

Do hard playing fields increase the risk of injury in community level Australian football?



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Existing Evidence

Increase in game injuries but not training in rugby league
(Gabbett et al., 2006)

Non significant association in elite level rugby union players
(Takemura et al, 2007)

Increase in clavicular fractures in rugby union
(Davidson, 1987)

Hard Ground & Injury Link

Increase in acromioclavicular sprains in AFL players
(AFL Injury report, 2002)

Increase in fractures in junior Australian football
(McMahon et al., 1993)

Aim

To investigate the link between hard grounds and injury risk in community level Australian football using objective ground measurements



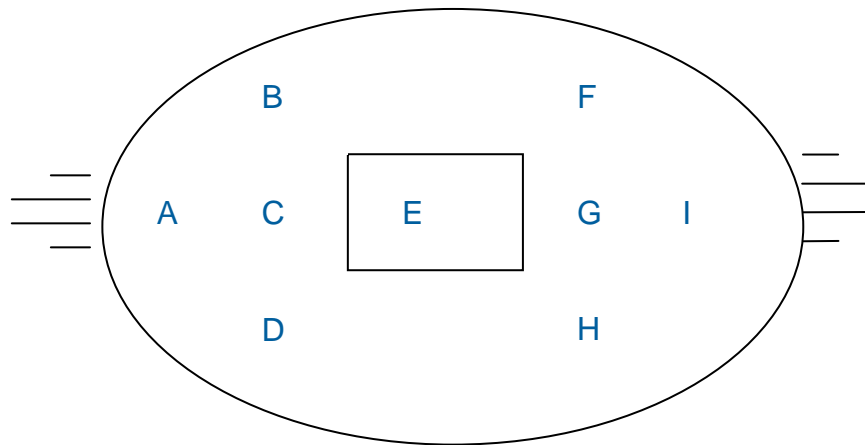
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Measurement Protocol

- Hardness measures were recorded on eight community level fields in Western Victoria during the 2007 football season
- Measures were undertaken at each of the nine positions below (A-I)



- Four repetitions of each measure at each test site within a 1m² area

Equipment

Clegg Hammer

-measures deceleration on impact



2.25kg hammer
dropped from 45cm



Display unit
with digital output

Linked to PAFIX Project

- Preventing Australian Football Injuries through Exercise (PAFIX)
- National Health & Medical Research Council funded project (\$1.06m)
- Examining the effectiveness of special training programs on reducing lower limb injuries in community level football players



Variety of Conditions



Injuries Sustained

- Total of 41 grounds tested, 7 of the 41 (17%) had no injuries recorded
- **130 injuries** were recorded at the grounds tested
- Likely relationship to ground conditions was ranked by three independent assessors
 - **12** 'likely' to be related
 - 29 'possibly' related
 - 75 'unlikely' to be related
 - 14 unknown (due to incomplete details)



Hardness Measures

- Clegg hammer measured deceleration on impact in Gravities(G)
- The following classification has been previously recommended (Chivers & Aldous 2004)

Grading	Unacceptably Low	Low/Normal	Preferred Range	Normal/High	Unacceptably High
Clegg Hammer(G)	≤ 30	31 – 69	70 – 89	90 – 119	≥ 120

- The Clegg hammer readings recorded in this study
42 – 165(G) at all 369 sites (41 fields x 9 test sites)
67 – 165(G) at 130 injury sites

Nature v's Hardness

Grading	Low/Normal	Preferred Range	Normal/High	Unacceptably High	Total
Clegg Reading (G)	31- 69	70 – 89	90 – 119	>120	
Abrasion/grazing	0	1	0	0	1
Cartilage injury	0	1	0	0	1
Cork/bruise	1	11	8	6	26
Cut/laceration	0	3	0	1	4
Concussion	0	6	2	1	9
Dislocation	0	2	2	1	5
Fracture	0	3	4	0	7
Strain	1	11	11	7	30
Sprain	0	13	17	5	35
Unsure	0	0	2	0	2
Other	0	7	3	0	10
Total	2	58	49	21	130

No. of readings

49

145

122

53

Relative to
ground results

4%

44%

43%

43%

Injury v's Hardness

Grading	Low/Normal	Preferred Range	Normal/High	Unacceptably High	Total
Clegg Reading (G)	31- 69	70 – 89	90 – 119	>120	
Likely to be related	0	4	6	2	12
Unlikely to be related	1	36	28	10	75
Possible related	1	9	12	7	29
Unknown	0	9	3	2	14
Total	2	58	49	21	130



Relationship between injury profiles and hardness

No apparent association between any specific body region, nature or mechanism of the injury and ground hardness.



Main Conclusions

- Majority of injuries occurred within acceptable hardness ranges
- Likelihood of being injured on hard ground was similar to grounds in the normal and preferred categories
- Only 9% of injuries could be confidently related to the ground
- No link between specific injury profiles and ground hardness measure



Future Implications

- Provide solid evidence on the link between ground conditions and increased injury risk for the first time at community level football in Australia
- When published and distributed to governing bodies and local councils it may help inform decisions on ground closure
- The need to continue building the evidence base in this area
- Need to look at measurement protocols - if based on first drop of the Clegg Hammer only, hard ground are less of a risk



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