

1 **Supplemental Table 1.** Complete-case analyses comparing the incidence rate and odds of concussion and the incidence rate of acute
 2 non-concussion injury between mouthguard use, mouthguard types, and helmet ages.
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Variables	Concussion Outcome				Acute Musculoskeletal Injury Outcome		
	^a Prospective Cohort, IRR (95% CI)	p-value	^b Nested Case-Control, OR (95% CI)	p-value	^c Crude IR/1000 hours, (95% CI)	^d Complete-Case, IRR (95% CI)	p-value
Mouthguard Use							
No	1 (reference)		1 (reference)		1.62 (1.21-2.04)	1 (reference)	
Yes	*0.65 (0.49-0.85)	0.002	*0.44 (0.26-0.74)	0.002	1.33 (1.07-1.59)	0.95 (0.70-1.29)	0.731
Off-the-Shelf	*0.60 (0.45-0.81)	0.001	0.61 (0.35-1.06)	0.080	1.26 (0.98-1.54)	0.97 (0.69-1.35)	0.844
Dentist-Fitted	*0.70 (0.51-0.95)	0.023	*0.38 (0.19-0.73)	0.004	1.43 (1.03-1.83)	0.92 (0.64-1.31)	0.632
Helmet Age							
< 2 years old	1 (reference)		1 (reference)		1.56 (1.26-1.85)	1 (reference)	
≥ 2 years old	1.00 (0.79-1.25)	0.980	1.24 (0.79-1.94)	0.351	1.18 (0.92-1.43)	0.83 (0.65-1.07)	0.151
Weight (kg)	1.00 (0.99-1.01)	0.440	0.99 (0.97-1.01)	0.423	NA	1.00 (0.99-1.01)	0.860
Level of Play							
Under-13	1 (reference)		1 (reference)		0.55 (0.36-0.74)	1 (reference)	
Under-15	1.33 (0.88-2.02)	0.180	0.84 (0.33-2.13)	0.717	1.41 (1.06-1.76)	1.08 (0.62-1.89)	0.788
Under-18	1.38 (0.83-2.31)	0.220	0.72 (0.24-2.17)	0.565	2.40 (1.83-2.96)	1.67 (0.88-3.16)	0.120

Policy Permitting Body Checking						
No	1 (reference)		1 (reference)		0.61 (0.45-0.77)	1 (reference)
Yes	*1.47 (1.05-2.05)	0.026	0.58 (0.27-1.22)	0.148	2.20 (1.80-2.59)	*2.73 (1.74-4.26) <0.001
Previous Concussion						
No	1 (reference)		1 (reference)		1.13 (0.89-1.38)	1 (reference)
Yes	*1.82 (1.45-2.28)	<0.001	1.58 (1.00-2.49)	0.052	1.84 (1.47-2.20)	*1.37 (1.07-1.74) 0.012
Position						
Forward	1 (reference)		1 (reference)		1.55 (1.24-1.85)	1 (reference)
Defense	1.08 (0.86-1.38)	0.501	1.11 (0.69-1.78)	0.669	1.27 (0.98-1.57)	0.86 (0.66-1.12) 0.254
Goalie	*0.56 (0.35-0.90)	0.016	1.02 (0.39-2.72)	0.961	0.89 (0.48-1.31)	*0.58 (0.35-0.97) 0.039

5 **Notes.** *Statistically significant finding, IR (incidence rate), IRR (incidence rate ratio), OR (odds ratio), CI (confidence interval), NA (not applicable). Acute non-
6 concussion musculoskeletal injury included injury locations between the shoulder and foot. Level of play included under-13 (formerly Pee Wee, ages 11-12),
7 under-15 (formerly Bantam, ages 13-14), and under-18 (formerly Midget, ages 15-17).
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9 ^a Complete-case mixed effects multivariable negative binomial regression model for concussion included 3,953 player-seasons (360 concussions suffered by 307
10 players over the study period in 331 player-seasons) with 1,157 team clusters (random effect) and 240,008.9 player-hours.
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12 ^b Complete-case mixed effects multivariable logistic regression model included 219 concussions (cases) suffered by 203 players over the study period in 211
13 player-seasons and 168 acute musculoskeletal injuries (controls) suffered by 119 players over the study period in 133 player-seasons with 205 team clusters
14 (random effect).
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16 ^c Crude incidence rates for acute musculoskeletal injury included 3,953 player-seasons (318 acute musculoskeletal injuries suffered by 269 players over the study
17 period in 289 player-seasons) with 1,157 team clusters (random effect) and 240,008.9 player-hours.
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19 ^d Complete-case mixed effects multivariable negative binomial regression model for acute musculoskeletal injury included 3,953 player-seasons (318 acute
20 musculoskeletal injuries suffered by 269 players over the study period in 289 player-seasons) with 1,157 team clusters (random effect) and 240,008.9 player-
21 hours.