



## Grant Information Summary:

# Incidence and Player Risk Factors for Injury in Youth Football

### Practical Significance:

**Injuries occurred twice as often in games as in practices, and case rates increased from 4th-6th to 7th-8th grades. Body size, estimated biological maturity status and perception of risk of injury were not significant risk factors for factors for injury in youth football.**

#### Background

Relatively little is known of the incidence of injuries at the youth sport level. Available data from accident reports, clinical records and retrospective questionnaires suggest lower rates than for high school football. Exposure statistics are not available and variable definitions of injury are used. Player-related risk factors are not systematically considered. One study suggests greater risk of injury among heavier players, while others suggest slightly greater risk among heavier linemen and less mature players. A factor of potential interest is the perception of risk of injury by youth participants.

#### Objective

The purposes of this study of youth football were threefold: (1) to estimate the incidence of injuries over two seasons, (2) to assess the perception of the risk of injury, and (3) to assess the relationship between player-related risk factors and injury.

#### Subjects

Subjects were 678 boys, 9-14 years of age, who were members of 34 youth football teams in two central Michigan communities in the 2000 and 2001 seasons. Each community had combined 4th-5th and 6th-7th grade teams. One community had 8th grade teams.

## Method

Height and weight were measured. The body mass index was calculated. Age, height and weight of the player and midparent height were used to predict adult height. The player's current height was then expressed as a percentage of his predicted adult height to provide an estimate of biological maturity status. A Risk of Injury in Sport Scale (RISSc) was completed. Three graduate assistants, who were certified athletic trainers (ATCs), measured the players and administered the RISSc. The ATCs were on site to record the number of participants at all practices and games, i.e., opportunities for injury (exposures), and injuries as they occurred. A reportable injury was defined after Powell and Barber-Foss (1999). Case rates were calculated for practices and games, and overall by grade. Logistic regression was used to evaluate the relationship between player-related risk factors (body size, biological maturity status, perception of risk of injury) and the risk of injury.

## Results

The overall injury rate was 10.4/1000 AE, but the rate was twice as high in games (18.6/1000AE) as in practices (8.7/1000 AE). Case rates during practices increased with grade, but case rates for games were about twice

**Table 1** Estimated exposure case rates per 1000 AE over two seasons in practices and games within grade.

Grade	Practices	Games	Total
4th-5th	5.2	13.3	6.6
6th	9.1	12.9	9.9
7th	10.7	26.1	13.4
8th	13.6	27.4	16.2
Total	8.7	18.6	10.4

as great in the 7th and 8th grades compared to the lower grades (Table 1). About two-thirds of the injuries was classified as minor in severity, so that case rates for injuries of moderate (18%) and major (13%) severity were very low (Table 2).

Youth football players exhibited moderate levels of perceived risk, but risk scores changed with grade suggesting that the perception of risk of injury decreases with age, with one exception. Concern for re-injury increased with age, and perhaps experience in football.

Results of logistic regressions within grade indicated no consistent pattern of associations between age, indicators of body size, maturity status and perception of risk, and risk of injury.

## Conclusions

Injuries occurred twice as often in games as in practices. Case rates for games and practices were lower among 4th-6th grade players than among 7th and 8th grade players.

Body size, estimated biological maturity status and perception of risk were not significant risk factors for injury in youth football.

Percentage of predicted adult height was successful in differentiating boys of contrasting maturity status.

**Table 2** Estimated exposure case rates per 1000 athlete exposures over two seasons by severity within grade.

Grade	Severity		
	Mild	Moderate	Major
4th-5th	4.4	1.4	0.8
6th	7.4	1.6	0.8
7th	9.2	2.2	1.9
8th	10.4	3.2	2.6
Total	7.2	1.9	1.3

## Primary Investigator:



**Robert M. Malina, PhD, FACSM**

Professor of Kinesiology  
Adjunct Professor of Anthropology

Department of Kinesiology  
Michigan State University  
128 IM Sports Circle  
East Lansing, MI 48824-1049  
Phone: 517.355.7620 Fax: 517.353.2944  
rmalina@pilot.msu.edu

## Co-Investigators:

**Mary Barron, ATC**  
**Peter Morano, ATC**  
**Susan Miller, ATC**  
**Sean P. Cumming, PhD**  
**Anthony P. Kontos, PhD**

## Reference

Powell JW, Barber-Foss KD (1999) Injury patterns in selected high school sports: A review of the 1995-1997 seasons. *Journal of Athletic Training* 34:277-284.

## Financial Support By:

NFL Charities

Ellington Printery, Ellington, CT



2952 Stemmons • Dallas, TX 75247  
214-637-6282

**Supporting and advancing the  
Athletic Training profession through  
research and education.**