ADFS
ALABAMA DEPARTMENT OF FORENSIC SCIENCES

Medical Cannabis Study Commission

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Typical DUI or DUI/D Scenarios

DUI – Traffic Stops

>0.08%

<0.08%, Suspected DUI/D

DUI – Traffic Crashes

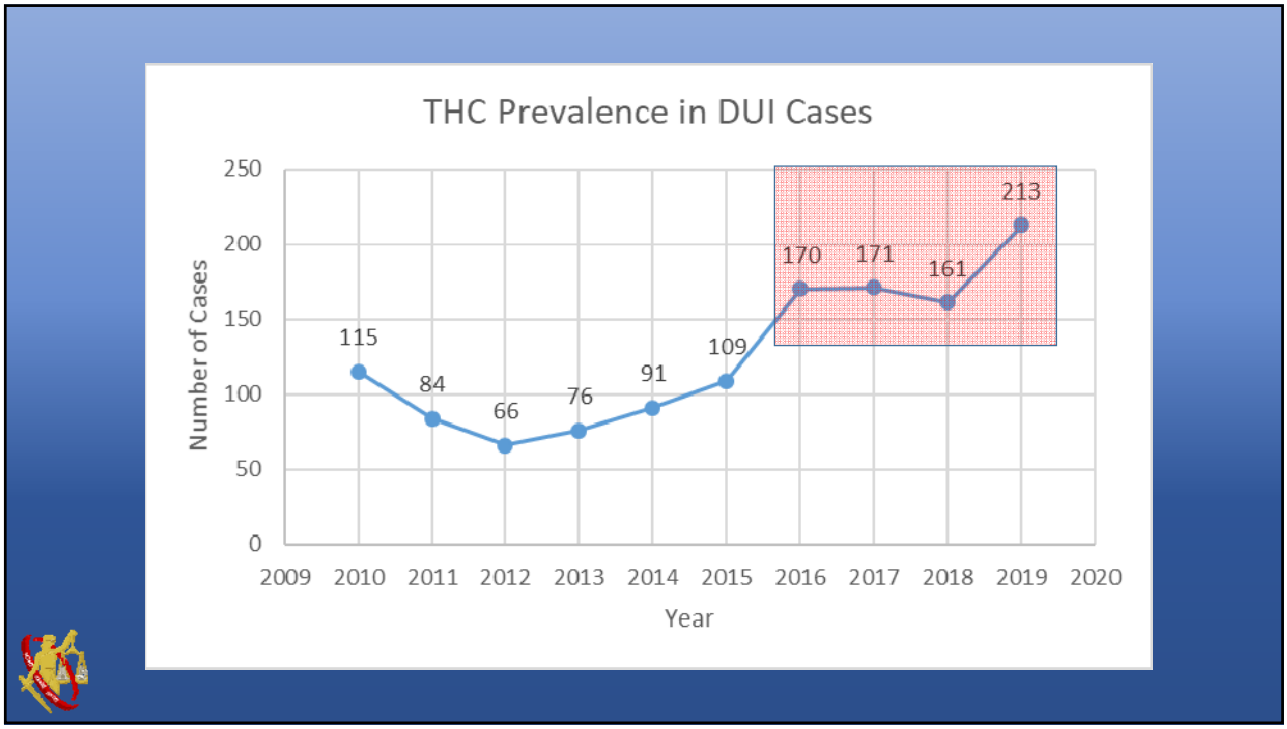
Involving Serious Injury/Deaths

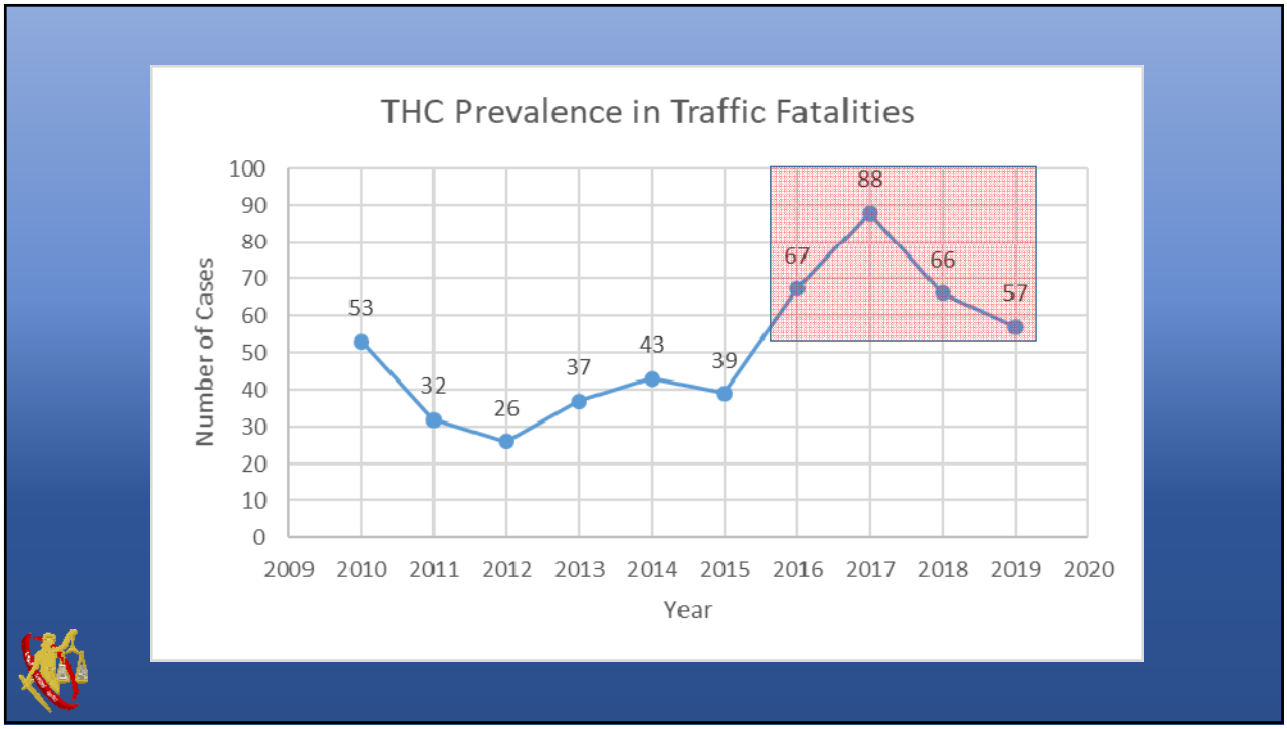
2018 DUIs in AL (Top Drugs)

Rank	Drug	Number of Cases	Prevalence (%)
1	Ethanol	375	35
2	THC & Metabolites	338	32
3	Meth/amphetamine	252	24
4	Alprazolam (Xanax)	224	21
5	Clonazepam (Klonopin)	91	9
6	Cocaine	81	8
7	Diazepam (Valium)	78	7
8	Hydrocodone (Lortab)	72	7
9	Morphine	56	5
10	Buprenorphine	55	5
11	Zolpidem (Ambien)	47	4
12	Oxycodone (Oxycontin)	43	4
13	Fentanyl	38	4
14	Tramadol (Ultram)	36	3
	# of Unique Cases	1059	

2018 Traffic Fatalities in AL (Top Drugs)

Rank	Drug	Number of Cases	Prevalence (%)
1	Ethanol	154	54
2	THC & Metabolites	91	32
3	Meth/amphetamine	54	19
4	Hydrocodone (Lortab)	25	9
5	Alprazolam (Xanax)	22	8
6	Cocaine	15	5
7	Oxycodone (Oxycontin)	11	4
8	Clonazepam (Klonopin)	10	3
9	Fentanyl	7	2
10	Lorazepam (Ativan)	7	2
11	Tramadol (Ultram)	7	2
	# of Unique Cases:	287	


THC Prevalence in DUI Cases
Number of Cases
250
200
150
100
50
0
115
84
66
76
91
109
170
171
161
213
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year


THC Prevalence in Traffic Fatalities
Number of Cases
100
90
80
70
60
50
40
30
20
10
0
53
32
26
37
43
39
67
88
66
57
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

THC Blood Concentrations in Alabama

Year	Average DUI THC Concentration (ng/mL)	Average Traffic Fatality THC Concentration (ng/mL)
2010	4.1	8.2
2011	3.9	8.3
2012	3.8	7.1
2013	3.8	6.5
2014	4.0	7.0
2015	4.2	13
2016	4.8	10
2017	4.6	9.3
2018	6.8	7.8
2019*	5.2	7.1

*Thru September 2019

THC Per Se Statutes?

At or Above Amount	# of Cases*	% of Total Cases*
≥ 1 ng/mL	726	95
≥ 2 ng/mL	521	68
≥ 3 ng/mL	339	44
≥ 4 ng/mL	214	28
≥ 5 ng/mL	154	20
≥ 6 ng/mL	118	15
≥ 7 ng/mL	84	11
≥ 8 ng/mL	70	9
≥ 9 ng/mL	51	7
≥ 10 ng/mL	39	5

*Alabama DUI Cases

The Concentration of THC decreases as time passes!

Time	Median THC Concentration (ng/mL)*	% of Total Cases*
0-30	3.6	4.6
31-60 min	2.9	14.2
1-2 hrs	2.9	35.4
2-3 hrs	2.9	23.0
> 3 hrs	2.6	22.8

*Alabama DUI Cases

Specimen Comparison: Best Window of Detection for DUIs?




Benefits of Oral Fluid Testing in DUID Cases

- Rapid, simple, non-invasive
- No medical professional required, saves time, $
- Difficult to adulterate
- On-site screening devices are available
- Parent (active) drug reflects recent drug use
- Most drug concentrate in Oral Fluid (e.g. THC)
- Specimen taken proximate to time of driving

Oral Fluid Drug Testing

Roadside Screen (Probable Cause)

Confirmation (Evidentiary)

ADFS is 1st State Crime Lab to offer In-house Confirmation

https://www.adfs.alabama.gov/services/tox/toxicology-oral-testing-program

Typical DUI or DUI/D Scenarios

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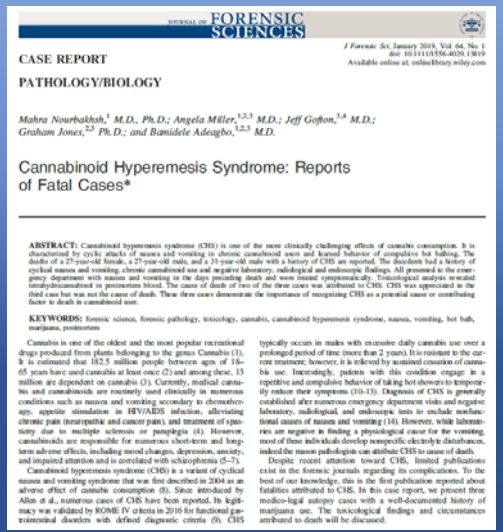
Overdoses on Marijuana?



JOURNAL OF FORENSIC SCIENCES

CASE REPORT

PATHOLOGY/BIOLOGY

Mahra Nourbakhsh,[1] M.D., Ph.D.; Angela Miller,[1,2,3] M.D.; Jeff Gofton,[3,4] M.D.; Graham Jones,[2,5] Ph.D.; and Bamidele Adeagbo,[1,2,3] M.D.

Cannabinoid Hyperemesis Syndrome: Reports of Fatal Cases*

Forensic Science International 298 (2019) 298–306

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Forensic Science International

journal homepage: www.elsevier.com/locate/forsciint

Cannabis as a cause of death: A review

Olaf H. Drummer, AO[a,*], Dimitri Gerostamoulos[a,b], Noel W. Woodford[a,b]

ARTICLE INFO

ABSTRACT

Synthetic cannabinoids have caused a large number of emergency presentations to hospitals for adverse cardiovascular events including numerous deaths, particularly for the more potent analogs acting on the CB_1 receptor. While smoked cannabis use is often associated with significant changes in heart rate and cardiac output, amongst other physiological changes, it has been rarely considered in the forensic literature as a significant contributory or causal factor in sudden unexpected death. A review of case reports of admissions to hospitals for cardiovascular events was undertaken together with a review of epidemiological studies, and case reports of sudden death attributed, at least in part, to use of this drug. These publications show that use of cannabis is not without its risks of occasional serious medical emergencies and sudden death, with reports of at least 35 persons presenting with significant cardiovascular emergencies who had recently smoked a cannabis preparation. At least 13 deaths from a cardiovascular mechanism have been reported from use of this drug which is very likely to be an under-estimate of the true incidence of its contribution to sudden death. In addition, many cases of stroke and vascular arteritis have also been reported with the latter often involving a limb amputation. While it is a drug with widespread usage among the community with relatively few deaths when faced with a circumstance of very recent use (within a few hours), a positive blood concentration of THC and a possible cardiac-related or cerebrovascular cause of death this drug should be considered, at least, a contributory cause of death in cases of sudden or unexpected death.

Medical Marijuana: Routes of Administration

- Oral
  - Pills, tablets
  - Tinctures (e.g. LA 1:20, 1:10, 1:1 (THC:CBD))
  - Edibles
- Smoking
- Vaping
  - Concentrates
  - Leaf material
- Inhalers

% of Medical MJ Prescription per illness

State	Pain	Cancer	PTSD	HIV/AIDS	Seizures	Spasms
Hawaii	84%	7%	13%	0.6%	<2%	12%
Montana	63%	5%	13%	5%*	<8%	N/A
West Virginia	22%	7%	16%	0.5%	5%	5%
Arizona	89%	2%	1%	0.3%	0.6%	0.4%
New Mexico	34%	5%	51%	0.8%	1%	N/A
Minnesota	64%	9%	18%	1%	4%	11%
New York	53%	12%	3%	1%	3%	N/A
Rhode Island	60%	8%	11%	0.5%	1%	5%
Delaware	58%	9%	9%	2%	2%	12%
Arkansas	31%	4%	11%	0.7%	3%	6%
New Hampshire	32%	10%	6%	N/A	2%	N/A
Ohio	53%	6%	13%	N/A	3%	N/A
Colorado	93%	5%	12%	0%	4%	37%