

“Impairment in the slightest degree”



- **While driving, no impairment is acceptable.**
 - Alcohol: psychomotor (reflexes) and judgement impaired.
 - ✦ Dose dependent
 - Opiates: Sleep, resulting in driving off road or across center.
 - ✦ judgement can be preserved
 - ✦ Dose dependent
 - Cannabis: effects variable with content and dose.
 - ✦ Combined effects more than additive
 - ✦ Dose dependent
 - ✦ Multiple active ingredients

Cannabis Derived Products



What has changed with regards to cannabis?

- Price lower corrected for inflation and concentration
- Active ingredient content has changed
- Plant concentrations higher
- Availability greater
- More processing
 - Dabs, waxes, butane extraction, shatter and synthetics

University of Mississippi Potency Monitoring Project



- THC concentration is usually expressed as %THC per dry weight of material.
- In 1983, average THC% dry weight, limited products:
 - Plant form marijuana 1-5%,
 - Hashish 5-15%,
 - Hashish oil 20%.

The average THC content as percent per dry weight over time...



1983, 4% and under

2007, 7.3%

2008, 10.1%

2014, 30% in some plants

- *Sinsemilla*, un-pollinated female plant THC content
- CO₂ controlled growing environments

2016, approaching 100% dry weight in some crystalline products (“Shatter”)

Lets abandon meaningless vocabulary



- Cannabis Derived Products are here.
- Say Marijuana only when that is what you mean.

Drugged driving enforcement and prosecution



- To enforce Cannabis Derived Products drugged driving laws, this is the kind of lab you need:
- Brady et al., drivers who died within 1 hour of a crash
- CA, HI, IL, NH, RI, and WV
- Routine serum toxicology testing on the drivers
 - 23,591 deceased MVA drivers serum analyzed

“Trends in Alcohol and Other Drugs Detected in Fatally Injured Drivers in the United States, 1999–2010.” **American Journal of Epidemiology Advance Access, January 29, 2014**

Crash Fatality Data



- Of the deceased drivers studied:
 - 39.7% tested positive for alcohol
 - 28.3% for other drugs.
- positive results for alcohol: unchanged in 11 years
- positive results for non-alcohol drugs increased
- 16.6% in 1999, 28.3% in 2010
- The increase in drugs was:
 - observed in all age groups,
 - and both sexes.
- Cannabis was the most commonly detected drug

Psychomotor retardation and driving



- δ -9-tetrahydrocannabinol (THC) associated with:
- longer response times
- slower driving speeds
- dose dependent

Effects of Alcohol and Cannabis on Driving



- Standard Deviations of Lateral Position SDLP
- SDLP = Lane drifting
- SDLP at $13.1\mu\text{g/L}$ THC approximates 0.08g/L BAC

Hartman, R.L., Brown, T.L., Milavetz, G., Spurgin, A., Pierce, R.S., Gorelick, D.A., Gaffney, G., Huestis, M.A., Cannabis Effects on Driving Lateral Control With and Without Alcohol. Drug and Alcohol Dependence (2015)

○ <http://dx.doi.org/10.1016/j.drugalcdep.2015.06.015>

Combining cannabis and alcohol is worse



- Combining alcohol with cannabis derived products has an additive effect on lane drifting;
- $5\mu\text{g/L}$ THC with 0.05g/L BAC similar in effects to 0.08g/L BAC.

Per se intoxication impairment



- Breathalyzer is convenient, validated and available
- Driving impairments begin below per se limits
- Combined effects of drugs with alcohol is recognized
- Drug Recognition Officers can identify impairment with clinical skill sets objectively, but,
- DRE officer often not available
- Testing for second drugs should begin as part of every stop positive for alcohol
- Fund a lab and obtain saliva samples as procedure

Drugged driving and per se limits



- Combined use of alcohol and drugs is increasing
- This requires new ideas about per se limits
- Saliva sampling can identify drug levels of second agent (cannabis derived substances)
- Combining this data with breathalyzer is easy
- Laboratory facilities do the analysis are not exorbitantly expensive
- Prosecution cannot proceed without the tools and legal limit definitions

A Per se limit of alcohol *plus any THC* is logical



- Should a BAC > 0.05 g/L BAC and any saliva concentration of cannabis be considered impaired?

“Let the buyer be *aware*”



- Define cannabis derived products by concentration
- Specify the use with attention to risk <23 years of age
- Issue use “permits” linked to factual education
- Establish cultural norms for use
- Emphasize the safety of others
- Consider combined “per se” thresholds
- Create treatment programs for those that will predictably develop addiction behavior (>14%)
- Make sure the user tax revenues exceed the costs

When personal freedom collides with public safety:



Let's have liberty and justice for all,
not *just* liberty.

References re. motor impairment *after* 2012:



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Ronen A, Gershon P, Drobiner H, et al. Effects of THC on driving performance, physiological state and subjective feelings relative to alcohol. *Accid Anal Prev*. 2008;40(3):926–934.