

Developing Per Se Laws for Driving Under the Influence of Cannabis (DUIC)

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Background

- Many countries are considering, or already use, “per se laws” to control drugged driving.
- To determine “impairment”, today’s per se laws either specify a “zero” limit or a finite limit for drug use indicators.
- For determining impairment by cannabis (hashish, marijuana) and for setting legal limits, the blood or urine levels of Δ^9 -THC, or its main metabolite THC-COOH, have been used as indicators.

Examples of Per Se Laws

- Examples of existing per se laws for DUIC
 - ▬ Belgium: 2 ng/mL THC in serum
 - ▬ Germany: zero tolerance (<1 ng/mL)
 - ▬ Pennsylvania, Nevada: 2-5 ng/mL in whole blood

Note on THC concentrations:

- Per se laws may specify THC limits in ***whole blood*** or in ***serum***.
- Rule of thumb: 1 ng THC / mL ***whole blood*** ~ 2 ng/mL in ***serum***
- ⇒ Use caution when comparing legal limits from different jurisdictions.

Comparing Per Se Laws for DUIC

Pros and Cons	Zero Tolerane	Science-Based THC Limit
Facilitates law enforcement / no need to prove impairment	Yes	Yes
Motivates drivers to separate cannabis use and driving	Unclear	Yes
May classify sober drivers as “impaired” for hours or days after the “high” ends (risk of <i>false positives</i>)	High	Depends on choice of legal limit
May classify strongly impaired drivers as sober (risk of <i>false negatives</i>)	Low	Depends on choice of legal limit

Scope & Objectives of This Study

- An international panel of physicians, traffic scientists and forensic toxicologists was assembled to:
 - Evaluate current scientific evidence from experimental and epidemiological studies on the impairment of drivers by cannabis,
 - Discuss whether this evidence is sufficient to develop rational, finite THC limits for per se laws,
 - Identify a range of suitable legal limits,
 - Identify gaps of knowledge and need for further studies.
- Study was commissioned by the Marijuana Policy Project, Washington, DC and coordinated by Drs. Grotenhermen and Leson.

Findings – Experimental Studies

- Commonly consumed THC doses may cause impairment of relevant driving skills comparable to a BAC of more than 0.08%,
- Strength and duration of these effects is dose dependent; effects relevant to driving typically subside within 3-4 hours after smoking,
- Drivers under the influence of low cannabis doses may partially compensate, e.g., by driving more conservatively.

Findings – Pharmacokinetics

- THC levels in blood decrease rapidly within 2-4 hours after smoking cannabis,
- High levels of main metabolite THC-COOH persist in blood and urine for days after consumption,
- Despite the lack of a simple relationship, THC in blood is the most suitable indicator of impairment of driving skills.
- Caution: Even moderate cannabis users may present with THC in serum above 2 ng/mL for up to 48 hours after last consumption.

Findings – Epidemiological Studies

- **Prevalence** studies on THC in accident victims are inconclusive:
 - Problems to obtain data from control groups,
 - Alcohol is also present in majority of victims.
- Several **culpability** studies have compared the crash responsibility of sober drivers and drivers with THC in their blood.

Culpability Studies

- Results suggest that whole blood THC levels below 5 ng/mL are not associated with elevated accident risk.
- THC levels above 5 ng/mL in blood appear to be increasingly associated with a higher OR but data are sparse.
- Cannabis users do not seem to have a generally higher culpability than non-users, unless they are under the acute influence of THC.

Implications for Selecting Per Se Limits



Similar to alcohol, per se laws for DUIC could specify a set of THC limits:

- a) Lower limit for “relative impairment”, violation treated as misdemeanor,
- b) Higher limit for “absolute impairment”, violation treated as felony.



Current limited evidence from culpability studies suggests that a rational limit for relative impairment by THC will likely be found in the 5-10 ng/mL serum range.

Implications for Selecting Per Se Limits (cont'd)

- ↓ Experimental studies suggest that a limit in this range is suitable for both smoking and oral use of cannabis.
- ↓ For drivers under the influence of cannabis and alcohol a lower THC limit may be appropriate.
- ↓ Further studies are needed to better assess correlation between blood THC and culpability. This is needed to minimize the risk of false positives and negatives.