

## Driving stoned: Marijuana legalization and drug-impaired driving

**A**fter alcohol, marijuana is the most frequently detected drug in crash-involved drivers. The Canadian government has indicated its intention to legalize marijuana for recreational use in 2017, and while many Canadians support this initiative some American studies indicate that marijuana legalization may adversely impact road safety. Since 2012 a growing number of American states have legalized the use of marijuana for recreational or medical and therapeutic use.

Canadian discussions around the legalization of marijuana must include a clear-headed assessment regarding the impact of legalization on road safety. We must create a scientifically sound and fair approach toward drug-impaired driving, and develop appropriate standards and penalties to enforce any new laws.

So far, postlegalization, motor vehicle fatality statistics in the US are sobering. In Washington State, fatal crashes among drivers who tested positive for marijuana doubled from 8% in 2013 to 17% in 2014.<sup>1</sup> In Colorado the number of drivers in fatal crashes who tested positive for marijuana without other drugs in their system tripled between 2005 and 2014 from 3.4% to 12.1%.<sup>2</sup>

Driver impairment from marijuana use may be different than alcohol use. Detrimental effects of marijuana vary in a dose-related fashion and are more pronounced in affecting the highly automatic functions of driving rather than complex tasks that require conscious control, as is the case for alcohol.<sup>3</sup> Cannaboid receptors are found in the amygdala, basal ganglia,

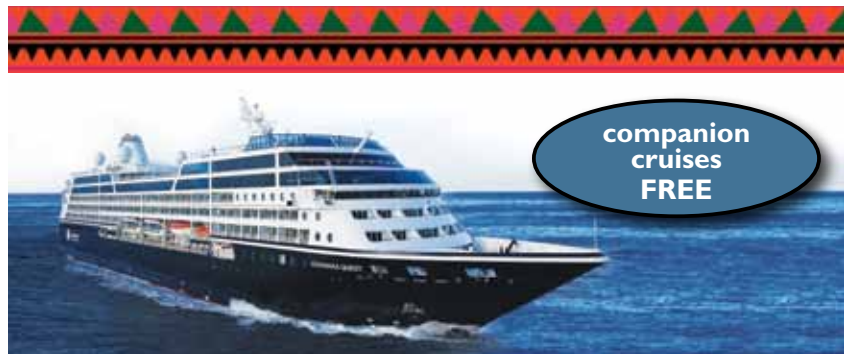
and cerebellum of the brain. Marijuana has been shown to negatively impact peripheral vision, awareness of the passage of time, motor control, and balance. Marijuana also affects the prefrontal cortex, the home for executive function. Driving is an exercise in timing, multitasking, and situational awareness, all functions adversely impacted by marijuana. It should be noted that unlike drivers under the influence of alcohol, marijuana users tend to be aware of their impairment, exhibit greater caution, and drive more slowly, although this may not adequately compensate for the impairments discussed above.

The most common standard used to define marijuana-impairment is

5 ng/mL, but legal levels vary significantly between American states. Marijuana's main psychoactive ingredient, THC, is fat soluble, making it difficult to connect a person's current state of impairment to a blood level. Blood levels will vary depending on a number of factors, including whether the individual is a chronic or occasional user. Similar to alcohol levels, Washington State's decision to use 5 ng/ml to define impairment is more of an administrative standard than a scientific one.

To date there is limited evidence supporting the 5 ng/mL standard. First, research from Australia demonstrates that chronic users of cannabis

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are unlikely to register higher than 5 ng/mL 24 hours following ingestion.<sup>4</sup> This diminishes the chance that unfair convictions would occur for those who have consumed cannabis more than a day before. Second, this research suggests that drivers below 5 ng/mL have twice the incidence of fatal accident involvement while drivers above the 5 ng/mL threshold have more than 6 times the incidence of fatal accident involvement.

Roadside breath testing for marijuana may become a reality for law enforcement but further testing for such devices is required. Through analysis of active THC, testing devices may be able to detect recent cannabis ingestion. This could assist a zero-tolerance enforcement program but would still lack the ability to define degrees of impairment.

Robust scientific evidence and practical roadside testing tools to precisely measure marijuana impairment for drivers are not yet available. Until these are available, road-side sobriety testing by properly trained officers will continue to be the method by which marijuana-impaired drivers are removed from our roads. Police officers in some American states may order drivers to undergo blood testing at a hospital to measure blood levels; however, the practicality of such tests is questionable due to the cost and time required for them. As we proceed to legalize marijuana, it will be imperative for federal and provincial governments to fully consider and appropriately mitigate the risks of marijuana-impaired driving.

—Chris Rumball, MD  
 Chair, Emergency Medical Services Committee

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