

On the value of team medical staff: can the “Moneyball” approach be applied to injuries in professional football?

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How important is the performance of the medical staff to professional sporting team success? Given that medicine is a science, it is surprising that there is no obvious scientific answer to this question. Achieving success in professional sport has traditionally been considered an “art” of coaching rather than a science. If a scientific revolution ever occurs in sports performance analysis, you can read about its early genesis in *Moneyball* by Michael Lewis.¹ *Moneyball* details the management strategy behind the Oakland Athletics baseball team for about 5 years from the late 1990s. In that time, they were one of the most successful teams in Major League Baseball (MLB), despite having one of the lowest payrolls. An equivalent achievement in the English Premier League (EPL) would be a team like Bolton or Wigan staying in the top echelon for 5 years straight. How did Oakland do it? The cynics would say that they got lucky. Michael Lewis’s story is that they made their own luck. They statistically analysed (with multifactorial regression analysis for the stats geeks) what the *real* factors were behind winning a baseball game, not necessarily what the coaches thought were the important factors. After looking at the analyses, they worked out that the baseball market for players was inefficient. There were some players who were particularly undervalued in the market (from Oakland’s perspective, including those batters who were very good at drawing walks and had a high on-base percentage²). Oakland’s philosophy is to buy players that are undervalued statistically and, vice versa, to sell overvalued players. They still punch above their weight but less so than they did in the *Moneyball* years. The cynics would say that their luck has run out. The *Moneyball* advocates would say that a side effect of Oakland’s success is that the market has become more efficient, and the Athletics have less of a comparative statistical advantage but still have their disadvantage of a small payroll.

Moneyball even described a new science, sabermetrics, which is the analysis of baseball through objective evidence. You can use the same sabermetric or econometric principles for other sports. Not surprisingly the Americans, who are the world leaders in sports statistics, have already done it. *The Wages of Wins* is another book from the statistical analysis genre, which focuses particularly on professional basketball.³ Its authors also write columns for the *New York Times*. In the book, they note that professional American football (gridiron) players show much more annual variation in their performance than baseball or basketball players. I

would suggest that injuries are the main explanation for this. Michael Lewis has written a follow-up book about American football called *The Blind Side*.⁴ One of the econometric principles of this book is that the left tackle was previously an undervalued position in gridiron. Most teams have now realised that a super-elite left tackle gives a right-handed quarterback more time to make decisions (as he protects the quarterback’s “blind” side), meaning that the left tackle may be as important as the quarterback himself.

My only two frustrations (as a non-American sports physician) with *Moneyball* were that: (1) injuries and injury management did not seem to be explicitly considered as part of the metric that Oakland were using to predict team success; and (2) non-American sports teams would perhaps take many years to start to think in the same enlightened fashion. An econometric group in England who write for *The Times* called the “Fink Tank”⁵ has recently eased these frustrations. The Fink Tank group performs a statistical/econometric analysis in the EPL, and they have found the market to be quite efficient. The so-called “big four” of Manchester United, Chelsea, Liverpool and Arsenal, who generally have the highest payrolls, also have what Fink Tank considers statistically are the strongest player rosters.⁵ Cristiano Ronaldo has recently been considered by experts to have been the best player in the EPL. Fink Tank previously found, in 2007, that statistically he was also the best player,⁵ meaning his positive on-field actions outweighed his negative actions more so than any other player. From a statistician’s viewpoint, a negative on-field action is one such as “missing a shot at goal,” whereas from a fan’s viewpoint, it is pouting after having done so! A recent update of the Fink Tank ratings showed that Petr Cech was the best player of 2008–9,⁶ with the statisticians having concluded that the greatest inefficiency in the football marketplace is that top goalkeepers are under-rated.⁶ Their full ratings are now available at <http://www.castrolfootball.com/rankings/rankings/>.

Because football is a contact sport, and injuries are more common than baseball or basketball, the Fink Tank experts have found the need to include “player availability” in their metric.^{5,6} The total value of a player is a multiplication of his skill (net positive actions on the football field per game) and his durability (percentage of games he is available to play). It obviously makes good sense that a very skilled player who is not durable (that is, he misses a high percentage of games through injury) is not

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as valuable as a player with similar skill but who is not injury-prone and therefore plays close to 100% of matches. The “injury missed time-team performance” nexus has been noted before in Australian football⁷ and in soccer where team performance has already been correlated with player availability.⁸

This Fink Tank metric raises an exciting but challenging proposition. There are two major components of team success in the EPL—player skill, which is the domain of the manager and coaching staff, and player availability, which is the domain of the medical, physiotherapy and fitness staff. The next question is a very important one—does player availability mainly come down to pure luck, or is skill of the medical staff a highly important determinant? If medical skill is a key component to team success, then perhaps doctors should be treated like coaches. The good news would be that medical staff members are probably worth far more money than they are currently paid. The bad news might be that, like coaches, teams should probably be more prepared to fire their medical staff if they are underperforming. But just as paying coaches and athletes more has been shown to assist in achieving success,⁹ the same logic should apply to medical staff.

Doctors and physiotherapists have probably contributed to the prevailing perception that missed time through injury is mainly a result of good or bad “luck.” For professionals, we doctors are a remarkably immobile group. It takes years to build up the goodwill of a successful private practice, so doctors do not tend to move cities often, let alone countries. A good team doctor would not necessarily want to test the market like a coach or player would, because he or she would not necessarily want to move to a different city. **So, both good and bad team doctors alike may prefer to perpetuate the belief that qualities such as “loyalty,” “familiarity with players” and an “easy going personality” are what makes a good team doctor. This mentality keeps medical wages down but also increases job security for team medical staff.** Previous research has shown the poor recruitment practices during the appointment of UK football team doctors and physiotherapists.¹⁰ From my observation of the medical treatment of EPL players, it can sometimes also mean that the medical team itself abdicates responsibility for treating players. If an Italian player at an English club, for example, wants to get his injury treated in Italy, then not only is he allowed to (as is his right), but he may even be encouraged to do so. This not only makes the medical staff seem obliging but lessens the workload and pressure on them, in that they are less accountable for the injury outcome.

The status quo feels very cosy, but what if it is wrong? What if team doctors are like goalkeepers or the left tackle in gridiron, a staff position that is substantially undervalued by the prevailing market wisdom? It is here that I can fully declare my bias in bringing this topic up for debate. I believe that Australia may be home to some of the world’s best sports physicians and physiotherapists. Australia has had one of the most advanced sports medicine training programmes for the last 15 years¹¹ and is well over-represented in the publication of sports medicine research.¹² Clinicians cut their teeth on multiple professional football competitions of various codes, all of which have high rates of injury and, because of salary caps and other limits to free agency, where player roster strength between teams is very similar. Even though the finances of the Australian Football League (AFL) and National Rugby League (NRL) teams in Australia are a fraction of those in the American and European leagues, the club doctor seems to be a much more highly valued staff position. If a team in the AFL or NRL has too many players missing through injury, because of the salary cap

What is already known on this topic

Player skill is a very important determinant of team success in professional sport.

What this study adds

- ▶ Player durability (availability through not being injured) may be under-recognised as an important factor in team success.
- ▶ The importance of the medical staff in improving availability may be currently undervalued by football team management.

and other limits to the player transfer market, it cannot buy its way out of trouble like one of the top teams in the EPL can. One experienced Australian football coach has even been quoted in the media as saying that the head coach is only the third most important staff member at a team, behind the recruiting manager and the doctor.¹³ The elevated status of the team physician in Australia is such that in the AFL, for example, the television and radio stations regularly employ sports physicians as part of their commentary teams to discuss the injuries of the various clubs and whether the team doctors have been managing them optimally.^{14 15} It may seem surprising that the Australian media has beaten the US media to the evolution of the “sports medicine commentator,” but perhaps this just reflects the fact that sports medicine is more mature in Australia than the USA. Team medical positions in the US are dominated by orthopaedic surgeons¹⁶ and healthcare franchises, who necessarily give more attention to their high-turnover operating lists than to trying to reduce injuries in their teams.

A black swan phenomenon¹⁷ has been occurring in the NFL over the past few years. Two of the four semifinal NFL teams in 2009 had ex-Australian Rules players as punters. Some of the NFL teams, in *Moneyball* fashion, after observing the success in the 1990s of Darren Bennett¹⁸ have worked out that a life of drop punting the ball around the field, Aussie Rules fashion, makes you a better NFL punter than a lifetime of being an afterthought player in a High School or College gridiron team. Could the next black swan in professional football/soccer be a major increase in the perceived value of team doctors? Will it mean that the EPL teams will start using as consultants, or even poaching, sports physicians from those countries with the best sports medicine culture and training programmes, like Australia, Canada, Finland, The Netherlands, Norway, New Zealand and Sweden? Will it mean that EPL General Managers insist on taking out club subscriptions to the *British Journal of Sports Medicine* and the *Journal of Quantitative Analysis in Sports*? The cynics will, of course, say no, but the boys at the Fink Tank are probably scratching their heads wondering why it has not already happened.

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