH MEMORY, CONCENTRATION, AND ATTENTION, AS WELL AS DIFFICULTY PROCESSING AND UNDERSTANDING BASIC INFORMATION.

<sup>2</sup> THIS GROUP INCLUDES ALL SPECIAL TEAMS' POSITIONS EXCEPT FOR KICKERS AND PUNTERS. KICKERS AND PUNTERS WERE ASSESSED AS A SEPARATE GROUP, ALONGSIDE QUARTERBACKS.



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# CTE DIAGNOSES IN LIVING PLAYERS

CTE, or chronic traumatic encephalopathy, is a specific type of brain change that is linked to repeated brain trauma. **CTE is a real condition; however, it can only be diagnosed after a person passes away.** As of yet, there is no test that can confirm whether a living person has CTE.

## What the Science Says

- We learned that some former players reported receiving a CTE diagnosis from their medical care provider.
- Former players of color, older former players, and former linemen were more likely to receive a CTE diagnosis.
- **Former players with CTE diagnoses were more likely to report sleep apnea, diabetes, hypertension, and other conditions that independently cause cognitive problems that are often treatable.**

## What This Means for You

- Cognitive symptoms (such as changes in mood and memory) can understandably raise concerns about CTE in former players. It is possible that you, or someone you know, has been given a CTE diagnosis. **Former players given the diagnosis of CTE are encouraged to call to a doctor or specialist who can provide quality, evidence-based healthcare and ensure symptoms are not from other treatable conditions.**
- Symptoms often attributed to CTE include difficulties with memory and concentration, mood swings, and irritability and can be caused by sleep apnea, chronic pain, opioid medications, hypertension, diabetes, and other conditions.
- Managing and treating medical conditions has been shown to improve cognitive health (e.g., memory and moodiness) in measurable ways.
- We recognize that some former players in our study may have the underlying brain changes associated with CTE. We believe that doctors should still be prioritizing health issues that can be managed or treated. If your physician believes you may have CTE, request a referral to see a specialist who is highly experienced in this area. These physicians will have access to the latest research and recently established criteria that can be considered for treatment. This [CDC fact sheet](#) provides useful information regarding CTE, CTE diagnoses, and more.

[Link to original paper](#)

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## Action Items for Former Players

### WITH A DOCTOR OR SPECIALIST

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**If your clinician suggests that you may have CTE, ask if you have been tested for the following conditions that can affect cognitive function:**

- High blood pressure
- Diabetes or high blood sugar
- Sleep apnea
- High cholesterol
- Other heart conditions
- Low testosterone
- Depression



**If you think you may be experiencing symptoms of cognitive impairment, talk to your primary care physician (PCP) about getting a**

comprehensive neurocognitive evaluation from a neurologist or highly trained specialist. If you don't currently have a doctor, contact the [NFL Life Line](#) or [The Trust \(Powered by the NFLPA\)](#) to get help finding a physician in your area.



**To learn more about your health during a visit to the doctor:**

- Ask questions
- Don't be afraid to question a CTE diagnosis – it might be something else!
- Seek second opinions from specialists
- Follow through and follow up with your physicians

It is important that your physician listens to you. Your PCP should be someone you trust, who understands your background, and with whom you can work.

### WITH A DOCTOR OR ON YOUR OWN

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**Physical exercise has been shown to be effective in improving cognitive health and quality of life:**

- Ask your physician to recommend specific exercises and lifestyle choices known to provide cardiovascular benefit while limiting wear and tear on joints, especially if you've had a prior ACL tear or joint injury.
- Even if you are not going to the gym, find resources for working out indoors. On YouTube, FitnessBlender and Yoga with Adriene are two great channels that have been keeping the study team active. Furthermore, EXOS's Twitter feed includes creative ways to stay healthy at home: [twitter.com/TeamEXOS](https://twitter.com/TeamEXOS)



**Train your brain:**

- Try a different walking route around your neighborhood or find a Sudoku puzzle to keep your brain sharp.
- If you would like to learn more about specific techniques and strategies for enhancing cognitive health, contact us for a copy of Harvard's Guide to Cognitive Fitness.



**Reach out to your social circle:**

- Maintaining a healthy social life with friends and family has been shown to improve cognitive function, physical health and even extend the lifespan.
- Arrange a hangout with long distance family and friends through Zoom or FaceTime to strengthen these vital connections.

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# RACIAL DISPARITIES AND NFL PLAYER HEALTH

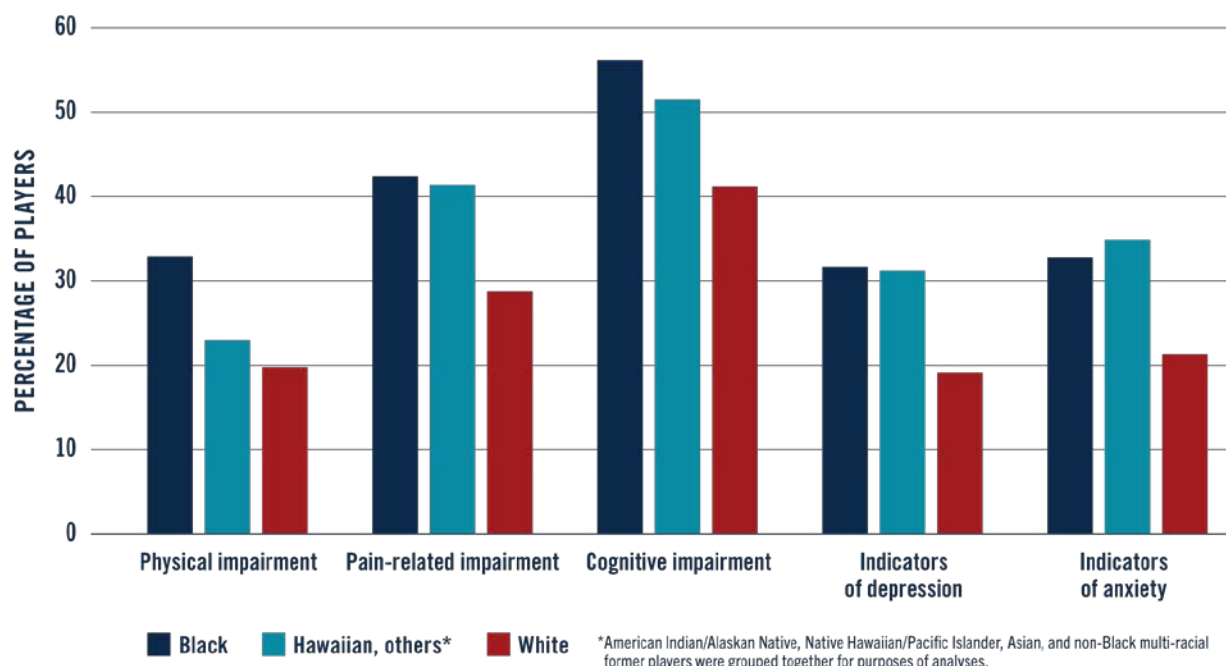
Health disparities, defined by the Department of Health and Human Services as “differences in health outcomes that are closely linked with social, economic, and environmental disadvantage [...] often driven by the social conditions in which individuals live, learn, work, and play,” are a major concern in our country. We examined whether disparities in health (physical and cognitive impairment, pain, depression, and anxiety) affect quality of life for 3,747 former players of different racial and ethnic backgrounds.

## What the Science Says

- **Black players were more likely to have poorer health in each area we examined than White players.** Native Hawaiians and players of other races had a greater risk in each area we studied except impaired physical functioning, compared with White players.
- **These findings were not explained by racial differences in playing position, years of play, or body mass index (BMI).** They were also not explained by games started, pain medication, or performance enhancing drug use.
- **We did not find smaller health differences by racial identity in younger players,** even though they played in the NFL in a more recent era (e.g., more Black coaches, higher salaries, perhaps reflecting a more progressive era) compared to older players.
- **Despite having access to resources that may be considered as advantages, such as higher median income, healthcare access, college education, and expert exercise regimens, race-associated disparities were present in former players. These findings mirror what is observed of health disparities by race in the general population.**

The following figure illustrates the differences in health outcomes by racial identity. Compared with White players, Black players were 36% to 86% more likely to have poorer health in each area. Additionally, other non-White players were 25% to 64% more likely to have poorer health in each area.

## Frequency of Reported Health Problems in Former NFL Players



### Action Items for Former Players

Our study suggests that socioeconomic advantages from participation in football does not eliminate health disparities associated with race. While these results may seem discouraging, our results confirm the presence of health disparities seen in the general United States population that need to be addressed through future policy and research to understand why these disparities persist.

The challenges that underlie health disparities by race and ethnicity are complex. For example, former players may have had these differences in experiences before, during, and after their NFL playing days. Experiences of discrimination encountered in society have been associated with high blood pressure, a major health concern. Consider speaking with your health care provider(s) about the ways your mental and physical health have been affected by these experiences. The Football Players Health Study is committed to looking beyond just the socioeconomic advantages of playing in the NFL and exploring other potential drivers of these disparities so we can better address them.

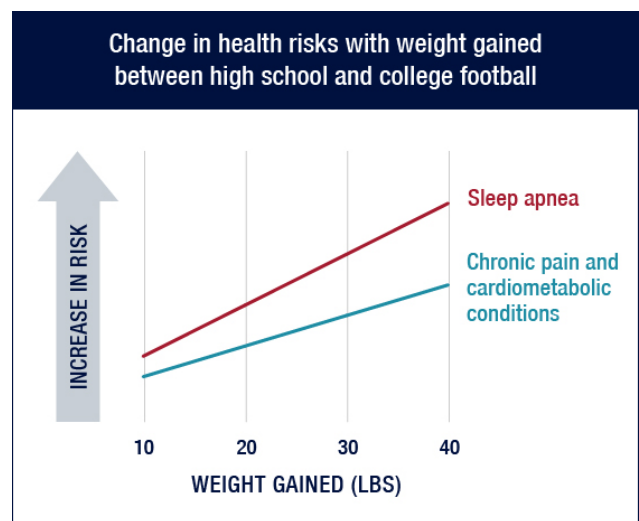
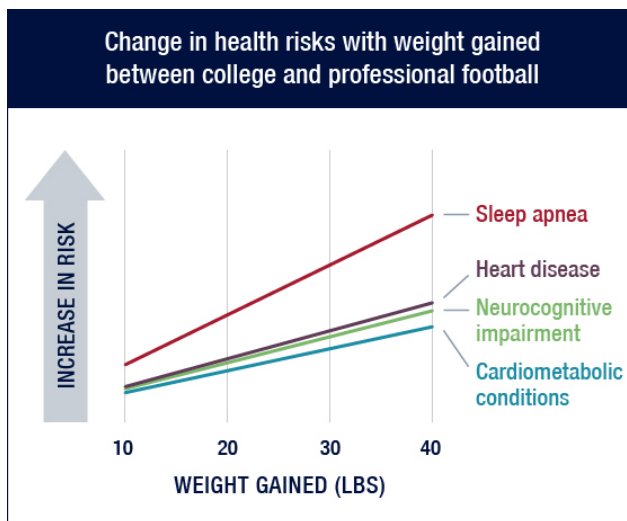
[Link to original paper](#)

# FOOTBALL-RELATED WEIGHT GAIN

Our research indicates that former players who experienced early-life substantial weight gain between high school football and professional play may be at a higher risk for chronic conditions. Weight gain, whether resulting from increased lean muscle mass or other tissue, was associated with post-career health conditions.

## What the Science Says

- Every 10 pounds of weight gained between college football and professional play increases the risk of sleep apnea by 25%, heart disease by 14%, neurocognitive impairment by 13%, and cardiometabolic conditions by 11%.
- Every 10 pounds of weight gained between high school and college football raises the risk of sleep apnea by 15%, and chronic pain and cardiometabolic conditions by 9%.
- Former players gained an average of 40 lbs. between high school football and present day, with the majority of weight gained during the football playing years.



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## Action Items for Former Players

While further research is being conducted on post-career weight gain and health, there are steps you can take now to improve health. Whether or not you experienced substantial weight gain over the course of your football career, you could benefit from taking the following steps:

- **Talk with your doctor about completing a comprehensive set of tests to evaluate your heart, sleep, brain, and metabolic health** as you may identify treatable conditions.
- **Work with your doctor to develop a treatment plan** based on what you learn about your health. Addressing sleep apnea, for example, may lead to feeling more rested, greater physical activity and improved overall quality of life.
- **Discuss with your doctor the role of a supervised weight loss program** that may have benefits for brain, heart, and joint health.
- Identifying health conditions early may help you feel better and prevent future illness.

[Link to original paper](#)



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# ACL INJURIES IN FORMER NFL PLAYERS

The ACL helps you perform cutting, multidirectional movements in football and other sports. Unfortunately, ACL tears frequently occur during the football playing years and may have important implications for long-term damage to your knee and overall health. Below, you will find our research results on the potential consequences following ACL injury, along with ways to be proactive about your health.

## What the Science Says

We studied 3,500 former players and found that those who sustained ACL tears may be at an increased risk for future health problems. Specifically, an ACL injury may:

- Increase future risk of heart attack by as much as 50%.
- Double the likelihood of knee replacement surgery.
- Raise arthritis risk by 50%.

**While we expected to find strong associations between ACL tears and long-term joint health (knee replacement surgery and arthritis), the potential relationship between ACL injury and heart health is surprising.** These results could be attributed to decreased activity after injury, stress, chronic inflammation, or a combination of factors. While we hope to learn how to prevent and improve treatment of ACL tears, former players who have prior ACL injury can follow practical guidance to improve current health.

## Action Items for Former Players

**Heart health is something all former players should prioritize, regardless of whether or not they have sustained an ACL injury.** Below are some joint-friendly tips for maintaining and improving your heart health:

- **Ask your physician to recommend specific exercises and lifestyle choices known to improve heart health** while limiting wear and tear on your joints – for example, swimming and biking.

- 
- **Talk with your doctor about tests that help you understand your cardiovascular risk profile.** This will provide you with personalized information on the factors most likely to impact your heart health (cholesterol levels, blood pressure, family history, etc.), and allow you to better target your efforts to maintain a healthy heart.
  - **Ensure you are taking appropriate steps to improve your knee function through physical therapy and other safer treatment options, and discuss with your physician the risks related to any pain medications you may be taking.**

[Link to original paper](#)

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# KNEE AND HIP REPLACEMENT IN FORMER NFL PLAYERS

The demands of sport including cutting, blocking, and tackling that football players do is a showcase of their athleticism, but can also take a toll on their joints. Healthy joints allow for the athletic movements demanded in football such as running and catching, along with functional activities during daily activities. Knowing that joint health is an important part of a football player's health, we measured the frequency of knee and hip replacement in former NFL players through our First Health and Wellness Questionnaire.

## What the Science Says

- Of the 3,913 former NFL players, 12.3% reported a previous knee replacement and 8.1% reported a previous hip replacement.
- Compared to the U.S. general population, football players reported knee and hip replacement more frequently than men in the general population. This gap between football players and the general population is large and widens with increased age (Figure 1).
- Former football players reported a higher percentage of knee replacements as compared to those of similar age who participated in soccer, rugby, and greater rates than prior cohorts of former football players (Figure 2).
- The elements of play that make football unique may contribute to the higher prevalence of joint replacement in football players. The comparison between sports also indicates that football players are having knee replacements earlier than other professional athletes.

## Prevalence of Knee and Hip Replacement in US General Population and Football Players Health Study (FPHS) Cohort

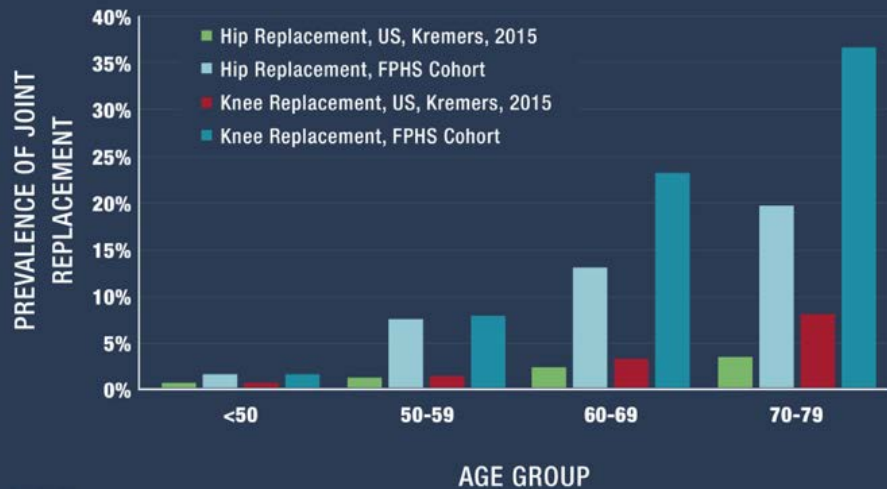


FIGURE 1

## Prevalence of Total Knee Arthroplasty (TKA) in Studies of Athletes

AVERAGE AGE AT TIME OF SURVEY OF PARTICIPANTS



**12.3%**

**52.4**

AMERICAN STYLE FOOTBALL (Football Players Health Study, 2019)



**11.1%**

**59.0**

SOCCER (Fernandes, 2018)



**9.0%**

**60.1**

RUGBY (Davies, 2016)



**7.7%**

**53.6**

AMERICAN STYLE FOOTBALL (Davies, 2019)

FIGURE 2



THE FOOTBALL PLAYERS  
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## Action Items for Former Players

There are many considerations on when to choose a joint replacement surgery, so make sure you discuss all your options with your healthcare provider.

- **In general, surgery in younger patients is not recommended unless non-surgical treatment options have been tried.** The goal is to have a joint replacement at an older age due to concerns that you are more active when younger, and the need to do a second surgical replacement is more challenging.
- **Physical therapy, weight loss, dietary changes, and certain non-steroid based injection treatments may help delay the need for a joint replacement.**
- **If you are experiencing early onset joint pain, consult with a doctor who is experienced in joint preservation** (e.g., sports medicine, orthopedics, or physical medicine and rehabilitation).

[Link to original paper](#)

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# UNEXPECTED CONSEQUENCES OF CONCUSSION

Concussions, a form of mild traumatic brain injury, are one of our study's top research priorities, which includes exploring how head trauma can affect other key areas of former player health, including sexual health and testosterone levels.

## What the Science Says

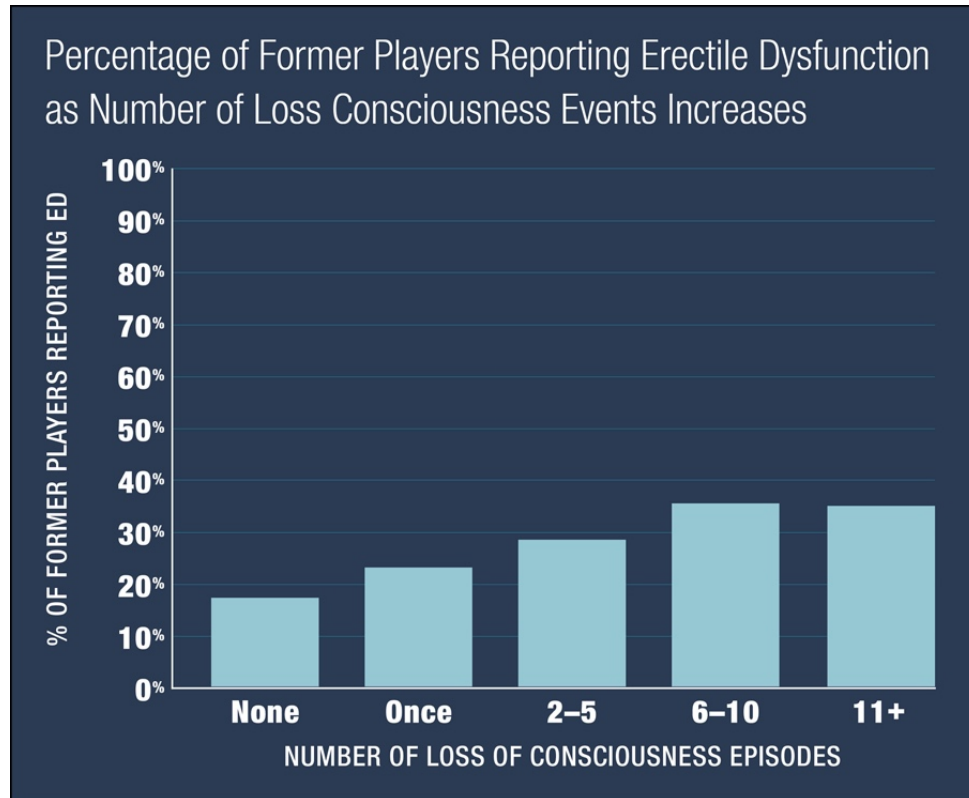
Our analysis of 3,400 former players indicates that **concussions and other conditions that disproportionately affect former NFL players may have adverse effects on sexual health**. Specifically, we found that:

- Former players who sustained more concussion symptoms during their playing years (loss of consciousness, disorientation, nausea, etc.) were more likely to experience erectile dysfunction (ED) later in life.
- Former players who sustained more concussion symptoms also had a greater likelihood of being diagnosed with low testosterone, a condition which is thought to lead to ED and poorer overall health.
- **Sleep apnea, prescription pain medication use, hypertension, and obesity additionally increased former players' risk for ED and low testosterone.**

The findings from our former football player study mirror what has been seen in head-injured military veterans and professional boxers. Strong associations between head injury and ED have also been found in civilians with just a single traumatic brain injury. This evidence, along with our findings, suggest that ED and hormone dysfunction may be the result of physically-based issues brought on by repeated head injury.

The graph below is an illustration of the relationship between ED and loss of consciousness – one of the ten concussion symptoms we studied. It demonstrates how the percentage of players with ED changes as the number of loss of consciousness events increases.





## Action Items for Former Players

While more research is clearly needed, there are many things you can do to improve your sexual health:

- **ED is highly treatable and can also be a symptom of a more serious condition, such as heart disease.** If you are experiencing ED or other symptoms of poor sexual health, talk to your doctor about these concerns and how you can address them.
- **Sleep apnea, hypertension, low testosterone, and obesity can significantly increase your risk for ED.** Work with your doctor to assess these. Treating even just one issue may lead to significant improvements in sexual health as well as other important health areas.

[Link to original paper](#)

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# PERSONAL NETWORKS OF PROFESSIONAL FOOTBALL PLAYERS

Our relatives, casual acquaintances, and even their connections with one another, are the people who make up our personal social network. The people in this group influence us in profound ways. **Research has shown that a strong personal social network can have remarkable benefits for one's health and quality of life.** Recently, our research scientists mapped the networks of former NFL players. The networks of 303 former players were compared to a control group of 269 American men who had not played professional contact sports. While the benefits of social networks have been examined in the general population, this is the first time they have been studied in contact sport athletes.

## What the Science Says

The networks of professional football players differed in some ways from the control group:

- **We found that health conditions such as brain injuries and some chronic illnesses are often associated with smaller personal social networks.** Despite the higher occurrence of traumatic brain injury and chronic illness, former players as a whole did not have the network shrinkage that we would typically expect. Their networks were the same size as those of the non-NFL control group.
- **Maintaining large social networks is associated with longer lifespans, reduced incidence of dementia, and higher cognitive function in Alzheimer's patients.** One possible explanation is that the team-based, fraternal culture of competitive football persists after a player's career has ended and accompanies him for the rest of his post-football life.

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## Action Items for Former Players

This research is relevant for professional football players, as many have experienced prior traumatic brain injuries, are living with chronic health conditions, or combination of both. Those who experience chronic illness or brain trauma can experience reductions in the size of their networks, which can make their existing health problems worse. Larger personal networks actually help to lessen the symptoms brought on by brain trauma and chronic illness.

**Your social calendar isn't the only thing that gets a boost when you stay connected with your friends and family. Being in touch with those in your personal network may enhance your health and theirs. Reach out to a loved one, send a message to a good friend to say hello, or set up a video chat with former teammates.**

**[Link to original paper](#)**

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## SELECTED ADDITIONAL FINDINGS

In addition to findings presented earlier in this report, the Football Players Health Study to date has published over 60 articles on former player health. We have included a sample of these findings and recommendations below. Visit [our website](#) for a more complete list of studies.

### Research in Development for Prevention, Diagnostics, and Interventions

- *An Arthritis Flare-responsive Drug Delivery System*
  - **We explored a novel treatment for arthritis using an injectable gel that releases steroid over longer time into a joint.** The approach studied has the potential to provide the optimal amount of a medication at a time when it is needed. Maximizing drug effectiveness may provide longer lasting benefits in the treatment of arthritis. Additional research into this new treatment is ongoing.
- *Bridge-Enhanced ACL Repair*
  - **This study evaluated the Bridge-Enhanced ACL Repair (BEAR) technique, a promising alternative to traditional ACL repair surgery.** Results show positive outcomes for those who have undergone this procedure and suggests this new method may help current players who qualify for this alternative approach to ACL surgery.
- *Use of Magnetic Resonance Imaging (MRI) in Healing Anterior Cruciate Ligaments and Grafts*
  - **Magnetic resonance imaging of the healing ACL or graft may provide a more direct measure of tissue recovery after surgery.** Use of imaging may provide a way to measure when it is safe for an athlete to return to play.

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## Traumatic Brain Injury: Prevention and Interventions

- *Traumatic brain injury treatment administration during transient permeability of the blood-brain barrier*
  - This early research focuses on innovative ways to deliver treatments to prevent the worsening of a traumatic brain injury over time. In the future, **using small (nano) particles may be helpful to provide medications directly into the brain of former players with injury.**
- *A novel head injury measurement tool that can differentiate players by position in the National Football League*
  - **This measurement tool shows promise for measuring repetitive head impact (RHI) on the field.** In the future this could help inform guidelines for managing player exposure.

## Cognitive Function and Mental Health

- *Self-Reported Cognitive Function and Mental Health Diagnoses among Former NFL Players*
  - This paper identifies that former players may be hesitant to seek help for mental health problems, but may be more willing to report cognitive symptoms. **Former players should be encouraged to talk to their doctors about both their mental health and cognitive symptoms to access the best care and treatment options.** Physicians are encouraged to be aware of players' tendencies to self-report cognitive symptoms when they may be actually seeking help for mental health.
- *The Impact of Head Trauma on the Body*
  - **This study provides early evidence that frequent symptomatic head trauma during a player's professional playing career is related to worse gait performance (e.g., balance while walking) in later life.** A remote smartphone-based assessment may help to evaluate balance while walking and doing a mental task. This could be a useful tool to identify potential dysfunction in former players. Work to further develop this assessment is ongoing.
- *College Football Players Less Likely to Report Concussions and Other Injuries with Increased Injury Accumulation*

- 
- Findings highlight the need for football teams and medical providers to understand that concussions are underreported, and to take steps to report possible concussions to their doctors.

## The Impact of a Playing Career

- *Mortality among Professional American-Style Football Players and Professional American Baseball Players*
  - This study found that NFL players had increased cardiovascular and neurodegenerative mortality rates compared with MLB players, although the number of excess deaths related to neurodegenerative disease (e.g., ALS) was small. While brain health is emphasized due to the nature of the sport of football, cardiovascular disease remains a much more common cause of death and may be preventable and treatable.
  - It is important for physicians to focus on cardiac health in a player's early years as heart disease plays an important role in cognitive health in later life.



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# FORTHCOMING RESULTS

## Scientific Previews: Future Results

- The GRIT Study (*Goal Directed Resilience Training to Mitigate Chronic Pain in Former Football Players*):
  - **Chronic pain can significantly impact former players' quality of life. Former players routinely dealt with acute pain during their active playing years (e.g., injuries), but treatment approaches and coping with acute pain does not prepare players to manage with chronic, ongoing pain. New methods that are both culturally acceptable and effective are needed to address the needs of former players with chronic pain.**
  - GRIT, led by Dr. Herman A. Taylor, Dr. Leroy Reese, and Dr. Brian McGregor at the Morehouse School of Medicine, is a novel, resilience-based program designed to reduce chronic pain. Current recruitment is focused on former players who have completed the first Health and Wellness Questionnaire.
  - Since the COVID-19 pandemic, GRIT has been adapted into a remote-based program, allowing for expanded recruitment.
  - The goal of this ongoing project is to determine whether GRIT might be a method that can help former players with managing chronic pain and lessening symptoms of chronic pain.
- The Sleep Study (*Developing A Scalable Sleep Health Intervention to Improve Pain, Quality of Life, and Health in Former Football Players*):
  - **Sleep plays a fundamental role in multiple aspects of health and wellness, including pain, mental health, cardiovascular and metabolic physiology, and quality of life. Untreated sleep difficulties can also worsen these conditions (e.g., worsen chronic pain, contributor to high blood pressure).** This study looks at a way of improving sleep without medications.

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- Led by Dr. Suzanne Bertisch at Brigham & Women's Hospital, we have tailored a remote sleep health program specifically for former football players. This four-week program provides a personalized sleep plan that is directed and supported by a sleep coach.
  - The goal is to see if this "Sleep Bootcamp" can improve former player's sleep, while supporting other health conditions.
  - This study is not open to new participants any longer. Results of the study will be shared with the former player community in the near future.

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# RELEVANT RESOURCES FOR PLAYERS

## Heart:

- The **Living Heart Foundation's Wellness Library** has a number of resources on heart health and other issues affecting former players.
- Visit the **American Heart Association** website for tips on keeping your heart healthy.

## Mind:

### *Cognitive function*

- This **Harvard Health article** outlines how exercise can actually keep your brain healthy and prevent cognitive decline.

### *Depression and anxiety*

- **NFL Life Line** is a free, independent, and confidential phone consultation service that is available to former players and their families 24 hours a day, 7 days a week. The Life Line is run by professionals who are trained to assist individuals seeking resources for mental or physical health concerns, or who are experiencing personal or emotional crises. Contact: 800.506.0078. <https://nfllifeline.org/>.
- The **Players Assistance & Counseling Services benefit** provides eligible former players and their families with up to eight free counseling sessions a year for matters ranging from family/marital concerns to depression. Contact: 866.421.8628.
- **Symptoms of Depression** and what you can do.
- **Anxiety** in the former player population. Medical/Wellness Assessments from The Trust (Powered by the NFLPA).

## Body:

### *Physical function*

- **Brain and Body Assessment** provides comprehensive medical evaluations to former players. This program identifies areas of concern and the resources and services to address them.
- **NFL Joint Replacement Program** This resource through the NFL Player Care Foundation can provide medical and financial assistance

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for former players who are eligible. Eligibility is determined by credited seasons. Related post-surgery rehabilitation may also be included.

- EXOS is a partner of The Trust, powered by the NFLPA. Through EXOS, former players can access physical therapy, a nutritionist, and other resources for physical wellbeing. [Learn more here.](#)
- The Trust, powered by the NFLPA, has partnered with the YMCA to provide former players with access to a free one-year Individual or Extended Household Membership at a participating YMCA location. [Learn more here.](#)

### *Pain*

- Learn more about [managing your chronic pain](#) from the Cleveland Clinic.

### *Sexual health*

- [Cleveland Clinic: Sexual Health:](#) a reliable source of information on ED, low testosterone, and related matters.

### *Sleep*

- Sleep apnea or other sleep problems may affect cognition and mood. [Check out this resource on sleep apnea](#) and consider consulting your doctor about a sleep evaluation that may help you to learn more about your own sleep patterns.

## **Community:**

### *Community Resources*

- **AthLife** is a partner of [The Trust \(Powered by the NFLPA\)](#), and assists former players with continuing education and career development. [Learn more here.](#)
- **The Manpower Group** is a partner of [The Trust \(Powered by the NFLPA\)](#) that supports former players along every step of the job search process, providing tools and assistance for success. [Learn more here.](#)
- The **NFL Foundation** offers grant assistance to current and former players to support the causes they care about, including grants for youth football camps, social justice initiatives, and more. [Learn more here.](#)

### *COVID-19 Support Resources*

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- Ways to [stay connected during the COVID-19 crisis](#).
  - Practical advice on [maintaining your emotional health](#) during the Coronavirus outbreak.

### *Social Networks*

- Cultivating your social support network – [tips from the Mayo Clinic](#).
- Identifying your [social support system](#).

## **Additional Resources:**

*If you would like to learn more about health disparities:*

- [Glossary of terms frequently used when discussing race and health disparities](#).
- In June, we invited [Dr. Camara P. Jones](#), an American physician, epidemiologist, and civil rights activist who specializes in the effects of racism and social inequalities on health, to join us for a conversation on naming racism in healthcare and achieving health equity. You can [view the conversation here](#).
- There is increasing evidence that some racial and ethnic minority groups are being disproportionately affected by COVID-19. Factors that contribute to this include discrimination, healthcare access and quality, education and income gaps, and housing access. Additional factors include health conditions such as obesity, hypertension, and heart disease. [Learn more about each factor here](#).

### *Tips for Locating a Primary Care Physician*

- If you have health insurance, your insurance company will have a list of primary care physicians within your network.
- Try reaching out to friends and family members for referrals to their primary care physicians.
- Large hospitals in your area will list available physicians on their website. Try reaching out to your local hospital for their available primary care physicians.



## OTHER RESOURCES: FROM THE NFLPA/THE TRUST

The following resources have been provided by the NFLPA/The Trust.

- **Professional Athletes Foundation (PAF)**  
Financial and Medical Assistance in a Time of Need.  
[www.yourPAF.com](http://www.yourPAF.com)  
Contact Professional Athletes Foundation (PAF) 202.756.9168.
- **Living Heart Foundation (LHF)** has provided former players with heart and comprehensive health screenings to educate former player membership on the risks of cardiovascular disease and obesity.
  - Blood Pressure & Blood Testing
  - Body Composition Measurements
  - Carotid Ultrasound
  - Echocardiogram
  - Electrocardiogram (EKG)
  - Hearing Health Screening
  - Neurological Consultations
  - Nutritional Consultations
  - Obstructive Sleep Apnea
  - Orthopedic Consultations
  - Prostate Blood Testing
  - Pulmonary Function Evaluation
  - Doctor's Exit Interview

To learn more about Living Heart Foundation and The HOPE (heart, obesity, prevention, education) program for former players, contact Professional Athletes Foundation (PAF) 202.756.9168.



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- **Players Health Alliance** as part of the LHF screening program provides sleep apnea testing, sleep apnea education and healthy long-term solutions for former players with sleep disorders.  
Contact Professional Athletes Foundation (PAF) 202.756.9168.
  - **EarQ** provides hearing screenings to former players at no cost, along with education on the importance of good hearing, various treatment options and prevention methods. Hearing aids can be requested upon application through PAF grant assistance program.  
Contact Professional Athletes Foundation (PAF) 202.756.9168.

## **THE TRUST**

### **Mind**

*Depression and Anxiety: SMHB, Eisenhower, Lakeview, and B&B*

- **SMHB** – The Trust and Cigna have partnered to offer eligible former NFL Players coverage for certain outpatient mental health services under The Trust’s Supplemental Mental Health Benefit (SMHB).
- **Eisenhower** – The Eisenhower Center’s AFTER THE IMPACT program is an intensive and transitional residential wellness program developed by The Eisenhower Center to educate and care for individuals with mental and physical health as well as behavioral services.
- **Lakeview** – Lakeview Health is a licensed and Joint Commission accredited addiction treatment and recovery center that addresses healing of your mind, body, and spirit.
- **B&B** – The Trust’s Brain & Body Assessment empowers you to take control of your health. Through an integrated and individually tailored assessment offered by premiere medical institutions, you obtain a thorough, in-depth evaluation of your overall health.

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## Body

### *Physical Function: EXOS IRT, EXOS PT, WW*

- **EXOS IRT** – The EXOS Intensive Restorative Training Program (IRT) is designed to help former players feel and move better, with a proactive approach to health and wellness through training and recovery.
- **EXOS PT** – The EXOS Physical Therapy allows former players to receive full Physical Therapy evaluations, joint and soft tissue mobilizations, corrective exercise plans focusing on individual goals and one-on-one remote or in-person nutrition consultations with a registered dietitian.
- **WW** – WW (Weight Watchers Reimagined) is here to help you and your family reach your wellness goals. WW offers an easy-to-use app and website for tracking your food, activity and sleep, as well as around-the-clock live coaching and supportive virtual. Through The Trust and WW partnership members and their spouse/domestic partner receive a WW membership at no cost.

### *Pain: EXOS PT*

- **EXOS PT** – The EXOS Physical Therapy allows former players to receive fully Physical Therapy evaluations, joint and soft tissue mobilizations, corrective exercise plan focuses on individual goals and one-on-one remote or in-person nutrition consultations with a registered dietitian.

### *Nutrition and Wellness*

- **WW** – WW (Weight Watchers Reimagined) is here to help you and your family reach your wellness goals. WW offers an easy-to-use app and website for tracking your food, activity and sleep, as well as around-the-clock live coaching and supportive virtual. Through The Trust and WW partnership members and their spouse/domestic partner receive a WW membership at no cost.
- **YMCA** – Through The Trust's partnership with YMCA, former players are eligible for a free one-year individual or extended household membership that allows you access to full service facilities that include an array of features, personalized fitness options to meet your health

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and wellness needs and a safe, friendly environment that builds community connections.

- **EXOS IRT** – The EXOS Intensive Restorative Training Program (IRT) is designed to help former players feel and move better, with a proactive approach to health and wellness through training and recovery.
- **EXOS Digital Coaching Platform** – The EXOS Digital Coaching Platform allows you access to upcoming and on-demand classes crafted by the EXOS coaches/instructors. The digital platform allows you to find the exact class you want based on type, category, instructor, equipment needed, duration, etc.

## Community

### *Community Resources*

- **AthLife** – AthLife services the education, career development, and life skills needed for post-professional athletes. Their approach is to guide individuals through a process that builds skills and confidence, thus enabling them to assume control over their ongoing career development.
- **ManpowerGroup** – The ManpowerGroup supports The Trust Members along every step of the job search and career development process, giving them the tools and assistance, they need to succeed.
- **SCORE** – SCORE individually matches mentors based on your business field and goals. Your mentor will support your success through offering experienced advice, consulting on best practices, and education on small business topics.
- **Financial Finesse** – The Trust has partnered with Financial Finesse to deliver former players and their families personalized financial guidance at no cost. Financial Finesse's offers former players ongoing access to one of the Certified Financial Planner professionals for unbiased phone-based financial coaching and planning.

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## GLOSSARY

- **ACL**

The ACL, or anterior cruciate ligament, is one of the key ligaments that helps to stabilize your knee joint and connects your thighbone (femur) to your shinbone (tibia). It can become torn or injured during sports-related activity where you stop short, change directions quickly, jump, or land. The ACL also may be severely injured after external trauma to the knee caused by kicks, tackles, or falls.

- **Cardiometabolic conditions and “metabolic health”**

Cardiometabolic conditions include high cholesterol, high blood pressure, diabetes, and kidney disease. Lifestyle choices such as physical inactivity, an unhealthy diet, and smoking are contributing factors of cardiometabolic conditions. The term “metabolic health” refers to how well you prevent or control these conditions. When they are out of control, your risk for heart disease and stroke increases.

- **Cardiovascular diseases (CVD)**

Cardiovascular diseases (CVD) refer to illnesses of the heart and blood vessels within the body, such as heart attack, stroke, heart rhythm irregularities (like Afib), blood clots, heart failure, and more. Some CVD can be in-born or genetic; however, the most common CVDs are associated with lifestyle factors like decreased physical activity, unhealthy diets, tobacco usage, and heavy alcohol consumption.

- **Cognitive or neurocognitive impairment**

Cognitive impairment is most often characterized by difficulty remembering, concentrating, making decisions, or learning new things. Symptoms can be mild with small changes in daily functioning or severe resulting in loss of independence due to an inability to perform daily functions. These are hallmarks of diseases like dementia, Alzheimer’s disease, and motor skill disorders.

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- **Cognitive symptoms**

Symptoms of cognitive impairment include confusion, poor motor coordination, short- or long-term memory problems, confusion in identifying items or people, and impaired judgement.

- **Concussion**

Concussions are a type of traumatic brain injury (TBI) caused by a bump, hit, or blow to the head or body which causes the head to move rapidly back and forth. Not every hit will result in a concussion. Signs of concussions include appearing dazed, moving clumsily, speaking slowly, and inability to recall events before or after the hit. Symptoms of a concussion include headaches, nausea, sensitivity to light or noise, blurry vision, balance problems, feeling hazy or foggy, and trouble concentrating.

- **Intervention (within the context of research)**

Intervention research is a type of research study that focuses on measuring what happens after the researchers “intervene” by introducing a change for the person or group involved in the research (like changing diets, giving a medication, undergoing a therapy, etc.). For example, in a study investigating heart health, researchers may require participants to follow a specific diet. The investigators will take certain cardiovascular measurements before applying the diet (baseline) and after. These measurements may be taken several times throughout the length of the study, and researchers will use this data to examine how the diet affected participants’ heart health.

- **Joints and the role they play in the body**

A joint is a part of the skeleton where two or more bones meet to allow certain movements. Joints come in different shapes which determine the specific movement allowed. Without joints, flexibility and bodily movement would be impossible.

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- **Socioeconomic**

Socioeconomic status is the overall standing of a specific group of people as it relates to a combination of social and economic factors. These factors include income, wealth, education, occupation, race, and others. Socioeconomic status differences often drive severe inequities in access to resources across groups, and are a leading cause of health disparities in the US.

- **Traumatic brain injury (TBI)**

A TBI is defined as any sort of injury that alters how the brain normally functions. They are often a result of a sudden external trauma to the head. Symptoms of TBIs include confusion, dizziness, blurry vision, and difficulty concentrating. There are three types of TBIs (mild, moderate, severe) and the symptoms will vary based on the type.

- **Sleep apnea**

Apnea is defined as a temporary cessation of breathing. It is often most mentioned in terms of sleep disorders, where breathing may repeatedly stop and start while asleep. Sleep apnea is considered a potentially serious sleep disorder with complications including restlessness, cardiovascular problems, metabolic issues, liver problems, and more. There are three main types: obstructive (caused by a narrowing of your airway), central (caused when your brain isn't sending the right signals to your breathing muscles), and complex (a combination of both obstructive and central sleep apneas).