

## The Great NFL Practice Conundrum: How Much Should You Train to Avoid Injury?

It seems like the most banal advice you could give an athlete: Don't overtrain. And yet, when the National Football League (NFL) and the NFL Players Association agreed, as part of their collective bargaining agreement (CBA) in 2011, to practice restrictions—ostensibly to cut down on injuries—controversy erupted.

The rules, which notably limited full-padded practice to once per day during off season and a total of 14 during the regular season, would change the way the game was played, critics warned—and to its detriment.

As ESPN Monday Night Football analyst and former NFL head coach Jon Gruden explained, “The less time we spend meeting, the less time we spend practicing, the less time we spend together practicing like we’re going to play on game day, the less we’re going to execute, the less we’re going to be disciplined and the less we’re going to perform.”

But the most hard-hitting criticism of all came from New England Patriots Coach Bill Belichick; far from preventing injuries, he believed the rules encouraged them. “You have a gap between preparation and competition level,” he told the Associated Press. “And I think that’s where you see a lot of injuries occurring. We get a lot of breakdowns. We get a lot of situations that players just aren’t as prepared [for] as they were in previous years, in my experience anyway.”

Zachary Binney had devoted his entire PhD dissertation to analyzing injuries in the NFL. A “sports nut” (his father had been the statistician for the Atlanta Braves), Binney accidentally got into sports injuries after beginning freelance analytics work for the Jacksonville Jaguars. “They saw I was an epidemiologist and assumed I’d know all about sports injuries; I didn’t at the time, frankly, but I found the topic fascinating.” He’s now been studying the field for five years, earned his PhD this year and presently consults for a number of sports teams.

Belichick’s claim simply begged for statistical analysis.

“He was proposing a classic case of unintended consequences, where if you don’t practice enough—if you’re undertraining—you’re not getting those muscles and tendons and ligaments

strong enough to survive the rigors of an NFL season,” says Binney. “I wanted to take a look at what actually happened over time in the NFL. Did injuries go up after those practice restrictions came about?”

Binney, along with other researchers from Emory’s Rollins School of Public Health, looked at data from 2007 to 2016: 10 NFL seasons that amounted to roughly 20 thousand player seasons and 7,425 injuries. “We looked to see if there were any sudden changes in the years before 2011 versus after 2011, while adjusting for the fact that more attention has been paid to NFL injuries over time, which means the number of reported injuries had been going up even before the new CBA.”

“What I often think as the genius of statistics is to be able to model whether subtle changes are going on,” says Binney. “It’s not simply a question of measuring before and after and then drawing a conclusion.” What would prove Belichick right was that the increase in injuries went faster after the new restrictions took effect. “And in a nutshell, we found that they didn’t,” says Binney. “They didn’t seem to go up or down on balance.”

“We also looked to see if there were changes in hamstring, calf and quadriceps injuries versus broken arms or legs or things that have nothing to do with how in shape a player is; it’s just a guy landed on you wrong. We didn’t see any differences in any of those subgroups, either.”

Did the NFL make the right call? “They didn’t make the wrong call,” says Binney, “but there’s a lot we don’t know. Are players still overtraining? We don’t know. Are players optimally training now? We don’t know. Were they undertraining before and they’re still undertraining now? We don’t know. What we know is that they didn’t do, on average, what Bill Belichick and others were afraid they did.”

How has Belichick reacted to the news? “We don’t know,” says Binney. “Perhaps someone will ask him!”

**JSM Talk:**

<http://ww2.amstat.org/meetings/jsm/2018/onlineprogram/ActivityDetails.cfm?SessionID=215809>

**Study link:** <https://arxiv.org/pdf/1805.01271.pdf>

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