Dazed and Confused:

Sports medicine, conflicts of interest and concussion management.

Abstract

Professional sports with high rates of concussion have become increasingly concerned about the long-term effects of multiple head injuries. In this context, return-to-play decisions about concussion generate considerable ethical tensions for sports physicians. Team doctors clearly have an obligation to the welfare of their patient (the injured athlete) but they also have an obligation to their employer (the team) whose primary interest is typically success through winning. At times, a team's interest in winning may not accord with the welfare of an injured player particularly when it comes to decisions about returning to play after injury. Australia's two most popular professional football codes – rugby league and Australian Rules football – have adopted guidelines that prohibit concussed players from continuing to play on the same day. I suggest that conflicts of interest between doctors-patients-teams may present a substantial obstacle to the proper adherence of concussion guidelines. Concussion management guidelines implemented by a sport's governing body do not necessarily remove or resolve conflicts of interest in the doctor-patient-team triad. The instigation of a concussion exclusion rule appears to add a fourth party to this triad (the NRL or AFL). In some instances, when conflicts of interest among stakeholders are ignored or insufficiently managed, they may facilitate attempts at circumventing concussion management guidelines to the detriment of player welfare.

Keywords

Conflict of interest; sports medicine; concussion; sport; ethics; rugby league; Australian Rules football

Introduction

Ethical issues such as patient autonomy, informed consent and the influence of third parties present difficult problems for sports medicine practitioners (Anderson and Gerrard 2005, Devitt and McCarthy 2010). In the context of modern professional sport and the emergence of the "team doctor" (Polsky 1998), the doctor-patient relationship has been described as a triad of doctor-patient-team (Dunn et al. 2007). The obligations that sports doctors have to third parties (often they may be paid by those third parties) may create tensions in the clinical decision making process. Team doctors clearly have a primary obligation to the welfare of their patient (the injured athlete) but they also have an obligation to their employer (the team) whose primary interest is typically success through winning. At times, a team's interest in winning may not accord with the welfare of an injured player particularly when it comes to decisions involving returning to play after injury.

Return-to-play decisions about mild traumatic brain injuries including concussion seemingly generate more debate than all other sports injuries combined (Kaye and McCrory 2012). Over the last decade there has been increasing concern about the management of concussion in all sports (Aubry et al. 2002, McCrory et al. 2005, McCrory et al. 2009), but particularly those which involve high rates of concussion due to frequent "collisions" between participants such as American football, ice hockey, rugby union, Australian Rules football and rugby league. Approximately 5-7 concussions per team per season occur at the elite level of Australian Rules football and rugby league in Australia (NRL 2013, AFL 2013). Although concussion is often thought of as an acute injury whose symptoms resolve relatively quickly, a growing number of post-mortem neuropathological investigations of the brains of former athletes (particularly those who played American football) have found evidence of Chronic Traumatic Encephalopathy (CTE) (McKee et al. 2009, Omalu et al. 2010, McKee et al. 2012). CTE is a degenerative brain disease linked to repeated head trauma and characterised by dementia-like symptoms, memory disturbances and speech problems. Such evidence has provided the impetus for thousands of former professional American footballers to file lawsuits against the National Football League (NFL) claiming that the

concussions they suffered were mismanaged and that the league concealed information about the long-term risks of concussion.

A number of professional contact sports have implemented concussion management guidelines (CMGs) that sports doctors must adhere to when treating athletes. In 2011, Australia's two most popular professional football codes – rugby league and Australian Rules football - adopted near identical CMGs that were based on a global protocol known as the Zurich Consensus Statement on Concussion in Sport (McCrory et al. 2009, McCrory et al. 2013). As part of these CMGs the National Rugby League (NRL) and the Australian Football League (AFL) prohibited players diagnosed with concussion from continuing to play or train on the day of the concussion; what I will refer to as the "concussion exclusion rule" (NRL 2012, AFL 2011)(the NRL and AFL concussion procedures were recently updated again in 2013 to reflect updates to the Zurich Consensus Statement (McCrory et al. 2013)).

The concussion exclusion rule represents a significant change of stance and is peculiar to the management of concussion because there are no specific league directives that prohibit players from continuing play after being diagnosed with any other injury. For example, neither the NRL nor AFL prohibits same day return-to-play for musculo-skeletal injuries. Previously in both leagues, team doctors were simply encouraged not to allow concussed players back on to the field if they were still symptomatic. It is clear that in the past a number of players who suffered a concussion continued to play the remainder of the match even after being examined by a team doctor. Given recent concerns about the long-term implications of repeated head trauma, it is worrying that some former players have revealed that they suffered multiple concussions during the same match, and that this occurred on several occasions throughout their career (ABC 2012, Gilbert and Partridge 2012).

There is evidence that best practice concussion management guidelines are not always adhered to in other professional sports. For example, a recent study examining the return-to-play recommendations of medical officers in the English Football Association (FA) found that a majority of teams did not follow the recommendations of the Zurich Consensus guidelines (Price, Malliaras, and Hudson 2012). It has been assumed that lack of awareness

is the major reason why concussion management guidelines are not enforced (around one-quarter of FA medical officers had not heard of the Zurich guidelines), leading some to propose wider dissemination strategies in the hope this will promote greater uptake (Finch et al. 2013).

However, lack of awareness may only be one cause for non-compliance with concussion guidelines. I suggest that conflicts of interest between doctors-patients-teams may present a more substantial obstacle to their proper adherence. Team doctors may feel pressure from coaches to return concussed players to the field on the same day – so perhaps the implementation of a concussion exclusion rule would negate such pressure because players would be forced by the league's guidelines to remain on the sideline for the remainder of the match following a diagnosis of concussion. However, tensions that bear upon clinical decisions about concussion may not necessarily be remedied by implementing concussion guidelines per se. In the case of the NRL and AFL, the instigation of a concussion exclusion rule appears to add a fourth party to this triad (the league itself). A concussion exclusion rule may simply mean that team doctors feel pressure from coaches about whether to apply a diagnosis of concussion in the first place.

The "standard view" of conflict of interest describes a situation whereby a person P (e.g. a doctor) is in a relationship with another party (e.g. a patient/injured athlete) and is required by their role to exercise judgement on behalf of this party. P has a conflict of interest if they also have a "special interest" that may potentially interfere with the proper exercise of their judgement in that relationship (e.g. a team/club/employer) (Davis 1982, Davis and Stark 2001). According to Davis an interest is "*any influence, loyalty, concern, emotion, or other feature of a situation tending to make P's judgement (in that situation) less reliable than it would normally be*" (Davis and Stark 2001, Davis 1982). For sports doctors, competing obligations can arise because of the different goals of medicine and contemporary, professional sport. Anderson and Jackson (2013) say:

> *Medicine has long-established values and professional codes that confer an obligation on doctors to behave in certain ways; instilling a commitment to promote the health and welfare of an individual patient and a prohibition against causing*

> *harm. On the other hand many would argue that the central concerns of contemporary sport, especially at the elite level, are strongly associated with commercial aims and the desire to win.* (Anderson and Jackson 2013)

In collision sports, participation (and the outcome of winning) entails the players placing themselves at risk of harm. At the elite level "team doctors" are sought out to facilitate this whilst still having a commitment to the "art" of medicine (Murray 1986).

The NRL and AFL have been applauded for adopting their CMGs and the concussion exclusion rule seems like a sensible proposal for reducing the risk of further injury. Nevertheless, this paper describes how this rule may create further ethical tensions among players, sports trainers, coaches and team doctors. Worryingly, in some situations these tensions may even increase the likelihood that concussions may be underreported or improperly managed.

Concussed or just dazed?

According to the current guidelines of the NRL and AFL there are three important steps that should be followed in managing concussion: 1) Recognising the injury; 2) Removing the player from the game, and 3) Referring the player to a medical practitioner for assessment (NRL 2013, AFL 2013).

In both the NRL and AFL it typically falls upon sports trainers to initially recognise the injury and instigate the concussion management process, although team doctors attend all NRL and AFL matches. Sports trainers are regularly seen on the field performing duties such as handing out drink bottles, performing first aid, and assisting with the smooth rotation of substitute players. They are not medical practitioners – in fact a number of sports trainers for NRL and AFL clubs are former players who are now employed by a team.

To assist sports trainers in making their assessment, the 2011 CMGs for both the NRL and AFL recommended they refer to the Pocket SCAT2 (Sport Concussion Assessment Tool), a checklist of 24 symptoms of concussion (NRL 2012, AFL 2011). These symptoms include (but are not limited to) loss of consciousness, imbalance, memory loss, headache, nausea, and confusion. The 2011 NRL guidelines advised:

> *Any player who is suspected of having a concussion must be removed from the game and be assessed by the first aider (sports trainer).* (NRL 2012)

The CMGs then offered confusing instructions: the CMGs advised sports trainers to use the Pocket SCAT 2 "*to help make the diagnosis of concussion*" but they also contained a second directive that would seemingly override that instruction:

> *All players with concussion or a suspected concussion need an urgent medical assessment by a medical practitioner.* (NRL 2012)

Given that any player suspected of having a concussion (i.e. any player who displays at least one symptom) must be urgently assessed by a medical practitioner, it is unclear why trainers would ever have needed the SCAT2 to *diagnose* concussion. In fact, instructing trainers on how best to make a diagnosis of concussion (by using the pocket SCAT2) would seem to be unwise given that the 2011 guidelines also stated that "*the management of head injury is difficult for non-medical personnel*", and that it is "*imperative to arrange a more comprehensive medical assessment by an appropriately experienced medical practitioner"* (NRL 2012, AFL 2011). According to the 2013 CMGs for the NRL and AFL, sports trainers are still integral in recognising concussion in the first place. They are now instructed to use the Concussion Recognition Tool (CRT) to help identify symptoms of concussion (the CRT lists symptoms of concussion similar to those listed in the old SCAT2, and the presence of any one is sufficient to suspect concussion). If a trainer suspects a concussion, then the player must be immediately removed from the field for a medical assessment.

Aside from diagnostic issues and the possibility of long-term harm, some of the most contentious questions about managing concussion on the field were raised in a recent scenario posed by Mellifont, Peetz and Sayers (2012) in the *Journal of Bioethical Inquiry.* The authors describe a young footballer (Jack) who appeared to suffer a concussion in his first professional match but continued to play on after turning away the sports doctor who initially attended to him. They ask: "*Who gets to decide if Jack can play on and why? Who has Jack's welfare as their first priority: the sport, the club, the medical staff, the coach … anyone?*" (Mellifont, Peetz, and Sayers 2012). The scenario implies that it is the player's own

desire to continue that it the likely reason for suspected concussions not being properly assessed – the young footballer avoids being assessed by pushing away the assessor. Even since the implementation of the 2011 CMGs in the NRL and AFL it is evident that some players who have displayed symptoms of concussion have not been immediately removed from the field to be assessed by the team doctor (Partridge 2011). While it is true that some players may seek to avoid being assessed for concussion for fear of being excluded from further play, this does not appear to be the case in every instance. In some cases it is unclear whether sports trainers have mistakenly ruled out concussion because they came to their own conclusions about whether a diagnosis of concussion should be applied, or whether they have simply failed to identify symptoms (either with the SCAT 2 or the new CRT) that should have lead them to suspect that a concussion may have occurred. This essentially reflects the "lack of awareness" argument for why CMGs may not be optimally enforced – that is, trainers simply have not received enough education about the concussion management process.

But there is another possibility. Sports trainers do not have the same obligations to the health and welfare of the players that sports doctors do, primarily because it is outside the scope of their expertise to provide comprehensive, informed medical assessments. In many ways the primary functions of sports trainers are to provide "running repairs" for cuts, sprains, dehydration and the like, often under the instruction of the coach. These duties are all intended to ensure the player keeps executing their role on the field so as to ensure the team's success. Some seemingly concussed players appear not to have been referred to the team doctor which raises suspicions that the team's chances of success may have been the priority for the sports trainers involved. If the player had been referred to the team doctor, then the team risks having them excluded if a diagnosis of concussion is applied. But if sports trainers do not refer players to the team doctor in the first place, no concussion diagnosis can be made. Although this is not likely to occur in every case, it is reasonable to suggest that for some sports trainers, the short-term success of the team is a higher priority than the long term welfare of the player – especially given that there is evidence coaches may not always prioritize the health of their players.

Coaches may not always prioritize player welfare

Severe concussions may render a player physically unable to continue however in milder cases some footballers may recover from many of their symptoms during a match. Without a "concussion exclusion rule" they could potentially be allowed to go back onto the field and perhaps play a useful role for their team. Some coaches may not want a player to continue after suffering concussion but there are examples of coaches allowing players to continue playing despite suspected concussion. This is best illustrated by the use of an actual example from the NRL. In Round 3 2011 (prior to the implementation of the current CMGs), Newcastle Knights player Richie Fa'aoso suffered a head clash after which he was unable to walk properly and staggered around the field trying to stand under his own weight. Despite several clearly observable symptoms of concussion (e.g. imbalance; confusion), Fa'aoso was not immediately brought from the field to be assessed by the team doctor. When interviewed after the match, the Newcastle Knights coach revealed that it was his decision to keep Fa'aoso on the field despite recognising that he had probably suffered a concussion:

> *"For player safety, Richie probably should have come straight off on the weekend, there's no doubt about that...If I had my time again, I would definitely do that. But sometimes you leave them out there to see if they can get back into the game and you don't have to make an interchange."* (Dillon 2011)

This example indicates that player health and safety are not always the priority for some coaches. In hindsight the Newcastle coach recognized that the player's safety was at risk, but at the time it was the team's chances of success that guided his decision on Fa'aoso's welfare. In some cases it may be in the team's best interests of winning to prevent a potentially concussed player from being assessed if there are no other substitute players available, or if the match is close or particularly important, or if there is a particularly important player involved.

Pressure on team doctors

The 2011 and 2013 CMGs of both the NRL and AFL acknowledge that coaches may also try to influence the decisions of medical staff and sports trainers when they are assessing suspected concussions:

> *"The assessor should not be swayed by the opinion of the player, coaching staff or anyone else suggesting premature return to play."* (NRL 2012)

Surveys with sports physicians have found that they frequently encounter pressure from coaches (and injured players) to give athletes clearance to return from injury rapidly despite risks to their welfare (Anderson and Gerrard 2005, Price, Malliaras, and Hudson 2012). Anderson and colleagues interviewed sports physicians in New Zealand and found that conflicts of interest were one of the ethical issues team doctors had trouble managing. This is unsurprising given that financial links between clinicians and interested industry bodies have been shown to subtly influence clinical decision making in other areas of medicine (Choudhry, Stelfox, and Detsky 2002). While this does not necessarily mean that clinicians will act unprofessionally, such conflicts of interest should be better managed than: "trust us; we're doctors".

Price and colleague found that some medical officers they interviewed "*felt rushed into making decisions on the pitch side and pressured into approving concussed players to return to play."* (Price, Malliaras, and Hudson 2012). It would be wrong to assume that this pressure is always in the form of a direct instruction from coaches. Rather, the interests of coaches and the team may be facilitated by team doctors because most sports physicians report a sense of responsibility to them (Anderson and Gerrard 2005). There is other evidence that in sports team doctors can also feel like part of the team and thus identify with team goals as strongly as the players. In discussing team doctors in American football, Polsky (1998) explains that:

> *"Unlike most doctor-patient relationships, it is not uncommon for the team doctor to go to the movies with players, join players in card games, or "party" with the players at either official or unofficial team functions...The team mentality can cause a doctor*

> *to experience the same emotional highs and lows that come from winning and losing games that players and coaches experience."* (Polsky 1998)

A revealing insight into the tensions between doctor-patient-team-league was given by a current NRL team doctor (formerly also an AFL team doctor), early in 2012 on the *British Journal of Sports Medicine* blog after the 2011 CMGs came into effect for both leagues (see Box 1 (Orchard 2012)). This is worth analysing because it illustrates a number of conflicts of interest that require better management if the CMGs are to be upheld in the NRL and AFL:

Box 1: BJSM blog post by NRL team doctor *(Orchard 2012)*

I told the coaching and training staff that the new official rule was that if I examined a player and determined that he had been concussed that day that, under the new rules, I couldn't let him return to the field and the club couldn't overrule me. However, it was quickly pointed out, if I didn't examine the player, then the rules would allow him to continue. I think everyone can see where this is heading. I am either going to be put in one of the 3 uncomfortable positions very soon:

1) *That I am going to be pulling players out of the game who I have been comfortable letting continue for many years, and possibly hurting our team's chances of winning games.*
2) *That I am going to turn a blind eye and not examine or fully assess a player who looks as though he is fit to continue.*
3) *That I am going to re-name something I used to call "mild transient concussion" something different like "traumatic migraine" so the player can be allowed to continue, even though deep down I think that the player has probably had a very mild concussion that has quickly recovered.*

The coaching staff of the NRL team pointed out to the doctor that "*if I didn't examine the player, then the rules would allow him to continue*" encapsulating their prioritization of team goals over player health. In practice, a team doctor could be prevented from examining a potentially concussed player if the sports trainer who initially assesses the player fails to refer them – potentially under the coach's direction. The attitude of the coaching staff described in the blog post alludes to such a situation.

However, the first point in Box 1 describes how the CMGs may create tension between the team doctors, the team, and the NRL. When the doctor says that *"I am going to be pulling players out of the game who I have been comfortable letting continue for many years",* he is referring to the previous policy of allowing concussed players to continue if their symptoms had resolved. Under the 2011 and 2013 guidelines, the NRL has sought to take such clinical judgement out of the hands of team doctors. While this may accord with the views of some sports physicians, others may see it as an unwelcome intrusion into their practice and a lack of confidence in their ability to properly manage players. It is true that concussion can sometimes be difficult to identify and that there is still some uncertainty about the lowest threshold for diagnosing concussion, but either way, the team doctor describes his awareness of how the concussion exclusion rule may "*hurt our team's chances of winning*", and that this tension is uncomfortable.

The second point described in Box 1 raises the worrying prospect that team doctors may actively avoid assessing players if a diagnosis of concussion may hurt their team's chances of winning. Concussed players could be put at risk of further injuries - the very outcome the CMGs are intended to prevent. There is one high profile case suggesting that the preparedness to diagnose concussion in the NRL may be affected by the importance of the game and the player involved. Prior to the 2012 State of Origin series (representative matches played annually between New South Wales and Queensland), the NSW team doctor suggested that the CMGs might not be enforced as stringently as in regular season matches:

> *"If someone gets knocked out in Origin, we're in strife...The onus is heightened because it's a major game. If someone gets knocked out in a grand final, are they going to stick to exactly the same rules as if you are playing at Campbelltown Oval or Shark Park?"* (Webster 2012)

This comment proved prescient. In the third State of Origin match in July 2012, NSW player Robbie Farah suffered an accidental head clash with a defending player in a tackle. Farah had difficulty getting to his feet and was visibly unsteady but remained on the ground. Play was stopped by the referee while a sports trainer for the NSW team examined Farah who

needed assistance sitting up. Curiously, despite Farah exhibiting a number of symptoms of concussion, he was helped to his feet by the trainer and not immediately referred to the team doctor. Play was restarted and Farah played the rest of the match. According to NSW medical staff he had been deemed fit to continue. However there were indications that Farah had suffered a concussion that was not properly managed (or at least not recognised) by the NSW medical staff because the medical staff at Farah's regular club (the Wests Tigers) deemed him unfit to play in a match 48 hours later due to the same head injury. While it is not unusual for two different medical practitioners to arrive at different diagnoses, such examples raise suspicion that clinical decision making about concussion in the NRL may be influenced by the nature of the game and the player involved.

The third point raised in Box 1 suggests that rather than avoid assessing players, team doctors may simply re-label concussion as "*being dazed*" or "*traumatic migraine*" so that a concussed player could continue. This is particularly concerning and runs the serious risk of delaying appropriate and timely treatment for concussion. Furthermore, because this injury would not be recorded as a concussion, the footballer would not be included in prospective studies of how concussed players fare. Good data about the long term consequences of concussion is essential to better management. Ironically, before the "concussion exclusion rule" there was less pressure to re-label concussion as something more benign because concussed players whose symptoms had resolved were permitted to continue. Upon the introduction of the concussion exclusion rule, one AFL team doctor claimed that this is the case:

> *''For a minor or brief concussion, what do you think nine out of 10 doctors will be calling that? No concussion. Round 1 last year we had two players concussed, I think, in the first 10 minutes. Both recovered and returned to the game. Under this new policy we would have been two players down … but my big concern is that this will mean those concussions won't be diagnosed as concussions, they won't be monitored, and that they, in a sense, will go underground.*'' (Lane 2011)

This could only happen if team doctors sometimes felt an obligation to interests of the team over the interests of the players or the league in upholding its concussion guidelines. In 2013, the AFL announced that it would allow one concussed player to be completely substituted each match, meaning that teams would not be a player short if one player was excluded for a concussion (the NRL has not yet implemented such a rule). This would appear to reduce some of the pressure on coaches and team doctors when assessing concussion – if a player can be replaced for the entire match then there may be less incentive to return a concussed player prematurely or avoid having him assessed. However, if the player suspected of having a concussion is a particularly important player to that team, there may still be an incentive for coaches and doctors to return them to play, or avoid having them assessed in the first place, regardless of whether they can be replaced (perhaps by a less influential player). Awareness of conflicts of interest is therefore still an integral component of monitoring concussion management guidelines even when concussed players can be replaced. In fact, the prioritization of winning was highlighted shortly after the substitution rule was announced when the AFL's Chief Executive Officer publicly urged clubs not exploit it (Thompson 2013). Exploitation of the rule could be achieved by enacting it to substitute a fatigued (but not concussed) player for a fresh player.

Monitoring concussion guidelines

The previous section described how the NRL's concussion guidelines may not be upheld, not necessarily because of lack of awareness, but because of competing interests on the part of team doctors. Given this and given that the NRL CMGs implicitly acknowledge that conflicting interests may influence clinical decision making, the NRL could be expected to monitor and manage these ethical tensions. It is therefore surprising that the Chief Medical Officer (CMO) of the NRL has insisted that team doctors in the NRL do not have any conflicts of interest affecting their decision making about concussion:

> *"There have been questions about whether club doctors have a conflict of interest because they are being paid by the clubs … their number one priority is the welfare of the player. They will always make the right decision by him.''* (Prichard 2012)

Echoing this sentiment, a co-author of the AFL CMGs discounted the influence of third parties by claiming that team doctors only ever make clinical decisions with their obligation to the player in mind:

> *''I may be idealistic, I may be wrong, but my feeling is that the guys are going to follow what they've been doing which is making sure players are safe. You have very experienced doctors working in the AFL … we're not going to be doing anything that compromises or risks player welfare."* (Lane 2011)

This trivializes the conflicts of interest facing team doctors and undermines confidence that such conflicts of interest can be managed well by the NRL or AFL. The introduction of the concussion exclusion rule in both codes came with the assertions that teams in breach of the CMGs would be sanctioned and fined (Badel 2012). To date, no sanctions have been imposed in either league for breaching the concussion exclusion rule or seeking to circumvent it. It is unclear whether this is because the NRL and AFL believe that no breaches have occurred or because the oversight and enforcement of the guidelines is not very rigorous. It also raises questions about whether sports doctors who have official roles in developing and monitoring the CMGs for the AFL and NRL are able to objectively police their fellow members of the sports medicine fraternity and apply sanctions when necessary.

Compared with the way other player safety rules are enforced, there is a lack of transparency in the way that teams comply with the concussion guidelines. In the NRL for example, a player who commits a high tackle may be penalised and reported to the NRL judiciary which decides whether he may be charged with an offence (e.g. a reckless or careless high tackle) and if so, what sanctions may be applied. Observers are aware of which incidents have been investigated, who is on the judiciary, and all charges and sanctions are made public and often receive considerable media coverage. The process is almost identical in the AFL.

By contrast, the oversight of CMGs is not made public. Again to use the NRL as an example, all games are viewed by the NRL General Manager of Football Operations (GMFO) for potential concussion incidents that require investigation – although, the current GMFO is not a medical practitioner. If the GMFO requires an investigation, he may ask the club's Chief Executive Officer about how the concussed player was managed. The GMFO may also ask the NRL's Chief Medical Officer (CMO) to view the footage of the incident and speak to the sports trainer or doctor involved. The CMO then prepares a report for the GMFO with recommendations about possible sanctions where appropriate. The NRL has acknowledged that some incidents have been reviewed but no investigations about potential breaches of the CMG have been made public.

In the interests of transparency all investigations into breaches of the CMGs (and the reasons for all findings) should be made public by the NRL and AFL. These steps would increase confidence that conflicting interests have not unduly influenced the diagnosis and management of concussion to the detriment of player welfare. Particular attention should be paid to incidents where trainers do not remove a player from the field for assessment despite symptoms of concussion.

Conclusions

Although professional rugby league and Australian Rules football have been the focus of this article, the issues raised potentially apply to other professional contact sports that introduce a "concussion exclusion rule". The rule aims to prevent concussed players from being exposed to further head trauma after concussion amid concerns that repeated head trauma (particularly head trauma that occurs before full recovery from a previous head injury) may be associated with long term neurological problems. In their paper exploring the return-to-play recommendations made by medical officers in the English Football Association (FA), Price and colleagues suggest that a lack of endorsement for concussion management guidelines allows coaches to push for premature return-to-play:

> *The English FA has not enforced the introduction of the CIS* [Zurich Consensus Statement] *guidelines. This potentially gives coaches the licence to demand the return of players when they need them, rather than when their recovery is complete. It is widely accepted that medical teams are under constant pressure to return players to fitness as soon as possible.* (Price, Malliaras, and Hudson 2012)

However, conflicts of interest in the doctor-patient-team triad are not necessarily removed or resolved simply because concussion management guidelines are implemented by a sport's governing body. It would be naive to think that non-compliance simply reflects a lack of awareness about concussion guidelines and best practice management. This paper has shown that when conflicts of interest among stakeholders are ignored or insufficiently managed, they may facilitate attempts at circumventing concussion management guidelines to the detriment of player welfare.

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