

AFL & VSFL Injuries 1994 report

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Contributors

The AFL & VSFL Injury Survey is the result of a team effort. There is a tremendous spirit of cooperation amongst AFL club doctors which allows football injuries to be studied in detail for the benefit of all parties. Major contributors to the injury survey in 1994 were:

- Tim Wood (Richmond/Geelong FC) who was responsible for the set up of this year's survey, was the initial coordinator, continuing on from his role in 1993, and helped write the final report
- John Orchard (Sydney FC) who shared the role of coordinator and was responsible for database design, data analysis and writing the report
- Adam Broad who did most of the data entry and editing
- Malcolm Rosier for help with statistical analysis
- Ian Rosier for help with database design
- Hugh Seward (Geelong FC) who was the inspiration for the Injury Survey, provided strong ongoing leadership of the AFLMOA and helped write the final report
- all doctors, physiotherapists and head trainers who collected injury data for the participating AFL and VSFL teams, who were Dr Brain Sando, Dr Peter Barnes (Adelaide), Dr Alan Mackenzie (Brisbane), Dr Phil Perlstein (Carlton), Dr Paul McCrory (Collingwood), Bruce Connor (physiotherapist, Essendon), Dr Ian Stone (Fitzroy), Dr Tim Hurren (Footscray), Dr Hugh Seward (Geelong), Dr Andrew Daff (Melbourne), Dr Paul Blackman (North Melbourne), Dr Tim Wood (Richmond), Dr Peter Edwards (St. Kilda), Dr John Orchard (Sydney), Dr Ken Fitch (West Coast), Dr Sandy Murray (Ballarat), Dr Dennis O'Connor (Bendigo), Dr Rob Voritch (Central), Hesham Azer (physiotherapist, Eastern), Nick Ames (physiotherapist, Geelong Falcons), Anthony O'Donnell (physiotherapist, Murray), Dr Bruce Mitchell (Northern), Dr Michael Turner (Southern), Dr Julian Piankas (Western)
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Abstract

Three thousand and thirty one AFL and 1034 injuries in the VSFL U/18 competition were recorded by club doctors over the 1992, 1993 and 1994 seasons. Hamstring strains had by far the highest incidence (86.4 per 10,000 player hours) and prevalence (30.2 hours missed per 1000 hours) of any injury in the AFL, but were significantly less common in the U/18 competition. Other common injuries in both competitions were ankle sprains, thigh haematomas, concussion, groin strains and head lacerations. Injury prevalence was higher overall in the AFL, with most lower limb muscle strains (hamstring, calf, quadriceps) being significantly more prevalent than in the U/18 competition ($p < .05$). Injuries which were significantly more prevalent in the U/18 competition included stress fractures and concussion. Coaches and medical staff in the U/18 competition need to be aware of the high risk of stress fractures in young footballers with heavy training loads. It is recommended that the most common and prevalent injuries in both competitions be studied further and also that the injury survey continue on an ongoing basis. Computerisation of the process of data entry will help this to be achieved.

Introduction

Injuries in football are receiving a constantly increasing amount of attention from the clubs, players, media and medical staff of the league. It is accepted by all parties that injuries are an major determinant of team success in the short term. The increasing awareness of the importance of injuries and of professionalism in the AFL in general has meant that clubs are devoting extra resources to their medical teams, who in turn are under more pressure to provide good management (7).

The benefits of surveying injuries at the elite level of Australian football include:

- the ability for clubs and the league to react to injury rates with changes in training, medical support, structure of the competition and rule changes
- supplying accurate statistics to the media, who are choosing to focus more attention to the area of player injuries (1,2,4,5)
- supplying a possible framework for survey of injuries at the amateur level, which has been recently recommended as a major priority by investigations into football injuries (3,6)
- as a starting point for more detailed analysis into the major injury types, which could lead to better preventive strategies in the future

Injuries in the AFL and VSFL have been surveyed continuously since 1992. Previously injuries in the VFL were surveyed from 1983-85 inclusive (12). The 1992 survey was conducted along with the major rugby league and rugby union competitions to give an Australia wide profile of injuries at the elite level (11). The 1993 survey was continued by the AFL medical officers and expanded to include the majority of teams in the VSFL U/18 competition (14).

The 1994 survey was a continuation of the studies of the previous two years. The aims have been similar to previous years, with particular attention given to making compliance and analysis easier and simpler, so that the injury survey can continue indefinitely as a baseline for observations and further research of AFL injuries.

Methods

All clubs in the AFL and VSFL U/18 competitions in 1994 were invited to participate in the survey. In most cases this was arranged through one of the club doctors, although some clubs preferred to have another person doing the recording, usually a physiotherapist.

Of the 15 AFL clubs, 14 were included in the survey in 1994 (all except Hawthorn). Eleven of these clubs fielded a second team in the VSFL reserves competition and reported results for this team as well.

Of the 10 VSFL U/18 teams, 9 participated in the survey in 1994 (all except Gippsland).

Participating doctors were sent a standard injury sheet arranged in a tabular format on which to record injury details.

The official injury definition for the purposes of the survey was:

- (1) Any injury which caused a player to be unavailable for selection in a match or participation in a training session; or
- (2) Any other injury which required specific medical treatment, other than routine conservative measures.

The period of the survey was the week of the first to the week of the last home and away match inclusive. Where injuries were recorded outside the survey period (e.g. in the preseason) the data was entered but excluded from the analyses of incidence and prevalence.

Players to be included (the population-at-risk) were all those playing matches for the club involved, irrespective of whether they were on the regular or supplementary list.

The defined time-at-risk was the duration of matches, although injuries were recorded at other times, particularly training. In order to standardize data with that of the 1992 and 1993 surveys, matches were considered to consist of 100 minutes playing time* There were considered to be an average of 18 players-at-risk per side per match (i.e. whoever was on the interchange bench was not at risk of injury).

Details included on the injury form were: Date of injury onset, Time of injury (training, match quarter or other), Player name, Injury diagnosis, Grade of match, Mechanism, Player position, Matches missed, Date returned, Surgery required?, Injury recurrence?, Bleeding on field?

Only actual matches missed were counted, for example if a player was injured severely in the second last round, only one match was missed despite the fact that the actual recovery period may have taken longer than one week.

Almost all teams chose to wait until the end of the season before sending in their data and most doctors first recorded injury details in their regular medical record and transposed them to the survey form at a later date. At least three AFL clubs are already keeping some form of computerised records of injuries. Hawthorn physiotherapists were recording the injuries directly onto the survey forms, but many of their forms were lost, so they were excluded from the 1994 survey.

Injury data was entered into a specific Microsoft Access database designed for the survey. Injuries were coded according to classification specifically designed for this survey, which has been published previously (8), and was updated for this year's survey (see Appendix A - Orchard Sports Injury Classification System (OSICS)). Each injury was allowed up to two injury code diagnoses, with the first code used for the most serious diagnosis. If more than one code was used, only the first code was used

* A rule change was brought in at the start of the 1994 season to reduce the time of quarters to twenty minutes (from twenty-five). However, a simultaneous rule change which allowed an expansion of time-on meant that the average length of quarters was only reduced by two minutes. Average playing time was 112 minutes in 1994 (compared to 120 minutes previously) including time-on.

to determine injury prevalence, while both codes were used to determine injury incidence (e.g. if a player suffered concussion and a lacerated scalp and missed two weeks, only the concussion was considered to have caused the missed matches, but both injuries were credited with an occurrence).

Data was analysed using queries within Access and was exported to Microsoft Excel for charting and statistics. Calculations of statistical significance were made using chi-squared (χ^2) tests.

Data from the 1992 and 1993 surveys was converted to the 1994 format and re-analysed with the 1994 data. There are some minor variations of results for 1992 and 1993 as presented in this survey compared to the original surveys, due to slight variations in methodology of analysis since the original calculations were made. The only substantial variation is the figure for overall injury prevalence in the AFL in 1993, which appears to have been calculated erroneously in the original survey.

Player match participation data and team injury payments in the salary cap were obtained directly from the AFL as alternative measures of overall injury prevalence, free from any biases which may be caused by different recording methods of doctors at the various clubs.

The reserves (second grade) competition is officially a VSFL competition, as is the U/18 competition. In this paper, AFL will be used to mean the senior age club competitions (both AFL seniors and VSFL reserves) to differentiate from the U/18 competition. The term VSFL will be avoided in the results section because of the ambiguity.

Results

Time-at-risk was calculated from number of team games that occurred over the survey period. As stated in the methods, all games were considered to last for 100 minutes and to have 18 players on the field ('at risk') at any given time.

Table 1. Summary of time-at-risk

	AFL (seniors & reserves)				VSFL U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
Calculation of number of team games per season	22x12 +	20x13 +	22x14 +		18x5	18x10	18x9	
	22x11	22x10	22x11					
Team games	506	480	550	1536	90	180	162	432
Player matches	9108	8640	9900	27648	1620	3240	2916	7776
Player hours	15180	14400	16500	46080	2700	5400	4860	12960

Injury incidence

Hamstring strains continue to be the most common injury in the AFL, by a clear margin. The 5 most commonly occurring injuries in the AFL are consistently hamstring strains, ankle sprains, thigh haematomas ('cork thighs'), head & facial lacerations and groin strains. In the U/18 competition the difference in frequency between the common injuries was not as great. Concussion is generally one of the top 5 injuries in the U/18 competition but not the AFL. Injury incidence is reported in more detail in Appendix B.

The incidence of head and facial lacerations is important as they account for the vast majority of uncontrolled bleeding on the field. Their rate is reasonably consistent from year-to-year.

Total reported injury incidence over 1992-1994 was significantly higher in the U/18 competition than the AFL ($p < .01$).

Table 2. Reported injury incidence (injuries per 10,000 player hours)

Competition Year	AFL				U18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	650.2	509.7	793.9	657.8	788.9	594.4	1028.8	797.8
Hamstring strain injuries	87.6	76.4	93.9	86.4	25.9	33.3	72.0	46.3
Thigh haematomas	36.9	25.0	51.5	38.4	40.7	40.7	72.0	52.5
Ankle sprains	38.2	31.3	46.7	39.1	59.3	35.2	57.6	48.6
Groin strains (muscular and unspecified)	21.1	25.7	48.5	32.3	33.3	24.1	63.8	40.9
Head/facial lacerations	40.8	26.4	41.2	36.5	51.9	33.3	24.7	34.0
Concussion	23.7	20.1	30.3	25.0	51.9	59.3	43.2	51.7

There were some significant differences in the reported incidence rates of certain injuries between the AFL and U/18 competitions over the three years. Injuries which occurred significantly more commonly in the AFL competition included hamstring strains ($p < .001$), knee cartilage injuries, knee medial ligament injuries, inguinal hernias and quadriceps strains ($p < .01$). Injuries which occurred significantly more commonly in the U/18 competition included concussion ($p < .01$) and foot stress fractures ($p < .05$).

Table 3. Injury frequencies by percentage for most common injuries

Competition Years	AFL	U18
	92-94	92-94
Hamstring strain injuries	13.1	5.8
Ankle sprains	5.9	6.1
Thigh haematomas	5.8	6.6
Head/facial lacerations	5.5	4.3
Groin strains (muscular and unspecified)	4.9	5.1
Concussion	3.8	6.5
Quadriceps strain injuries	3.7	2.1
Lumbar non-disc soft tissue injuries	3.3	3.8
Calf muscle strain injuries	2.9	2.6
Calf and shin haematomas	2.7	2.2
Knee cartilage injuries	2.5	1.2
Knee medial ligament injuries	2.5	1.0
Acromioclavicular joint injuries	2.4	1.7
Wrist and hand fractures	2.5	1.5
Hip and groin haematomas	2.0	3.3

Injury prevalence

Injury prevalence figures from the survey are summarized in Tables 4 & 5 and presented in further detail in Appendix C. Hamstring strains account for far more missed playing time than any other injury in the AFL. In the U/18 competition, ankle sprains were the most prevalent injury. The other most prevalent injuries are different to the most frequent injuries because most of the common injuries are not severe and hence do not cause many matches to be missed. Certain injuries feature more prominently in the list of prevalent injuries because of their severity, particularly knee injuries in the AFL competition and stress fractures in the U/18 competition.

Total reported injury prevalence over three years and in total was significantly higher in the AFL than U/18 competition ($p < .05$). The 1994 prevalence rates were higher than the previous two years, with this difference being significant in the U/18 competition ($p < .001$) but not the AFL.

Table 4. Reported injury prevalence (hours missed per 1,000 hours)

Competition Year	AFL				U18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	177.2	162.7	183.2	174.8	116.0	116.0	170.4	136.4
Hamstring strain injuries	27.9	32.1	30.7	30.2	3.7	9.3	12.3	9.3
Ankle sprains	7.4	8.4	7.7	7.8	8.6	7.7	14.7	10.5
Quadriceps strain injuries	10.0	7.5	10.7	9.5	0.6	2.5	4.1	2.7
Knee cartilage injuries	8.8	4.9	9.9	8.0	12.3	4.3	6.9	6.9
Anterior cruciate ligament injuries	11.2	3.0	9.2	7.9	3.1	7.4	0.0	3.7
Dislocated/subluxed shoulders	9.4	4.6	8.9	7.7	0.6	3.7	6.9	4.2
Groin strains (muscular and unspecified)	4.9	5.1	11.0	7.2	5.6	3.4	7.2	5.3
Knee medial ligament injuries	6.5	9.7	8.0	8.0	0.6	0.9	3.4	1.8
Foot stress fractures	2.1	6.7	5.9	4.9	28.4	6.2	7.2	11.2
Wrist and hand fractures	6.1	4.4	4.0	4.8	0.0	5.2	11.7	6.6
Stress fractures tibia/fibula	2.5	4.1	1.8	2.7	0.0	10.5	2.7	5.4
Concussion	2.7	2.3	1.9	2.3	3.7	6.2	5.8	5.5

There were some significant differences between the AFL and U/18 competitions with regards to reported injury prevalence for certain injuries. Injuries which were more prevalent in the AFL included

hamstring strains, quadriceps strains, calf strains, knee medial ligament strains, inguinal hernias and anterior cruciate tears (all at least $p < .01$). Injuries which were more prevalent in the U/18 competition included ankle sprains, foot stress fractures, shin stress fractures, concussion, wrist and hand fractures and thigh haematomas (all $p < .001$).

Table 5. Injury prevalence as a percentage of all time missed

Competition Years	AFL 92-94	U18 92-94
ALL INJURIES	100	100
Hamstring strain injuries	17.3	6.8
Quadriceps strain injuries	5.4	2.0
Anterior cruciate ligament injuries	4.5	2.7
Knee medial ligament injuries	4.6	1.3
Knee cartilage injuries	4.6	5.1
Dislocated/subluxed shoulders	4.4	3.1
Ankle sprains	4.5	7.7
Groin strains (muscular and unspecified)	4.1	3.9
Calf muscle strain injuries	2.9	1.3
Other knee ligament (PCL, LCL, PLC) injuries	3.1	3.0
Foot stress fractures	2.8	8.2
Wrist and hand fractures	2.9	4.8
Fractured long bone, leg and ankle	2.7	3.2
Fractured facial bones (other than noses)	2.4	2.2
Inguinal hernias	2.4	0.2

Injury prevalence was also calculated from alternative sources of data. The official AFL records of games played enabled injury prevalence for the Melbourne teams to be calculated in 1994 (see Table 7 and Figure 1). This was because the Melbourne teams were required to field every available listed player in either the seniors or reserves each week.

Table 6. Senior injury match payments (matches missed) by year

Senior matches missed	1988	1989	1990	1991	1992	1993	1994	Average (1988- 1994)
Average (per team)	85	93	93	88	76	62*	74	78
Maximum (of any team)	130	177	173	156	103	90	138	103
Minimum (of any team)	39	35	47	53	43	22	35	54

* The 1993 average was multiplied by 22/20, as there were only 20 rounds in 1993, with 22 rounds in all other years.

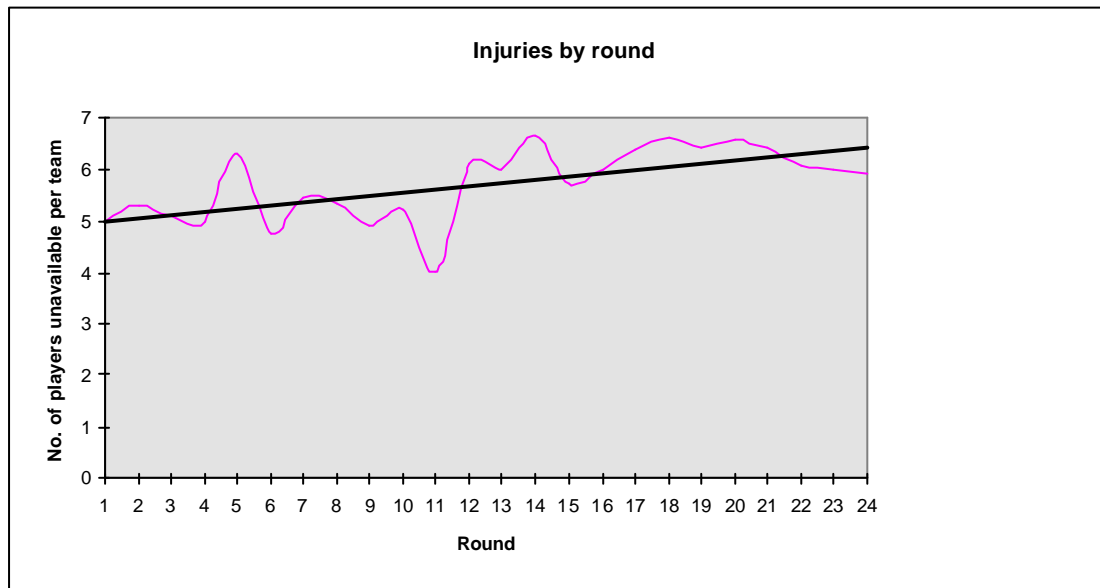
All AFL teams have recorded the number of senior players out injured (and given match payments) since 1988 to comply with salary cap regulations. In most circumstances, only players injured during senior grade matches (or subsequent training sessions) are given senior match payments when injured. This data is presented in Table 6 and shows that the injury prevalence has been gradually falling since 1988. The year with the lowest senior injury prevalence was 1993, even when figures are adjusted taking into account the two fewer rounds that year. This is consistent with the reported data from the injury survey.

Table 7. Total injury prevalence of Melbourne-based teams by round in 1994

Round	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Average	5.0	5.3	5.1	5.0	6.3	4.8	5.5	5.4	4.9	5.2	4.0	6.1	6.0	6.7	5.7	6.0	6.4	6.6	6.4	6.6	6.4	6.1	6.0	5.9
Maximum	10.0	10.0	9.0	8.0	11.0	8.0	8.0	8.0	9.0	9.0	7.0	9.0	11.0	12.0	10.0	12.0	9.0	11.0	9.0	10.0	9.0	14.0	12.0	12.0
Minimum	2.0	1.0	3.0	2.0	1.0	1.0	2.0	1.0	1.0	1.0	0.0	3.0	2.0	2.0	3.0	2.0	4.0	3.0	4.0	4.0	2.0	3.0	3.0	3.0

Players who were not suspended or unavailable for other reasons were presumed injured. During the 1994 season, Melbourne-based teams had an average injury prevalence of five players during the first half of the season and six players during the second half of the season. The numbers from team-to-team and week-to-week varied quite appreciably.

Figure 1. Injuries by round (players missing) for Melbourne teams 1994



Severe injuries

As has been mentioned in previous reports, it is pleasing to note that there have been no injuries with catastrophic outcomes over the survey period. Serious injuries do occur with regularity, sometimes ending a player's season and rarely his football career.

Table 8. Matches missed for the severe injuries 1992-94 (all competitions)

Injury description	Average	Maximum
Anterior cruciate ligament strain/tear/rupture	12.4	22
Dislocated shoulder	7.1	22
Stress fracture metatarsal	6.9	22
Fractured clavicle	6.7	12
Stress fracture midtarsal bone	5.6	12
Posterior cruciate ligament strain/tear/rupture	5.4	16
Stress fracture tibia	5.2	11
Fractured mandible	4.6	11
Medial meniscus tear	4.4	10
Hernia/inguinal canal/ conjoint tendon tear	4.1	14
Shoulder subluxation/ chronic instability	3.9	20
Fractured radius +/- ulna	3.8	8
Knee articular cartilage damage	3.5	10
Fractured facial bone(s)	3.1	6
Knee medial collateral lig str/tear/rupture	3.0	16
Osteitis pubis	3.0	16
Disc prolapse/disruption	2.8	13
Fractured metacarpal	2.7	7
Lateral meniscus tear	2.4	7
Quadriceps strain/tear	2.2	9
Hamstring strain/tear	2.2	10
Knee arcuate lig/posterolateral complex str/tear	1.9	4
Fractured phalanx	1.8	6
Knee lateral collateral ligament str/tear/rupture	1.7	8
Calf muscle strain	1.5	9
Ruptured finger tendon (including mallet finger)	1.5	8
Fractured rib(s)	1.5	5

The most severe injury seen regularly is the anterior cruciate tear, which generally requires a reconstruction that causes the player to miss the remainder of the season. The figure of an average of 12.4 matches missed for ACL tears reflects that on average 12 matches are missed (because some occur near the end of the season) rather than the injury taking 12 weeks to recover.

Table 9. Injuries most commonly requiring operations (92-94, all competitions)

Injury	Operation	% surgery
Anterior cruciate tear	Knee reconstruction	96
Hernia/inguinal canal tear	Hernia repair	76
Medial meniscus tear	Knee arthroscope	79
Knee articular cartilage	Knee arthroscope	70
Fractured facial bone	Internal fixation	74
Dislocated patella	Patellar reconstruction/knee 'scope	63
Lateral meniscus tear	Knee arthroscope	55
Dislocated shoulder	Shoulder reconstruction/arthroscope	52
Fractured mandible	Internal fixation	54
Fractured phalanx	Internal fixation	34

Injury types

Table 10. Injury prevalence by type (1992-94)

Injury type	AFL	U18	% AFL	% U18
Muscle/tendon overuse injuries	1752	189	38.5	20.3
Joint/ligament sprains	1249	266	27.4	28.5
Fracture	643	209	14.1	22.4
Chronic joint injuries	455	68	10.0	7.3
Stress fracture	265	129	5.8	13.8
Haematomas/lacerations	187	72	4.1	7.7
Other acute injuries/illnesses	283	128	6.2	13.7
TOTAL	4551	933	100.0	100.0

Table 11. Injury prevalence by body area (1992-94)

Body area	AFL	U18	% AFL	% U18
Groin & thigh	1589	192	32.9	18.1
Lower leg & foot	1048	308	21.7	29.0
Knee	965	201	20.0	18.9
Upper limb	669	188	13.8	17.7
Trunk	284	76	5.9	7.2
Head & neck	217	91	4.5	8.6
General	62	5	1.3	0.5
TOTAL	4834	1061	100.0	100.0

Injury types and body areas are summarised in Tables 10 & 11. The predominance of hamstring strains in the AFL reflects in these figures, with ‘muscle/tendon overuse injuries’ being the most prevalent type of injury in the AFL and ‘groin & thigh’ the most prevalent area.

Recurrence of injuries was recorded, with lower limb muscle strains, low back injuries, inguinal canal tears (hernias) and dislocated shoulders the most likely injuries to be recurrent.

Stress fractures

Table 12. Stress fractures in AFL & VSFL 1992-94

Bone	No. reported	Max. matches missed
Tibia	16	10
Navicular	10	20
Third metatarsal	8	8
Second metatarsal	6	22
Pars interarticularis (L5/L4/L3)	6	12
Fibula	5	11
Fifth metatarsal	4	12
Fourth metatarsal	4	7
Calcaneus	1	8
First metatarsal	1	3
Ischial tuberosity	1	6

Stress fractures are more commonly diagnosed in elite footballers than in the past because of improved technology and awareness and possibly increased training loads, particularly in younger players. Stress fractures most commonly affect the bones of the leg and foot. The most common types are reported in Table 12.

Timing of injuries

Table 13. Injury occurrence by quarter of match

Injury type	1	2	3	4
Chronic joint injuries	6	9	7	10
Contact & traumatic injuries*	60	183	144	92
Muscle/tendon injuries (new)*	15	35	37	53
Muscle/tendon injuries (recurrent)*	3	8	4	4
Other injuries	11	27	28	21
Total	95	262	220	180

* Muscle haematomas were counted as contact injuries rather than muscle injuries

Table 13 summarizes the breakdown by quarters for injuries occurring in matches, where the quarter was recorded. The differences between quarters were significant for contact & traumatic injuries and all injuries ($p < .001$) with the first quarter having the lowest rate and the second quarter the highest. There were significantly more new muscle/tendon injuries occurring in the second half than the first half ($p < .001$).

Date of injury was entered into the database in 1994 and 1992 only. The month with the highest rate of injury was April, whereas May and June had the lowest rates. Tests for statistical significance were not performed because the total exposure (number of matches and training sessions each month) were not available at the time of analysis.

Discussion

The total injury incidence and prevalence has risen in 1994 in both the AFL and VSFL U/18 competitions, compared to the previous two years, with the rise in the U/18 prevalence being statistically significant ($p < .001$). Some of the apparent rise appears to be due to increased reporting of injuries by some doctors, although the data obtained from salary cap injury payment figures, where doctor compliance is eliminated, also suggests a higher injury prevalence in 1994 than 1993. A possible contributing factor is the reduced number of games in the season in 1993, where only 20 home & away rounds were played. However, a concurrent change that was made in 1994 to slightly reduce the length of games has not had a positive effect on the injury rate. There may be other factors which affect yearly injury rates that are poorly understood at present (e.g. weather, ground conditions, evenness of competition, prevailing coaching and fitness philosophy) and random variation is of course to be expected.

The pattern of injuries is fairly consistent over the last three years, with no major impact made in decreasing specific injuries. The injury prevalence of Melbourne-based clubs in 1994 shows the gradual increase in player unavailability over the season which is presumably due to the accumulation of more serious and long-term injuries as the season progresses. Surgery is required for many injuries, but the full extent of this is not known due to limitations of our recording methods.

Timing of acute injuries by quarter shows a consistent pattern of contact and traumatic injuries peaking in the second and third quarters, which was first revealed in the 1983-85 injury survey (12). A new feature highlighted in this report is a different pattern for new overuse injuries which steadily rise through the game, suggesting that fatigue plays a major role. The explanation for the peak of contact injuries in the second quarter is less clear, perhaps reflecting the average peak in intensity of the game.

The VSFL U/18 competition reveals some distinctive differences from the AFL injury profile. Overall there is a higher reported injury incidence, but lower prevalence, indicating the injuries are generally less severe in the junior competition. There is a significantly higher incidence and prevalence of stress fractures, ankle sprains and concussion, but fewer muscle strains (particularly hamstrings). The high stress fracture incidence is probably somewhat due to the relative immaturity of the bones in adolescent age athletes and their inability to withstand the unaccustomed training load. Training errors may also be a cause and this should be investigated further, with attention given by VSFL U/18 coaches to the training and competition demands on their players of both their VSFL U/18 team and also those other teams and competitions they may be involved in (e.g. school sport).

The higher rates of concussion in the U/18 competition has been noted previously and may be partially due to more conservative medical practices at the junior level. The incidence of concussion may have been lowered in the AFL by stricter umpiring, tribunal penalties and trial-by-video. The higher rates of ankle sprains in the U/18 competition should be investigated, particularly with respect to ankle strapping procedures at junior level.

The AFL & VSFL injury survey has provided the leagues, clubs and doctors with a wealth of useful data over the last three years, as summarised in this report. There are however many limitations to the amount of information that can be gathered from the survey in its current format.

The major limitation of the current method of data collection is that it is injury-orientated rather than player-orientated. That is, we have good information about most of the injuries that occur, but because the compliance is inconsistent, we cannot accurately follow the medical injuries of players over time. The most obvious example of this limitation is in the reporting of pre-season injuries - if a player suffers a serious injury in the pre-season, such as an anterior cruciate ligament tear, this will affect much of the regular season. In all years of the survey so far, doctors have not been asked to record pre-season injuries (although *some* doctors *did* include some pre-season injuries for the 1994 season, which were not included in the analyses).

The solution to this problem would seem to be to ask doctors to record injuries for the entire year, but this is not as easy as it seems. Despite the best of intentions, most of the club doctors leave the task of

writing up injuries for the survey until the end of the season. This is understandable, as the regular season is usually an outrageously busy period for all football club officials. This would mean that pre-season injuries, if they were recorded in the usual manner, would be in the distant past when they were written up for submission to the survey. Pre-season training is also usually conducted at smaller training grounds with inferior medical facilities, so the quality of medical records may be poor in some cases. Nevertheless, it is important that significant pre-season injuries and operations be recorded and included in the injury survey in the future.

With the year-round monitoring of injuries and continued compliance amongst clubs a better profile of a player's injuries in career in football can be developed. For example, a newspaper survey last year found that 174 players on the current AFL lists had had knee surgery, including 44 reconstructions (4). This is important data which should be made available through the AFL injury survey.

The injury survey can also provide an important starting point for further more detailed investigation into particular injuries. Because of the multiple numbers of data recorders in the survey, there will always be limitations in compliance and in determining more detailed information about possible injury cause. Various doctors and physiotherapists in the league are researching into specific areas (e.g. Hugh Seward on ACL tears, Paul McCrory and Garth Dicker on concussion, John Orchard on muscle strains, Olympic Park Sports Medicine Centre on hamstring strains).

Another area that particularly needs further study is the long term effects of Australian football injuries. It is possible that such research will have similar findings to that performed in other sports, which has shown for example that ex-sportsmen in Sweden have a higher than expected rate of osteoarthritis of the hip (13). Given the rates of groin, thigh and knee injuries in the AFL it may be expected that ex-players have increased rates of hip and knee joint degeneration. However, not all such follow up should focus on the negatives, as there also may be significant social and health benefits from an AFL career. It has been shown that world class male athletes have an increased life expectancy (10) although the reasons for this are not certain.

In the medium term, the injury survey should be expanded to include a register of players whose career is significantly cut short by injury. In the NFL competition in the USA, a recent survey reported that over 40% of past players felt their retirement was primarily caused by injuries (9). It would be a surprise if the figure was as high for past AFL players, but a recent survey has shown that 70.5% of AFL players believe that the season runs too long (2). The high injury rate and obvious player and media concern makes research into the effects of injuries after football a high priority.

There is little doubt that the injury survey in its current form is valuable in providing information about injuries and should eventually lead to better preventative measures. Whether future improved management actually reduces the injury rates is problematic, as the competitive nature of the sport may mean that coaches take the opportunity to train their players harder, with the game moving faster as players are fitter. Competition amongst teams will also ensure advances in injury management. However, it is heartening to see the cooperation evident amongst the medical officers of the leagues which allows the injury survey to occur.

Conclusions & recommendations

1. Lower limb muscle strain injuries (particularly hamstrings) are very common and prevalent in the AFL competition and are potentially preventable, therefore they are the injuries which should be given most attention in club preventative programs and most urgently require further study into risk factors, outcomes and prevention.
2. Concussion in the VSFL U/18 competition requires further investigation to determine whether the higher incidence and prevalence reflect an actual increase in occurrence or merely reflect more conservative medical practice in junior football. Particularly if the former is the case, then umpiring and tribunal procedures and the role of protective helmets in the U/18 competition should be investigated further.
3. Coaches in the VSFL U/18 competition should be specifically informed about the high rate of stress fractures in their junior elite footballers and review the overall training programs of their players in light of this. Particular care must be taken where a player is training with both a VSFL U/18 team and another team in a different competition.
4. Ankle strapping practice should be reviewed in the VSFL U/18 competition given the higher prevalence of ankle sprains.
5. The development of computer software for keeping player medical records, which can be run on both IBM and Macintosh notebook systems, should be a priority for the AFL, VSFL and all clubs. It would be advantageous for all clubs to be using a similar format.
6. The AFLMOA and injury survey should assist with the development of record keeping and injury surveillance systems for football at the amateur level, liaising with the Monash University Accident Research Centre.
7. In future years of the survey, records of significant pre- and off-season injuries and particularly operations should be kept for all players. Recent media records suggest a very high rate of off-season operations (5).
8. The long-term effects of football injuries should be studied in further detail, including the occurrence of players having their football career cut short by injury.
9. The injury rates in 1993 (per week), when there were only 20 home and away rounds, were lower than in 1992 and 1994 by all methods of measurement. It is uncertain if this was due to chance or the shortened season, but the AFL may consider a lower injury rate to be a potential benefit of a shorter season.

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Appendices

Appendix A - Orchard Sports Injury Classification System (OSICS) Version 3.0 (February 1995)

Explanation of codes:	-Q-	Old fracture mal- or non- union	-N-	Neural condition/nerve damage
FIRST CHARACTER (Body area)	-D-	JOINT Dislocation	-V-	Vascular condition
	-U-	Recurrent instability/ subluxation	-X-	Systemic disease process
HEAD & NECK	-C-	Articular/chondral damage	-Z-	Undiagnosed
H-- Head			THIRD CHARACTER	
N-- Neck	-J-	Minor joint trauma +/- synovitis	--1 to --7	
UPPER LIMB	-P-	Atraumatic arthritis/effusion/ joint pain/ chronic synovitis/ gout/other rheumatologic condition		Co mmon diagnoses (see attached list)
S-- Shoulder			--8	Character to be used when making a diagnosis not included in common diagnosis list
U-- Upper arm	-A-	Chronic degenerative arthritis (including avascular necrosis)	--9	Character to be used when specific diagnosis is not known or supplied
E-- Elbow	-L-	Ligament tear or sprain	--A to -Z	
R-- Forearm		SOFT TISSUE		Spe cial diagnoses used for individual centre research or expansion
W-- Wrist	-M-	Muscle tear or strain		
P-- Hand	-Y-	Muscle spasm/cramps/ soreness/trigger points/ myalgia/overuse		
TRUNK	-T-	Tendinitis/bursitis/ enthesopathy/ apophysitis/ periostitis		
C-- Chest			Abbreviations used in the listing of codes	
O-- Abdomen	-R-	Complete rupture of tendon	#	fracture
D-- Thoracic back	-H-	Haematoma/bruising/ cork	jt	joint
L-- Lumbar back	-K-	Laceration/skin condition	disl	dislocation
LOWER LIMB		OTHER	lig	ligament
B-- Buttock	-B-	Developmental anomaly	spr	sprain
G-- Groin/Hip	-I-	Infection	str	strain
T-- Thigh	-E-	Tumours	pts	points (as in trigger points)
K-- Knee	-O-	Visceral damage/trauma/surgery	inc	including
Q-- Lower leg				
A-- Ankle/heel				
F-- Foot				
GENERAL				
X-- Multiple areas				
M-- Medical problem				
Z-- Area not specified				
SECOND CHARACTER (Type of pathology)				
BONE				
-F-		Fracture (not stress or avulsion)		
-G-		Avulsion or chip fracture		
-S-		Stress fracture		

About OSICS (Orchard Sports Injury Classification System)

The Orchard Sports Injury Classification System has been developed for the coding injuries in football injury surveys. The range of diagnoses is broad enough for use in most other sports, as long as coding is made by practitioners who are familiar with sporting injuries. Contained within the OSICS code of three alphanumeric characters are the relevant body area (first character) and type of pathology (second character). Please note that OSICS is only a list of common diagnoses and must be used in conjunction with a larger database structure for a complete injury survey.

Currently, this system is being used by the Australian Institute of Sport, the major football competitions in Australia and some sports medicine centres. Copyright is owned by Dr. John Orchard, but use of the system for research is free and encouraged by the author. Potential

uses include to compile an injury database and statistics, archiving of files and comparison of injury profiles between groups.

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HEAD

HF1 # nose
HF2 # skull
HF3 # mandible
HF4 # facial bone(s)
HG1 Avulsed/# tooth
HD1 Disl temporomandibular jt
HJ1 Spr temporomandibular jt
HY1 Facial muscle trigger pts
HH1 Head/facial haematoma
HK1 Scalp laceration
HK2 Facial laceration
HI1 Otitis externa
H2 Cellulitis/skin infection, face
HO1 Eye injury/trauma
HO2 Perforated eardrum
HN1 Concussion
HN2 Intracranial bleed
HN3 Chronic brain injury
HV1 Epistaxis
HZ1 Headache/pain undiagnosed

NECK

NF1 Stable cervical #
NF2 Unstable cervical #
NG1 Avulsion # cervical spine (e.g. spinous process)
NC1 Cervical disc prolapse
NC2 Cervical disc degeneration
NJ1 Whiplash/neck sprain
NP1 Cervical facet joint pain
NA1 Cervical facet jt degenerative arthritis
NM1 Neck muscle strain
NY1 Neck muscle trigger pts/spasm/torticollis
NH1 Neck haematoma
NK1 Neck laceration
NB1 Cervical developmental anomaly
NO1 Laryngeal trauma
NN1 Cervical nerve root compression/stretch
NN2 Neck spinal injury
NN3 Cervical spinal canal stenosis
NZ1 Neck pain undiagnosed

SHOULDER

SF1 # clavicle
SF2 # scapula
SF3 # neck of humerus
SG1 Avulsion # shoulder
SS1 Stress # coracoid process
SD1 Dislocated shoulder
SD2 Acromioclavicular jt disl (Grade 3)
SU1 Shoulder subluxation/chronic instability
SJ1 Shoulder jt sprain
SJ2 Acromioclavicular jt sprain
SP1 Adhesive capsulitis or frozen or stiff shoulder
SA1 Shoulder jt degenerative arthritis

SA2 Acromioclavicular arthritis/distal clavicle osteolysis
SM1 Muscle strain, shoulder region
SY1 Shoulder trigger pts/posterior muscle soreness
ST1 Rotator cuff tendinitis/subacromial bursitis
ST2 Biceps tendinitis
SR1 Rotator cuff tendon rupture/large tear
SR2 Rupture of long head of biceps tendon
SH1 Shoulder haematoma
SK1 Shoulder laceration
SB1 Cervical rib
SE1 Tumour, shoulder region
SN1 Brachial plexus traction injury/burner/stinger
SN2 Axillary nerve palsy
SN3 Nontraumatic brachial plexus lesion (incl thoracic outlet)
SV1 Axillary vessel thrombosis/insufficiency
SN4 Suprascapular nerve entrapment or palsy
SZ1 Shoulder pain undiagnosed

UPPER ARM

UF1 # shaft of humerus
UM1 Upper arm muscle strain
UY1 Upper arm muscle soreness/ trigger pts
UR1 Pectoralis major tendon rupture
UH1 Upper arm haematoma
UK1 Upper arm laceration

ELBOW

EF1 Supracondylar # humerus
EF2 # humerus condyle(s)
EF3 # head of radius or olecranon
EG1 Elbow avulsion #
ED1 Dislocated elbow
ED2 Disl head of radius (including pulled elbow)
EU1 Elbow valgus instability
EC1 Osteochondritis elbow (+/- loose bodies)
EJ1 Sprained/jarred elbow
EP1 Elbow atraumatic synovitis
EA1 Elbow jt degenerative arthritis
EL1 Elbow medial collateral ligament strain or tear
ET1 Tennis elbow (lateral epicondylitis)
ET2 Golfer's elbow (medial epicondylitis)
ET3 Olecranon bursitis/apophysitis/triceps tendinitis
EH1 Elbow haematoma

EK1 Elbow laceration
E1 Elbow infection
EN1 Ulnar neuropathy, elbow
EN2 Posterior interosseus nerve entrapment
EZ1 Elbow pain undiagnosed

FOREARM

RF1 # radius +/- # ulna
RS1 Stress # radius or ulna
RM1 Forearm muscles strain
RY1 Forearm muscle trigger pts
RY2 Forearm compartment syndrome
RT1 Extensor tenosynovitis/intersection syndrome
RH1 Forearm haematoma
RK1 Lacerated forearm
RK2 Forearm skin lesion

WRIST

WF1 # scaphoid
WF2 # other carpal bone
WF3 Intraarticular # radius
WS1 Radial epiphysis lesion or carpal stress fracture
WQ1 Non-union # scaphoid
WD1 Dislocated carpus
WU1 Carpal instability
WU2 Distal radioulnar joint instability
WC1 Wrist fibrocartilage tear
WJ1 Sprained/jarred wrist jt
WP1 Wrist jt synovitis (including impingement syndrome)
WA1 Wrist osteoarthritis (including avascular necrosis)
WL1 Carpal ligament tear
WT1 Extensor tenosynovitis/de Quervain's disease
WT2 Wrist ganglion
WT3 Flexor tenosynovitis
WH1 Wrist haematoma
WK1 Wrist laceration
WN1 Wrist nerve compression (incl. carpal tunnel syndrome)
WV1 Aneurysm of vessel near wrist
WZ1 Wrist pain undiagnosed

HAND

PF1 Bennett's #/disl
PF2 # Metacarpal
PF3 # Phalanx
PG1 Avulsion # phalanx
PQ1 Malunion finger #
PD1 Disl metacarpophalangeal or interphalangeal jt
PU1 Chronic jt instability of finger or thumb
PJ1 Spr metacarpophalangeal or interphalangeal jt
PP1 Finger joint chronic synovitis

PP2 Hand Reflex Sympathetic Dystrophy
 PA1 Finger degenerative arthritis
 PL1 Spr ulnar collateral ligament (Skier's) thumb
 PL2 Other hand or finger ligament tear
 PT1 Trigger finger
 PT2 Hand tendinitis
 PR1 Ruptured finger tendon (including mallet finger)
 PH1 Hand haematoma
 PH2 Subungual haematoma/fingernail problem
 PK1 Hand/finger laceration
 PK2 Hand/finger blisters/contact dermatitis/callus
 PK3 Hand wart or other skin lesion
 P1 Hand/finger infection

CHEST

CF1 # rib(s)
 CF2 # sternum
 CS1 Stress # rib(s)
 CC1 Costal cartilage/costochondral jt injury
 CJ1 Sternoclavicular jt injury
 CM1 Chest muscle strain
 CY1 Chest muscle trigger pts
 CH1 Bruised ribs/chest wall (excluding sternum)
 CH2 Bruised sternum
 CO1 Pneumo-/ haemo- thorax
 CZ1 Chest pain undiagnosed

ABDOMEN

OM1 Abdominal muscle str
 OY1 Abdominal muscle trigger pts or spasm or winding
 OT1 Rectus abdominus tendinitis
 OH1 Abdominal haematoma
 OO1 Abdominal trauma to internal organs
 OZ1 Abdominal pain undiagnosed

THORACIC BACK

DF1 # thoracic vertebrae
 DG1 # thoracic transverse or spinous process
 DC1 Thoracic disc prolapse
 DJ1 Thoracic facet jt sprain
 DP1 Chronic thoracic facet jt pain/stiffness
 DA1 Thoracic facet jt degenerative arthritis
 DM1 Thoracic extensor muscle str
 DY1 Thoracic back trigger pts
 DT1 Scheuermann's disease
 DH1 Thoracic back haematoma
 DK2 Upper back skin lesion
 DB1 Thoracic scoliosis
 DE1 Tumour, thoracic spine
 DZ1 Thoracic pain undiagnosed

LUMBAR BACK

LF1 # lumbar vertebrae
 LG1 # lumbar transverse or spinous process
 LS1 Stress # pars interarticularis
 LQ1 Nonunion lumbar fracture
 LC1 Disc prolapse/disruption
 LC2 Disc degeneration
 LJ1 Lumbar facet jt strain/jar
 LP1 Chronic lumbar facet joint pain (including referred)
 LA1 Lumbar facet jt degenerative arthritis
 LL1 Lumbar region ligament sprain
 LM1 Lumbar muscle str
 LY1 Lumbar trigger pts or muscle spasm
 LH1 Lumbar haematoma
 LK1 Lumbar laceration
 LB1 Spondylolisthesis/lysis
 LB2 Lumbar scoliosis
 LB3 Other lumbar anomaly (e.g. spina bifida occulta)
 LE1 Tumour, lumbar spine
 LN1 Lumbar spinal injury
 LN2 Lumbosacral nerve root impingement
 LN3 Lumbar spinal canal stenosis
 LN4 Lumbosacral nerve stretch/traction injury
 LZ1 Lumbar pain undiagnosed

BUTTOCK

BF1 Fractured sacrum/coccyx
 BG1 Avulsion # ischial tuberosity
 BP1 Sacroiliac joint pain (including spondyloarthropathies)
 BP2 Sacrococcygeal jt pain
 BM1 Gluteal muscle str/tear
 BY1 Gluteal muscle or piriformis trigger pts
 BT1 Ischial bursitis
 BT2 Gluteal tendinitis/enthesopathy
 BH1 Buttock haematoma
 BK1 Buttock laceration
 BI1 Ischial abscess
 BN1 Piriformis syndrome (with sciatic nerve impingement)
 BZ1 Buttock pain undiagnosed

HIP & GROIN

GF1 # neck of femur
 GF2 # pelvic ring
 GF3 # ilium
 GG1 Pelvic avulsion # (iliac spines and pubic rami)
 GS1 Osteitis pubis
 GS2 Stress # neck of femur
 GS3 Pelvic bone stress #

GD1 Dislocated hip jt
 GC1 Hip chondral lesion
 GJ1 Hip joint sprain/jar
 GP1 Hip joint synovitis
 GA1 Hip jt osteoarthritis/ avascular necrosis
 GA2 Slipped capital femoral epiphysis
 GA3 Perthes' syndrome
 GM1 Hip flexor (including psoas) muscle str/tear
 GM8 Groin muscle str (unspecified)
 GY1 Groin soreness or trigger points
 GT1 Adductor tendinitis/tear
 GT2 Hernia/inguinal canal/conjoint tendon tear
 GT3 Iliopsoas tendinitis/bursitis
 GT4 Trochanteric bursitis
 GH1 Haematoma, hip region
 GH2 Testicular haematoma
 GK1 Groin laceration or abrasion
 GB1 Congenital dislocation hip
 GI1 Groin rash/fungal infection
 GI2 Hip joint infection
 GO1 Damage to pelvic organ
 GN1 Nerve entrapment, groin region
 GZ1 Groin pain undiagnosed

THIGH

TF1 # shaft of femur
 TS1 Stress # shaft of femur
 TM1 Hamstring strain/tear
 TM2 Quadriceps strain/tear
 TM3 Adductor muscle str/tear (incl. sartorius)
 TY1 Hamstring spasm/cramps/trigger pts
 TY2 Quadriceps spasm/cramps/trigger pts/wasting
 TY3 Posterior thigh compartment syndrome
 TH1 Haematoma of thigh/hamstrings +/- myositis
 TK1 Thigh laceration
 TE1 Tumour, thigh region
 TZ1 Thigh pain undiagnosed

KNEE

KF1 # patella
 KF2 Knee # intraarticular
 KS1 Stress # patella
 KD1 Dislocated patella
 KD2 Dislocated knee
 KU1 Knee jt chronic instability
 KU2 Patella instability
 KC1 Knee articular cartilage damage
 KC2 Medial meniscus tear
 KC3 Lateral meniscus tear
 KC4 Knee osteochondritis (+/- loose bodies)
 KC8 Knee joint cartilage injury (unspecified)

KJ1	Knee jt sprain/jar	QH1	Bruised shin	AZ1	Ankle pain undiagnosed
KP1	Patellofemoral jt pain	QH2	Calf haematoma		
KP2	Knee jt rheumatological condition/atraumatic effusion	QK1	Lacerated shin	FOOT	
KP3	Knee synovial plica	QK2	Lacerated calf	FF1	# tarsal bone (other than talus or calcaneus)
KA1	Knee jt degenerative arthritis	QI1	Lower leg soft tissue infection	FF2	# metatarsal(s)
KL1	Anterior cruciate ligament strain/tear/rupture	QE1	Tumour, lower leg	FF3	# phalanx (foot)
KL2	Posterior cruciate ligament strain/tear/rupture	QN1	Common peroneal nerve palsy (foot drop)	FG1	Foot avulsion #
KL3	Knee medial collateral lig str/tear/rupture (+/- Pell/Steid)	QV1	Deep venous thrombosis	FS1	Stress # midtarsal bone (navicular, cunieforms, cuboid)
KL4	Knee lateral collateral ligament str/tear/rupture	QV2	Calf/ankle oedema	FS2	Stress # metatarsal
KL5	Knee arcuate lig/posterolateral complex str/tear	QV3	Varicose veins	FQ1	Non- or mal-union foot fracture
KT1	Iliotibial band syndrome	QV4	Popliteal artery entrapment or arterial insufficiency	FD1	Dislocated toe
KT2	Patellar tendinitis +/- bursitis incl SLJ syndrome	QZ1	Lower leg pain undiagnosed	FD2	Dislocated joint(s) of foot (incl. Lisfranc injury)
KT3	Hamstring tendinitis/ bursitis			FC1	Foot osteochondrosis (including Kohler's and Frieberg's)
KT4	Osgood-Schlatter syndrome/tibial tuberosity pathology	ANKLE & HEEL		FJ1	Sprain foot joint
KT5	Popliteal tendinitis/strain	AF1	Pott's #	FJ2	Sprained toe/'turf toe'
KT6	Prepatellar bursitis	AG1	Chip/avulsion # ankle	FP1	Sesamoiditis/1st metatarsophalangeal jt pain
KT7	Quadriceps tendinitis or suprapatellar bursitis	AS1	Stress # Calcaneus or Talus	FP2	Tarsal joint pain/synovitis
KR1	Ruptured patellar tendon	AD1	Dislocated ankle	FP3	Metatarsalgia
KH1	Knee haematoma (extraarticular)	AU1	Ankle instability	FP4	Gout (foot)
KH2	Infrapatella fat pad haematoma +/- bursitis	AC1	Ankle osteochondral lesion (incl. talar dome) +/- loose body	FP5	Foot Reflex Sympathetic Dystrophy
KK1	Lacerated knee	AJ1	Ankle jarring or joint capsule sprain	FA1	1st Metatarsophalangeal jt degenerative arthritis
KB1	Bipartite patella	AJ2	Inferior tibiofibular syndesmosis sprain	FA2	Other foot jt degenerative arthritis
KB2	Discoid meniscus	AP1	Ankle jt synovitis (including meniscoid lesion)	FL1	Foot ligament sprain (including 'spring' ligament)
KI1	Infected knee jt	AP2	Ankle Reflex Sympathetic Dystrophy	FM1	Foot muscle strain
KE1	Tumour, knee region	AP3	Sinus tarsi syndrome (subtalar jt synovitis)	FY1	Foot muscle spasm/cramps/ trigger pts
KO1	Complication of knee jt surgery	AA1	Ankle jt degenerative arthritis	FT1	Plantar fasciitis/strain/calcaneal spur
KZ1	Knee pain undiagnosed	AF2	# talus or # calcaneus	FT2	Foot extensor tendinitis
KZ2	Knee jt haemarthrosis caused by internal derangement	AL1	Sprain lateral collateral ligament ankle	FT6	Cuboid syndrome or foot peroneal tendinitis
		AL2	Sprain medial collateral (deltoid) ligament ankle	FT7	Tibialis posterior insertion tendinitis
LOWER LEG		AT1	Achilles tendinitis/ retrocalcaneal bursitis	FR1	Ruptured tibialis posterior tendon
QF1	# tibia +/- fibula	AT2	Sever's disease	FH1	Foot haematoma
QF2	# fibula	AT3	Ankle posterior impingement (including Os Trigonum)	FH2	Toenail problem/haematoma
QS1	Stress # tibia	AT4	Ankle anterior impingement +/- osteophytes	FH3	Heel fat pad bruise
QS2	Stress # fibula	AT5	Ankle extensor tendinitis (incl. Tibialis Anterior)	FK1	Foot laceration
QD1	Dislocated superior tibiofibular jt	AT6	Peroneal tendinitis or subluxation or dislocation	FK2	Foot blistering/callus/ulcer
QJ1	Sprained superior tibiofibular jt	AT7	Tibialis posterior or flexor hallucis tendinitis (ankle)	FK3	Plantar wart
QP1	Baker's cyst (+/- rupture)	AR1	Achilles tendon rupture	FB1	Tarsal coalition
QM1	Calf muscle strain	AH1	Ankle haematoma	FB2	Symptomatic accessory bone of foot
QY1	Calf muscle cramps/ spasm/trigger pts	AK1	Ankle laceration	FB3	Foot deformity (including claw, hammer toes, bunions)
QY2	Compartment syndrome	AI1	Ankle infection	F11	Athlete's foot/tinea
QY3	Lower leg delayed onset muscle soreness	AE1	Osteoid osteoma (ankle)	F12	Foot cellulitis/infected ulcer
QT1	Medial Tibial Stress Syndrome ('shin splints')	AN1	Tarsal tunnel syndrome	FE1	Osteoid osteoma (foot)
		AN2	Medial calcaneal nerve entrapment		

FN1 Morton's neuroma or
Joplin's neuritis
FZ1 Foot pain undiagnosed

MULTIPLE AREAS

XU1 Generalised joint
hypermobility
XP1 Widespread
rheumatological joint
condition
XY1 Fibromyalgia/multiple trigger
points
XY2 Generalised muscle
spasticity/joint
hypomobility
XK1 Rash or other
dermatological condition
XB1 Congenital disease
affecting
musculoskeletal system

MEDICAL

M1 Otorespiratory infection
(incl. tonsillitis, otitis
media)

M2 Gastrointestinal infection
(including food
poisoning)
M4 Systemic non-specific virus
M5 Virus proven by serology
(e.g. Epstein-Barr,
Hepatitis B)
M6 Genitourinary infection
M8 Infection, other
ME1 Non-musculoskeletal tumour
(e.g. lymphoma)
MO1 Appendicitis
MO2 Urological including
haematuria, varicocele
MO3 Dental, eye, ear, nose or
throat disease
MO8 Other surgical diagnosis
MN1 Neurological including
epilepsy, migraine, coma
MV1 Cardiovascular
MX1 Environmental (incl. hyper-
/hypo-thermia,
barotrauma)
MX2 Condition due to drug use,
overdose, poisoning

MX3 Asthma/allergy/hay
fever/respiratory
MX5 Gynaecological
MX6 Psychological/psychiatric
MX7 Nutritional or haematological
or enterological or
endocrine
MX8 Other medical diagnosis
MZ1 Tired athlete undiagnosed
MZ2 Other medical symptoms or
signs, non-specific

AREA NOT SPECIFIED

ZZ1 Paperwork (certificate,
referral, prescription etc
ZZ2 Preparticipation screening
or precompetition or
insurance
ZZ3 Immunisations or
preparation for overseas
travel
ZZ4 Advice regarding equipment
(e.g. suitable footwear)

Appendix B - Summary data for reported injury incidence

Table B.1. Reported incidence of injuries (occurrences)

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	987	734	1310	3031	213	321	500	1034
Hamstring strain injuries	133	110	155	398	7	18	35	60
Thigh haematomas	56	36	85	177	11	22	35	68
Ankle sprains	58	45	77	180	16	19	28	63
Groin strains (muscular and unspecified)	32	37	80	149	9	13	31	53
Head/facial lacerations	62	38	68	168	14	18	12	44
Concussion	36	29	50	115	14	32	21	67
Quadriceps strain injuries	34	29	48	111	3	9	10	22
Lumbar non-disc soft tissue injuries	27	21	52	100	5	17	17	39
Calf muscle strain injuries	26	34	27	87		3	24	27
Calf and shin haematomas	27	14	41	82	4	5	14	23
Acromioclavicular joint injuries	22	19	31	72	2	6	10	18
Knee cartilage injuries	26	17	34	77	3	4	5	12
Knee medial ligament injuries	22	30	25	77	4	2	4	10
Hip and groin haematomas	31	9	20	60	6	9	19	34
Wrist and hand fractures	21	15	28	64		8	8	16
Patellar injuries (including tendon)	17	18	21	56	2	5	12	19
Other knee ligament (PCL, LCL, PLC) injuries	12	18	22	52		7	7	14
Bruised ribs and costochondral injuries	21	7	20	48	6	5	5	16
Achilles tendon injuries	13	9	21	43	2	3	9	14
Wrist and finger dislocations	14	6	28	48	5	9	3	17
Dislocated/subluxed shoulders	18	8	13	39	2	2	5	9
Fractured facial bones (other than noses)	14	10	12	36	1	2	4	7
Ribs, trunk and spine fractures	11	15	12	38	2		1	3
Internal infections and viruses	8	5	17	30	2		2	4
Broken noses	5	6	14	25	4	3	6	13
Chronic ankle injuries	8	10	10	28		1	2	3
Inguinal hernias	9	7	12	28		1		1
Foot stress fractures	4	5	12	21	8	4	5	17
Foot bone fractures	12	5	4	21		1	1	2
Rotator cuff injuries	7	1	12	20	2	2	2	6
Fractured long bone, leg and ankle	8	4	6	18	2		3	5
Anterior cruciate ligament injuries	9	4	6	19	1	1		2
Arm haematomas, lacerations, abrasions	8	2	5	15	2	5	4	11
Shoulder and clavicle fractures	5	4	7	16	1	1	2	4
Lumbar disc prolapses/injuries	4	5	6	15			2	2
Stress fractures tibia/fibula	4	6	4	14		6	2	8
Eye injuries	6	2	4	12	3	1	3	7
Osteitis pubis/groin stress fractures	4	1	9	14	2			2
Pneumothorax or abdominal organ damage	10	1	3	14		3		3
Arm fractures	4	4	3	11		3	2	5
Elbow joint injuries	1	5	5	11		3	2	5
Shin splints/compartment syndrome	1	2	7	10	4	2	3	9
Hip joint injuries	1	5	2	8		2		2
Lumbar stress fractures	2	1	1	4			1	1
Cervical fractures, disc and canal injuries		1	1	2				0
Other injuries	134	74	190	398	64	64	139	267

Table B.2. Injury incidence (injuries per 10,000 player hours)

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	650.2	509.7	793.9	657.8	788.9	594.4	1028.8	797.8
Hamstring strain injuries	87.6	76.4	93.9	86.4	25.9	33.3	72.0	46.3
Thigh haematomas	36.9	25.0	51.5	38.4	40.7	40.7	72.0	52.5
Ankle sprains	38.2	31.3	46.7	39.1	59.3	35.2	57.6	48.6
Groin strains (muscular and unspecified)	21.1	25.7	48.5	32.3	33.3	24.1	63.8	40.9
Head/facial lacerations	40.8	26.4	41.2	36.5	51.9	33.3	24.7	34.0
Concussion	23.7	20.1	30.3	25.0	51.9	59.3	43.2	51.7
Quadriceps strain injuries	22.4	20.1	29.1	24.1	11.1	16.7	20.6	17.0
Lumbar non-disc soft tissue injuries	17.8	14.6	31.5	21.7	18.5	31.5	35.0	30.1
Calf muscle strain injuries	17.1	23.6	16.4	18.9	0.0	5.6	49.4	20.8
Calf and shin haematomas	17.8	9.7	24.8	17.8	14.8	9.3	28.8	17.7
Acromioclavicular joint injuries	14.5	13.2	18.8	15.6	7.4	11.1	20.6	13.9
Knee cartilage injuries	17.1	11.8	20.6	16.7	11.1	7.4	10.3	9.3
Knee medial ligament injuries	14.5	20.8	15.2	16.7	14.8	3.7	8.2	7.7
Hip and groin haematomas	20.4	6.3	12.1	13.0	22.2	16.7	39.1	26.2
Wrist and hand fractures	13.8	10.4	17.0	13.9	0.0	14.8	16.5	12.3
Patellar injuries (including tendon)	11.2	12.5	12.7	12.2	7.4	9.3	24.7	14.7
Other knee ligament (PCL, LCL, PLC) injuries	7.9	12.5	13.3	11.3	0.0	13.0	14.4	10.8
Bruised ribs and costochondral injuries	13.8	4.9	12.1	10.4	22.2	9.3	10.3	12.3
Achilles tendon injuries	8.6	6.3	12.7	9.3	7.4	5.6	18.5	10.8
Wrist and finger dislocations	9.2	4.2	17.0	10.4	18.5	16.7	6.2	13.1
Dislocated/subluxed shoulders	11.9	5.6	7.9	8.5	7.4	3.7	10.3	6.9
Fractured facial bones (other than noses)	9.2	6.9	7.3	7.8	3.7	3.7	8.2	5.4
Ribs, trunk and spine fractures	7.2	10.4	7.3	8.2	7.4	0.0	2.1	2.3
Internal infections and viruses	5.3	3.5	10.3	6.5	7.4	0.0	4.1	3.1
Broken noses	3.3	4.2	8.5	5.4	14.8	5.6	12.3	10.0
Chronic ankle injuries	5.3	6.9	6.1	6.1	0.0	1.9	4.1	2.3
Inguinal hernias	5.9	4.9	7.3	6.1	0.0	1.9	0.0	0.8
Foot stress fractures	2.6	3.5	7.3	4.6	29.6	7.4	10.3	13.1
Foot bone fractures	7.9	3.5	2.4	4.6	0.0	1.9	2.1	1.5
Rotator cuff injuries	4.6	0.7	7.3	4.3	7.4	3.7	4.1	4.6
Fractured long bone, leg and ankle	5.3	2.8	3.6	3.9	7.4	0.0	6.2	3.9
Anterior cruciate ligament injuries	5.9	2.8	3.6	4.1	3.7	1.9	0.0	1.5
Arm haematomas, lacerations, abrasions	5.3	1.4	3.0	3.3	7.4	9.3	8.2	8.5
Shoulder and clavicle fractures	3.3	2.8	4.2	3.5	3.7	1.9	4.1	3.1
Lumbar disc prolapses/injuries	2.6	3.5	3.6	3.3	0.0	0.0	4.1	1.5
Stress fractures tibia/fibula	2.6	4.2	2.4	3.0	0.0	11.1	4.1	6.2
Eye injuries	4.0	1.4	2.4	2.6	11.1	1.9	6.2	5.4
Osteitis pubis/groin stress fractures	2.6	0.7	5.5	3.0	7.4	0.0	0.0	1.5
Pneumothorax or abdominal organ damage	6.6	0.7	1.8	3.0	0.0	5.6	0.0	2.3
Arm fractures	2.6	2.8	1.8	2.4	0.0	5.6	4.1	3.9
Elbow joint injuries	0.7	3.5	3.0	2.4	0.0	5.6	4.1	3.9
Shin splints/compartment syndrome	0.7	1.4	4.2	2.2	14.8	3.7	6.2	6.9
Hip joint injuries	0.7	3.5	1.2	1.7	0.0	3.7	0.0	1.5
Lumbar stress fractures	1.3	0.7	0.6	0.9	0.0	0.0	2.1	0.8
Cervical fractures, disc and canal injuries	0.0	0.7	0.6	0.4	0.0	0.0	0.0	0.0
Other injuries	88.3	51.4	115.2	86.4	237.0	118.5	286.0	206.0

Table B.3. Percentage frequencies of injuries

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hamstring strain injuries	13.5	15.0	11.8	13.1	3.3	5.6	7.0	5.8
Thigh haematomas	5.7	4.9	6.5	5.8	5.2	6.9	7.0	6.6
Ankle sprains	5.9	6.1	5.9	5.9	7.5	5.9	5.6	6.1
Groin strains (muscular and unspecified)	3.2	5.0	6.1	4.9	4.2	4.0	6.2	5.1
Head/facial lacerations	6.3	5.2	5.2	5.5	6.6	5.6	2.4	4.3
Concussion	3.6	4.0	3.8	3.8	6.6	10.0	4.2	6.5
Quadriceps strain injuries	3.4	4.0	3.7	3.7	1.4	2.8	2.0	2.1
Lumbar non-disc soft tissue injuries	2.7	2.9	4.0	3.3	2.3	5.3	3.4	3.8
Calf muscle strain injuries	2.6	4.6	2.1	2.9	0.0	0.9	4.8	2.6
Calf and shin haematomas	2.7	1.9	3.1	2.7	1.9	1.6	2.8	2.2
Acromioclavicular joint injuries	2.2	2.6	2.4	2.4	0.9	1.9	2.0	1.7
Knee cartilage injuries	2.6	2.3	2.6	2.5	1.4	1.2	1.0	1.2
Knee medial ligament injuries	2.2	4.1	1.9	2.5	1.9	0.6	0.8	1.0
Hip and groin haematomas	3.1	1.2	1.5	2.0	2.8	2.8	3.8	3.3
Wrist and hand fractures	2.1	2.0	2.1	2.1	0.0	2.5	1.6	1.5
Patellar injuries (including tendon)	1.7	2.5	1.6	1.8	0.9	1.6	2.4	1.8
Other knee ligament (PCL, LCL, PLC) injuries	1.2	2.5	1.7	1.7	0.0	2.2	1.4	1.4
Bruised ribs and costochondral injuries	2.1	1.0	1.5	1.6	2.8	1.6	1.0	1.5
Achilles tendon injuries	1.3	1.2	1.6	1.4	0.9	0.9	1.8	1.4
Wrist and finger dislocations	1.4	0.8	2.1	1.6	2.3	2.8	0.6	1.6
Dislocated/subluxed shoulders	1.8	1.1	1.0	1.3	0.9	0.6	1.0	0.9
Fractured facial bones (other than noses)	1.4	1.4	0.9	1.2	0.5	0.6	0.8	0.7
Ribs, trunk and spine fractures	1.1	2.0	0.9	1.3	0.9	0.0	0.2	0.3
Internal infections and viruses	0.8	0.7	1.3	1.0	0.9	0.0	0.4	0.4
Broken noses	0.5	0.8	1.1	0.8	1.9	0.9	1.2	1.3
Chronic ankle injuries	0.8	1.4	0.8	0.9	0.0	0.3	0.4	0.3
Inguinal hernias	0.9	1.0	0.9	0.9	0.0	0.3	0.0	0.1
Foot stress fractures	0.4	0.7	0.9	0.7	3.8	1.2	1.0	1.6
Foot bone fractures	1.2	0.7	0.3	0.7	0.0	0.3	0.2	0.2
Rotator cuff injuries	0.7	0.1	0.9	0.7	0.9	0.6	0.4	0.6
Fractured long bone, leg and ankle	0.8	0.5	0.5	0.6	0.9	0.0	0.6	0.5
Anterior cruciate ligament injuries	0.9	0.5	0.5	0.6	0.5	0.3	0.0	0.2
Arm haematomas, lacerations, abrasions	0.8	0.3	0.4	0.5	0.9	1.6	0.8	1.1
Shoulder and clavicle fractures	0.5	0.5	0.5	0.5	0.5	0.3	0.4	0.4
Lumbar disc prolapses/injuries	0.4	0.7	0.5	0.5	0.0	0.0	0.4	0.2
Stress fractures tibia/fibula	0.4	0.8	0.3	0.5	0.0	1.9	0.4	0.8
Eye injuries	0.6	0.3	0.3	0.4	1.4	0.3	0.6	0.7
Osteitis pubis/groin stress fractures	0.4	0.1	0.7	0.5	0.9	0.0	0.0	0.2
Pneumothorax or abdominal organ damage	1.0	0.1	0.2	0.5	0.0	0.9	0.0	0.3
Arm fractures	0.4	0.5	0.2	0.4	0.0	0.9	0.4	0.5
Elbow joint injuries	0.1	0.7	0.4	0.4	0.0	0.9	0.4	0.5
Shin splints/compartment syndrome	0.1	0.3	0.5	0.3	1.9	0.6	0.6	0.9
Hip joint injuries	0.1	0.7	0.2	0.3	0.0	0.6	0.0	0.2
Lumbar stress fractures	0.2	0.1	0.1	0.1	0.0	0.0	0.2	0.1
Cervical fractures, disc and canal injuries	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Other injuries	13.6	10.1	14.5	13.1	30.0	19.9	27.8	25.8

Appendix C - Summary data for reported injury prevalence

Table C.1. Reported injury prevalence (weeks missed)

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	1614	1406	1814	4834	188	376	497	1061
Hamstring strain injuries	254	277	304	835	6	30	36	72
Ankle sprains	67	73	76	216	14	25	43	82
Quadriceps strain injuries	91	65	106	262	1	8	12	21
Knee cartilage injuries	80	42	98	220	20	14	20	54
Anterior cruciate ligament injuries	102	26	91	219	5	24		29
Dislocated/subluxed shoulders	86	40	88	214	1	12	20	33
Groin strains (muscular and unspecified)	45	44	109	198	9	11	21	41
Knee medial ligament injuries	59	84	79	222	1	3	10	14
Foot stress fractures	19	58	58	135	46	20	21	87
Wrist and hand fractures	56	38	40	134		17	34	51
Other knee ligament (PCL, LCL, PLC) injuries	33	50	65	148		23	9	32
Fractured long bone, leg and ankle	48	25	59	132	16		18	34
Calf muscle strain injuries	46	55	39	140		1	13	14
Fractured facial bones (other than noses)	57	19	42	118	0	10	13	23
Stress fractures tibia/fibula	23	35	18	76		34	8	42
Inguinal hernias	48	28	39	115		2		2
Acromioclavicular joint injuries	29	26	39	94	0	6	12	18
Shoulder and clavicle fractures	19	15	47	81	4	10	13	27
Concussion	25	20	19	64	6	20	17	43
Foot bone fractures	52	21	15	88			8	8
Lumbar non-disc soft tissue injuries	21	26	24	71	2	5	13	20
Achilles tendon injuries	10	35	37	82	0	1	7	8
Patellar injuries (including tendon)	16	34	18	68	3	7	5	15
Thigh haematomas	20	17	16	53	2	4	22	28
Ribs, trunk and spine fractures	13	28	13	54	0		3	3
Arm fractures	8	17	9	34		18	4	22
Lumbar disc prolapses/injuries	22	20	14	56			0	0
Internal infections and viruses	18	11	21	50	3		0	3
Osteitis pubis/pelvic fractures	18	2	13	33	12			12
Wrist and finger dislocations	18	1	9	28	1	10	2	13
Calf and shin haematomas	5	22	3	30	0	1	3	4
Pneumothorax or abdominal organ damage	13		5	18		16		16
Hip and groin haematomas	11	5	4	20	2	5	6	13
Broken noses	0	3	7	10	5	4	8	17
Chronic ankle injuries	14	9	2	25			0	0
Elbow joint injuries	1	3	15	19		4	2	6
Lumbar stress fractures	13	8	0	21			0	0
Shin splints/compartment syndrome	1	10	1	12	1	0	8	9
Bruised ribs and costochondral injuries	6	3	5	14	2	2	2	6
Rotator cuff injuries	2	0	9	11	0	0	2	2
Eye injuries	2	2	6	10	2	0	0	2
Hip joint injuries	1	4	2	7		2		2
Arm haematomas, lacerations, abrasions	1	0	0	1	0	0	4	4
Cervical fractures, disc and canal injuries		5	0	5				0
Head/facial lacerations	0	0	1	1	1	0	0	1
Other injuries	141	100	149	390	23	27	78	128

Table C.2. Injury prevalence (hours missed per 1000)

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	177.2	162.7	183.2	174.8	116.0	116.0	170.4	136.4
Hamstring strain injuries	27.9	32.1	30.7	30.2	3.7	9.3	12.3	9.3
Ankle sprains	7.4	8.4	7.7	7.8	8.6	7.7	14.7	10.5
Quadriceps strain injuries	10.0	7.5	10.7	9.5	0.6	2.5	4.1	2.7
Knee cartilage injuries	8.8	4.9	9.9	8.0	12.3	4.3	6.9	6.9
Anterior cruciate ligament injuries	11.2	3.0	9.2	7.9	3.1	7.4	0.0	3.7
Dislocated/subluxed shoulders	9.4	4.6	8.9	7.7	0.6	3.7	6.9	4.2
Groin strains (muscular and unspecified)	4.9	5.1	11.0	7.2	5.6	3.4	7.2	5.3
Knee medial ligament injuries	6.5	9.7	8.0	8.0	0.6	0.9	3.4	1.8
Foot stress fractures	2.1	6.7	5.9	4.9	28.4	6.2	7.2	11.2
Wrist and hand fractures	6.1	4.4	4.0	4.8	0.0	5.2	11.7	6.6
Other knee ligament (PCL, LCL, PLC) injuries	3.6	5.8	6.6	5.4	0.0	7.1	3.1	4.1
Fractured long bone, leg and ankle	5.3	2.9	6.0	4.8	9.9	0.0	6.2	4.4
Calf muscle strain injuries	5.1	6.4	3.9	5.1	0.0	0.3	4.5	1.8
Fractured facial bones (other than noses)	6.3	2.2	4.2	4.3	0.0	3.1	4.5	3.0
Stress fractures tibia/fibula	2.5	4.1	1.8	2.7	0.0	10.5	2.7	5.4
Inguinal hernias	5.3	3.2	3.9	4.2	0.0	0.6	0.0	0.3
Acromioclavicular joint injuries	3.2	3.0	3.9	3.4	0.0	1.9	4.1	2.3
Shoulder and clavicle fractures	2.1	1.7	4.7	2.9	2.5	3.1	4.5	3.5
Concussion	2.7	2.3	1.9	2.3	3.7	6.2	5.8	5.5
Foot bone fractures	5.7	2.4	1.5	3.2	0.0	0.0	2.7	1.0
Lumbar non-disc soft tissue injuries	2.3	3.0	2.4	2.6	1.2	1.5	4.5	2.6
Achilles tendon injuries	1.1	4.1	3.7	3.0	0.0	0.3	2.4	1.0
Patellar injuries (including tendon)	1.8	3.9	1.8	2.5	1.9	2.2	1.7	1.9
Thigh haematomas	2.2	2.0	1.6	1.9	1.2	1.2	7.5	3.6
Ribs, trunk and spine fractures	1.4	3.2	1.3	2.0	0.0	0.0	1.0	0.4
Arm fractures	0.9	2.0	0.9	1.2	0.0	5.6	1.4	2.8
Lumbar disc prolapses/injuries	2.4	2.3	1.4	2.0	0.0	0.0	0.0	0.0
Internal infections and viruses	2.0	1.3	2.1	1.8	1.9	0.0	0.0	0.4
Osteitis pubis/pelvic fractures	2.0	0.2	1.3	1.2	7.4	0.0	0.0	1.5
Wrist and finger dislocations	2.0	0.1	0.9	1.0	0.6	3.1	0.7	1.7
Calf and shin haematomas	0.5	2.5	0.3	1.1	0.0	0.3	1.0	0.5
Pneumothorax or abdominal organ damage	1.4	0.0	0.5	0.7	0.0	4.9	0.0	2.1
Hip and groin haematomas	1.2	0.6	0.4	0.7	1.2	1.5	2.1	1.7
Broken noses	0.0	0.3	0.7	0.4	3.1	1.2	2.7	2.2
Chronic ankle injuries	1.5	1.0	0.2	0.9	0.0	0.0	0.0	0.0
Elbow joint injuries	0.1	0.3	1.5	0.7	0.0	1.2	0.7	0.8
Lumbar stress fractures	1.4	0.9	0.0	0.8	0.0	0.0	0.0	0.0
Shin splints/compartment syndrome	0.1	1.2	0.1	0.4	0.6	0.0	2.7	1.2
Bruised ribs and costochondral injuries	0.7	0.3	0.5	0.5	1.2	0.6	0.7	0.8
Rotator cuff injuries	0.2	0.0	0.9	0.4	0.0	0.0	0.7	0.3
Eye injuries	0.2	0.2	0.6	0.4	1.2	0.0	0.0	0.3
Hip joint injuries	0.1	0.5	0.2	0.3	0.0	0.6	0.0	0.3
Arm haematomas, lacerations, abrasions	0.1	0.0	0.0	0.0	0.0	0.0	1.4	0.5
Cervical fractures, disc and canal injuries	0.0	0.6	0.0	0.2	0.0	0.0	0.0	0.0
Head/facial lacerations	0.0	0.0	0.1	0.0	0.6	0.0	0.0	0.1
Other injuries	15.5	11.6	15.1	14.1	14.2	8.3	26.7	16.5

Table C.3. Prevalence as a percentage of all time missed

Competition Year	AFL				U/18			
	1992	1993	1994	92-94	1992	1993	1994	92-94
ALL INJURIES	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hamstring strain injuries	15.7	19.7	16.8	17.3	3.2	8.0	7.2	6.8
Ankle sprains	4.2	5.2	4.2	4.5	7.4	6.6	8.7	7.7
Quadriceps strain injuries	5.6	4.6	5.8	5.4	0.5	2.1	2.4	2.0
Knee cartilage injuries	5.0	3.0	5.4	4.6	10.6	3.7	4.0	5.1
Anterior cruciate ligament injuries	6.3	1.8	5.0	4.5	2.7	6.4	0.0	2.7
Dislocated/subluxed shoulders	5.3	2.8	4.9	4.4	0.5	3.2	4.0	3.1
Groin strains (muscular and unspecified)	2.8	3.1	6.0	4.1	4.8	2.9	4.2	3.9
Knee medial ligament injuries	3.7	6.0	4.4	4.6	0.5	0.8	2.0	1.3
Foot stress fractures	1.2	4.1	3.2	2.8	24.5	5.3	4.2	8.2
Wrist and hand fractures	3.5	2.7	2.2	2.8	0.0	4.5	6.8	4.8
Other knee ligament (PCL, LCL, PLC) injuries	2.0	3.6	3.6	3.1	0.0	6.1	1.8	3.0
Fractured long bone, leg and ankle	3.0	1.8	3.3	2.7	8.5	0.0	3.6	3.2
Calf muscle strain injuries	2.9	3.9	2.1	2.9	0.0	0.3	2.6	1.3
Fractured facial bones (other than noses)	3.5	1.4	2.3	2.4	0.0	2.7	2.6	2.2
Stress fractures tibia/fibula	1.4	2.5	1.0	1.6	0.0	9.0	1.6	4.0
Inguinal hernias	3.0	2.0	2.1	2.4	0.0	0.5	0.0	0.2
Acromioclavicular joint injuries	1.8	1.8	2.1	1.9	0.0	1.6	2.4	1.7
Shoulder and clavicle fractures	1.2	1.1	2.6	1.7	2.1	2.7	2.6	2.5
Concussion	1.5	1.4	1.0	1.3	3.2	5.3	3.4	4.1
Foot bone fractures	3.2	1.5	0.8	1.8	0.0	0.0	1.6	0.8
Lumbar non-disc soft tissue injuries	1.3	1.8	1.3	1.5	1.1	1.3	2.6	1.9
Achilles tendon injuries	0.6	2.5	2.0	1.7	0.0	0.3	1.4	0.8
Patellar injuries (including tendon)	1.0	2.4	1.0	1.4	1.6	1.9	1.0	1.4
Thigh haematomas	1.2	1.2	0.9	1.1	1.1	1.1	4.4	2.6
Ribs, trunk and spine fractures	0.8	2.0	0.7	1.1	0.0	0.0	0.6	0.3
Arm fractures	0.5	1.2	0.5	0.7	0.0	4.8	0.8	2.1
Lumbar disc prolapses/injuries	1.4	1.4	0.8	1.2	0.0	0.0	0.0	0.0
Internal infections and viruses	1.1	0.8	1.2	1.0	1.6	0.0	0.0	0.3
Osteitis pubis/pelvic fractures	1.1	0.1	0.7	0.7	6.4	0.0	0.0	1.1
Wrist and finger dislocations	1.1	0.1	0.5	0.6	0.5	2.7	0.4	1.2
Calf and shin haematomas	0.3	1.6	0.2	0.6	0.0	0.3	0.6	0.4
Pneumothorax or abdominal organ damage	0.8	0.0	0.3	0.4	0.0	4.3	0.0	1.5
Hip and groin haematomas	0.7	0.4	0.2	0.4	1.1	1.3	1.2	1.2
Broken noses	0.0	0.2	0.4	0.2	2.7	1.1	1.6	1.6
Chronic ankle injuries	0.9	0.6	0.1	0.5	0.0	0.0	0.0	0.0
Elbow joint injuries	0.1	0.2	0.8	0.4	0.0	1.1	0.4	0.6
Lumbar stress fractures	0.8	0.6	0.0	0.4	0.0	0.0	0.0	0.0
Shin splints/compartment syndrome	0.1	0.7	0.1	0.2	0.5	0.0	1.6	0.8
Bruised ribs and costochondral injuries	0.4	0.2	0.3	0.3	1.1	0.5	0.4	0.6
Rotator cuff injuries	0.1	0.0	0.5	0.2	0.0	0.0	0.4	0.2
Eye injuries	0.1	0.1	0.3	0.2	1.1	0.0	0.0	0.2
Hip joint injuries	0.1	0.3	0.1	0.1	0.0	0.5	0.0	0.2
Arm haematomas, lacerations, abrasions	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.4
Cervical fractures, disc and canal injuries	0.0	0.4	0.0	0.1	0.0	0.0	0.0	0.0
Head/facial lacerations	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.1
Other injuries	8.7	7.1	8.2	8.1	12.2	7.2	15.7	12.1
