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FEATURED ARTICLES

*...And What a Year it Was!*..... 4  
N. EL-GUEBALY

*Marijuana and the Workplace* ..... 5  
C. ELS, A. AMIN, S. STRAUBE

*Treatment of Cannabis Dependence with  
Synthetic Cannabinoids: A Systematic Review*..... 8  
A. BAHJI, M.N. MAZHAR

*Culturally Specific Treatment Programs and  
the Muslim Community in Canada* ..... 13  
S. AHMED, N. DOUKAS

*Naloxone Infusion in the Setting of an  
Unknown Ingestion: a Case Report* ..... 19  
R. ZIVANOVIC, E. WOOD, S. NOLAN

*25 Abstracts from CSAM-ISAM Montreal 2016*..... 25

# Marijuana and the Workplace

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## ABSTRACT

The legal sale and consumption of marijuana for recreational purposes will likely become a reality in Canada in 2017. It remains the most commonly encountered substance in workplace drug testing, and given the substance's impairing effects, the impact of its legalization will have on safety sensitive workplaces remains an insufficiently explored occupational risk issue. By extrapolating crash risk data, the authors conclude that single or recurrent marijuana consumption is not recommended for persons who perform safety sensitive tasks. Although further epidemiological research is needed, current evidence allows for an argument of precluding marijuana use, irrespective of source of procurement, in safety-sensitive jobs. A formal guideline development process should be initiated to provide evidence-based guidance on the issue of marijuana use in safety sensitive settings.

La vente et la consommation légales de marijuana à des fins récréatives deviendront vraisemblablement une réalité au Canada en 2017. Elle demeure la substance la plus couramment rencontrée dans le dépistage des drogues en milieu de travail et les effets de la légalisation sur les lieux de travail sensibles à la sécurité demeurent une question de risque professionnel insuffisamment explorée. En extrapolant les données sur les risques d'accidents, les auteurs concluent que la consommation de marijuana unique ou récurrente n'est pas recommandée pour les personnes qui effectuent des tâches sensibles à la sécurité. Bien que d'autres recherches épidémiologiques soient nécessaires, les données actuelles permettent d'exclure l'utilisation de la marijuana, quelle que soit la source de l'approvisionnement, dans les emplois sensibles à la sécurité. Un processus formel de développement des lignes directrices devrait être lancé pour fournir des conseils factuels sur la question de la consommation de marijuana dans des contextes sécuritaires.

After a century of prohibition, marijuana remains the most commonly used illicit substance in Canada<sup>1</sup>, and the single most commonly encountered substance in

workplace drug testing<sup>2</sup>. In 2000 the Ontario Court of Appeal ruled that the total prohibition of marijuana possession was unconstitutional<sup>3</sup>. Following this, and with arguably only low- and moderate-quality evidence supporting effectiveness of cannabinoids for medical use, Canada became the first country-wide jurisdiction in which marijuana could be authorized for medicinal use, with several other jurisdictions following suit.

The regulatory and legislative environment continues to change along with public attitudes toward marijuana - a more permissive approach appears to have developed. As per the Government of Canada's expressed intent, Canada may become the first of the G7 group of countries with countrywide regulations in place to allow for use of both medicinal and recreational marijuana. To date, only Uruguay has fully legalized marijuana. The end of prohibition and the regulated, but legal sale and consumption of marijuana may become a reality in 2017 in Canada. However, several salient challenges have emerged, among others the anticipated impact this may have on occupational health, specifically as it pertains to safety-sensitive duties in workplaces. The term "safety-sensitive" (or "safety-critical") refers to concerns that a performance error may result in the injury of a worker, coworkers or the general public, and/or disruption of equipment, production or the environment<sup>4</sup>.

Marijuana contains more than 100 cannabinoids, some of which are centrally acting and which can result in adverse effects including cognitive and performance impairment. With consumption occurring via various routes, there currently exists no reliable method of controlling dose. Marijuana's potency has increased over time, rising by an estimated factor of three in the last few decades, and there is also a rise in consumption of Butane Hash Oil (BHO, or "shatter"), containing 80 to 90 percent tetrahydrocannabinol.

Marijuana consumption has been demonstrated to have an adverse impact on a range of cognitive functions<sup>5-6</sup> as well as be associated with performance deficits<sup>7-10</sup>. In contrast to existing large-scale epidemiological evidence, and following limited testing in cannabis users (n=77) and controls (n=53), the COMPASS study<sup>11</sup> found no difference in neuro-cognitive function after 1 year between these groups after adjustment for confounders. Of note, this finding is different from that found in other studies, i.e. systematic

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reviews<sup>5,6</sup> and a meta-analysis of fifteen studies<sup>12</sup>, suggesting a broad range of impairments in various cognitive domains

It has been established that the cognitive skills required for safety-sensitive work tasks overlap to varying degrees with those required to safely operate a vehicle<sup>13</sup>. Driving can be viewed as a proxy for determination of levels of impairment for other safety-sensitive duties. The required cognitive skills and capacities include unimpaired alertness, attention, concentration, coordination, reaction time, memory, ability to multi-task, perceptual abilities, thought processing, judgment, and insight. There is compelling evidence in support of the notion that marijuana, like alcohol and like opioids, can impair skills required for safe driving. A substantial body of epidemiological evidence demonstrates that cognitive impairments result in an increased risk for motor vehicle crashes. Two meta-analyses<sup>14,15</sup> suggest that marijuana use is associated with an increased risk of motor vehicle crashes, and one of these<sup>14</sup> suggests that is especially the case for fatal collisions. These two meta-analyses quantify the risk of motor vehicle crashes with marijuana use as roughly doubled, reporting statistically significant odds ratios of 2.66<sup>14</sup> and 1.92<sup>15</sup>, respectively. There is also evidence for a dose-response relationship<sup>16</sup>.

Extrapolation from crash risk data has been widely used to perform risk assessments in other settings, and it was the use of such extrapolation methods that resulted in the American College of Occupational and Environmental Medicine's guideline suggesting that the use of opioids is incompatible with working in safety-sensitive settings<sup>13</sup>. Given that single or recurrent marijuana exposure can result in both cognitive and performance deficits, and is associated with an increased crash risk, the extrapolation of risk to safety-sensitive occupational settings appears reasonable.

Despite the established evidence that cannabis use prior to driving is an independent risk factor for motor vehicle accidents, the advice regarding the duration of such impairment following consumption appears inconsistent. The College of Family Physicians of Canada suggest that patients taking medical marijuana in the form of dried cannabis should be advised not to drive for at least four hours after inhalation, six hours after oral ingestion, and eight hours after inhalation or oral ingestion if the patient experiences euphoria<sup>17</sup>. Yet, Health Canada states that the ability to drive or perform activities requiring alertness may be impaired for up to 24 hours following a single consumption<sup>18</sup>. Other evidence suggests that some cognitive impairment may persist for longer post-consumption and may continue to exert impairing effects in executive functions even after 3 weeks of abstinence<sup>6</sup>. Although occasional cannabis consumption can result in acute impairment of a range of cognitive functions, the long-term cognitive impact of cannabis is best demonstrated in chronic, heavy cannabis consumers, as opposed to occasional or light users. It is noted that a person consuming

marijuana may be impaired despite feeling well, and also that an individual may test positive from past use but may not necessarily be impaired. Workplace drug testing does not measure impairment, but only the presence of the parent compound or its metabolite(s). Further, the degree of impairment following concurrent consumption of marijuana and alcohol is cumulative<sup>19</sup>, and although users may be aware of deficits it has been suggested that they may only partially compensate for such decrements<sup>20</sup>.

By extrapolation, we conclude that single or recurrent marijuana consumption is not recommended for persons who perform safety-sensitive tasks. This recommendation is extended beyond operation of motor vehicles to include any task that may require high levels of cognitive function and judgment, and may, furthermore, not be restricted to so-called safety-sensitive workers. In decision-critical settings<sup>4</sup>, also, the cognitive and performance impairment resulting from marijuana use may pose a foreseeable threat to occupational safety.

On the contrary, it could be argued that reliance on motor vehicle crash data alone, and without supportive evidence specific to safety-sensitive workplaces may be insufficient to make the proposed extrapolations. It is the case that sufficient epidemiological evidence of non-driving activities in all safety-sensitive jobs is lacking. However, it is not feasible to wait to obtain direct data for each and every safety-sensitive position or task where marijuana consumption by workers may be anticipated. It is the norm for occupational health and safety guidelines to utilize evidence from other relevant populations when there exists a dearth of research for the target population. Creating the expectation that empirical studies have to be completed for every single safety-sensitive position, and that no extrapolation is allowed before we can assume that impairment caused by substance consumption may pose a risk, is unreasonable. It places an impossible burden of proof on adopting steps to ensure occupational safety. Adopting such approach could be considered a dereliction of duty, if argued from the opposing side. For example, what if a marijuana consuming person in a safety-sensitive position, involved in a serious accident, launches a tort case against a health provider or occupational health physician who authorized the use of marijuana, or declared the person (using marijuana) as fit for duty, while evidence suggested marijuana impairs driving capacity and increased risk? If it is reasonably foreseeable that if marijuana consumption impairs cognition, performance, and increases crash risk, it would also foreseeably increase risk in other safety-sensitive tasks. To date, the totality of evidence does not support the viewpoint that cognitive impairments related to marijuana use are not a problem in safety sensitive positions. The burden of proof that consumption of potentially impairing substances under such circumstances is not hazardous would arguably be with the cultivators and distributors of the marijuana products. With the legalization of marijuana, the duty of

the Government of Canada in this regard has not been sufficiently explored. As of this writing, unsurprisingly most of the provincial medical regulatory authorities advise their members to caution workers on risks as well as benefits of consumption of marijuana<sup>18</sup>. Such risks include working in safety-sensitive positions and operating a vehicle.

A weakness of this analysis of extrapolating crash risk data to safety-sensitive workers is the potential for unnecessary restrictions on persons who are not necessarily impaired, and who may not be at occupational risk. Further, there may emerge the increased potential for stigmatization of substance using individuals. The addicted population is already heavily stigmatized and this approach may result in lower levels of access to treatment.

The impact on specific safety-sensitive occupations and the threshold for determining impairment, as well as

the duration of such, remain unclear. Further epidemiological research investigating this issue is needed. Despite the uncertainty, evidence would allow for an argument of preclusion of marijuana use, irrespective of source of procurement, in safety-sensitive jobs, unless absence of impairment could be demonstrated. The expansion of this analogy to other decision-critical positions, where consumption may also pose a potential risk, requires more in-depth analysis. The authors believe that following this preliminary analysis, a more formal guideline development process should be initiated, including a comprehensive literature review, identification of the relevant evidence, assessment of the quality of this evidence, and evidence synthesis, followed by application to practice by a multidisciplinary expert panel to develop guidance on the use of marijuana by workers with safety-sensitive duties.

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