



NATIONAL FOOTBALL LEAGUE

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Dear Mr. Deubert, Mr. Cohen, and Ms. Lynch:

I. Introduction

We appreciate the opportunity to comment on “Promoting and Protecting the Health of NFL Players: Legal and Ethical Analysis and Recommendations,” by Deubert, et al. (the “Report”). The issue of player health and safety is extremely important to the NFL and our partners at the NFL Players Association (“NFLPA”). As is set forth in more detail below, we are proud that this shared commitment has ensured that NFL players receive unparalleled medical care, provided by world-class, highly credentialed physicians, who are supported by superior athletic trainers, and we welcome the opportunity to outline the various health and safety benefits provided to NFL players. We will also continue to work together with the NFLPA to advance and improve our health and safety policies, as we have always done, and ensure that we are informed by the most up-to-date scientific and medical consensus.

Notwithstanding, we were disappointed that the Report appeared to start with the premise that the health care system in the NFL suffers from an “inherent conflict of interest,” and then sought to justify that predetermined conclusion through an unscientific survey of an anonymous “convenience sample” of only thirteen current and former NFL players. From this basis, the Report ultimately promotes the untenable and impractical recommendation that NFL players receive care from “two distinct groups of medical professionals”—a recommendation that would, as set forth in more detail in this response, have unintended but extremely detrimental effects on NFL players’ care.

II. The NFL’s Commitment to Player Health and Safety

Like the authors of the report, the NFL and NFLPA take a holistic approach to players’ wellbeing including their physical and mental health, financial security, and personal and professional development throughout and long after their football career. NFL players receive exceptional medical care and have benefits and programs that are unheard of in other industries. The NFL, NFLPA, NFL Physicians Society (“NFLPS”), Professional Football Athletic Trainers Society (“PFATS”), player agents, players’ families, the media and the public regularly scrutinize these issues. The NFL and NFLPA, as the parties responsible for working conditions through their collective bargaining relationship, are focused on continual improvements in this realm. This fundamental commitment to the betterment of NFL players’ and their families’ lives drives all decisions pertaining to their overall health and security, including how to ensure each player is informed, prepared and empowered to leverage all opportunities afforded to him and manage any challenge that he may face.

NFL players are cared for by some of the world’s finest medical professionals. NFL club physicians’ training, subspecialty medical and surgical expertise, and reputations in patient care, clinical

leadership and medical professionalism are largely unparalleled in the world of sports medicine.¹ Every club physician has been selected because NFL clubs want the best possible care for their players. Most club physicians educate medical students and even their physician peers in their areas of expertise across the United States and throughout the world. Many are nationally and internationally renowned researchers who lead the way in seeking to improve the medical care and health of patients.

The 2011 CBA included a landmark effort to fund medical and scientific research and innovations to improve the lives of our current and former players. In September 2012, the NFL announced a \$30 million unrestricted grant to the Foundation for the National Institutes of Health (“FNIH”) to advance medical research on brain injuries, especially among athletes and veterans. This marked the single-largest donation to any organization in the league’s history. And, in 2013, GE and the NFL teamed up to launch the Head Health Initiative, a four-year, \$60 million collaboration to accelerate improvements in concussion diagnosis, prevention, and treatment.

This year, the NFL launched “Play Smart, Play Safe,” an initiative to drive progress in the prevention, diagnosis and treatment of head injuries, enhance medical protocols and further improve the way the game is taught and played. The League has pledged an additional \$100 million for independent medical research and engineering advancements—building on the \$100 million already committed to medical and neuroscience research. The NFL has allocated \$60 million toward the Engineering Roadmap, a plan to incentivize the development and commercialization of new and improved helmets and protective equipment over the next three to five years. More than \$40 million has been earmarked for medical research over the next five years, primarily dedicated to neuroscience. Research topics may include the long-term effects of concussion, the incidence and prevalence of chronic traumatic encephalopathy (“CTE”), exploring new and effective ways to treat concussions, and what can be done to improve long-term player health.

In 2016, to ensure that we were meeting the needs of the player population and identifying potential health issues, the NFL and NFLPA jointly retained a third-party company to design and administer a confidential survey of every NFL player regarding health and safety issues. The results were used to identify the practices of the best performing clubs and to work to replicate those experiences. The NFL and NFLPA have also worked collaboratively to design and implement the most comprehensive concussion diagnosis and treatment protocol in professional sports—the first to incorporate the concept of a “medical time-out,” the first to use unaffiliated neurotrauma consultants, and the first to contemplate sanctions for violations of the protocol.

Independent studies have shown that NFL players live long and healthy lives. The Report barely acknowledges one of the largest independent studies of player health, in which the National Institutes on Occupational Safety and Health (“NIOSH”) issued multiple reports on more than 3400 retired players, who played between 1959 and 1988 for five or more years. Decisions on study design, data collection and analysis were made entirely by the federal researchers and the study itself was completely independent of the NFL. The study found that “overall mortality and mortality from cancer, heart diseases, and assault/homicide continue to be significantly less than [that of men of the same age and background who did not play football].” It also found that NFL retirees “had rates of suicide mortality that were less than half of what would be expected in a comparable sex/race/age grouping from the general U.S. population.” The most recent NIOSH report is attached at Appendix B.

¹ See Appendix A for a listing of the NFL Clubs’ Head Team Physicians, their credentials and their affiliations.

Commissioner Roger Goodell has prioritized player health and safety from the inception of his tenure, and continues to today. As he noted in this year's letter introducing "Play Smart, Play Safe":

A central goal of this new effort is to help us understand more about the prevention, diagnosis, treatment and long-term impact of concussions and brain injury. Until then, we will further strengthen our medical care, and we will enforce our concussion protocols. We will continue to evolve the game and our rules. We will work to bring together engineers toward the development of better equipment. We will continue to fund independent scientific research. And we will share what we learn along the way. It all comes down to one overriding priority: the health, safety and well-being of every player.

The League's commitment in this realm is shared by the NFLPA. As NFLPA Executive Director DeMaurice Smith noted in 2014:

I think the good news is we are well ahead of where I thought we would be on the issues of player safety. We changed the collective bargaining agreement and we thought in really bold strokes. . . . The limits on contact in practice during the regular season, as well as the protocols we now have for when a player does get hurt, have made the game safer. I think the good news is, not only have we made bold steps in the national level, you've seen the high school and youth football level start to mimic virtually everything we have done to make their game safer. So when you do have injuries such as Wes Welker and you do have injuries in the National Football League, I'm confident that our team doctors are employing the right protocols.

In other words, the NFL and NFLPA are consistently bringing together the various stakeholders identified by the Report to discuss ways to improve our work in this area.

III. Health and Safety Programs

These efforts have resulted in a series of improvements to the health and safety of NFL players:

Club Medical Staff Qualifications and Responsibilities

The CBA specifically emphasizes that the NFL club physicians' primary responsibility is to the player-patient.² This commitment is reinforced with steps that ensure that players are provided with the most advanced medical care available and that their health always takes precedence over competitive concerns. Those include longstanding rights of players to a second opinion and to select a surgeon of his choice—both at no cost to the player.

The CBA requires that certain medical specialties, with defined qualifications, be represented on every club's medical team. In addition to a physician who is board-certified in an internal medicine discipline (who must also have a Certificate of Added Qualification in Sports Medicine) and a board-

² "[E]ach Club physician's primary duty in providing medical care shall be not to the Club but instead to the player-patient. This duty shall include traditional physician/patient confidentiality requirements. In addition, all Club physicians and medical personnel shall comply with all federal, state, and local requirements, including all ethical rules and standards established by any applicable government and/or other authority that regulates or governs the medical profession in the Club's city." 2011 CBA, Article 39, Section 1(c).

certified orthopedist, club medical staffs must include all of the following fields: neurology, cardiology, neuropsychology and nutrition. After 2011, all new Head Team Physicians must also have earned a Certificate of Added Qualification in Sports Medicine. An independent firm confirms that every physician on every club staff has the required qualifications. The CBA also expanded team athletic training staffs and required athletic trainers to meet certain defined professional qualifications.

Each primary team doctor, as well as team affiliated orthopedic surgeons and internists, is a member of the NFLPS, a professional organization founded in 1966 whose mission is to provide superior medical and surgical care to their patients—NFL players. NFLPS members are focused on the prevention and treatment of injuries in NFL players and are constantly working to improve the care of their patients both on and off the field. Additionally, NFLPS members work closely with athletic trainers, physical therapists, chiropractors, psychologists and other medical personnel as a cohesive unit to deliver well-rounded care to every NFL player.

Medical Program Initiatives/Committees

The commitment to player health and safety is further evidenced by the addition of the NFLPA Medical Director as a voting member of every NFL health and safety committee with access to all of the data, records and other information provided to NFL representatives.

The 2011 CBA established the Accountability and Care Committee (“ACC”) to provide guidance on matters affecting player health and safety. Three members are appointed by each party, and the ACC reports to the NFL Commissioner and NFLPA Executive Director. The committee recommends continuing education programs for club medical teams, develops standard player physical examinations, and investigates complaints filed by players or the NFLPA concerning medical care provided by club medical teams. Upon receipt of a complaint, the committee retains independent experts who investigate and report their findings to the NFL Commissioner and NFLPA Executive Director.

The ACC complements the work of the Joint Committee on Player Safety and Welfare, which has broad authority to review any subject regarding player safety and welfare, and to issue reports to the NFL Commissioner, the NFLPA Executive Director, and any NFL medical committee.

The NFL and NFLPA jointly selected the Duke Infection Control Outreach Network (“DICON”) to develop and implement infectious disease control programs. Physicians from DICON inspect every club’s practice facility and stadium to ensure that it employs current and effective infection control practices. The program also educates players and team medical staffs regarding infection control, including blood borne pathogens and high-profile issues, such as MRSA and the Zika virus. DICON also provides emergency assistance to any player or club, if needed.

The NFL and NFLPA jointly retained eClinicalWorks to develop an electronic medical record (“EMR”) system that houses every player’s medical record. This system allows physicians (club and second opinion) access to a player’s diagnostic test results and records to provide counseling from wherever they are located. Players have ready access to their records via a secure online portal, which remains active after the player retires. The EMR system has greatly enhanced the accuracy and detail of the NFL’s Injury Surveillance System, which is managed by Quintiles, a third-party company providing epidemiological analysis of the injury data. Quintiles’ analysis allows the League to make data-based changes in rules and permissible techniques used in play in an effort to make the game safer.

Finally, the NFL and NFLPA, with their medical advisors and committees, developed a standard pre-season medical educational course that every player receives at the start of training camp. The presentation was developed by subject matter experts and includes information on exertional heat stroke, concussion diagnosis and management, mental health, infection control, substance abuse and performance enhancing substances.

Sideline Medical Support

As of the 2016 season, at least 29 medical professionals are at every stadium on game day, including members of each team's medical staff as well as unaffiliated medical professionals. These include two unaffiliated neurotrauma consultants ("UNC") who support the team medical staffs in the diagnosis of in-game concussions; two certified athletic trainers in a stadium box ("Booth ATC Spotter") who monitor the field and television replays to help identify players with a potential injury and share that information and video feeds of potential injuries with the team medical staffs; Visiting Team Medical Liaisons ("VTML")—board-certified emergency physicians licensed in the state where the stadium is located—who work with the visiting team to provide medical care for its players, including access to emergency care if needed; and specially-trained airway management physicians for responding to a critical incident requiring intubation.

All of these physicians work under an Emergency Action Plan, which has been specifically designed for each stadium, reviewed by the NFL and NFLPA, and approved by third party experts. This plan, which the club is required to practice prior to the start of the season, also requires the home team to designate a Level One Trauma Center and to retain two certified crews of paramedics and advanced life support ambulances. All of these improvements were accomplished in a cooperative way, without "adversarial" bargaining.

Mandatory Rules and Protective Equipment

The NFL's Competition Committee, composed of NFL owners, general managers, and coaches, meets with representatives of the NFLPA and uses injury data from Quintiles, along with input from medical advisors and committees, to constantly evaluate whether rules need to be changed and certain techniques removed from the game. Since 2002, the NFL has made 42 rules changes to eliminate dangerous tactics and reduce the risk of injuries, especially to the head and neck.³

Concussion Protocol

Beyond rule changes, the NFL and NFLPA worked with their medical and scientific advisory committees to develop comprehensive protocols to manage potential concussions from diagnosis through return-to-play. These protocols incorporate several ground breaking concepts in the care of professional athletes, including the first "medical time-out" in professional sports. The NFL and the NFLPA revisit and update the concussion protocol every season in an ongoing effort to improve medical care.

³ See Appendix I to the Report.

Highlights of the Concussion Diagnosis and Management Protocol include:

- **Mandatory Sideline Evaluation:** The protocol applies whenever a club's medical staff (and/or a coach, teammate, game official, Booth ATC Spotter or UNC) observes a player sustain a hit or other triggering incident (including a "stinger" or "burner"). When that occurs, the club's medical team and UNC must review the video of the play and the player must receive a focused neurological examination to determine if he may return to the game. Should there be any doubt about whether the player sustained a concussion, he must go to the locker room for a more extensive evaluation by both the team physician and the UNC.
- **Unaffiliated Neurotrauma Consultant ("UNC"):** UNCs are doctors with significant experience with head trauma and are independent of either team. There is one on each sideline of every NFL game to help in spotting possible concussions and to assist the team medical staff with the concussion diagnosis (including by reviewing video of the play). UNCs are employed by the leading medical centers in the home team's community and are selected by the NFL's Head, Neck & Spine Committee, approved by the NFLPA's Medical Director, and compensated by the League.
- **Booth ATC Spotters:** Unaffiliated certified athletic trainers staff every NFL game, watching the action live and monitoring the network video feed to determine if a player needs medical attention. The Booth ATC Spotter communicates with team medical staffs and the game officials via radio to relay medical information, and sends video clips of relevant plays to team medical staffs. In appropriate cases, the Booth ATC Spotter may stop the game to call a medical time-out.
- **Medical Time Out:** In the first rule of its kind in professional sports, the Booth ATC Spotter has the authority to halt play if he observes a player who may have suffered a concussion, yet appears likely to remain in the game without an evaluation from the medical staff.
- **Sideline Video:** The NFL has developed sideline video and communications equipment that permit both teams' medical staffs to communicate with the Booth ATC Spotter and to review video of plays in which a player may have sustained an injury.
- **Madden Rule:** A player suspected of having sustained a concussion during a game has his helmet taken away and is escorted to the locker room for further evaluation and treatment. If the player is diagnosed with a concussion, the player will not be permitted to return to the game.
- **Mandatory Policy:** The protocol is mandatory and suspected failures properly to apply the protocol are jointly investigated. When a deviation from the protocol occurs, the Commissioner may impose discipline against the team, which may include fines or the loss of a draft pick.

Return-to-Participation Protocol

- **Standard Five-Step Process:** The NFL and NFLPA have established a standard five-step process that every NFL player diagnosed with a concussion must follow before being cleared to fully practice and participate in an NFL game. This process, developed from the International Consensus Statement on Concussions, ensures that every player in the NFL receives consistent treatment.

- Independent Neurological Consultant (“INC”): After a player has progressed through the five-step process, and is cleared by the club physician, he must be seen and separately cleared by an INC, jointly approved by the NFL and NFLPA with no club affiliation. Until cleared by this independent physician, a player may not return to practice and play.

Practice Rules and Playing Equipment

The 2011 CBA changed mandatory practice rules throughout the year. Offseason Organized Team Activities may not include “live” contact and must be conducted at a pace and intensity conducive to learning. Two-a-day practices have been eliminated in training camp and contact practices have been significantly reduced. During the season, NFL teams are limited to 14 days of full-contact football practice during the 17-week season—fewer than one full-contact practice per week.

The NFL and NFLPA have assembled a team of engineers, biomechanical experts and material scientists to undertake a comprehensive analysis of football helmets and turf shoes. Testing was conducted in 2015 and again in 2016, and the results were shared with players, athletic trainers and equipment managers to help players make informed decisions. Posters summarizing the results are in all club locker rooms. Copies of the posters are attached as Appendix C.

Building on existing programs to test playing surfaces, the Field Surface Safety & Performance Committee was created to provide advice on the safety, performance, and testing of playing and practice surfaces. This committee will perform research and advise on injury prevention, testing methods, and tools and techniques to evaluate and improve field surface performance. It will also oversee the stadium inspection program, which includes testing of NFL playing surfaces by engineers retained by the NFL, under observation by NFLPA experts.

Benefits for Current Players, Retired Players and their Families

The 2011 CBA enhanced the benefits of vested players and provides for the future financial and health security for the player and his family in his post-football career. A vested player is one who has been on a club’s Active/Inactive roster for three games in a season for three seasons.

Current Players

For current players the CBA offers a series of plans—the NFL Pension Plan, the 401(k) Savings Plan Matching Contribution, and Annuity Program to provide financial security for players after their NFL careers are over and they retire from the workforce. They provide separate sources of post-retirement income and have been substantially increased from prior agreements.

The chart below outlines the estimated annual post-retirement income* for an active player who concludes his career in 2016:

Benefits Commence	4 Credited Seasons	7 Credited Seasons	10 Credited Seasons
Age 55: Total Estimated Income/Year	\$112,872	\$243,768	\$299,064
Annuity	\$33,384	\$107,856	\$133,836
401(k)	\$50,208	\$88,632	\$101,028
Pension	\$29,280	\$47,280	\$64,200
Age 65: Total Estimated Income/Year	\$292,368	\$630,864	\$774,180
Annuity	\$86,136	\$278,328	\$345,336
401(k)	\$129,552	\$228,708	\$260,700
Pension	\$76,680	\$123,828	\$168,144

*Assuming 7% investment return

The chart below outlines the estimated annual post-retirement income* for an active player who starts his career in 2016:

Benefits Commence	4 Credited Seasons	7 Credited Seasons	10 Credited Seasons
Age 55: Total Estimated Income/Year	\$127,008	\$297,204	\$441,168
Annuity	\$39,564	\$137,016	\$216,576
401(k)	\$53,364	\$98,748	\$135,792
Pension	\$34,080	\$61,440	\$88,800
Age 65: Total Estimated Income/Year	\$329,016	\$769,236	\$1,141,764
Annuity	\$102,072	\$353,544	\$558,816
401(k)	\$137,688	\$254,784	\$350,376
Pension	\$89,256	\$160,908	\$232,572

*Assuming 7% investment return

Benefits for Retired Players and their Families

The 2011 CBA also addressed the needs of retired NFL players, adding three new programs. First, the NFL and NFLPA invested \$620 million to create a Legacy Benefit to enhance retirement benefits for players who vested before 1993. Second, the CBA created the Neurocognitive Disability Benefit, which provides benefits to former players diagnosed with mild or moderate neurocognitive impairments. And third, the NFL significantly enhanced post-career medical benefits for retirees. NFL players are now provided with health insurance for themselves and their families for the first five years after their retirement at no cost and are also given up to \$350,000 in a tax-free Health Reimbursement

Account (“HRA”) which they may use to pay for medical procedures or to purchase continuing health insurance after the five years of free NFL coverage expires.⁴

Understanding the programs available is essential for retired players to maximize their benefits, and improved education has been a priority. Current and former players receive individualized statements describing their benefits and offering strategies that encourage prudent financial decisions in retirement. The NFL player benefits website will soon provide players the ability to perform transactions online and run calculations on benefit distributions.

Education begins as soon as players enter the League as part of the Rookie Transition Program, and additional educational opportunities continue throughout the players’ careers.

For certain programs, a coordinator is present to assist families and caretakers in navigating the benefits programs, including the NFL’s “88 Plan,” which supports players suffering from dementia, Alzheimer’s, Parkinson’s, or ALS.

NFL Player Engagement

NFL Player Engagement (“NFLPE”) reaches more than 2,000 NFL players and spouses each year through a variety of programs and services focused on career development, financial and continuing education, as well as personal, psychological and physical wellness. NFLPE is based on the peer-to-peer model, connecting players with one another. To reflect the distinct phases of the NFL playing experience, the NFLPE team focuses on two primary platforms—NFL Life and NFL Next.

NFL Life engages current NFL players with personal and professional development resources such as:

- Rookie Transition Program, a comprehensive overview of all resources available to players and their families;
- Continuing Education Program, in partnership with colleges and universities across the country;
- Internships (China, Mexico and Canada) where players gain real-world, professional experience in an international setting;
- Individualized career coaching;
- Princeton Review test preparation for graduate school admission exams and discounts on Princeton Review resources;
- Money Management International classes that provide information and one-on-one counseling on reaching financial goals by managing income and expenses, creating wealth, using credit wisely, controlling debt, and building savings;
- Industry Boot Camps that let players explore careers and gain experience in a variety of fields.

The NFL Player Care Foundation (“PCF”) provides support with medical, emotional, financial, and other issues. Since 2008, more than 3,000 former players have benefited from the Healthy Body and Mind Screening program, offered by the PCF, NFL Alumni Association, and, currently, Tulane University

⁴ After the five years of cost free health insurance coverage expires, retired players may opt to continue to participate in the League health plan by paying the favorable group rate premium, which they may do with their HRA. They may continue to do so for life.

School of Medicine. The events include a series of free cardiovascular and prostate screenings as well as mental health resources and education. The PCF has also issued almost \$11,000,000 in monetary grants to more than 1,100 qualifying former players and their family members for needs as varied as basic housing, transportation, and utilities to coordinating and paying for substance abuse, mental health and medical treatment.

IV. Fundamental Failings of the Report

While we commend the Report for raising topics important to player health and safety, we believe that it falls short of its stated goal to provide recommendations that will “have the most meaningful and positive impact on player health” due to a deeply flawed methodology, which amounted to little more than interviewing thirteen anonymous, current and former NFL players and collecting and citing internet articles and other third party sources, some many decades old. The Report’s “Top 10” recommendations have either already been implemented by the NFL and NFLPA, such as the recommendation “not to make player health a subject of adversarial collective bargaining,” or reflect a fundamental misunderstanding about our industry and relationship. The Report’s primary recommendation that we create two separate medical teams to care for NFL players has never been proposed by the NFLPA, nor to our knowledge has it been employed or even seriously considered in any setting in or out of professional sports, which is not surprising since it would unnecessarily complicate the patient-physician relationship to the detriment of the player’s health.

The selection of Mr. Deubert to serve as the lead author of an allegedly unbiased, neutral report examining the adequacy of NFL health and safety programs is curious. According to his biography, Mr. Deubert does not have any prior experience in the fields of medicine or ethics and his only experience with professional football was gained working as an analyst for a sports agent, a summer intern for the New York Jets, and as an associate to a lawyer who has sued the NFL and individual NFL employees in federal court three times and has appeared on behalf of NFL players in several cases challenging the application of the NFL and NFLPA’s jointly-administered drug and steroid policies.

We review below some specific concerns with the Report.

a. Lack of Foundation

The foundation of the Report is largely limited to interviews of thirteen current and former players and citations from excerpts of books and internet articles, many of which are more than two decades old.⁵ The Report does not identify the thirteen interviewees beyond noting that they included both current and former players,⁶ does not indicate how these players were selected or even attempt to describe how they are representative of the current or former player population. The evidentiary basis for the Report’s conclusions, along with its recommendations, rely heavily on selected statements from

⁵ The Report is based on a fundamental misunderstanding of the actual roles that NFL club doctors, athletic trainers, coaches and others play in keeping players healthy. Because our response has been limited by the authors, we are unable to respond using a stakeholder-by-stakeholder approach to analysis and recommendations, therefore we address broad areas of concern and provide examples that illustrate our concerns.

⁶ It is difficult to reconcile the Report’s repeated criticism of both the Michigan Study and the Newsday Survey as being based on insufficient or unrepresentative samples with the Report’s dogged reliance on excerpts from thirteen anonymous interviews to support each of its most fundamental conclusions.

this “convenience sample.” But, a convenience sample is in no way scientifically valid and should not be the basis for the fundamental conclusions in a report such as this.

The comments of a similar “convenience sample” of NFL players would support a very different set of conclusions from those offered in the Report:

- Aaron Williams, after suffering a serious neck injury during the 2015 NFL season, commended the Buffalo Bills’ medical staff for their treatment of his injury: *“I truly cannot say enough about Dr. Cappuccino and the rest of our medical staff. Maybe I’m biased, but I think you’d be hard pressed to find better doctors anywhere. And while I’m on that topic I’d like to give a special shout-out to our team athletic trainer Shone Gipson—what Shone has done for me since the day I arrived in Buffalo is something I can’t even begin to explain.”*
- Dez Bryant spoke highly of the care he received from the Director of Rehabilitation for the Dallas Cowboys as he recovered from foot surgery in January 2016: *“It’s complete trust . . . We all know that Britt has our best interest. Britt, he’s always honest. He’s extremely honest with us. He pushes us to the max. . . . Man, I love Britt, . . . I just love the way he goes about his business. He’s extremely aggressive. Honest. He cares a lot about us. And he just wants us to do good. When you’re around somebody like that, you have to go that extra mile for him.”*
- Brian Westbrook acknowledged the care he received from Rick Burkholder, the Head Athletic Trainer for the Philadelphia Eagles, after he suffered a concussion in 2009: *“Burkholder said, ‘We’re not going to let you touch that football field until you’re absolutely ready,’ . . . It was that decision and those words that changed my life dramatically for the better. It’s what allows me to go out there on the radio and TV and speak to young people today without worrying about head and brain disease.”*
- Ricardo Lockett credited the Seattle Seahawks’ athletic trainers with saving his life after he suffered a concussion and disk and ligament injuries in his neck during a game in 2015: *“What saved my life is the trainers . . . The trainers came over, and they did it perfectly, perfectly by the book. The way that they held my neck, all the training is what saved my life. If they would have went too far to the left or moved me without stabilizing this or that, then I would have been dead . . . I thank God that I’m here and I thank you guys for the work that you do.”*
- Eric Berry thanked the Kansas City Chiefs’ medical staff for helping him to discover he had cancer: *“My support system just took care of me, starting off with my parents, my friends, family and everybody. From my coaching staff, the whole Chiefs Kingdom . . . I’m just so thankful that the training staff when the whole situation happened, they didn’t just sweep it under the rug because they easily could have done that, because at first we couldn’t find anything in the x-rays and the MRI kind of showed some things. I mean it could have been so easy for them to say, ‘you are okay – get back out there,’ but they did the proper protocol, proper procedure and I’m just very thankful for that because without that I don’t know where we would be right now. . . I was just so thankful that Rick [Burkholder] and the training staff did not sweep that under the rug, and think that I was just saying, ‘hey, I’m a little nicked up.’ They actually did the extra things that they needed to do to make*

sure everything was straight. We found out what was going on and got everything handled.”

- Matt Hasselbeck, during the Super Bowl 50 NFLPA Press Conference: *“One thing that we’ve fought for and we’ve tried to do is change the culture of our game. Forever, when I got into the game, it was a ‘no-no’ to be honest with the medical professionals on the sideline. Like you felt like you were a wimp if you were honest with your team doctor, trainer or a teammate or coach if something was wrong with your head – really any injury, but especially your head. Through a lot of discussion and really education I think what we’ve learned as players is it’s partly our job – it’s everybody’s job – but it’s partly our job to take ownership of changing the culture in our locker room and to educate the younger guys. And sometimes you educate the older guys, and sometimes that’s a coach that also played the game. But it’s our job to be honest with the medical professionals and let them do their job. And we fought hard for independent doctors on our sidelines that aren’t affiliated with the team doctor. We fought hard to improve relationships with our athletic trainers and with our team doctors. And these things are important and they’re important to us obviously because we played in the NFL, but I think for me personally, I think it’s even more important to us because whatever we fight for, we know that it trickles down. That it trickles down to college, and these college kids, they don’t have someone speaking up for them.”*
- Aaron Rodgers, quarterback of the Green Bay Packers: *“The protocol for concussions cannot be any more difficult to get back on the field . . . It is incredible the process and the tests you have to go through to get back on the field. . . So something is being done. It’s unfortunate that we’ve had to go through some years of learning what those steps look like, but I don’t think there’s a whole lot more that can be done. . . . The helmet I started my career with in 2005 is no longer allowed because the safety requirements on those helmets is so high now. I feel confident the helmet I’m wearing has kept me from a couple concussions in the last year, especially one hit in particular I took in the Giants’ playoff game.”*

b. Proposed Standard of Care

The Report’s completely unscientific basis is compounded by the unrealistic standard of care that it proposes: *“In every scenario, ask what system and rules you would wish to be in place to protect and promote health if you or your son were an NFL Player?”* We know of no health care system—whether private, government, or workplace-based—that operates under such a standard, and the Report identifies none. We doubt seriously that even Harvard University, with its extraordinary resources, provides health care on that basis or offers its employees the access to premium medical care and the host of financial, medical and other benefits given to NFL players and described in this response.

c. “Inherent Conflict of Interest”

Not surprisingly, what follows is an inherently flawed and unreliable assessment that concludes with several unrealistic recommendations that would not improve player care. The Report posits an “inherent conflict of interest” in the role of clubs’ medical staff that stems from the structure of health care in the NFL. But the Report cites no evidence that a conflict of interest *actually* exists. The authors theorize that having clubs’ medical staff treat players as patients while also communicating with coaches and club officials creates a situation in which players do not trust the clubs’ medical teams,

compromising players' health. But while acknowledging that this is hardly unique to the NFL, or even to professional sports, the authors fail to acknowledge that physicians overcome such apparent conflicts routinely without compromising the health care they provide to their patients.

The authors hold fast to this premise despite clear provisions in the CBA emphasizing that the club physicians' primary responsibility is to the player and substantial provisions to enforce that obligation.⁷ Club physicians practice under the AMA's Code of Medical Ethics and other ethical codes of their professional societies. The Report identified no incident in which team physicians were alleged to have ignored the health status of players, failed to adhere to patient confidentiality consent procedures, or made recommendations to clubs that were contrary to the health of players. The NFL's position regarding the separation of competitive concerns from medical care could not be more clearly expressed.

The Report acknowledges that there are very few civil lawsuits alleging medical malpractice against club physicians and very few grievances filed regarding issues with player health care under the CBA. Indeed, while the Report references the numerous CBA provisions that permit a player or the NFLPA to address substandard medical care, it asserts without evidence that the infrequency of such complaints is due to the difficulty in winning a civil lawsuit and the inadequacy of remedies available under the CBA. This rationale simply ignores the extent to which player health care is monitored, not only by the NFLPA, but by individual team player representatives, active player agents, and player surveys focused upon the care players receive from club physicians and athletic trainers.

The authors label this alleged conflict of interest as "structural," arising from how players' health is assessed, injuries are treated, and information is conveyed to clubs about players' health and fitness to play. The authors declare "[w]hen structure is the problem, it is structure that must be changed" and then proceed to recommend a new structure for healthcare in the NFL; one that would undoubtedly have an adverse impact on the quality of care provided to NFL players, as discussed below.

d. Competitive Concerns

The second fundamental premise of the article is that club medical teams are influenced by competitive concerns to the detriment of player care. Part 2, Chapter 2, Section 5, states, "there are still concerns that some club doctors have much closer relationships with, and sometimes can be pressured by, the coaching staff." There is neither a citation for this accusation nor support found anywhere in the Report. In fact, the only reference in the entire section to any connection between a team's win-loss record and the motivation of the team's medical staff is the following quotation from Dr. Matthew Matava, the former Head Team Physician of the St. Louis Rams and President of the NFLPS:

Physician jobs are not dependent on wins and losses. . . I've survived 1-15, 2-14 and 3-13 seasons with the Rams. We can go 0-16 and my job does not change one iota. . . Obviously we know that we want to have the guys back on the field as quickly as they can be in a safe fashion—and we can be creative in the ways we do so—but there are no competitive issues involved in our decision to return to play.

Incredibly, following Dr. Matava's clear and unequivocal rejection of any nexus between a club's win-loss record and the provision of care to players, the Report states, "Nevertheless, it is possible that these

⁷ See *supra* note 2.

pressures have subtle influences that even the doctors do not themselves fully recognize.” The authors provided no basis for this accusation.

The claims that: (i) club physicians are inherently conflicted in providing medical care to their player patients; and (ii) sometimes competitive concerns will cause them to favor their “duty” to the club over the needs of their patients, are not only unsupported by the record presented in the Report, but flatly contradicted by both the single relevant quotation cited and by the empirical evidence available to the public. Not only do the facts not support this hypothesis, but they squarely refute it. The NFL’s position on this issue is crystal clear and has been outlined repeatedly by Commissioner Goodell:

My approach to this concussion issue in football has been simple and direct – medical considerations must always take priority over competitive considerations.⁸

If there is any suspicion about a player being concussed, he should be removed from the game. Period. This is consistent with our policy that medical considerations must steer the ship and always override competitive concerns.⁹

*There’s concern obviously about the player first, his condition . . . And the good news is he’s never shown any symptoms. And he still doesn’t. So that’s good news on that one. Second, **from almost the time I became commissioner, I made the point of saying that medical issues always override competitive issues.** And I believe our football personnel fully understand that. They don’t interfere. They allow the medical personnel to do their job. But these are issues that the process and the evaluation — the focus is to allow the medical personnel to make those decisions, not commissioners or reporters or anybody else. Medical personnel need to do that.*¹⁰

The clearest proof that Commissioner Goodell’s statements in this respect reflect actual practice is found in the makeup of NFL clubs’ medical staffs. Going back for a period of ten years, in not one single instance has a club’s head coaching change resulted in the replacement of its medical team. Indeed, as the Report notes, there is very little turnover among club physicians and athletic training staffs. One would expect that if a team medical staff’s “judgments are compromised”—or even influenced—by competitive concerns one would see some relationship between a team’s winning percentage and the retention of its medical team.¹¹ There is no such connection.

⁸ Testimony of Roger Goodell, Commissioner, National Football League Before the House Committee on the Judiciary “Legal Issues Relating to Football Head Injuries” October 28, 2009.

⁹ Roger Goodell to press after speech at the Congress of Neurological Surgeons, Associated Press, “Roger Goodell discusses safety, hits,” October 3, 2011.

¹⁰ Roger Goodell, The Washington Post, “Roger Goodell: Officials ‘missed at least one’ illegal hit on Cam Newton, discipline coming,” by Mark Maske, September 12, 2016.

¹¹ As part of our review of a draft of the Report, we unequivocally stated that there is not one instance in which a club’s medical staff reports to the head coach. The authors noted our comment but concluded that because there is no policy in place that would prevent such a structure, they could not conclude that it does not exist.

e. Unsupported Assertions

Other assertions in the Report are either similarly unsupported or are actually refuted by the cited sources. One example relates to the League's Policy on Medical Services Agreements and Sponsorships. NFL Commissioner Tagliabue first addressed medical sponsorship and medical services agreements in 2004, when he prohibited clubs from entering into medical sponsorship agreements that granted the sponsor the right to provide medical care to NFL players. Over time, that policy has developed to prohibit teams from linking medical services agreements with medical sponsorship agreements in any way. Every NFL team's internal medicine physician and orthopedist must have an individual services contract with the club, which must be reviewed by the League. Each year, the responsible club official must certify that business considerations did not adversely impact medical care considerations. The NFL sent the authors a copy of the League's policy. Despite the clear language in the policy prohibiting the exchange of medical services for sponsorship, the initial draft of the Report asserted, "[a]dditionally the Medical Sponsorship Policy does not prohibit medical service providers from paying for the right to provide medical services to players." The NFL identified this inaccurate statement, and advised the authors that, "[t]he Policy on Medical Services Agreements and Sponsorships does [prohibit a physician from paying for the right to provide medical care to NFL Players]." Incredibly, the Report rejected the NFL's interpretation of the language in its own policy, which we enforce, by asserting the interpretation of the language was unclear to the authors, and as result refused to remove this reference from the Report. The Report cites no example where the policy has not been followed.

Another example is the unsupported assertion that it is difficult for a player to obtain a second opinion consultation. Not only is there no empirical support in the Report for this claim, but it is almost immediately contradicted by the comments of player agents interviewed by the authors. Five of the six agents interviewed reported that they "routinely" require a second opinion upon diagnosis of injury. To conclude that this right is somehow illusory is to resist facts, not to rely on them.

f. Recommendations

We have already implemented several of the Report's recommendations. Many of the recommendations ignore that the NFL: (i) engages in ongoing, non-adversarial collective bargaining with the NFLPA to improve health and safety programs and practices; (ii) enforces its Policy on Medical Services Agreements and Sponsorships to ensure that medical services providers do not provide consideration of any kind in exchange for the right to provide medical services to an NFL club; (iii) has demonstrated a commitment to supporting scientific efforts to research health risks and benefits to playing professional football; (iv) is committed to continuing to improve its collection and analysis of injury data; (v) increased bonuses and salary guarantee provisions in NFL Player Contracts, as well as provided for Termination Pay,¹² Severance Pay,¹³ and expanded Injury Protection¹⁴ benefits in the 2011

¹² Termination Pay is available to an eligible player once in his career when his contract is terminated prior to the end of the season, and when elected, entitles the player to the unpaid balance of his salary for that season.

¹³ Severance Pay is a lump sum payment provided to a player after he retires from the NFL.

¹⁴ A player who sustains a football-related injury and is unable to return to play will receive his full salary for the year of injury. If that player has a contract for the year following his injury and he qualifies, he is entitled to the Injury Protection Benefit, which equals 50% of his salary for that season. If the player has a contract for a second

CBA; (vi) developed, in partnership with the NFLPA, NFLPS and outside experts, standard pre-season medical education for every NFL player at the start of training camp; and (vii) recently updated and expanded its efforts to educate players about the programs and benefits available to them, through the NFLPE and through website and toll-free phone lines.

The NFL and NFLPA have also previously considered, and rejected as impractical or unrealistic, other recommendations in the Report. The primary recommendation—the creation of two completely separate medical teams to care for players and to provide advice to the clubs not only presents a host of impracticalities, but the Report cites no instance where it exists anywhere in the world. Such a system would certainly not improve the medical care provided to NFL players; having physicians providing care or reporting on a player’s condition based entirely on a written “Player Health Report” would lead to confusion, errors and ultimately failure. Relying solely on written summaries is a poor, inadequate, and imprecise substitute for actual collaboration and patient interaction, particularly with respect to complex medical situations. Put simply, the structure recommended by the Report would require physicians to make medical care decisions on an incomplete picture of the patient’s medical status. Moreover, this recommendation essentially absolves the player of his contractual obligation to fully and accurately report his mental and physical condition to the club’s physician because doing so might adversely impact the player’s future employment opportunities. Eliminating this requirement not only puts the player’s health at risk, as it necessarily hinders a club physician’s ability to properly diagnose and treat a player, but it is inherently unethical in that it urges players to withhold information relevant to determining their fitness for duty and the risk involved in playing football.

V. Media Analysis

The Report is of ambitious scope—not only is it an attempt to provide commentary regarding the relationships of NFL stakeholders in ensuring the health and safety of NFL players, but also to provide detailed analysis of the public debate regarding issues important to NFL players. Although we have outlined our significant concerns with the Report’s efforts to accomplish this first objective, we believe that it generally meets its second objective; particularly in its description of “[t]he media’s coverage of player health issues” as “mixed,” because it has been “occasionally misleading or not entirely accurate.” The Report notes that “[t]he medical, scientific and legal issues concerning player health are extremely complicated, which demands that the media take care to avoid making assertions that are not supported or that do not account for the intricacies and nuance of medicine, science, and the law.” The Report emphasizes the need for the media to engage experts to help it understand these complex issues in order to avoid inaccurate reporting. The Report also accurately states that the coverage “shows a tendency to ignore important benefits to players (including those offered by the NFL and NFLPA) and others, and other positive aspects of the game.”

The Report also carefully addresses the state of the science regarding chronic traumatic encephalopathy. The authors acknowledge that CTE “is a complicated issue” and that “significant open questions” remain to be answered. The Report accurately describes how “further research is needed” to determine “a clinical phenotype” for CTE, and that “a mechanistic connection between head trauma and CTE has not yet been demonstrated” and requires further study. These comments confirm, as the courts considering approval of the NFL concussion settlement stated, that the clinical study of CTE is in

season following the season of injury and he qualifies, he is also entitled to the Extended Injury Protection benefit, which equals 30% of his salary for that season.

its infancy. The authors also aptly note the media's inaccurate portrayal of Segal's actuarial report submitted in the NFL concussion litigation.

However, the NFL must reject the inference that our lack of express public disagreement with the assertions of the 2013 book *League of Denial* is somehow a concession of their accuracy. That is flatly incorrect. As the Report notes, the NFL is a defendant in ongoing litigation relating to the subject matter of that book. The League has consistently and publicly maintained—both before and after the book's publication—that the allegations of misconduct are false. The NFL is disappointed that legal scholars chose to repeat many of the allegations as purported facts, particularly given the authors' introductory comments that they "are forward-looking" and their "role is not to evaluate fault or assign blame for player health problems."¹⁵

VI. Conclusion

It is hard to envision an environment in which the practice of medicine is scrutinized more closely, and by more eyes, than in the NFL. Despite this scrutiny, as the Report acknowledges, there are very, very few instances in which an NFL club physician's care, diagnosis and treatment of a player has been challenged. The NFL, NFLPA, NFLPS and PFATS take their responsibilities seriously and have implemented the numerous programs described above to achieve this goal. The NFL and the NFLPA understand that there is always more that can be done and our ongoing—and almost daily—dialogue will continue.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey A. Miller". The signature is written in a cursive style with a large, stylized initial "J".

Jeffrey A. Miller
Executive Vice President
Health & Safety Initiatives

¹⁵ See Preface.

Appendix A

NFL Club Head Team Physicians

Club	Head Team Physician Name	Medical School	Board Certification(s)	Practice/Hospital/University Affiliation or Privileges
Arizona Cardinals	Wayne E. Kuhl, MD	University of Iowa	American Board of Internal Medicine	Internal Medicine of Arizona
Atlanta Falcons	Spero G. Karas, MD	Indiana University	American Board of Orthopaedic Surgery	Emory Healthcare Sports Medicine/Emory University
Baltimore Ravens	Andrew Tucker, MD	Southern Illinois University	American Board of Family Practice, CAQ Sports Medicine	Union Memorial Sports Medicine
Buffalo Bills	Leslie Bisson, MD	Johns Hopkins	American Board of Orthopaedic Surgery, CAQ Sports Medicine	University Sports Medicine
Carolina Panthers	Patrick M. Connor, MD	University of Oklahoma	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Orthocolina/Carolinas Medical Center – University of North Carolina
Chicago Bears	Mark Bowen, MD	Cornell University Medical College	American Board of Orthopaedic Surgery	NOI NorthShore Orthopedics Chicago/Northwestern University
Cincinnati Bengals	Marc T. Galloway, MD	Duke University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Cincinnati Sports Medicine & Orthopaedic Center/University of Cincinnati

Club	Head Team Physician Name	Medical School	Board Certification(s)	Practice/Hospital/University Affiliation or Privileges
Cleveland Browns	James E. Voos, MD	University of Kansas	American Board of Orthopaedic Surgery, CAQ Sports Medicine	University Hospital Department of Orthopaedic Surgery/University of Kansas
Dallas Cowboys	Daniel E. Cooper, MD	University of Texas Southwestern	American Board of Orthopaedic Surgery	The Carrell Clinic/University of Texas Southwestern
Denver Broncos	Martin Boublik, MD	Columbia University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Steadman Hawkins Clinic – Denver/University of Colorado
Detroit Lions	Kyle Anderson, MD	University of Michigan	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Michigan Orthopaedic Institute
Green Bay Packers	Patrick J. McKenzie, MD	Medical College of Wisconsin – Milwaukee	American Board of Orthopaedic Surgery	Bellin Health - Ashwaubenon
Houston Texans	Walter R. Lowe, MD	University of Texas	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Department of Orthopaedics UT Medical Center/University of Houston
Indianapolis Colts	Arthur C. Rettig, MD	Cornell University	American Board of Orthopaedic Surgery	Methodist Sports Medicine/Indiana University
Jacksonville Jaguars	Kevin Kaplan, MD	NYU	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Jacksonville Orthopaedic Institute

Club	Head Team Physician Name	Medical School	Board Certification(s)	Practice/Hospital/University Affiliation or Privileges
Kansas City Chiefs	Cris D. Barnthouse, MD	University of Kansas	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Orthopaedics & Sports Medicine Clinic of Kansas City/University of Missouri – Kansas City, University of Kansas
Los Angeles Rams	Neal ElAttrache, MD	University of Pittsburgh	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Kerlan-Jobe Orthopaedic Clinic
Miami Dolphins	John W. Uribe, MD	University of North Carolina	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Miami Orthopedics & Sports Medicine Institute/Florida International University
Minnesota Vikings	Christopher Larson, MD	University of Minnesota Medical School	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Twin Cities Orthopedics
New England Patriots	Mark Price, MD	Harvard Medical School	American Board of Orthopaedic Surgery, CAQ Sports Medicine	MGH Sports Medicine/Harvard
New Orleans Saints	Deryk Jones, MD	Stanford University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Ochsner Sports Medicine Center/Tulane University
New York Giants	Scott A. Rodeo, MD	Cornell University Medical College	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Hospital for Special Surgery/Cornell University

Club	Head Team Physician Name	Medical School	Board Certification(s)	Practice/Hospital/University Affiliation or Privileges
New York Jets	Kenneth D. Montgomery, MD	University of California, San Francisco	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Tri-County Orthopedics
Oakland Raiders	Warren King, MD	University of Southern California	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Palo Alto Medical Foundation
Philadelphia Eagles	Peter DeLuca, MD	Georgetown University	American Board of Orthopaedic Surgery	Rothman Institute/Thomas Jefferson University
Pittsburgh Steelers	James P. Bradley, MD	Georgetown University	American Board of Orthopaedic Surgery	Burke & Bradley Orthopedics/University of Pittsburgh
	Anthony Yates, MD	George Washington University	American Board of Internal Medicine	University of Pittsburgh Medical Center
San Diego Chargers	Tal David, MD	Baylor College of Medicine	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Synergy Specialists Medical Group/UC San Diego
San Francisco 49ers	Timothy McAdams, MD	Georgetown University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Stanford University
Seattle Seahawks	E. Edward Khalfayan, MD	St. Louis University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Orthopedic Physician Associates, Proliance Surgeons, Inc., P.S./University of Washington

Club	Head Team Physician Name	Medical School	Board Certification(s)	Practice/Hospital/University Affiliation or Privileges
Tampa Bay Buccaneers	Arnold Ramirez, MD	The Chicago Medical School	American Board of Family Medicine, CAQ Sports Medicine	Tampa Orthopaedic & Sports Medicine
Tennessee Titans	David R. Moore, MD	Vanderbilt University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Elite Sports Medicine
Washington Redskins	Anthony Casolaro, MD	Georgetown University	American Board of Internal Medicine; Pulmonology	Pulmonary and Medical Associates/Georgetown University
	Robin West, MD	George Washington University	American Board of Orthopaedic Surgery, CAQ Sports Medicine	Inova Medical Group Sports Medicine and Orthopaedics

APPENDIX B

Suicide Mortality Among Retired National Football League Players Who Played 5 or More Seasons

Everett J. Lehman,^{*†} MS, Misty J. Hein,[†] PhD, and Christine M. Gersic[†]
Investigation performed at the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Cincinnati, Ohio, USA

Background: There is current disagreement in the scientific literature about the relationship between playing football and suicide risk, particularly among professional players in the National Football League (NFL). While some research indicates players are at high risk of football-related concussions, which may lead to chronic traumatic encephalopathy and suicide, other research finds such a connection to be speculative and unsupported by methodologically sound research.

Purpose: To compare the suicide mortality of a cohort of NFL players to what would be expected in the general population of the United States.

Study Design: Cohort study; Level of evidence, 3.

Methods: A cohort of 3439 NFL players with at least 5 credited playing seasons between 1959 and 1988 was assembled for statistical analysis. The vital status for this cohort was updated through 2013. Standardized mortality ratios (SMRs), the ratio of observed deaths to expected deaths, and 95% CIs were computed for the cohort; 95% CIs that excluded unity were considered statistically significant. For internal comparison purposes, standardized rate ratios were calculated to compare mortality results between players stratified into speed and nonspeed position types.

Results: Suicide among this cohort of professional football players was significantly less than would be expected in comparison with the United States population (SMR = 0.47; 95% CI, 0.24-0.82). There were no significant differences in suicide mortality between speed and nonspeed position players.

Conclusion: There is no indication of elevated suicide risk in this cohort of professional football players with 5 or more credited seasons of play. Because of the unique nature of this cohort, these study results may not be applicable to professional football players who played fewer than 5 years or to college or high school players.

Keywords: suicide; football; National Football League; concussion

A rigorous debate is currently being conducted in the scientific literature and in the court system about the relationship between playing football in the United States (US)

and suicide risk. Those who support this connection primarily refer to autopsy-based case reports that identified relatively large numbers of suicide cases among contact-sport athletes, including those who played football.^{17,19-21,31,33} Presumably, those suicides resulted from, or were exacerbated by, a disease known as chronic traumatic encephalopathy (CTE), a syndrome that is theorized by some to develop after repetitive concussive and subconcussive impacts to the head and is manifested by a complex set of progressive neurodegenerative and/or psychiatric disorders.^{16,17} The logic follows that because football players are at high risk of concussions, they would also be at high risk of CTE and suicide.

Those who question the football play/concussion/CTE/suicide connection most commonly reference the significant limitations of the evidence used to support the connection: the selection bias of cases examined for CTE, the lack of information about preexisting or comorbid conditions, and the incomplete ascertainment of individual head injury medical histories.^{11,18,30,36} A study of a cohort of professional football players has also been cited as a refutation

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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of any connection.^{1,11,36} The 2012 study that primarily focused on cardiovascular mortality in the cohort reported causes of death for multiple categories, including mortality from suicide.¹ Suicide mortality in the cohort was significantly less than would be expected compared with the general US population: 21.8 deaths expected, 9 observed, standardized mortality ratio (SMR) = 0.41 (95% CI, 0.19-0.78).¹

The purpose of this article is to provide updated suicide mortality data for this unique cohort of retired professional football players who played 5 or more seasons in the National Football League (NFL). We will briefly discuss these findings in the context of the research that has been conducted to date on suicide among football players and other professional athletes.

METHODS

Full details of the cohort have been previously described.^{1,5,14} Briefly, the cohort includes 3439 NFL players identified by a pension fund database of vested players with at least 5 credited playing seasons between 1959 and 1988. Vital status follow-up was ascertained from pension fund records, the Social Security Administration, and the Internal Revenue Service. In our original study, players were matched to the National Death Index (NDI) beginning in 1979 (when the NDI began) through 2007. In this article, vital status updating and NDI matching have been extended through December 31, 2013. The NDI provided causes of death coded to the International Classification of Diseases (ICD) revision in effect at the time of death. Death certificates were obtained from state vital statistics offices and coded by a certified nosologist when death information was not provided by the NDI. Institutional review board approval for this study was obtained under the auspices of the National Institute for Occupational Safety and Health (NIOSH), HSRB 06-DSHEFS-04XP.

Mortality was analyzed using the NIOSH life table analysis system (LTAS.NET).²⁷ Analyses used US male mortality rates (1960-2009) for 119 cause of death categories; rates for 2010-2013 are estimated based on rates for the 2005-2009 time period.²⁵ Because all cohort members had a minimum of 5 credited seasons, a risk begin date was determined as the approximate date at the end of the fifth credited season (assigned as February 1). Each cohort member accumulated person-years at risk (PYAR) for each year of life from the risk begin date until the date of death or the study end date, whichever came first. To calculate the expected number of deaths, the PYAR were stratified into 5-year intervals by age and calendar time and then multiplied by the appropriate male US race- and cause-specific mortality rates. The ratio of observed to expected number of deaths was expressed as the SMR; 95% CIs were obtained using exact methods when the observed number of deaths was ≤ 10 or approximate methods when the observed number of deaths was >10 . We considered 95% CIs that excluded unity to be statistically significant.

Intentional self-harm is a term used in ICD revision 10 and is equivalent to the term *suicide* that we will use

throughout this article. The following ICD codes, by revision, were used to identify causes of death from suicide in this analysis: ICD revision 8, E950 to E959; ICD revision 9, E950 to E959; and ICD revision 10, X60-X84 and Y87.0.³⁴

To determine if there were mortality differences based on the characteristics of football playing positions, we stratified players into 2 position categories: "speed" positions that include quarterback, running back, halfback, fullback, wide receiver, tight end, defensive back, safety, and linebacker and "nonspeed" positions that include all defensive and offensive linemen. Biomechanical studies of football-related concussions among college players indicate certain positions place players at higher risk of high speed impacts to the head and thus at higher risk of concussive-level head injuries.^{8,26} Speed position players are those who may be at higher concussion risk compared with players in nonspeed positions and thus may be at higher risk of suicide. Punters and kickers were excluded from the stratified analysis because their positions generally did not involve contact that resulted in a risk of head injury. LTAS.NET was used to calculate directly standardized rate ratios (SRRs) and 95% CIs for suicide using the nonspeed players as an internal referent.

RESULTS

By the end of follow-up in 2013, the final cohort of 3439 players contributed 122,843 person-years at risk. Summary results of the updated mortality analysis are provided in Tables 1 and 2. As of December 31, 2013, a total of 537 members of this cohort were deceased, an increase of 203 deaths from the last analysis (as of December 31, 2007). Overall mortality (SMR = 0.60; 95% CI, 0.55-0.65) and mortality from cancer (SMR = 0.59; 95% CI, 0.50-0.70), heart diseases (SMR = 0.75; 95% CI, 0.65-0.86), and assault/homicide (SMR = 0.14; 95% CI, 0.04-0.37) continue to be significantly less than expected. The NFL cohort also experienced a significantly reduced risk of mortality from suicide, with 12 suicide deaths observed compared with 25.6 that would be expected in a comparable sex/race/age sector of the US population (SMR = 0.47; 95% CI, 0.24-0.82). There were 6 suicides among players in speed positions and 6 suicides among players in nonspeed positions. Suicide was significantly reduced in the speed position stratum compared with the US referent population (SMR = 0.39; 95% CI, 0.14-0.86) and was reduced, but not significantly, compared with the nonspeed position stratum (SRR = 0.47; 95% CI, 0.14-1.51).

Characteristics of the suicide deaths are shown in Table 3. Fifty-eight percent of the suicide deaths were among white players and 42% were among black players, virtually equal to their representation in the entire cohort (59% white, 41% black). While the cohort comprised approximately two-thirds speed position players and one-third nonspeed position players, the number of suicide deaths was equally distributed between the 2 player categories. Although accounting for only 22% of the cohort, players who first played in the 1980s accounted for 42% of the suicide deaths. The median number of seasons played for

TABLE 1
Overall Mortality, Selected Causes, National Football League Player Cohort (1960-2013)^a

Underlying Cause of Death	Observed	Expected	SMR (95% CI)
All deaths	537	901.7	0.60 (0.55-0.65)
All cancers	137	230.8	0.59 (0.50-0.70)
Heart diseases	207	277.1	0.75 (0.65-0.86)
Suicide	12	25.6	0.47 (0.24-0.82)
Assault and homicide	4	27.6	0.14 (0.04-0.37)

^aSMR, standardized mortality ratio (US referent rates).

those committing suicide (8.5 seasons) was comparable with the number of seasons for all players (8 seasons).

DISCUSSION

Although there have been opinions expressed in both the popular and scientific literature that football players are at higher risk of suicide than the general population, this study did not find that to be the case among this cohort of professional football players. This NFL cohort had rates of suicide mortality that were less than half of what would be expected in a comparable sex/race/age grouping from the general US population. In an earlier study of neurodegeneration in this NFL cohort, an indirect method was used to assess any possible relation between concussion and neurodegeneration because concussion data were not available for individual players.¹⁴ Two strata were created based on playing positions classified as “speed” and “nonspeed” positions. Studies of the incidence of concussion in football players generally have found that players in speed positions experienced concussions more commonly than players in nonspeed positions. Because some research has linked CTE to both neurodegeneration and to suicide, we reran the speed/nonspeed analysis for suicide mortality. Unlike the results of the earlier study, which found statistically elevated neurodegeneration mortality among speed players, suicide mortality was not elevated in either the speed or the nonspeed player stratum. There was no significant statistical difference in suicide mortality when the 2 strata were directly compared.

To date, few studies have examined suicide or suicide risk factors in sports cohorts. One report that examined 34 years of the medical literature on suicide in athletes (that included football players) found that football players accounted for a significant portion of the total number of suicide cases (42%). The author speculated that these proportionately large numbers may be due to characteristics of football play such as heightened aggression and high prevalence of substance abuse and serious injury. However, few conclusions could be drawn from that report because no distinction was made as to the level of football played (professional, college, high school, other), and no numbers could be provided as to the number of athletes and years at risk for each sport.²

A 9-year study of suicide among National Collegiate Athletic Association athletes reported a significantly lower

TABLE 2
Suicide Mortality, National Football League Player Cohort, Stratified by Position Type (1960-2013)^a

Player Category ^b	Obs	SMR (95% CI)	SRR (95% CI)
Nonspeed	6	0.65 (0.24-1.42)	Referent
Speed	6	0.39 (0.14-0.86)	0.47 (0.14-1.51)

^aObs, observed number of deaths; SMR, standardized mortality ratio (US referent rates); SRR, standardized rate ratio.

^bPlayer position was collapsed into 2 strata for analysis purposes: “speed” positions (fullback, halfback, defensive back, quarterback, wide receiver, running back, linebacker, and tight end) and “nonspeed” positions (defensive and offensive linemen); punters and placekickers (n = 79) were excluded from this analysis.

TABLE 3
Characteristics of the National Football League Player Cohort and Suicide Deaths (1960-2013)

Characteristic (% of Total Cohort) ^a	Suicide Deaths (n = 12)
Race	
White (59%)	7
Black (41%)	5
Other (<1%)	
Position played	
Offensive line (20%) ^b	3
Defensive line (15%) ^b	3
Offensive nonlinear (33%) ^c	1
Defensive nonlinear (32%) ^c	5
Decade, first season played	
1950-1959 (9%)	1
1960-1969 (29%)	4
1970-1979 (40%)	2
1980-1989 (22%)	5
No. of seasons played, median (range)	
Total cohort	8.0 (3-22)
Suicide deaths	8.5 (5-14)
Age at death, median (range), y	
Suicide deaths	45.3 (30.8-66.3)

^aPunters and placekickers were not included (n = 79).

^bOffensive and defensive line positions constitute the “non-speed” stratum.

^cOffensive and defensive nonlinear positions constitute the “speed” stratum.

annual suicide rate among student athletes (0.93/100,000) compared with the rate for all college students (7.5/100,000). Study authors noted that the highest rate in the sports sectors occurred in football players (2.25/100,000); the relative risk (RR) among football players was more than twice as high as other non-football playing male athletes (RR = 2.21; 95% CI, 1.05-4.61). However, the football player rate was still significantly lower than the reported suicide rate of 9/100,000 reported for all male college students.²⁴

Only 1 study has quantified suicide mortality in a large cohort of professional athletes. A study of 5389 Italian professional-league soccer players reported that suicide mortality among the players was not statistically different

from suicide mortality found in a general population referent group (SMR = 0.81; 95% CI, 0.35-1.59).³¹ It has been postulated that soccer is comparable with American-style football in that players from both sports experience recurrent blows to the head that may result in CTE.¹⁶

Five studies have examined depression, a significant risk factor for suicide,²⁹ among professional football players. A survey of 2552 retired NFL players (average career of 6.6 years) found that players reporting 1 or 2 concussions were 1.5 times more likely to be diagnosed with depression than players reporting no concussion history.⁹ Players with 3 or more concussions were 3 times more likely to report depression.⁹ A follow-up study of the original cohort reported a strong exposure-response relation between concussion history and depression diagnosis during the 9-year follow-up period.¹³ A second study, a survey of 1617 retired NFL players with an average age of 53.4 years and playing career of 7.1 years, reported player depression levels similar to what would be found in the general US population.²⁸ Study authors cautioned that players experiencing ongoing problems with pain management may be at increased risk for not only depression but also suicide.²⁸ The survey did not ask questions relating to concussions or head injuries.²⁸ A third survey of 1063 retired NFL players asked younger (age <50 years) and older (age ≥50 years) retirees questions about depression; results were then compared with the general US male population.³² Overall, self-report of major depression was 3.9% among the younger retirees compared with 3.0% in the general population.³² No notable differences were detected within the older retiree stratum.³² Because the survey focused on postretirement issues, no data were captured on concussion or head injury that may have occurred while playing football.³² A fourth study involved neurological and neuropsychological testing of 34 retired NFL players (9.7 years career average).¹⁰ Most (32 of the 34) players reported sustaining at least 1 concussion during their careers with an overall lifetime average of 4 concussions per player.¹⁰ Prevalence of depression was higher among the NFL players (24%) than would be expected in a comparable age grouping in the general population (15%).¹⁰ A similar study reported data derived from a convenience sample of 45 retired NFL players who completed a battery of neurological and psychological tests.³ These players played an average of 6.8 years in the league and reported an average of almost 7 concussions incurred during their playing careers.³ Thirty-three percent of these players were found to exhibit some level of depression, which is higher than the 15% to 20% reported for the general population.³ However, the percentage of players found to have moderate to severe depression was within the prevalence range found in the general population.³ Furthermore, none of the depression scores were statistically associated with football-related exposures.³ On the basis of these results, the study authors concluded that a career in the NFL is not causally related to later-life depression.³

To date, the connection among football play, suicide, and CTE has been based primarily on autopsy case reports. The first reports, published in 2005 and 2006, chronicled the deaths of 2 long-career, professional football players

with histories of multiple concussions. Both died 12 years after retiring from football.^{22,23} A 2013 article reported the results of an autopsy-based study that included 35 former professional football players with histories of multiple concussions. Thirty-four of the 35 players were found to have some form of CTE, and 3 of the 34 died of suicide.¹⁷ The biological mechanism for this connection is not clear, although it is reportedly related to the disruption of normal neuronal functioning caused by neurofibrillary tangles and neuritic threads in specific areas of the brain that result in mood, neuropsychiatric, or cognitive disorders.^{16,17,21}

In the past few years, a number of studies have been published that strongly caution against drawing the premature conclusion that a concussion-CTE-suicide pathway has been scientifically established.^{4,11,12,15,18,35,36} Main criticisms involve the weakness of the evidence used to support the relationships,^{11,36} the selection bias associated with the autopsies of contact sports professionals,^{15,18} and the lack of information about the number and severity of the head injuries that may have been incurred by those diagnosed postmortem with CTE or those who committed suicide.³⁵ In recently published reviews of CTE research, Iverson et al¹² and Castellani et al⁴ unequivocally assert that the link between CTE and depression/suicide has not been established because no scientific study has been published that confirms such a link. They note that between 1928 (when a neuropathology related to contact sports was first identified) and 2010, suicide had not been identified as a clinical feature of CTE. In 2010, Omalu et al²¹ published a case report of an autopsy of a deceased professional football player; in that article, they identified suicide as one of the potential outcomes of CTE. Iverson et al¹² and Castellani et al⁴ note that this conclusion appears to be based solely on the fact that 2 of the 3 football players that Omalu et al²¹ had examined had committed suicide. Since that time, suicide has been accepted by most CTE researchers as a clinical outcome of CTE. The review articles conclude that much more epidemiological and clinical evidence is needed before claims can be substantiated that neurotrauma causes CTE and that CTE is associated with suicide.

Limitations

In addition to the lack of concussion data, our study had several limitations. First, our study may not be generalizable to all professional football players. At the time our cohort was assembled, complete records were only available for players who were vested in the NFL pension plan (players who played on or before 1988 with 5 or more credited seasons in the NFL). Our cohort had an average career length of 8 seasons, which is longer than the 4.6 seasons played by the average professional player.⁶ Our longer term career players may be inherently different from shorter career players, possibly due to factors related to football play or personal medical conditions. Second, because of the unique capabilities and risk factors experienced by professional players, our results would not be directly applicable to nonprofessional football players. Third, we did not have information on risk factors for

suicide or information about psychological morbidity. Fourth, we did not have specific income or other socioeconomic information for cohort members and therefore were unable to account for the potential protective effect that an NFL salary and pension may have had on suicide risk. There is a body of research that suggests higher income individuals may be at lower risk of suicide due to better access to mental health treatment and to other aspects of daily life.⁷ Fifth, because reference population mortality data were available only through 2009, we applied rates for 2005-2009 to the 2010-2013 calendar period; however, rates for suicide were similar in the 2 time periods for nonwhite males across all age groups and only slightly different for white males (slightly lower for ≥ 70 years; slightly higher for 40 to < 70 years), so this likely had little effect on the results. Finally, because our study was a mortality study, we only accounted for those players who died from a suicide attempt. Our study did not account for living players who may have experienced significant psychological impairments or for deceased players who also had such impairments but died from other causes.

CONCLUSION

There is no indication of elevated suicide risk in this cohort of professional football players with 5 or more credited seasons of play. Because of the unique nature of this cohort, these study results may not be applicable to professional football players who played fewer than 5 years or to college or high school players. Clearly, our one study does not resolve the issue of suicide in football. Before reliable conclusions can be drawn on any relationship among football play, concussion, CTE, and suicide, more work needs to be done in several areas: (1) quantitatively assessing football-related risk factors, particularly in collecting valid concussion data; (2) collecting longitudinal non-football related suicide risk factor data, including the existence and prevalence of recurring pain among current and retired players; and (3) analysis of how the higher income and socioeconomic profile of professional football players compared to the general population positively or negatively affects suicide risk.

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APPENDIX C

TOP-PERFORMING GROUP



The SGH-1 Pro helmet was tested but not ranked because damage to the shell suggested that the helmet may not be able to withstand the rigors of NFL practices and games.



2016 HELMET LABORATORY TESTING PERFORMANCE RESULTS

THE NFL, IN COLLABORATION WITH THE NFLPA, THROUGH THEIR RESPECTIVE APPOINTED BIOMECHANICAL EXPERTS, COORDINATED EXTENSIVE LABORATORY RESEARCH ON 23 HELMETS TO DETERMINE WHICH HELMETS BEST REDUCED HEAD IMPACT SEVERITY.

Helmets are listed in order based on their performance in the laboratory testing. The performance of each helmet is illustrated on the bar graph, with a shorter bar representing better performance. The performance of the helmets in the top group was statistically significantly better than the helmets in the bottom group. Within the top-performing group of helmets, there was no statistically significant difference in performance. The information presented here is based solely upon the results of this research and the expert opinions of the scientists involved.

The laboratory test conditions were intended to represent NFL impacts. The results of this study should not be extrapolated to collegiate, high school, or youth football.

ALL TESTED HELMETS WERE CERTIFIED AS COMPLIANT WITH THE NATIONAL OPERATING COMMITTEE ON STANDARDS FOR ATHLETIC EQUIPMENT (NOCSAE) AND ARE THEREFORE PERMITTED FOR USE BY NFL PLAYERS. NO HELMET SYSTEM CAN COMPLETELY PROTECT AGAINST SERIOUS BRAIN AND/OR NECK INJURIES A PLAYER MIGHT RECEIVE WHILE PARTICIPATING IN FOOTBALL.



CONCUSSION

A Must Read for NFL Players ... Let's Take Brain Injuries Out of Play

CONCUSSION FACTS

- > Concussion is a *brain injury* that alters the way your brain functions.
- > Concussion can occur from a blow to the head/body:
 - following helmet to helmet contact, and/or
 - contact with the ground, object, or another player.
- > Most concussions occur without being knocked unconscious.
- > *Severity of injury depends on many factors* and is not known until symptoms resolve and brain function is back to normal.
- > *All concussions are not created equally.* Each player is different, each injury is different, and all injuries should be evaluated by your team medical staff.

CONCUSSION SYMPTOMS

Different symptoms can occur and may not show up for several hours. Common symptoms include:

- Confusion
- Headache
- Amnesia/difficulty remembering
- Balance problems
- Irritability
- Dizziness
- Difficulty concentrating
- Feeling sluggish, foggy, or groggy
- Nausea
- Sensitivity to noise
- Sensitivity to light
- Double/fuzzy vision
- Slowed reaction time
- Feeling more emotional
- Sleep disturbances
- Loss of consciousness

Symptoms may worsen with physical or mental exertion (e.g., lifting, computer use, reading).

WHY SHOULD I REPORT MY SYMPTOMS?

- > Your brain is the most vital organ in your body.
- > Practicing or playing while still experiencing symptoms can prolong the time it takes to recover and return to play.
- > Unlike other injuries, there may be significant consequences to “playing through” a concussion.
- > Repetitive brain injury, when not managed promptly and properly, may cause permanent damage to your brain.

*For more information about concussion and other types of traumatic brain injuries, go to

www.cdc.gov/Concussion

What Should I Do if I Think I've Had a Concussion?

REPORT IT. Never ignore symptoms even if they appear mild. Look out for your teammates. Tell your Athletic Trainer or Team Physician if you think you or a teammate may have a concussion.

GET CHECKED OUT. Your team medical staff has your health and well being as its first priority. They will manage your concussion according to NFL/NFLPA Guidelines which include being fully asymptomatic, both at rest and after exertion, and having a normal neurologic examination, normal neuropsychological testing, and clearance to play by both the team medical staff and the independent neurologic consultant.

TAKE CARE OF YOUR BRAIN. According to CDC*, “traumatic brain injury can cause a wide range of short- or long-term changes affecting thinking, sensation, language, or emotions.” These changes may lead to problems with memory and communication, personality changes, as well as depression and the early onset of dementia. Concussions and conditions resulting from repeated brain injury can change your life and your family’s life forever.

Work smart. Use your head, don't lead with it. Help make our game safer. **Other athletes are watching...**



NOT RECOMMENDED FOR USE ON ARTIFICIAL TURF



2016 UPDATE

Adidas models with the Quick Frame Plate



Freak x Carbon Low
Freak x Carbon Mid
Freak x Carbon High

Nike models with the Shark Plate



Code Elite 3/4 Pro Shark
Code Elite Stove Pro Shark

Nike models with the Strike TD Plate



Code Elite 3/4 TD	Lunar Super Bad Pro TD
Jordan Retro 7 TD	Lunarbeast Elite TD
Jordan Super.Fly 3 TD	

The NFL Foot & Ankle Committee has coordinated extensive research on athletic shoe safety and performance. Based upon the results of this research and the expert opinions of the scientists involved, the committee recommends that the shoes listed here should not be used on artificial turf.