



Position Statement on the Use of Nonpowder Projectile Weapons, Including Airsoft, BB, Nerf, Paintball, and Pellet Guns

Recommendations:

1. **Protective eye wear.** CSA-approved eye protection should be worn at all times by any individual within firing range of a nonpowder projectile weapon.
2. **Adult supervision.** Children should only use nonpowder projectile weapons under adult supervision.
3. **Below the neck.** Nonpowder projectile weapons should never be aimed at the face or eyes.

Background:

The use of nonpowder projectile weapons, including airsoft, ball bearing (BB), Nerf, paintball, and pellet guns, is associated with a risk of eye injury that could result in vision loss, blindness, or loss of the eye. Given the growing number of recreational activities—for both children and adults—involving nonpowder projectile weapons, the COS has developed the following position statement and recommendations to encourage the safe use of these weapons and minimize the risk of eye injuries.

Position Statement:

Nonpowder projectile weapons include airsoft, ball bearing (BB), Nerf, paintball, and pellet guns. For the purposes of this position statement, bows that shoot foam-tipped arrows are also included on this list. While companies offering activities that involve nonpowder projectile weapons require all participants to wear protective eye wear, these types of weapons are not regulated by the Canadian government. As such, individuals who use nonpowder projectile weapons privately are not required to wear eye protection, nor are they required to use these weapons at a safe distance from other people who are not wearing eye protection.

There are many examples of serious eye injuries resulting from different types of nonpowder projectile weapons reported in the literature, including retinal dialysis,^[1] retinal detachment,^[2] traumatic hyphema,^[3] traumatic glaucoma,^[4] irreversible retinal damage,^[5] optic nerve avulsion,^[6] and enucleation or evisceration.^[7]

According to a 2015 report, US emergency departments treated 3,161 children for eye injuries related to nonpowder guns in 2012, and the rate of severe pediatric eye injuries resulting from a nonpowder gun increased by more than 500% between 2010 and 2012.^[8] A British study of 105 air gun-related eye injuries reported that 20% resulted in a ruptured globe and 11% resulted in the loss of the injured eye.^[7] The literature also indicated that a lack of protective eye wear was a factor in this type of eye injury. In the JAAPOS report, over 98% of the children who sustained eye injuries were not wearing eye protection,^[8] and in a Finnish study, 100% of the patients were not wearing eye protection.^[9] Ocular trauma caused by a nonpowder projectile weapon can have serious lifelong consequences, but the use of protective eye wear can reduce the risk of injury.

Airsoft guns originated in Japan in the early 1970s^[10] and paintball first emerged in the United States in 1981.^[11] Since then, the use of nonpowder projectile weapons for sport and recreation has spread all over the world. Recently, there has been an explosion in the popularity of similar games played with Nerf guns, which many parents see as a safer alternative to other nonpowder guns. However, Nerf's current high velocity ball projectile technology allows its foam projectiles to reach speeds of 45 metres per second with a kinetic energy of 1.92 Nm, which is enough energy to cause permanent vision loss.^[1] In comparison, airsoft pellets can reach speeds between 75 and 110 metres per second with a kinetic energy between 0.5 and 1.8 Nm.^[12] While airsoft guns can fire faster projectiles, Nerf gun projectiles can impact harder and have the potential to cause irreversible ocular damage.

As seen in the literature, the use of nonpowder projectile weapons carries a risk of eye injury that could result in vision loss, blindness, or loss of the eye. Given the seriousness of this risk, the COS recommends taking the following precautions whenever a nonpowder projectile weapon is being used:

1. **Protective eye wear.** CSA-approved eye protection should be worn at all times by any individual within firing range of a nonpowder projectile weapon.
2. **Adult supervision.** Children should only use nonpowder projectile weapons under adult supervision.
3. **Below the neck.** Nonpowder projectile weapons should never be aimed at the face or eyes.

References:

1. Henry T, Palakkamanil M, Rubin U, Tennant M. Traumatic retinal dialysis resulting from Nerf foam bullet. *Canadian Journal of Ophthalmology*. 2019;54(3):e100-e102. doi:10.1016/j.jcjo.2018.08.008
2. Mandviwala MM, Sassani PP. Traumatic Retinal Detachment Caused By Nerf Gun Shot In A Pediatric Patient. *Retinal Cases & Brief Reports*. January 2019:1. doi:10.1097/icb.0000000000000853
3. Bizrah M, Verma S. Nerf gun eye injuries: traumatic hyphema. *BMJ Case Reports*. 2017. doi:10.1136/bcr-2017-220967
4. Lee KM, Seery C, Khouri AS. Traumatic glaucoma due to paintball injuries: A case series. *Journal of Current Ophthalmology*. 2017;29(4):318-320. doi:10.1016/j.joco.2017.06.006
5. Nemet AY, Asalee L, Lang Y, Briscoe D, Assia EI. Ocular Paintball Injuries. *Israel Medical Association Journal*. 2016;18(1):27-31.
6. Barnard L, Ajlan R. MRI visualization of optic nerve avulsion due to ocular perforation from BB gun projectile. *American Journal of Ophthalmology Case Reports*. 2018;11:121-123. doi:10.1016/j.ajoc.2018.06.016
7. Shuttleworth GN, Galloway P, Sparrow JM, Lane C. Ocular air gun injuries: a one-year surveillance study in the UK and Eire (BOSU). 2001–2002. *Eye*. 2009;23(6):1370-1376. doi:10.1038/eye.2008.275
8. Lee RH, Fredrick D. Pediatric eye injuries due to nonpowder guns in the United States, 2002-2012. *Journal of American Association for Pediatric Ophthalmology and Strabismus*. 2015;19(2):163-168. doi:10.1016/j.jaapos.2015.07.073
9. Haavisto AK, Sahraravand A, Puska P, Leivo T. Toy gun eye injuries – eye protection needed Helsinki ocular trauma study. *Acta Ophthalmologica*. 2019;97(4):430-434. doi:10.1111/aos.13948
10. The History of Airsoft. <https://www.abbeysupply.com/resources/the-history-of-airsoft>.
11. Jones C. Paintball History: The First Paintball Markers. <https://nicolpawn.ca/paintball-blog.php/2011/05/27/history-of-paintball-markers>. Published May 27, 2011.
12. Airsoft Safety. <http://www.eliteforceairsoft.com/airsoft-safety/>.

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