Foveal laser pointer injury: are laser pointers safe enough for public possession?
Kelvin Ngan, Sacha Moore

Combining the increasing use of laser pointers and the exponential growth of the internet and e-commerce,¹ New Zealanders have never had easier access to high-power laser pointer (HPLP) products. These devices are easily misused when directed at people, aircraft or treated as toys; this may result in permanent destructive visual impairment² or even death (in the event of aviation accident). Although the Custom Import Prohibition Order 2017 requires authorisation to be obtained from the Director-General of Health for acquisition or importation of HPLPs (output power more than 1mW),³ the availability of these products on the internet makes regulation difficult. We report a case of foveal laser pointer injury in New Zealand caused by a device purchased through an overseas online retailer.

Case report
A usually well 17-year-old European male presented with a week's history of left central scotoma and headaches following seconds of direct ocular exposure to a class 3B (50mW) green laser pointer operated by himself at home. The device was purchased from an overseas online retailer through a simple internet search, without written consent from the New Zealand Director-General of Health. The patient was unaware of such regulations around HPLPs and had sought the device to be used as a toy.

His best corrected visual acuities (BCVA) were 6/4.8 right and 6/76 left. Intraocular pressures were 9mmHg right and 10mmHg left. A left relative afferent pupillary defect was noted. The left conjunctiva was not injected, the cornea was clear, anterior chamber quiet, lens clear and vitreous quiet. Dilated fundal examination (Figure 1) showed subtle left subfoveal pigmentary changes, otherwise unremarkable. Right eye dilated examination was unremarkable. OCT maculae demonstrated multiple foci of subfoveal lucency, retinal pigment epithelium irregularity, inner segment/outer segment junction loss, associated with small pockets of subretinal fluid, in the left (Figure 2). OCT discs were normal. Unfortunately, given the limited evidence-based treatment options for such an injury, no treatment other than monitoring for support and management of secondary complications was recommended.

Over two months, his left BCVA improved and stabilised at 6/30, developing multiple small left subfoveal scars, with unchanged small pockets of subretinal fluid. Given the concern with secondary choroidal neovascular membrane formation, the patient is currently being monitored for consideration of anti-VEGF treatment.

Discussion
The potential for permanent visual impairment with misused HPLP to the individual is tremendous. Due to the lack of caution, awareness and insight, younger populations, especially males, who have the most productive life years ahead, tend to be affected by such injuries.²,⁴ Current New Zealand regulations dictate a permit for acquisition of HPLPs,³ although this has not stopped consumers from purchasing them from an overseas online retailer without one. Under the Summary Offences Act 1981, it is an offence to be in possession of a...
HPLP in a public place without a reasonable excuse. However, none of these regulations ban the possession of these devices outright. In addition, many of these devices have incorrectly labelled power outputs, either by lack of testing and/or to avoid regulation. It can be hypothesised that the increasing availability of laser pointers will increase usage and subsequently laser-related incidents and complications. Although the number of cases of retinal injuries related to laser pointers in New Zealand are unknown, there is an increasing trend to laser incidents reported to the New Zealand Civil Aviation Authority suggesting this.

The authors propose an awareness campaign of the damage these devices can cause, and consideration of law proposals banning the possession of HPLPs in New Zealand without official approval ensuring safe and proper use, with a subsequent amnesty period allowing voluntary disposal prior to new law changes taking effect.

**Figure 1:** Left eye colour fundus photograph (left) and red-free fundus photograph (right) of the same eye showing multiple subtle central foci of pigmentary changes.

**Figure 2:** OCT macula of the patient’s left eye showing subfoveal lucency, retinal pigment epithelium irregularity, inner segment/outer segment junction loss, associated with small pockets of subretinal fluid.
Competing interests:
Nil.

Author information:
Kelvin Ngan, Ophthalmology Registrar, Eye Department, Nelson Marlborough District Health Board, Nelson; Sacha Moore, Consultant Ophthalmologist, Eye Department, Nelson Marlborough District Health Board, Nelson.

Corresponding author:
Kelvin Ngan, Ophthalmology Department, Nelson Hospital, Tipahi St, Nelson 7010. kelf.ngan@gmail.com

URL:

REFERENCES: