Why do so many footballers end up developing neurological disorders and should the Football Association be doing more to protect their players?

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For many years, scientists have been aware of a link between football and neurological disorders but only recently have the Football Association (FA) started to listen.

Light was first brought to this topic back in 2002 when Jeff Astle, former England player famed for his ability in the air, passed away from chronic traumatic encephalopathy (CTE) brought on by frequent heading of the ball[1].

A 22-month study carried out by the Glasgow Brain Injury Research Group has revealed that ex footballers are 3.5 times more likely to develop dementia, along with other neurological dissorders, confirming the fears of many who have long suspected a link between devastating brain injury and football[2].

In the study, the lives of 7,676 ex-professional male Scottish footballers were studied. Each ex-footballer was matched up with three men in the general public of similar age, living in an area of similar social deprivation. In the 18 years that followed the start of this study, researchers found 1,180 former footballers and 3,807 control group men had died. When looking at the cause of death, they discovered that there is a five-fold increase in Alzheimer's, a four-fold increase in Motor Neurone disease and a two-fold increase in Parkinson's disease for former professional footballers.

Even though there has been a known link between football and neurological disorders since shortly after Jeff Astle passed away, the FA has failed to take any proper action until 2021 when they introduced a trial for concussion substitutes. Even then I believe that they are falling short of where they need to be to protect their players and are years behind other sports such as rugby and cricket. In this essay I will explore the different options the FA has, and which ones I think will be the most effective if implemented.

How players can damage their brains while playing football

Football was originally introduced as a safer sport for athletes to play and it provides participants with multiple physical and psychosocial health benefits, but all of these benefits also come with injury risk. Football players most commonly sustain lower extremity injuries, but they are also at risk of sustaining head injuries. As many as 22 percent of all football injuries are head injuries[3]. These head injuries are most commonly sustained in one of two ways. The first is through heading a football and the second is though player-player contact.

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[1] *Jeff Astle killed by heading ball, coroner rules*
Nick Britten (12 November 2002)
https://www.telegraph.co.uk/news/uknews/1412908/Jeff-Astle-killed-by-heading-ball-coroner-rules.html

[2] *Revealed: Footballers five times more likely to suffer from Alzheimer's disease, landmark study finds*
Jeremy Wilson (21 October 2019)
https://www.telegraph.co.uk/football/2019/10/21/footballers-five-times-likely-suffer-alzheimers-disease-landmark/

[3] *Is traumatic brain injury preventable in amateur boxing competition?*
Kevin Rezzadeh (18 January 2019)
https://www.clinicalcorrelations.org/2019/01/18/is-traumatic-brain-injury-preventable-in-amateur-boxing-competition/

Football is one of the only sports in which you use your head to manipulate the ball. This heading of a football might look effortless, but scientists suspect that it could actually cause harm to the players brain[4]. During a football match, scientists have calculated that a ball can strike a players head at speeds of up to 128km/h[5]. These high speeds will cause the brain to bounce back against the skull's back wall, sustaining a bruise[6]. As the brain continues to bounce around the skull, it sustains more and more bruises. These bruises can result in concussion like side effects such as loss of consciousness.

A study was carried out on a group of footballers to determine the effects of heading a football on the brain[7]. A machine fired a ball, to stimulate the pace and power of a corner, and each player was asked to head the ball twenty times. Beforehand, the players brain inhibition and cognitive function were measured. These same measurements were taken again straight afterwards, the next day, the day after that and two weeks later. The study found that football heading resulted in immediate and measurable changes in brain function. Increased inhibition in the brain was detected and a decrease in memory test performance by between 41 and 67% was witnessed. The good news is that this study found that these changes in brain function normalised within 24 hours. However, it is unclear what the cumulative effects would be on the brain if a player headed a ball repeatedly.

Although football heading has recently been associated with causing neurological disorders, the most frequent mechanism to cause a concussion in a match is actually player-player contact[8]. This type of contact covers situations where a players head collides with another players body part such as an arm or a leg. A detailed study was carried out in 2015 which looked at heading related football concussions, in America. It revealed that player-player contact was the most common mechanism of concussion in boys and girls football. Player-player contact was the cause of 78% of the concussions studied in boys football and 62% in girls football.

Although player-player contact would appear to be the main cause of head injuries, the majority of these injuries occur when two players battle for the ball in the air. A study which analysed football matches from the Norwegian and Icelandic leagues between 1999 and 2000

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[4] *How we discovered that heading a football causes impairment of brain function*
(24 October 2016)
https://theconversation.com/how-we-discovered-that-heading-a-football-causes-impairment-of-brain-function-67468

[5] *Dementia: Does heading a football cause the disease?*
(24 February 2020)
https://www.bbc.co.uk/news/explainers-51135579

[6] Soccer heading can lead to brain damage and mid-life dementia – here's what should be done
Howard G. Smith, M.D. (15 March 2017)
https://www.businessinsider.com/soccer-heading-brain-damage-dementia-study-2017-3?r=US&IR=T

[7] *How we discovered that heading a football causes impairment of brain function*
(24 October 2016)
https://theconversation.com/how-we-discovered-that-heading-a-football-causes-impairment-of-brain-function-67468

[8] *An evidence based discussion of heading the ball and concussions in high school soccer*
R. Dawn Comstock, PhD; Dustin W. Currie, MPH; Lauren A. Pierpoint, MS; Joseph A. Grubenhoff, MD; Sarah K. Fields, JD, PhD (September 2015)
https://jamanetwork.com/journals/jamapediatrics/fullarticle/2375128

revealed 192 incidents of head injuries[9]. 112 of these occurred during a heading duel. This means heading is still indirectly effecting the number of head injuries even when the head injury occurs through player-player contact. So if heading was banned it would eliminate the current problem of the long term effects of heading the ball, as well as reducing the number of injuries from player-player contact.

How different players are affected differently by head injuries

Everyone is effected by head injuries differently - it is very similar to alcohol. Some people can take more knocks to their head then others before any damage is done, just as some people can drink more than others before being affected by it. Two categories of player have been identified as suffering from head injuries significantly worse than others. These are young and female players.

Most of what we know about the brain is based off research done on the mature, adult brain[10]. However, it is well known that the brain is not fully developed until our early 20s. The frontal lobe is especially late to mature. Dr Jefferey Barth states, in his research at the University of Virginia Medical school that "the brain develops from the bottom up and from the back forward. So the last thing that kicks in is the frontal lobe"[11]. This is particularly problematic as the frontal lobe is the part of the brain that absorbs most of the impact of the ball during a header.

In teenage years, brain chemicals are also in a state of flux and the brain is very sensitive in many ways. As a result, it can be detrimental for a developing child's brain to suffer from a trauma and can prevent continued growth that would normally happen during various stages of life. Both of these factors make it clear that young people are far more susceptible to sustaining a concussion than an adult who's brain is fully mature.

Compelling new research also suggests that male and female brains react very differently to head injuries[12]. It states that female players are not only more likely to sustain a concussion in any given sport, they also tend to experience more severe symptoms and take longer to recover than their male counterparts. A study using brain scans shows distinct patterns of damage in the brains of female football players compared to male players (See appendix Figure 1) [13]. The study revealed that women in general had more of their brain matter

[9] *Mechanisms of head injuries in elite football*
T E Andersen, A Arnason, L Engebretsen, R Bahr (23 November 2004)
https://bjsm.bmj.com/content/38/6/690

[10] *How we discovered that heading a football causes impairment of brain function*
(October 24 2016)
https://theconversation.com/how-we-discovered-that-heading-a-football-causes-impairment-of-brain-function-67468

[11] *There's a world of difference between adult and child TBIs*
https://crosleylaw.com/blog/theres-world-difference-adult-child-tbis/

[12] *Women are more at risk from concussion*
David Robson (31 January 2020)
https://www.bbc.com/future/article/20200131-why-women-are-more-at-risk-from-concussion

[13] *Heading a soccer ball harms women more than men, study finds*

affected. The brains of female players who headed frequently had eight brain regions that showed damage, while men had only 3 regions of damage. In a study of 266 athletes it was found that, on average, women took 76 days to recover from a head injury while men took 50 days.

It is unclear why this is the case but research has proposed three different answers.

1. Women have smaller necks than men, which could cause the head to move differently, perhaps shaking and damaging the brain in different ways[14].

2. Women have high levels of progesterone, a hormone secreted by the uterus to prepare women for pregnancy. Studies have revealed that the level of progesterone in women drop suddenly after a head injury, causing worse concussion outcomes[15]. The levels of progesterone are high in women of child-bearing age, but low in men, pre-pubescent girls and menopausal women.

3. Women fare from head injuries worse because they are more willing to report symptoms than men. Much of the diagnosis of brain injuries is subjective, relying on what people say they are experiencing.

All of these possible reasons are only theories at the moment as not enough research has been done to solidify them[16].

How the Football Association currently deals with head injuries

Head injuries are dealt with differently in professional football and grassroots football as the professional game has more money and resources for medics, brain scans and video replays.

Currently there are only guidelines for dealing with head injuries in youth football. These guidelines, which were created by the FA, aim to reduce the amount of heading practice done in training at different age levels. They also give guidance on what to do if a player has a suspected concussion and how to gradually return a player back to football after a head injury.

To try and protect the younger players who are more at risk of sustaining head injuries while playing football, the FA introduced guidelines for heading in youth football (see appendix

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Maggie Fox (31 July 2018)
https://www.nbcnews.com/health/health-news/heading-soccer-ball-harms-women-more-men-study-finds-n896236

[14] *Heading a soccer ball harms women more than men, study finds*
Maggie Fox (31 July 2018)
https://www.nbcnews.com/health/health-news/heading-soccer-ball-harms-women-more-men-study-finds-n896236

[15] *Why birth control pills help a concussion + Why you should care*
(14 November 2013)
https://www.pinkconcussions.com/pink-concussions-1/2013/11/15/menstrual-phase-as-predictor-of-outcome-after-mtbi-in-women

Figure 2) [17]. These guidelines were updated on the 24 February 2020 and they aim to "reduce or remove repetitive and unnecessary heading in youth football"[18]. The guidelines recommend a gradual progression into heading through youth football. Starting with no heading practice for children under the age of 11 through to reduced heading practice for under 18s.

The FA also released concussion guidelines in 2016, which explains what a concussion is, how to recognise a concussion, what to do if a player suffers a concussion in a match or during training and guidelines for players returning to football after suffering a concussion[19]. The FA has been heavily advertising their 'If in doubt, sit them out' message, which simplifies what a grassroots teams should do if a player has suffered a suspected concussion. They then go on to advise that 'once safely removed from play they must not be returned to activity that day' and recommend that in all cases, the player should be 'referred to a medical or healthcare professional for diagnosis and advice, even if the symptoms resolve'. Their guidelines also contain a recommended graduated return to play protocol (see appendix Figure 3, 4 and 5). This protocol contains 6 stages and a player can only move from one stage to the next if they experience none of the concussion symptoms.

Although the FA has put all of these guidelines in place, in my 5 years of experience playing grassroots football I would say that this advice is rarely followed. I have only ever seen one player taken off for a suspected concussion, even though there have been many more incidents where a player could have suffered a head injury, and this player returned to sport the next day.

In professional football the protocol is more advanced as there is more money available. At the start of the 2014/15 season, the FA introduced new rules for the Premier League on how to deal with head injuries[20]. These rules stated that all players must undergo a pre-season neurological assessment as part of their annual medical check-up to help doctors measure their recovery rate, should they sustain a head injury during the season. This also states the protocol for when a head injury occurs during play (this protocol has been the same up until the introduction of concussion substitutes at the beginning of February 2021). If a head injury occurred in a match, the medical team would enter the field to attend to the player. The medical staff would assess the player and if there was a loss of consciousness, the protocol stated that "the player must be removed from the field of play, and not be allowed to return". When there was no loss of consciousness, the guidelines stated that "an on-field or touchline

[17] *The FA releases new guidelines for managing concussion*
https://www.thefa.com/get-involved/fa-concussion-guidelines-if-in-doubt-sit-them-outold

[18] *Updated heading guidance announced for youth training sessions*
FA staff (24 February)
https://www.thefa.com/news/2020/feb/24/updated-heading-guidance-announcement-240220

[19] *The FA releases new guidelines for managing concussion*
https://www.thefa.com/get-involved/fa-concussion-guidelines-if-in-doubt-sit-them-outold

[20] *Premier League head injury and concussion rules explained*
Peter Smith (19 September 2016)
https://www.skysports.com/football/news/11662/10584878/premier-league-head-injury-and-concussion-rules-explained

assessment will take place" and a decision should be made "by the attending doctor". This meant that the non-impartial team doctor was the one making the decision which leads to players staying on more often than not. Luke Griggs from Headway the Brain Injury Association brought up his concerns about the way that the protocol was being applied. He told Sky Sports News HQ, "Over the past couple of seasons we've seen numerous high profile instances where a player has had a head injury, been assessed and continued, only to be removed from the field of play a short while later, showing more clear-cut signs of concussion". As a result of many instances like this, it became clear that the protocol wasn't sufficient, so at the beginning of February 2021 a new concussion substitute trial began.

The updated rules from the 2014/15 season also contained clear 'return to play' guidelines for players who are suspected to have suffered a concussion. Essentially, no player will be allowed to return for a competitive game for at least six days. The steps on the 'return to play' guidelines in the Premier League are identical to the six stages in the youth football 'return to play' guidelines (see appendix Figure 4). The only difference being that in the Premier League, a player can progress a step every 24 hours (although the process often takes longer).

Possible changes the Football Association could implement for dealing with head injuries

The FA has many different options which they could implement to help make the 'beautiful game' safer. These options range from the drastic end, such as banning heading in football to the more simple, such as bringing in a head injury action plan unique to women who play the sport.

1. Introduce a concussion action plan specifically for female players.

   There is new research that suggests that male and female brains may respond to head injuries in a very different way[21]. Recent research also suggests that female athletes are not only more likely to sustain a head injury while playing sport, but will also tend to have more severe symptoms, and to take longer to recover than their male counterparts.

   There are over 30 million female footballers worldwide and nearly 3 million in the UK.

   And although research has proven that male and female brains respond to head injuries very differently, the FA's concussion guidelines are identical for men and women.

2. Substitute wet footballs for dry footballs.

[21] *Why women are more at risk from concussion*
David Robson (31 January 2020)
https://www.bbc.com/future/article/20200131-why-women-are-more-at-risk-from-concussion

When footballs get wet, they absorb water. During a match on a rainy day, the ball will get wet and could quickly go over the weight limit for game play, proposed by Federation Internationale de Football Association (FIFA).

Researchers tested water absorption of footballs[22]. After 15 minutes submerged in water, the balls already exceeded the allocated weight cited within the rules.

Although the modern balls are far better nowadays, in terms of water absorption, there is still a lot of room for improvement.

3. Introduce concussion substitutes

When I started my research, there were no concussion substitutes, but from 6 February 2021, the FA introduced a concussion substitute trial that will run until the end of the season in the Premier League and the Women's Super League[23].

The main idea of concussion substitutes is to be able to remove a player who has sustained a potential concussion. If there is clear evidence of a concussion, either through the player exhibiting symptoms or the video analysis providing clear evidence of a suspected concussion, then the player will be replaced by a teammate as a concussion substitute[24]. To make this fair for the opposition team, they will be given the right to make an extra 'normal substitution'. Throughout a match each team will be allowed to make a total of two concussion substitutes in addition to the normal three substitutes .

4. Introduce mandatory protective head gear

If you have ever watched football, you might have seen some players wearing rugby scrum caps or other forms of protective head gear. Currently players only wear these after they have suffered from a nasty head injury, like the Czech international, Petr Cech, after suffering a skull fracture[25]. Research that was published in the British Journal of Sports Medicine (BJSM) in 2005 explored the effectiveness of head gear in football[26]. They carried out tests on many different types of head gear and showed that they provide a 33% reduction in impact response. This study along with others, found that protective head

[22] *Swap* wet footballs for dry to prevent brain damage risk, research suggest
Lizzie Roberts (14 February 2021)
https://www.telegraph.co.uk/news/2021/02/14/swap-wet-footballs-dry-prevent-brain-damage-risk-research-suggests/

[23] *Concussion substitutions: What you need to know*
(6 February 2021)
https://www.premierleague.com/news/1980769

[24] *Concussion substitutions: What you need to know*
(6 February 2021)
https://www.premierleague.com/news/1980769

[25] *What is football's concussion protocol? Symptoms, rules & health risks to head injuries*
Robin Bairner (17 April 2017)
https://www.goal.com/en-gb/news/what-is-footballs-concussion-protocol-symptoms-rules-health/1nt10k2oti9hd1w96ye6mms2j7

[26] *Effectiveness of headgear in football*
C Withnall, N Shewchenko, M Wonnacott, J Dvorak (25 July 2005)
https://bjsm.bmj.com/content/39/suppl_1/i40

gear does not provide any benefit during minor impacts such as heading a football[27]. It does however, provide measurable benefits during larger impacts such as player-player contact, which as we have already discovered is the major cause of head injuries in football.

5. Ban heading

Since midway through 2002 following the coroner's report on Jeff Astle, who died as a result of heading, there have been calls to ban heading in football. A footballer can be subjected to 6-12 incidents of heading a football per competitive football match and studies have shown that heading involves repeated acceleration-deceleration of the brain inside the skull, and possible rotation of the brain. Even if the impacts of heading a football aren't present straight away, the repetition can lead to brain damage over time.

So far these calls have been ignored by the FA, as heading is still a staple part of football. The FA has however, tried to limit the amount of heading in youth football.

6. Change ball pressure

A professional regulation football (size 5) is 58 – 62cm in circumference at its widest point, it weighs 410 – 460g and is inflated to 65.7 – 68.8kPa[28]. Scientists recommend inflating balls to a lower pressure to prevent them from "turning into a weapon". This latest research, published in the journal PLUS One, shows that inflating balls to pressures on the lower end of the ranges could cut certain links to potential injury by about 20 percent[29].

7. Implement tougher sanctions for dangerous aerial duels

We have already discovered that the large portion of head injury incidents are as a result of player-player contact, so it makes sense to try and reduce the occasions when this contact occurs the most. This is normally during aerial duels. As both players are primarily focussing on the ball, accidents frequently occur where a players head collides with another players head, elbow or hand.

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[27] *Sports-related Head injury*
Nitin Agarwal, MD, Rut Thakkar, Khoi Than, MD, FAANS
https://www.aans.org/en/Patients/Neurosurgical-Conditions-and-Treatments/Sports-related-Head-Injury

[28] *Football (ball)*
(3 April 2021)
https://en.wikipedia.org/wiki/Football_(ball)

[29] *Factors affecting peak impact force during soccer headers and implications for the mitigation of head injuries*
Joshua Auger, Justin Markel, Dimitri D. Pecoski, Nicolas Levia-Molano, Thomas M. Talavage, Larry Leverenz, Francis Shen, Eric A. Nauman (16 October 2020)
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0240162

A study revealed that currently, even when an aerial duel resulted in a head injury, the referee's decision was commonly "no foul" [30]. For example out of 79 elbow to head incidents during play, in 53 cases the decision made by the referee was "no foul". While a freekick was only awarded in 21 of these incidents and of these free kicks, 4 resulted in a player receiving a yellow card and 4 a red card.

To reduce these incidents, the FA need to change the rules to implement tougher sanctions for players who injure their opponents. Player's might then this twice before trying to contest for the ball in such a reckless way. Less aerial duels would occur and less head injuries would be seen as a result.

8. Change Grassroots guidelines to rules

The FA currently have guidelines in place in grassroots for the amount of heading children can participate in during training and how a suspected concussion should be dealt with. However, from my personal experience in grassroots youth football, these guidelines are just not being followed. For example, with my U16 girls team, we have regularly exceeded the recommend limit for heading (See appendix Figure 2) in our weekly training sessions.

I think that the current guidelines are a positive step in the right direction, but are just not being followed, so the guidelines should be changed to rules that are enforced by sanctions for clubs that do not comply.

Conclusion

Jeff Astle was the first footballer recorded to die as a result of repetitive head injuries during his footballing career. His death in 2002, started a general debate into head injuries in football and the link between football and dementia. An increase of research quickly followed but it was still many years later before the Football Association took any action.

The research that followed showed that professional footballers are 3.5 times more likely to die from neurological dissorders, such as dementia. Interestingly, it was also shown that professional footballers are less likely to die from other diseases such as heart disease and certain types of cancer and lived, on average, 3 years longer than the general population.

As many as 22 percent of all injuires in football are head injuries. These injuires are most commonly sustained in one of two ways. The first way is through heading a football and the second is through player-player contact.

[30] *Mechanisms of head injuries in elite football*
T E Andersen, A Arnason, L Engebretsen, R Bahr (23 November 2004)
https://bjsm.bmj.com/content/38/6/690

Of these, heading is perceived through the media to be the most, as football is the only sport in which you use your head to manipulate the ball. This is actually not the case with player-player contact accounting for near 60% of all head injuries.

Heading a football cause causes the brain to bounce back against the skull's back wall resulting in bruising. This bruising can lead to concussion and the accumulation of such bruising can lead neurological dissorders such as chronic traumatic encephalopathy.

Player-player contact covers any situation when a player's head collides with another player's body. This impact also causes the brain to move inside the skull resulting in bruising form.

Although player-player contact is the main cause of head injuries, the majority of player-player contact injuries occur when two player contest for the ball in the air. So both player-player contact and heading the ball are linked.

Different players are affected differently by head injuries and there are two categories of player that have been identified as suffering significantly worse than others. These are young players and female players.

Young players experience head injuries more severely than adult player because their brains are still developing. If they suffer a head trauma they often experience more severe consequences as it can prevent the continued growth that would normally happen during the various stages of life.

Female players also experience head injuries worse than their male counter parts. It has been shown that women are more likely to sustain concussion, suffer worse symptoms and take longer to recover. Currently it is unclear why this is the case and more research is needed.

Although most of the research shows conclusive evidence for a link between football and neurological disorders, many are cohort study, carried out retrospectively. These types of studies are useful for identifying links between risk factors and outcomes but do not tell us what is behind the link. We are therefore, still unaware of what the definitive reason is for why more footballers end up suffering with neurological disorders, such as dementia, than the general public.

Just because we do not yet have the definitive reason for why footballers suffer with neurological disorders, we do not the risk factors involved and action can be taken to reduce these risks and protect the players. I have identified the following four actions that could easily be implemented by the FA and would have a significant impact in making the game safer.

1. The rules should be changed to make it the responsibility of a player to avoid contact with another player's head. Any contact with another players head should result in a free kick with the appropriate cards awarded depending on the severity of the challenge.

   Currently, a free kick is only awarded if the challenge is deemed to be dangerous deliberate. Accidental contacts are legal.

   This change of rule would reduce the number of arial duels and hence reduce the number of head injuries

2. Make it mandatory for all youth players to wear protective headgear. This would give youth players a small degree of protection against heading and a larger degree of protection against player-player contact. As player-player contact accounts for the majority of head injuries, this is likely to reduce the number of head injuries in the more vulnerable young players.

   The introduction of protective headgear in youth football was successful and had an impact on the amount and severity of head injuries, extending it to adult football could be reconsidered.

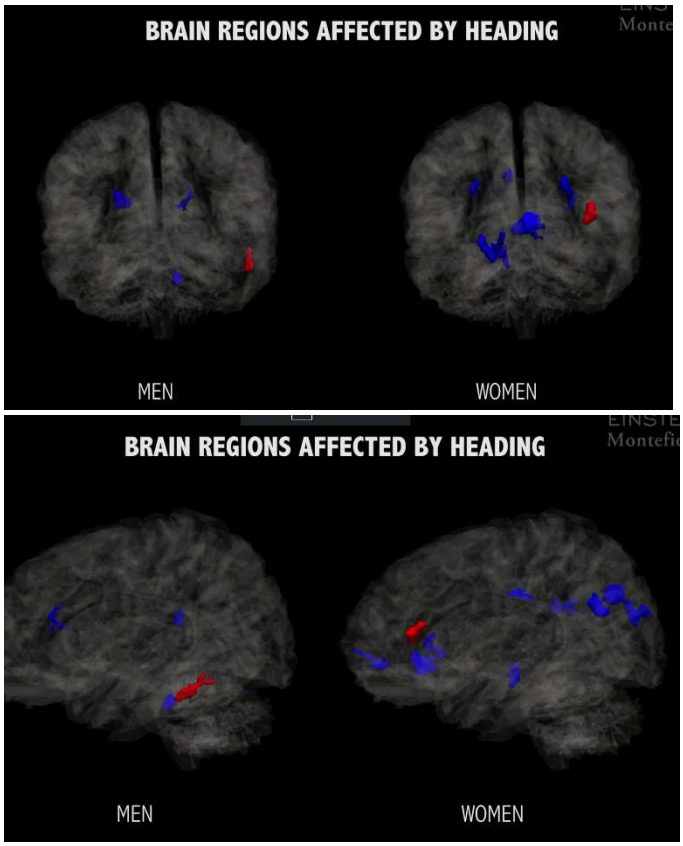
3. Introduce a specific concussion action plan for female players. As female athletes suffer from head injuries in a different way to their male counterparts, the action taken should be tailored specifically to their needs. This would ensure that they make a full recovery and protect them from longer term damage.

4. Upgrade the current guidelines for head injury management in grassroots football to rules. The guidelines are good and are probably effective, but they're just not being enforced. By upgrading them to rules sanctions could be handed out to teams that do not follow them.

In the words of Charlotte Cowie, the FA chief medical officer, "The one thing I would love would be if people in the general public were more aware of these guidelines. They are based on one important message which is 'If In Doubt, Sit Them Out'. If every player who was suspected of concussion, not just in professional football, but across all levels of football, was removed from play immediately and not returned, this would be the single most useful thing we could do to protect players."

Appendix:

Figure 1:



Heading a soccer ball harms women more than men, study finds
Maggie Fox (31 July 2018)
https://www.nbcnews.com/health/health-news/heading-soccer-ball-harms-women-more-men-study-finds-n896236

Figure 2:

Age Group	Heading frequency
U7, U8, U9, U10, U11	Heading should not be introduced in training sessions at this age
U12	Heading remains a low priority – 1 session per month & max 5 headers
U13	Heading remains a low priority – 1 session per week & max 5 headers
U14,U15, U16	Heading remains a low priority – 1 session per week & max 10 headers
U18	Heading drills should be reduced as far as possible, taking into consideration the heading exposure in matches

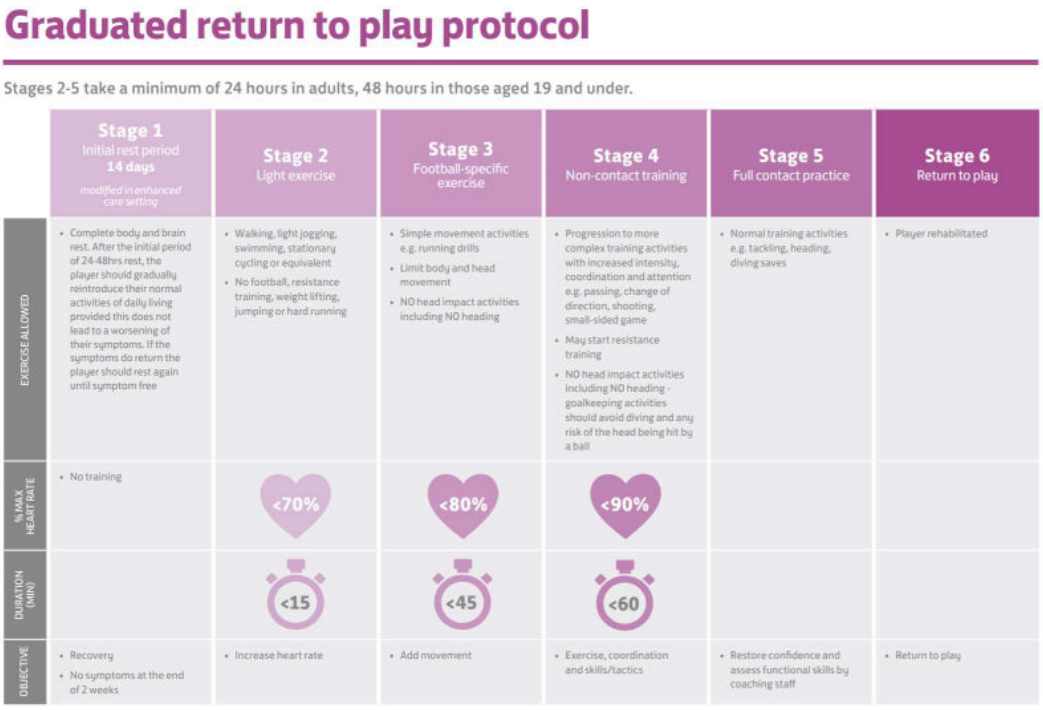
The FA releases new guidelines for managing concussion
https://www.thefa.com/get-involved/fa-concussion-guidelines-if-in-doubt-sit-them-outold

Figure 3:



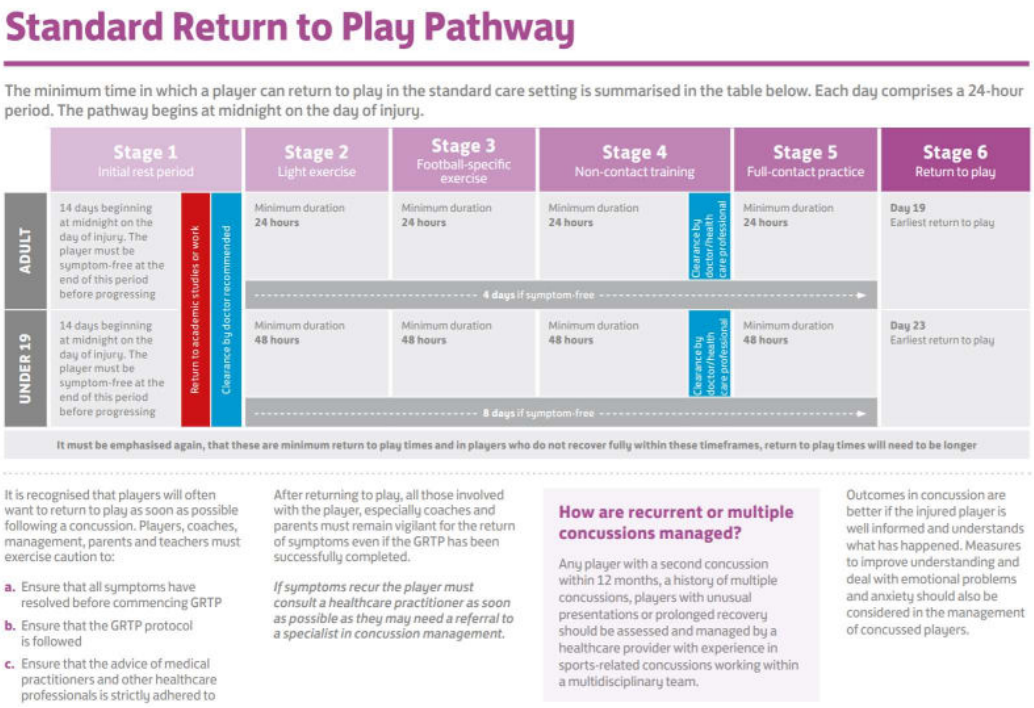
Updated heading guidance announced for youth training sessions
(24 February 2020)
https://www.thefa.com/news/2020/feb/24/updated-heading-guidance-announcement-240220

Figure 4:



Updated heading guidance announced for youth training sessions
(24 February 2020)
https://www.thefa.com/news/2020/feb/24/updated-heading-guidance-announcement-240220

Figure 5:



Standard Return to Play Pathway

The minimum time in which a player can return to play in the standard care setting is summarised in the table below. Each day comprises a 24-hour period. The pathway begins at midnight on the day of injury.

	Stage 1 Initial rest period	Stage 2 Light exercise	Stage 3 Football-specific exercise	Stage 4 Non-contact training	Stage 5 Full-contact practice	Stage 6 Return to play
ADULT	14 days beginning at midnight on the day of injury. The player must be symptom-free at the end of this period before progressing Return to academic studies or work Clearance by doctor recommended	Minimum duration **24 hours**	Minimum duration **24 hours**	Minimum duration **24 hours** Clearance by doctor/health care professional	Minimum duration **24 hours**	**Day 19** Earliest return to play
		4 days if symptom-free				
UNDER 19	14 days beginning at midnight on the day of injury. The player must be symptom-free at the end of this period before progressing Return to academic studies or work Clearance by doctor recommended	Minimum duration **48 hours**	Minimum duration **48 hours**	Minimum duration **48 hours** Clearance by doctor/health care professional	Minimum duration **48 hours**	**Day 23** Earliest return to play
		8 days if symptom-free				

It must be emphasised again, that these are minimum return to play times and in players who do not recover fully within these timeframes, return to play times will need to be longer

It is recognised that players will often want to return to play as soon as possible following a concussion. Players, coaches, management, parents and teachers must exercise caution to:

a. Ensure that all symptoms have resolved before commencing GRTP
b. Ensure that the GRTP protocol is followed
c. Ensure that the advice of medical practitioners and other healthcare professionals is strictly adhered to

After returning to play, all those involved with the player, especially coaches and parents must remain vigilant for the return of symptoms even if the GRTP has been successfully completed.

If symptoms recur the player must consult a healthcare practitioner as soon as possible as they may need a referral to a specialist in concussion management.

How are recurrent or multiple concussions managed?

Any player with a second concussion within 12 months, a history of multiple concussions, players with unusual presentations or prolonged recovery should be assessed and managed by a healthcare provider with experience in sports-related concussions working within a multidisciplinary team.

Outcomes in concussion are better if the injured player is well informed and understands what has happened. Measures to improve understanding and deal with emotional problems and anxiety should also be considered in the management of concussed players.

Updated heading guidance announced for youth training sessions
(24 February 2020)
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Glossary:

Alzheimer's disease - is a progressive brain disorder that slowly destroys memory and thinking skills. Alzheimer's Is a type of dementia.

Chronic Traumatic Encephalopathy (CTE) – is a progressive and fatal brain disease associated with repeated traumatic brain injuries, including concussions and repeated blows to the head.

Cognitive brain functions – are mental processes that allow the brain to receive, select, store, transform, develop and recover information that it's received from external stimuli. These processes allow us to understand an relate to the world more effectively.

Concussion – a concussion is defined as a temporary injury to the brain caused by a bump, blow or jolt to the head that forces the head and brain to move rapidly back and forth.

Concussion symptoms – The main symptoms of a concussion are:

- A headache that does not go away or is not relieved by painkillers
- Dizziness
- Feeling or being sick
- Memory loss (e.g. you may not remember what happened before or after the injury)
- Clumsiness or trouble with balance
- Unusual behaviour (e.g. you may become irritated easily or have sudden mood swings)
- Feeling stunned, dazed or confused
- Changes in your vision (e.g. blurred vision, double vision or 'seeing stars')
- Being knocked out or struggling to stay awake

Dementia - is the general term for the impaired ability to remember, think or make decisions that interferes with doing everyday activities.

Federation Internationale de Football Association (FIFA) – FIFA was founded in 1904 to provide unity among football associations, FIFA boosts 209 members, and is arguably the most prestigious sports organisation in the world.

Football Association (FA) – the Football Association, founded in 1863, is the national governing body for football in England and is responsible for sanctioning competition Rule Books and regulating on-field matters.

Grassroots football – grassroots football is football in a community where local players get together and play in their own environment whatever age, gender, physical condition, skin colour, religion or ethnic origin.

Motor Neurone disease - is an uncommon condition that affects the brain and nerves. It causes weakness that gets worse overtime.

Parkinson's disease - is a condition which parts of the brain become progressively damaged over many years.

Progesterone – is a steroid hormone released by the corpus luteum that stimulates the uterus to prepare for pregnancy.

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