AFL Injury Report: Season 2007

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Released May 28th 2008

Highlights:

- Presents findings from the 16th consecutive year of injury surveillance for the AFL, the last eleven years with 100% compliance.
- Shows ongoing low rates for head and neck injuries. Head and neck injury incidence was at an all-time low in season 2007.
- Shows knee posterior cruciate ligament (PCL) injury incidence and prevalence to be both at an all-time low, as a positive flow-on from changes to the centre bounce rule in 2005.
- Reveals that hamstring and groin injuries are the most common and most prevalent injuries in the AFL, with rates that were increased slightly in season 2007.

Summary

The Australian Football League (AFL) has commissioned a continuous injury surveillance system annually since 1992. From 1997 onwards, the definition of an injury has been an "injury or medical condition which causes a player to miss a match". Contemporaneous weekly player monitoring from 1997 to 2007 inclusive has meant that for this entire eleven year period, all 16 AFL teams have provided injury details for 100% of cases where conditions have met this injury definition. This level of compliance over such a long period is unmatched in the injury surveillance systems of professional sport worldwide. Hamstring strains, groin injuries and knee anterior cruciate ligament (ACL) injuries, have consistently accounted for more missed playing time than other injury categories. In 2007, knee posterior cruciate ligament (PCL) injuries were at their lowest levels for both incidence and prevalence. The AFL's investment in robust injury surveillance, advanced research, and rule changes, where necessary, demonstrate a major commitment to player health and welfare in the sport.

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INTRODUCTION

The AFL has conducted and published an annual injury survey every season for the past 16 years, since 1992[1]. This is the longest running injury surveillance system in Australia. The injury survey also has had a pivotal position in guiding the AFL Research Board to fund projects which study injuries that are common, severe and/or increasing in incidence in AFL players. As the AFL was also the first professional sporting body to implement a funded research board, it has distinguished itself as the most progressive professional sport in this country with respect to injury research.

Injury surveillance is now universally considered to be an important obligation of professional sporting bodies [2-5]. However, the degree to which it is successfully undertaken varies substantially. Nationally (and even internationally) the AFL injury survey structure is seen as a model of "how to get it right", given that it leads to consistent reports and ongoing analysis of injuries. The first public release of the annual report was following the 1996 injury survey [6], believed to be the first time in the world that a professional sport openly tabled its injury data.

METHODS

The methods of the injury survey are now well established and have been previously described in detail [7], although minor changes to methods are made on an annual basis. The definition of an injury is "any injury or other medical condition that prevents a player from participating in a regular season (home and away) or finals match". Player movement monitoring essentially requires that all clubs define the status of each player each round to be either: (1) playing AFL football (2) playing football at a lower level (3) not playing football due to injury or (4) not playing football for another reason. The injury survey coordinator can cross-check the data provided by each club after the conclusion of the season with the player movement monitoring done in 'real time' during the season, in order to maximise compliance with the injury survey definition. Individual player injury details are not revealed in any report of the injury survey. Player Movement Monitoring has allowed the injury survey to achieve '100% compliance' for all instances of missed player games since 1997 [7]. In 2001 this was extended to include rookie listed players and finals matches.

Injury definition

The injury survey has defined an injury as a condition "causing a player to miss a match". This decision was made with the aim of assuring maximum compliance to the survey and has enabled the capture of 100% of defined injury episodes since 1997. As a result the AFL injury survey is one of the few sports injury surveillance systems in use that is highly reliable [7-9].

Injury categories

Injury categories have been slightly changed based on which specific diagnoses (using OSICS[10]) are included within each category in the 2007 analysis. Where changes have been made they have been made *retrospectively* for all previous survey years. Therefore, some of the category data presented in this report for previous years varies slightly from what is apparently the same data that has been published before in the previous reports.

One significant change which was made to injury categories for the 2008 report was that injuries which specifically occurred in events outside football were grouped with medical illnesses as part of an 'other conditions' category, where the mechanism was not considered related to playing AFL football. This change was applied retrospectively to all previous data.

Injury Rates

The major measurement of the number of injuries occurring is *seasonal injury incidence* measured in a unit of *new injuries per club per season* (where a club is defined as 40 players and a season is defined as 22 rounds). The major measurement of the amount of playing time missed through injury is *injury prevalence* measured in a unit of *missed games per club per season*, or alternatively *percentage of players unavailable through injury*. The recurrence rate is the number of recurrent injuries expressed as a percentage of the number of new injuries. A recurrent injury is an injury in the same injury category occurring on the same side of the body in a player during the same season. Therefore, by this definition, an injury of one type that recurred the following season was defined as a new injury in that next season.

All injury rates are adjusted to account for differing player list sizes and number of matches per club in each season, so that the injury rates reported each season represent a hypothetical club with 40 listed players participating in 22 matches.

RESULTS

Key indicators for the past ten years (and estimated key indicators for the previous five years) are shown in Table 1. The injury incidence (number of new injuries per club per season) for 2007 was in keeping with the low rates of recent years. However, injury prevalence, severity and recurrence rates all rose slightly in season 2007.

Table 1 - Key indicators for all injuries over the past eleven seasons

All injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Incidence (new injuries per club per season)	41.9	40.3	36.9	37.4	35.8	34.4	34.1	34.8	35.3	34.1	34.7
Incidence (recurrent)	8.4	7.6	5.2	5.9	5.5	4.4	4.6	3.7	4.8	4.1	5.6
Incidence (total)	50.3	47.9	42.1	43.3	41.3	38.7	38.7	38.5	40.1	38.2	40.4
Prevalence (missed games per club per season)	159.2	141.9	135.9	131.8	136.4	134.7	118.7	131.0	129.2	139.5	147.5
Average injury severity (number of missed games)	3.8	3.5	3.7	3.5	3.8	3.9	3.5	3.8	3.7	4.1	4.2
Recurrence rate	20%	19%	14%	16%	15%	13%	14%	11%	14%	12%	16%

Injury incidence

Table 2 details the incidence of the major injury categories. The injury profile of 2007 shows diverging trends for some of the major categories. Incidence of head and neck injuries (combined), lumbar spine injuries, rib injuries and knee PCL (posterior cruciate ligament) injuries were at all time lows. However hamstring injury incidence was at its highest level since 1999 and groin injury incidence was at its highest level since 1997.

Table 2 - Injury incidence (new injuries per club per season)

Body area	Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Head/ neck	Concussion	0.6	0.7	0.5	0.6	0.7	0.7	0.3	0.3	0.7	0.3	0.3
	Facial fractures	0.8	0.6	0.7	0.7	0.4	0.4	0.6	0.8	0.6	0.3	0.4
	Neck sprains	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.3	0.1
	Other head/neck injuries	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.1	0.2	0.2
Shoulder/ arm/ elbow	Shoulder sprains and dislocations	1.0	0.9	0.7	0.7	1.1	0.9	1.3	1.0	1.4	1.6	1.0
	A/C joint injuries	0.9	0.9	0.6	1.3	0.9	1.1	0.3	1.1	0.8	1.2	0.8
	Fractured clavicles	0.4	0.4	0.3	0.5	0.3	0.3	0.2	0.6	0.3	0.3	0.3
	Elbow sprains or joint injuries	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.1
	Other shoulder/ arm/elbow injuries	0.6	0.5	0.2	0.5	0.5	0.8	0.5	0.4	0.6	0.3	0.2
Forearm/ wrist/ hand	Forearm/wrist/hand fractures	1.1	1.7	1.7	1.4	0.8	1.1	0.8	1.1	1.3	1.1	0.9
	Other hand/wrist/ forearm injuries	0.4	0.4	0.4	0.5	0.3	0.4	0.7	0.4	0.3	0.3	0.6
Trunk/ back	Rib and chest wall injuries	1.2	0.6	1.0	0.8	0.4	0.9	0.8	0.7	0.4	1.0	0.4
	Lumbar and thoracic spine injuries	1.8	1.4	1.4	2.2	1.4	0.9	0.8	1.6	2.1	1.5	1.3
	Other buttock/back/ trunk injuries	1.2	1.0	1.1	0.8	0.5	0.4	0.5	0.6	0.4	0.6	0.5
Hip/ groin/ thigh	Groin strains/osteitis pubis	4.1	3.2	3.1	3.0	3.5	3.8	2.8	3.1	2.9	3.3	4.1
	Hamstring strains	6.6	6.4	6.7	5.6	6.0	4.4	5.8	6.3	5.2	6.4	6.7
	Quadriceps strains	2.5	3.0	2.4	2.0	1.6	1.7	2.0	1.9	1.9	1.7	1.8
	Thigh and hip haematomas	1.3	1.3	1.1	1.1	0.6	1.0	0.3	1.1	1.0	1.1	0.6
	Other hip/groin/thigh injuries	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.8
Knee	Knee ACL	1.2	0.8	0.7	0.5	0.9	0.8	0.6	0.5	0.6	1.0	0.7
	Knee MCL	0.7	1.3	1.2	0.9	1.2	0.9	1.0	0.7	1.0	0.8	1.4
	Knee PCL	0.6	0.3	0.7	0.5	1.0	0.4	0.5	0.7	0.4	0.3	0.2
	Knee cartilage	0.9	1.1	1.1	1.2	1.9	1.3	1.7	1.2	1.3	1.0	1.2
	Patella injuries	0.2	0.4	0.1	0.2	0.2	0.4	0.1	0.1	0.3	0.3	0.3
	Knee tendon injuries	0.5	0.6	0.7	0.7	0.5	0.8	0.7	0.4	0.7	0.4	0.3
	Other knee injuries	1.4	0.4	0.9	1.3	0.8	0.5	0.7	0.7	0.9	0.2	0.8
Shin/ ankle/ foot	Ankle sprains or joint injuries	2.7	2.8	2.1	2.7	2.0	2.5	2.6	2.5	2.5	2.1	2.2
	Calf strains	1.9	2.3	1.4	1.9	1.6	2.2	1.6	0.9	1.9	1.6	1.2
	Achilles tendon injuries	0.4	0.3	0.5	0.4	0.2	0.4	0.4	0.2	0.3	0.3	0.4
	Leg and foot fractures	0.5	0.8	1.1	0.6	1.0	0.8	0.5	0.5	0.4	0.7	0.5
	Leg and foot stress fractures	0.8	0.7	0.8	0.5	0.9	0.7	0.9	0.9	0.9	1.1	1.1
	Other leg/foot/ankle injuries	1.9	1.7	1.3	1.3	1.7	0.8	1.5	1.7	1.3	1.5	1.3
Other	Medical illnesses/ non-football injuries	2.7	2.9	1.7	2.2	2.0	2.6	2.8	2.1	2.3	0.9	2.1
NEW INJURIES / CLUB / SEASON		41.9	40.3	36.9	37.4	35.8	34.4	34.1	34.8	35.3	34.1	34.7

Injury recurrence

Table 3 shows the rate of recurrence of some of the common injury types, particularly muscle strains which have a comparatively high recurrence rate. Most contact-mechanism injuries, such as fractures, concussions and 'cork' injuries have a low recurrence rate. The issue of recurrence for muscle strains is the subject of ongoing research [11]. The rate of injury recurrence has been showing a fairly steady decline over the last 10 years, although the rate of 16% in season 2007 was a return to the long-term average. The recurrence rate for groin injuries in season 2007 was high at 38%.

Table 3 - Recurrence rates (recurrent injuries as a percentage of new injuries)

Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Hamstring strains	38%	36%	31%	37%	25%	30%	27%	22%	26%	16%	22%
Groin strains	36%	31%	6%	16%	20%	23%	20%	24%	23%	28%	38%
Ankle sprains	20%	21%	9%	11%	17%	16%	6%	11%	15%	10%	20%
Quadriceps strains	35%	20%	20%	18%	10%	17%	9%	6%	20%	19%	18%
Calf strains	15%	15%	17%	32%	17%	13%	14%	6%	12%	7%	9%
ALL INJURIES	20%	19%	14%	16%	15%	13%	14%	11%	14%	12%	16%

Weekly player status and injury prevalence

Table 4 details player status on a weekly basis over the past ten seasons. The 'average' status of a club list of 44 players in any given week for 2007 was:

- 34 players playing football per week;
- 7 missing through injury; and
- 3 missing through other reasons (such as suspension, being used as a travelling emergency, team bye in a lower grade, etc).

Table 4 - Average weekly player status by season

Status	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Playing AFL	21.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Playing lower grade football	11.8	11.4	11.4	11.3	12.9	12.1	12.0	11.9	12.2	11.8	11.9
TOTAL playing	32.8	33.4	33.4	33.3	34.9	34.1	34.0	33.9	34.2	33.8	33.9
Not playing because of injury	7.7	6.7	6.4	6.2	6.7	6.6	5.7	6.4	6.4	7.0	7.4
Not playing for other reasons	1.9	1.6	1.8	1.8	1.8	2.3	2.5	2.5	2.8	3.1	2.9
TOTAL not playing	9.6	8.3	8.3	8.0	8.5	8.9	8.2	8.9	9.1	10.1	10.4
Players in injury survey (per club)	42.3	41.7	41.7	41.4	43.4	43.0	42.2	42.8	43.3	43.9	44.2
Injury prevalence (%)	18.1%	16.1%	15.4%	15.0%	15.5%	15.3%	13.5%	14.9 %	14.7 %	15.9 %	16.8 %

Table 5 details the amount of missed playing time attributed to the most notable injury categories. In season 2007, hamstring injuries continued as the no. 1 injury in the game with respect to missed playing time, surpassing both groin injuries and knee anterior cruciate ligament (ACL) injuries. Based on injury prevalence (missed playing time), these three categories are consistently the highest categories for injury prevalence. With respect to mechanism these injuries are most commonly non-contact.

As was the case with injury incidence, some divergent trends were noted in 2007. Knee PCL injuries and facial fractures were at an all time low with respect to contribution to missed playing time. However, hamstring and groin injury prevalence were both at their highest levels since the commencement of injury surveillance.

Table 5 - Injury prevalence (missed games per club per season)

Body area	Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Head/ neck	Concussion	0.7	0.7	0.5	0.7	1.3	2.0	0.6	0.3	0.9	0.3	0.3
	Facial fractures	2.5	2.0	2.2	2.0	1.3	1.4	1.0	2.2	1.4	0.8	0.7
	Neck sprains	0.6	0.7	1.6	0.3	0.2	0.0	0.0	0.6	0.3	0.3	1.1
	Other head/neck injuries	0.3	0.2	0.4	0.8	1.5	0.2	0.7	0.2	0.2	1.1	1.6
Shoulder/ arm/ elbow	Shoulder sprains and dislocations	5.3	5.9	5.6	4.0	5.4	5.9	5.7	5.9	7.7	10.8	6.4
	A/C joint injuries	2.2	2.1	0.9	3.1	2.1	2.4	0.7	2.5	1.9	2.7	1.4
	Fractured clavicles	1.4	1.6	1.2	3.0	1.6	2.0	1.0	3.5	1.3	1.7	1.8
	Elbow sprains or joint injuries	0.7	1.2	0.2	0.1	0.4	0.3	0.4	0.7	0.4	0.7	0.8
	Other shoulder/ arm/elbow injuries	2.4	1.9	0.3	1.3	1.3	3.4	1.6	1.6	2.4	1.7	0.7
Forearm/ wrist/ hand	Forearm/wrist/hand fractures	4.1	5.4	5.9	5.6	2.7	3.1	2.5	3.9	3.8	4.3	2.3
	Other hand/wrist/ forearm injuries	0.6	1.3	0.9	1.4	0.3	2.2	2.9	1.2	1.2	0.5	3.1
Trunk/ back	Rib and chest wall injuries	2.8	1.0	2.0	1.3	0.7	1.5	1.7	1.3	0.6	2.2	1.9
	Lumbar and thoracic spine injuries	9.7	4.3	7.9	8.4	5.6	5.8	2.1	5.4	6.4	5.4	2.8
	Other buttock/back/ trunk injuries	6.0	1.6	2.3	2.6	1.5	1.6	1.6	2.3	0.7	1.3	1.7
Hip/ groin/ thigh	Groin strains/osteitis pubis	17.4	13.6	9.4	7.5	13.6	15.7	13.6	13.3	11.2	14.0	18.0
	Hamstring strains	20.9	21.0	22.3	22.4	21.3	15.6	18.7	21.6	18.6	21.8	24.3
	Quadriceps strains	8.6	9.5	6.7	5.6	3.8	4.3	6.0	4.2	6.4	5.5	5.6
	Thigh and hip haematomas	2.4	1.8	1.5	1.8	0.6	1.9	0.5	1.7	1.6	1.4	1.0
	Other hip/groin/thigh injuries	1.7	0.5	2.3	1.4	1.7	1.2	1.5	2.6	1.0	2.3	4.5
Knee	Knee ACL	19.8	15.8	10.8	4.8	13.6	15.3	10.8	10.1	9.3	15.3	15.9
	Knee MCL	3.3	4.3	3.3	3.5	4.8	2.8	2.9	2.9	3.0	1.7	4.7
	Knee PCL	1.9	2.2	5.2	2.3	5.9	2.3	2.0	6.5	2.7	1.8	1.6
	Knee cartilage	4.0	5.6	5.3	8.6	12.5	6.0	7.0	6.1	7.8	5.7	9.1
	Patella injuries	0.9	1.6	0.8	1.8	0.8	2.5	0.6	0.1	0.8	1.2	2.7
	Knee tendon injuries	2.4	1.6	3.9	3.9	2.5	3.7	2.9	0.9	2.6	1.8	0.7
	Other knee injuries	3.9	0.8	2.2	3.6	2.5	1.0	2.4	1.3	3.8	0.2	2.6
Shin/ ankle/ foot	Ankle sprains or joint injuries	7.2	6.9	3.9	6.8	4.3	5.9	5.3	6.4	9.2	8.1	7.1
	Calf strains	5.8	6.4	3.4	5.7	3.4	4.4	3.8	1.7	4.5	3.4	3.1
	Achilles tendon injuries	1.3	1.4	1.3	1.6	0.7	0.9	1.5	0.8	1.9	2.1	2.2
	Leg and foot fractures	2.6	5.4	8.8	4.6	7.0	7.9	2.9	3.7	2.7	5.7	2.7
	Leg and foot stress fractures	4.9	4.0	6.7	3.8	4.4	3.9	5.3	6.3	5.1	8.2	6.8
	Other leg/foot/ankle injuries	6.4	5.1	3.1	3.9	4.2	2.3	3.7	4.3	4.2	4.1	4.2
Other	Medical illnesses/ non-football injuries	4.3	4.5	3.4	3.4	2.8	5.4	4.8	4.6	3.7	1.2	4.1
MISSED GAMES / CLUB / SEASON		159.2	141.9	135.9	131.8	136.4	134.7	118.7	131.0	129.2	139.5	147.5

ANALYSIS & DISCUSSION FOR SIGNIFICANT INJURY CATEGORIES

Hamstring injuries

Hamstring strains remain the most common injury in the AFL. Previous analysis of hamstring and other muscle strain data shows a high rate of recurrence [11-14].

The current AFL data shows that management of these injuries has become more conservative over the last decade in the AFL, with recurrence tending to decrease [15] (Table 6). The risk of recurrence however does remain high and persists for three months after return to play because players often return with subtle strength deficits and/or biomechanical compensations [11].

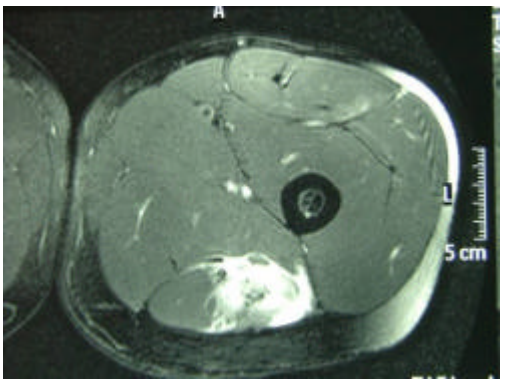

Table 6 - Key indicators for hamstring strains over the past eleven seasons

Hamstring strains	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Incidence	6.6	6.4	6.7	5.6	6.0	4.4	5.8	6.3	5.2	6.4	6.7
Prevalence	20.9	21.0	22.3	22.4	21.3	15.6	18.7	21.6	18.6	21.8	24.3
Severity	3.2	3.3	3.3	4.0	3.5	3.5	3.2	3.4	3.6	3.4	3.6
Recurrence rate	38%	36%	31%	37%	25%	30%	27%	22%	26%	16%	22%

Head and neck injuries

Table 7 shows consistently low incidence and prevalence for head and neck injuries (combined) over the past decade. Season 2007 reported the lowest incidence of head & neck injuries since the survey was commenced, with a zero percent recurrence rate.

Reduced tolerance of head-high contact and stricter policing of dangerous tackles along with the introduction of rules to penalise a player who makes forceful contact to another player with his head over the ball may have contributed to these positive trends.

Table 7 - Key indicators for head & neck injuries over the past eleven seasons

Head and neck	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Incidence	1.8	1.6	1.6	1.6	1.5	1.2	1.2	1.4	1.6	1.0	0.9
Prevalence	4.1	3.5	4.6	3.8	4.2	3.7	2.2	3.3	2.7	2.5	3.7
Severity	2.3	2.2	3.0	2.3	2.9	3.0	1.8	2.4	1.7	2.6	4.0
Recurrence rate	0%	4%	4%	0%	0%	5%	9%	0%	3%	0%	0%

Knee ligament injuries

Knee ligament injury incidence fell in 2007, particularly with respect to PCL injuries. New rules were introduced in 2005 to limit the ruckman's run up, with the introduction of a 10 metre outer circle at centre bounces. There have been no centre bounce ruck mechanism PCL injuries in 2006 or 2007, indicating success with this rule change (Table 8). The trend of higher PCL injuries amongst ruckmen has been eliminated and there also appears to be a drop in 'ground-contact' PCL injuries.

Knee ACL injuries were at average rates for season 2007. There was a smaller number than usual occurring in the AFL Premiership Season matches, but a relatively high prevalence due to pre-existing ACL injuries where the player had not yet recovered from his reconstruction. These injuries are the subject of further research[16] and due to their regular occurrence and devastating impact on footballers will continue to be a priority topic.

Table 8 - Key indicators for major knee ligament injuries over the past ten seasons

Category	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
PCL incidence	0.6	0.3	0.7	0.5	1.0	0.4	0.5	0.7	0.4	0.3	0.2
PCL prevalence	1.9	2.2	5.2	2.3	5.9	2.3	2.0	6.5	2.7	1.8	1.6
PCL severity	3.3	7.4	7.2	4.8	5.9	5.9	4.4	9.0	7.0	6.8	9.7
Number of centre bounce PCL injuries (compared to total injuries)	0/10	2/5	3/12	4/8	4/18	3/7	2/8	5/13	1/9	0/5	0/3
ACL incidence	1.2	0.8	0.7	0.5	0.9	0.8	0.6	0.5	0.6	1.0	0.7
ACL prevalence	19.8	15.8	10.8	4.8	13.6	15.3	10.8	10.1	9.3	15.3	15.9
Number of graft ruptures (compared to total ACL injuries)	3/21	2/15	0/8	1/8	1/17	4/15	0/11	2/9	1/10	4/19	2/13

CONCLUSIONS

The AFL injury profile is moving further towards being predominantly one of non-contact injuries as key contact injuries such as head and neck injuries, rib injuries and knee PCL injuries continue to reduce in incidence. However, there still remains an enormous challenge in controlling key non-contact soft tissue injuries such as hamstring and groin strains, which showed rates in 2007 which were high by historical standards.

The ongoing trends in the injury incidence vindicate the approach the AFL is taking towards injury surveillance and research[3]. Possible variables that may have (or in some cases certainly have) reduced injury incidence over the past decade includes:
(1) the new centre circle rule to limit the run-up of ruckmen at the centre bounce;
(2) the program of ground condition testing and surveillance;
(3) video surveillance and non tolerance of illegal play;
(4) the introduction of specific rules, such as the rule to protect players from forceful contact when their head is over the ball;
(5) the establishment of a research board which funds research projects to improve our knowledge base;
(6) improved management and prevention of injuries at club level.

The AFL injury profile continues to be consistently defined and published in sports medicine scientific literature and in public media releases [7]. Hamstring injuries, knee ACL injuries and groin injuries (including osteitis pubis) are consistently the most prevalent injuries in AFL players.

- Historically, the AFL injury survey is the world's longest running publicly-released injury survey in sport[1 7 17];
- The survey has run for 16 seasons, achieving 100% participation and compliance over the last 11 seasons;
- The survey defines an injury as a 'condition which causes a player to miss a game' striking a balance which has enabled comprehensive analysis without sacrificing compliance[9]; and
- The survey has led directly and indirectly to dozens of published studies and interventions which have improved the safety of the AFL competition [1 7 11 14 16-29] (e.g. ruck rule changes to decrease PCL injuries and changes in ground preparation to reduce ACL injuries).

Acknowledgments:

The authors and AFL Medical Officers would like to acknowledge the following people who contributed to the survey in 2007: David Binney, Dr Andrew Potter (medical services coordinator and doctor, Adelaide), Victor Popov (physiotherapist, Brisbane), Dr Ben Barresi (doctor, Carlton), Dr Andrew Jowett, Gary Nicholls (doctor and physiotherapist, Collingwood), Bruce Connor (physiotherapist, Essendon), Jeff Boyle and Norm Tame (physiotherapist and football staff, Fremantle), Dr Chris Bradshaw (doctor, Geelong), Dr Peter Baquie + Nick Russell (doctor and football staff, Hawthorn), Dr Andrew Daff (doctor, Melbourne), Dr Con Mitropolous (doctor, Kangaroos), Dr Peter Barnes and Michael Heynan (doctor and football staff, Port Adelaide), Dr Greg Hickey (doctor, Richmond), Dr Ian Stone (doctor, St. Kilda), Dr Nathan Gibbs (doctor, Sydney), Paul Tucker (physiotherapist, West Coast Eagles), Dr Gary Zimmerman (doctor, Western Bulldogs), Dr Peter Harcourt and Dr Harry Unglik (AFL Medical Commissioners), Rod Austin, Jill Lindsay and Adrian Anderson (AFL administration), Champion data and all those acknowledged in the injury reports for previous years (particularly Dr Tim Wood who had a major administrative role during the early years of the injury survey).

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