Hand-held Laser Pointers and Eye Safety

Background

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Laser pointers are small, hand-held devices that emit a narrow beam of light that can be directed over long distances. They are commonly used in Canada for educational, professional, and recreational purposes. A simple hand-held laser pointer can be more than a million times brighter than the average 100-watt lightbulb typically found in homes.[1]

The availability of hand-held laser devices and laser pointers in Canada has expanded significantly in recent years, driven by reduced production costs and the convenience of online shopping.[2] Based on data from the 2019 Canadian Community Health Survey, an estimated 12.4% of Canadians aged 12 years and older reported using a hand-held laser device or being exposed to laser light from a hand-held laser device in the preceding 12 months.[2]

Lasers are classified using the International Electrotechnical Commission (IEC) Standard 60825-1 into the following hazard levels, from lowest to highest potential risk: Class 1, 1M, 2, 2M, 3R, 3B and 4.[3] Roman numerals may also be used to classify to lasers. The most hazardous lasers, Class 3B and 4, pose significant health risks, including burns and permanent eye damage, and require professional laser safety training for safe operation.[1]

In Canada, the sale, import, advertisement, and manufacture of consumer handheld laser pointers classified as Class 3B and 4 are prohibited.[1] In contrast, battery-powered hand-held lasers and laser pointers classified as 3R/IIIa or less are available to consumers and can be safely operated when used according to directions but can pose hazards when used incorrectly.[1]

In 2019, Canada's Consumer and Clinical Radiation Protection Bureau (CCRPB) surveyed 909 members of the Canadian Ophthalmological Society and the Canadian Association of Optometrists about eye injuries from handheld laser devices.[4]

17.4% of respondents encountered at least one eye injury from a handheld laser between 2013 and 2017, with a total of 318 reported eye injuries. 53.5% of survey respondents, when reporting on their most severe case, reported that the patient they treated for the most severe eye injuries caused by a handheld laser device experienced vision loss ranging from minor to disabling. Most individuals with minor or moderate vision loss indicated that their impairment lasted for more than six months.

Policy Issue

The health risks associated with hand-held laser pointers are not inherently obvious to most users. Most Class 3B and 4 handheld laser devices closely resemble safer, low-powered devices, making it difficult for most Canadians to assess the hazard level of a hand-held laser pointer by examining it.[5] Additionally, misinformation or lack of information from laser device manufacturers and distributors further contributes to a lack of awareness of the hazards and promotes unsafe use. Sample testing conducted by the CCRPB between 2013 and 2017 revealed that 99% of the battery-powered handheld lasers were mislabelled in terms of completeness of information, power output, and laser class.[5]

Canadians need information and education about lasers and their potential to harm eyes and vision. Staring into the beam or directing the beam into the eyes can result in injury.

Policy Position

Optometrists should be familiar with laser-related eye problems, and should educate their patients about lasers, as appropriate. Individuals affected by lasers should be encouraged to seek care from an eye care professional if they experience visual discomfort, afterimages, or a disturbance in reading for a duration of more than a few minutes.

The following tips may help to reduce risk:

- Laser pointers categorized as Class 3R or lower can be operated safely if used as directed and should always be used with caution.
- Be wary of Internet sales or the purchase of lasers advertised for purposes other than pointing or beam-display (e.g. for burning, balloon popping).
- Look for warning labels, safety features, and instructions that explain how to properly handle the laser.

- Choose a laser pointer that stays on only when the button is pressed, so that the beam cannot be left on by accident.
- Never point a laser beam at anyone, nor look directly into the beam.
- Never aim a laser pointer at surfaces that would reflect the light back, like mirrors or mirrored surfaces.
- Never aim a direct bright light source like a laser into the cockpit of an aircraft. This may jeopardize aviation safety and can be hazardous to pilots and threaten passenger safety. This is a federal offence under the Aeronautics Act.
- Do not aim lasers at cars, or trucks, or other vehicles.
- Keep laser pointers out of the reach of children and do not allow children to use them.
- When uncertain about the classification of a laser, contact the manufacturer or retailer.
- Never 'play around' with lasers, as they can be a fire hazard, cause flash blindness or even permanent eye damage.

References

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