



There's more to lose than the game.
Use protective eyewear.

Sports-Related Eye Injuries Fact Sheet

Eye Injury and Sports

- Eye injuries are the leading cause of blindness in children in the United States and most of those occurring in school-aged children are sports-related. Ninety percent of these injuries can be avoided with protective eyewear.¹
- Of the 1.6 to 2.4 million Americans who sustain eye injuries each year, an estimated 40,000 will be legally blinded in the injured eye. About one-third of these injuries result from sports.²
- More than 100,000 eye injuries in the United States each year are estimated to be sports-related.³
- Sports-related eye injuries in the United States account for more than 100,000 physician visits yearly at a cost of \$175 million.⁴
- More than 42,000 of these sports-related eye injuries require a visit to an emergency room.⁵
- Every 13 minutes an emergency room in the United States treats a sports-related eye injury.⁶
- An estimated 27 percent of all eye injuries in children aged 11 to 14 are sports-related.⁷
- Children under age 15 account for 43 percent of sports and recreational eye injuries overall.⁸
- The sports responsible for the greatest number of injuries are baseball, ice hockey, and racquet sports.⁹
- In 2002, 15 percent of children and 33 percent of adults reported wearing eye protection always or most of the time when participating in sports, hobbies, or other activities that can cause eye injuries.¹⁰

- Polycarbonate lenses provide the best eye protection for many sports because they are lightweight, scratch resistant, thin, and can be designed to meet most eyewear designs or prescriptions.¹¹
- The following are risk ratings for individual sports:
 - High risk of eye injury: air rifle, BB gun, baseball, basketball, boxing, cricket, fencing, hockey, lacrosse, full-contact martial arts, paintball, racquetball, softball, squash.
 - Moderate risk of eye injury: badminton, fishing, football, golf, soccer, tennis, volleyball.
 - Low risk of eye injury: bicycling, diving, non-contact martial arts, skiing (snow and water), swimming, wrestling.
 - Eye safe: track & field, gymnastics.¹²

Baseball

- Baseball is the leading cause of sports-related eye injury among children aged 14 and under.¹³

Basketball

- Basketball is a leading cause of sports-related eye injury in athletes aged 15 to 24.¹⁴ The odds of an eye injury for basketball players are one in 10.¹⁵
- Of 1,092 injuries sustained by National Basketball Association players during a 17-month period in 1992 and 1993, 5.4 percent involved the eye and adnexa.... Nine players (15.3%) missed subsequent games because of their injury. Fifty-seven players (96.6%) were not wearing protective eyewear at the time of injury.... To prevent these injuries, protective eyewear is recommended.¹⁶

Football and Soccer

- From 1980 to 1997, 29 players in the National Football League suffered fractures to the bones around the eye.¹⁷
- From 1988-1989 to 2003-2004, less than 1 percent of National Collegiate Athletic Association (NCAA) football injuries occurred to the eye.¹⁸
- One in 50 soccer players will suffer an eye injury in an eight-year career.¹⁹
- Soccer ball-related ocular injuries disproportionately affect young players, are more frequent in females than previously reported, and have more severe visual consequences than previously recognized. Injury prevention strategies to minimize contact between the eye and the soccer ball may reduce the incidence and severity of eye injuries.²⁰

Golf

- Golf-related ocular injuries account for 1.5 percent to 5.6 percent of all sports injuries.... The incidence of ocular injuries caused by golf-related trauma is low compared with that for other sports-related injuries.²¹

Ice Hockey and Field Hockey

- As of July 2007, National Collegiate Athletic Association (NCAA) field hockey players are permitted to wear a face mask, soft protective head covering, or eye protection in the form of plastic goggles.²²
- In 1980 dollars, the hockey face protector saves society \$10 million a year by preventing approximately 70,000 eye and face injuries in 1.2 million protected players.²³

Lacrosse (Women's)

- The 2007 NCAA Women's Lacrosse Rules and Interpretations mandates: "All field players must properly wear eye protection." Eye protection must meet the most current American Society for Testing and Materials (ASTM) Specification Standard F803 for women's lacrosse....²⁴
- Eye injuries were a frequent occurrence in women's lacrosse before the rule was added. Before protective eyewear was mandated, eye injuries occurred 15 times more often in women's lacrosse than in men's.²⁵

Paintball

- An estimated 11,998 persons aged seven or older with paintball game-related injuries were treated in emergency departments between 1997 and 2001, with an annual average rate of 4.5 per 10,000 participants. Nearly 60 percent of these patients were treated for paintball pellet wounds of which most were to the eye.²⁶
- The proportion of [paintball] injuries that occurred in the pediatric population may be well over 40 percent. ...[M]any of the patients in these cases sustained permanent visual impairment, with 43 percent having best vision at follow-up of 20/200 or worse.²⁷
- Although eye protective devices designed for paintball are extremely effective in preventing injuries, the failure to properly wear these devices has resulted in an alarming number of severe ocular injuries.²⁸

Racket sports (badminton, table tennis, tennis, racquetball, squash)

- ...[T]ennis, badminton, and squash formed the highest percentage of presentations in a 1995 survey of the presentation of eye injuries to a casualty clinic. In the case of squash and tennis injuries, follow-up treatment and/or admission to hospital was required in 100 percent of cases.²⁹
- Thirty-seven cases of ocular injury incurred while persons were playing racquetball were found in reviewing records of 1,071 emergency room patients in a three-month period. ...[O]cular safety devices are strongly recommended to help prevent racquetball injuries.³⁰
- Tennis is a leading source of eye injury in female adults.³¹

¹ Harrison, A., & Telander, D.G. (2002). Eye Injuries in the youth athlete: a case-based approach. *Sports Medicine*, 31(1), 33-40.

² Feist, R.M., & Farber, M.D. (1989). Ocular trauma epidemiology. *Archives of Ophthalmology*, 107(4), 503-504.

³ Ducharme, J.F., & Tsiaras, W.G. (2000). Sports-related ocular injuries. *Medicine and Health, Rhode Island*, 83(2), 45-51.

⁴ Napier, S.M., Baker, R.S., Sanford, D.G., & Easterbrook, M. (1996). Eye injuries in athletics and recreation. *Survey of Ophthalmology*, 41(3), 229-244.

⁵ U.S. Consumer Product Safety Commission. (2000). *Sports and recreational eye injuries*. Washington, DC: U.S. Consumer Product Safety Commission.

⁶ Ibid.

⁷ Strahlman, E., Elman, M., Daub, E., & Baker, S. (1990). Causes of pediatric eye injuries. A population-based study. *Archives of Ophthalmology*, 108(4), 603-606.

⁸ American Academy of Pediatrics, Committee on Sports Medicine and Fitness, American Academy of Ophthalmology, Eye Health and Public Information Task Force. (2004). Protective eyewear for young athletes. *Ophthalmology*, 111(3), 600-603.

⁹ Napier et al., 1996.

¹⁰ National Center for Health Statistics. (2003). 2002 National Health Interview Survey. Hyattsville, MD: Centers for Disease Control and Prevention.

¹¹ Vinger, P.F., Parver, L., Alfaro, D., III, Woods, T., & Abrams, B.S. (1997). Shatter resistance of spectacle lenses. *The Journal of the American Medical Association*, 277(2), 142-144.

¹² American Academy of Pediatrics and American Academy of Ophthalmology, 2004.

¹³ Prevent Blindness America. (2002). *Sports & Recreational Eye Injuries by Age*. Chart based on statistics provided by the U.S. Consumer Product Safety Commission, National Electronic Injury Surveillance System NEISS product summary report for 2002.

¹⁴ Ibid.

¹⁵ Marton, K., Wilson, D., & McKeag, D. (1987). Ocular trauma in college varsity sports, abstracted. *Medicine and Science in Sports Exercise*, 19(2 suppl), S53.

¹⁶ Zigelbaum, B.M., Starkey, C., Hersh, P.S., Donnenfeld, E.D., Perry, H.D., & Jeffers, J.B. (1995). The National Basketball Association eye injury study. *Archives of Ophthalmology*, 113(6), 749-752.

¹⁷ Williams, R.J., III, Marx, R.G., Barnes, R., O'Brien, S.J., & Warren, R.F. (2001). Fractures about the orbit in professional American football players. *The American Journal of Sports Medicine*, 29(1), 55-57.

¹⁸ Randall, D., Ferrara, M.S., Agel, J., Courson, R., Marshall, S.W., Hanley, M.J., et al. (2007). Descriptive epidemiology of collegiate men's football injuries: National Collegiate Athletic Association Injury Surveillance System, 1988–1989 through 2003–2004. *Journal of Athletic Training*, 42(2), 221-233.

¹⁹ The Mechanisms and Prevention of Sports Eye Injuries (n.d.). Table 3, Eye Injury Risk, based on NCAA data, probability calculation advice courtesy of Randy Dick and Preston Fiske.

²⁰ Horn, E.P., McDonald, H.R., Johnson, R.N., Ai, E., Williams, G.A., Lewis, J.M., et al. (2000). Soccer ball-related retinal injuries: a report of 13 cases. *Retina*, 20(6), 604-609.

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- ²¹ Mieler, W.F., Nanda, S.K., Wolf, M.D., & Harman, J. (1995). Golf-related ocular injuries. *Archives of Ophthalmology*, 113(11), 1410-1413.
- ²² 2007 NCAA Rules Modifications as posted at www1.ncaa.org.
- ²³ Vinger, P.F. (1981). Sports eye injuries a preventable disease. *Ophthalmology*, 88(2), 108-113.
- ²⁴ 2007 NCAA Women's Lacrosse Rules and Interpretations, Rule 2, Section 9.
- ²⁵ NCAA data.
- ²⁶ Conn, J.M., Annet, J.L., Gilchrist, J., & Ryan, G.W. (2004). Injuries from paintball game related activities in the United States, 1997-2000. *Injury Prevention*, 10(3), 139-143.
- ²⁷ Listman, D.A. (2004). Paintball injuries in children: more than meets the eye. *Pediatrics*, 113(1 Pt 1), e15-18.
- ²⁸ Fineman, M.S. (2001). Ocular paintball injuries. *Current Opinion in Ophthalmology*, 12(3), 186-190.
- ²⁹ Pardhan, S., Shacklock, P., & Weatherill, J. (1995). Sport-related eye trauma: a survey of the presentation of eye injuries to a casualty clinic and the use of protective eye-wear. *Eye*, 9(Pt 6 Su), 50-53.
- ³⁰ Doxanas, M.T., & Soderstrom, C. (1980). Racquetball as an ocular hazard. *Archives of Ophthalmology*, 98(11), 1965-1966.
- ³¹ Vinger et al., 1997.