

Marijuana Ahead



EXIT 420

**WHAT
ARE
YOU
DOING?**

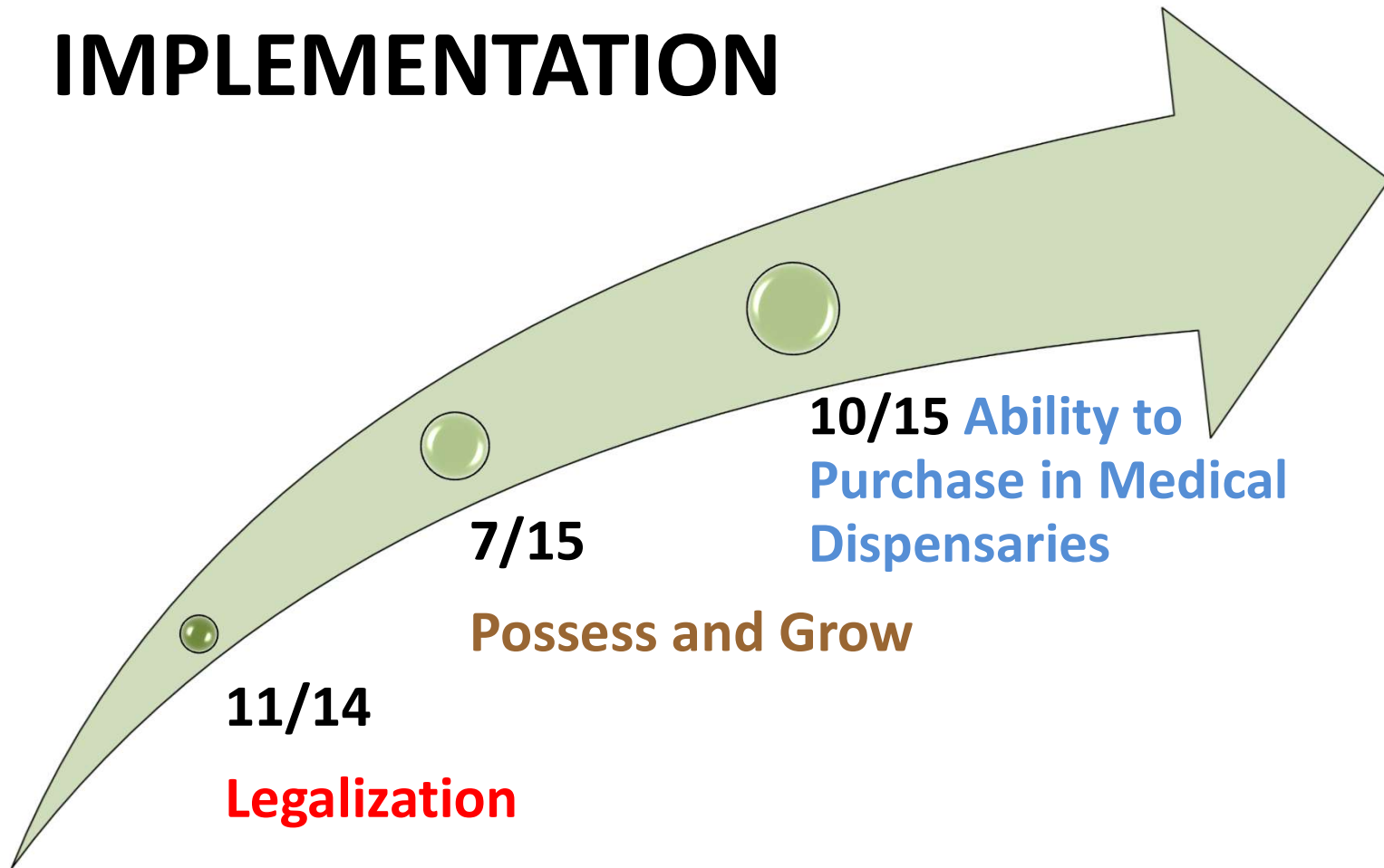


Legal *Recreational* Marijuana Comes to the state of Oregon



Measure 91, Passed by voters on Nov. 4, 2014

IMPLEMENTATION



Oregonians bought more than \$1 billion of weed in 2020; Multnomah County led the way

Updated Jan 07, 2021; Posted Jan 06, 2021



By [Douglas Perry | The Oregonian/OregonLive](#)

Oregon recreational-cannabis sales surged in 2020, peaking during a difficult summer of protests and lockdowns.

The result was a record year of business for the state's marijuana purveyors, based on [data from the Oregon Liquor Control Commission](#), which oversees marijuana sales. Total marijuana sales in Oregon jumped from \$795 million in 2019 to more than \$1 billion -- \$1,110,520,723 -- for the year that just ended.



THINK OUT LOUD

City of Portland dissolves Vision Zero task force

Portland keeps trying to reduce traffic fatalities, but 2020 was especially deadly. What's going wrong?

In 2020, Portland saw its deadliest traffic-related year since 1996, despite a pandemic that reduced road use for a few months and the city's continuing effort to make its streets safer.

Fifty-four drivers, bicyclists or pedestrians died. City leaders are still trying to figure out why.

Dylan Rivera, a spokesperson for the Portland Bureau of Transportation, joined OPB's "Think Out Loud" to talk about the reasons and what the city is doing to make 2021 safer.

Here are highlights of that conversation. You can listen to the entire discussion using the audio player at the top of this story.

Why did so many people die last year?

"So far, it appears that excessive speed and driving under the influence of alcohol and other drugs contributed to the majority of these traffic deaths. This is a really unusual occurrence during a recession. This is not what you would have expected ... In a recession, you have less travel overall across driving, biking — all modes, really — and you tend to have fewer traffic fatalities in a recession. 2020 bucked that trend. It was unusual."

58 people killed in Portland traffic crashes in 2020 — the most since 1996 — despite the pandemic (2/21)

Traffic Division, the latest police task force to go

Oregon Fatalities

From 2017- 2018, alcohol only involved fatalities (fatality is one person rather than one crash) saw a 24% decrease and overall substance-involved fatalities increased 23%. However, drug only involved fatalities have seen a yearly increase since 2014, increasing 76% across Oregon in the past year (2017-2018). Poly-substance fatalities, which have increased every year since 2014, saw a 32% increase from 2017-2018.

Oregon	2014	2015	2016	2017	2018	% increase/(decrease) 2017-18
Alcohol Only Fatalities	90	155	135	107	81	(24%)
Drug Only Fatalities	49	56	65	85	150	76%
Total Alcohol or Drug Involved Fatalities	139	211	200	192	231	20%
Poly-substance Fatalities	31	32	38	63	83	32%
Total Substance-Involved Fatalities	170	243	238	255	314	23%

In 2018, there was a decrease in substance involved serious injuries in all categories, and total substance involved serious injuries saw an 8% decrease; however, due to the increase in fatalities, total substance involved fatalities and serious iniuries. increased 6% from 2017-2018.



DRIVING CONCERNS

How much marijuana can I have and still be safe to drive?

JASON TCHIR

Special to The Globe and Mail

Published Tuesday, Dec. 22, 2015 5:00AM EST

Last updated Thursday, Dec. 24, 2015 10:29AM EST



The Real but Exaggerated Danger of Stoned Driving

A new study indicates that marijuana's impact on crash risk is much smaller than prohibitionists claim.

Jacob Sullum | March 21, 2016



EMAIL SHARE PRINT

How High Is Too High to Drive?

By Manisha Krishnan
Staff Writer

April 4, 2016



Driving While Stoned Is Much Safer Than Driving Drunk, Says a New Study

U.S. TRANSPORTATION

Driving While Stoned Is Much Safer Than Driving Drunk, Says a New Study

Rishi Iyengar @Iyengarish Feb. 12, 2015



But that doesn't mean that using pot before driving has no risk at all, researchers emphasize

What's The Reality.....

Woman hit in Gresham crosswalk by driver accused of smoking pot has died



Jacob McLeod Walters



By Betsy Hammond | The Oregonian/OregonLive

Email the author | Follow on Twitter

on October 06, 2015 at 11:07 AM, updated October 06, 2015 at 3:11 PM



Study: Fatal Car Crashes Involving Marijuana Have Tripled

February 4, 2014 9:14 PM

Filed Under: cannabis, drugged driving, drunk driving, fatalities, legal pot, MADD, Marijuana, pot



LOS ANGELES, CA - JULY 25: on July 25, 2012 in Los Angeles, California. The Los Angeles City Council has unanimously voted to ban storefront medical marijuana dispensaries and to order them to close or face legal action. The council also voted to instruct staff to draw up a separate ordinance for consideration in about three months that might allow dispensaries that existed before a 2007 moratorium on new dispensaries to continue to operate. It is estimated that Los Angeles has about one thousand such facilities. The ban does not prevent patients or cooperatives of two or three people to grow their own in small amounts. Californians voted to legalize medical cannabis use in 1996, clashing with federal drug laws. The state Supreme Court is expected to consider ruling on whether cities can regulate and ban dispensaries. (Photo by David McNew/Getty Images) (Photo by David McNew/Getty Images)



237 comments

Fatal crashes involving marijuana doubled in Washington after legalization



Police: Man high on pot killed Beaverton woman in crash

Nate Hanson, KGW.com Staff 11:33 a.m. PDT July 13, 2015



THURSTON, Wash. -- Police say the driver who crashed into a Beaverton woman's car and killed her, ...



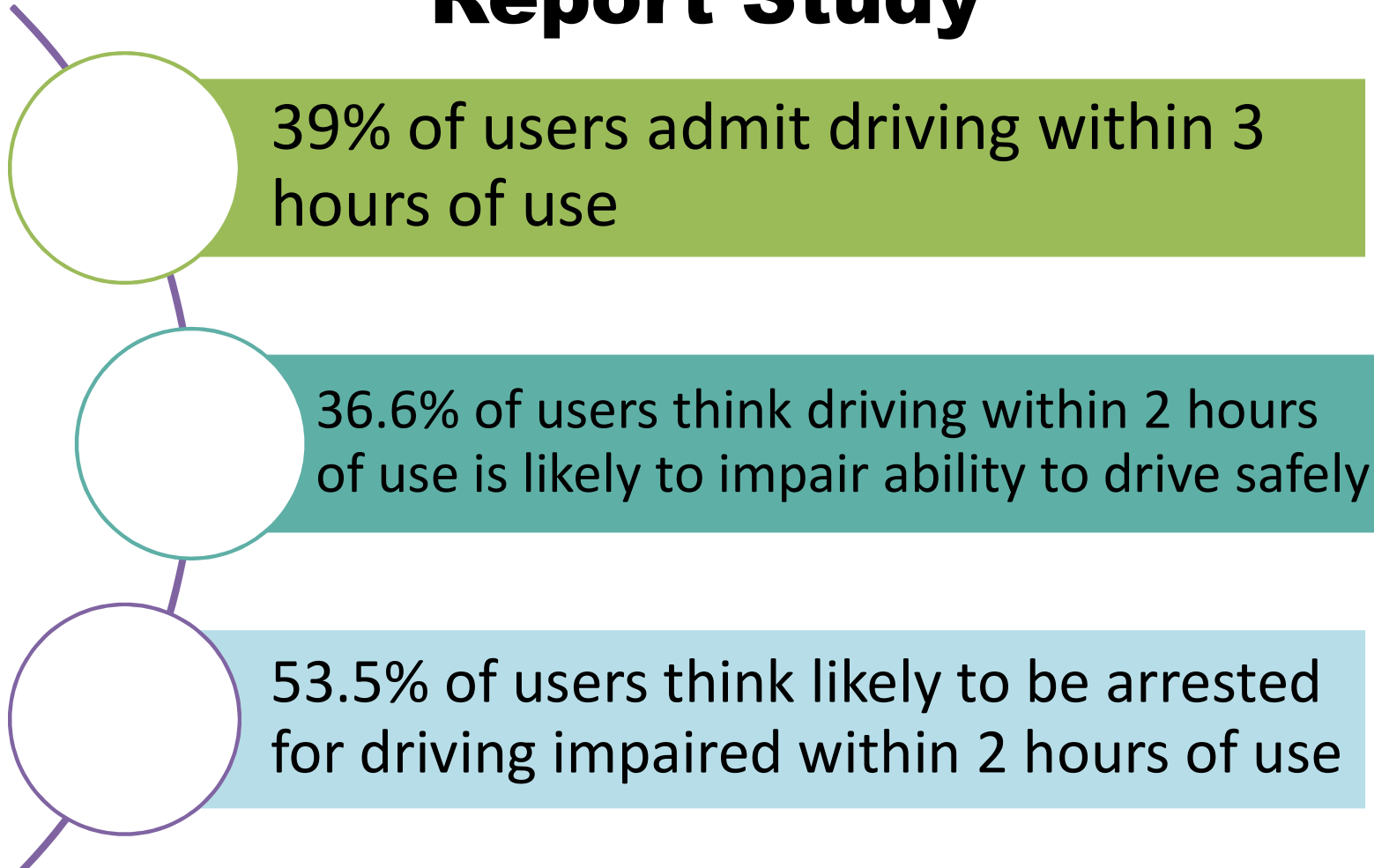
marijuana played role in July 4 crash

Are YOU Meeting Your

lay in Thurston County Superior Court. He is accused of aignment has been set for July 21.



Washington Roadside Self Report Study



LAW ENFORCEMENT CHALLENGES - CANNABIS

Society's attitudes toward cannabis legalization – jury selection so important

- Medicine?
- Impairing?
- Driving?

Toxicology challenges

- #? no #?
- Delta 8?
- Blood/urine

What can toxicologist say?

- Impaired? Not impaired?

One in Four consumers don't want to see any cannabis-focused advertisement, regardless of content



However, the majority
don't mind...

62% are comfortable
seeing cannabis
advertisement in
mainstream media,
regardless of the legal
status of cannabis in
their own states



- How has cannabis changed over the years?
- Are there different forms of cannabis?
- Are there different ways to use cannabis?
- How does this impact how cannabis can affect you?

TIE IN WITH DIRECT EXAM!!!!

DISCREET MARIJUANA PRODUCTS FOR DABBING AND VAPORIZING

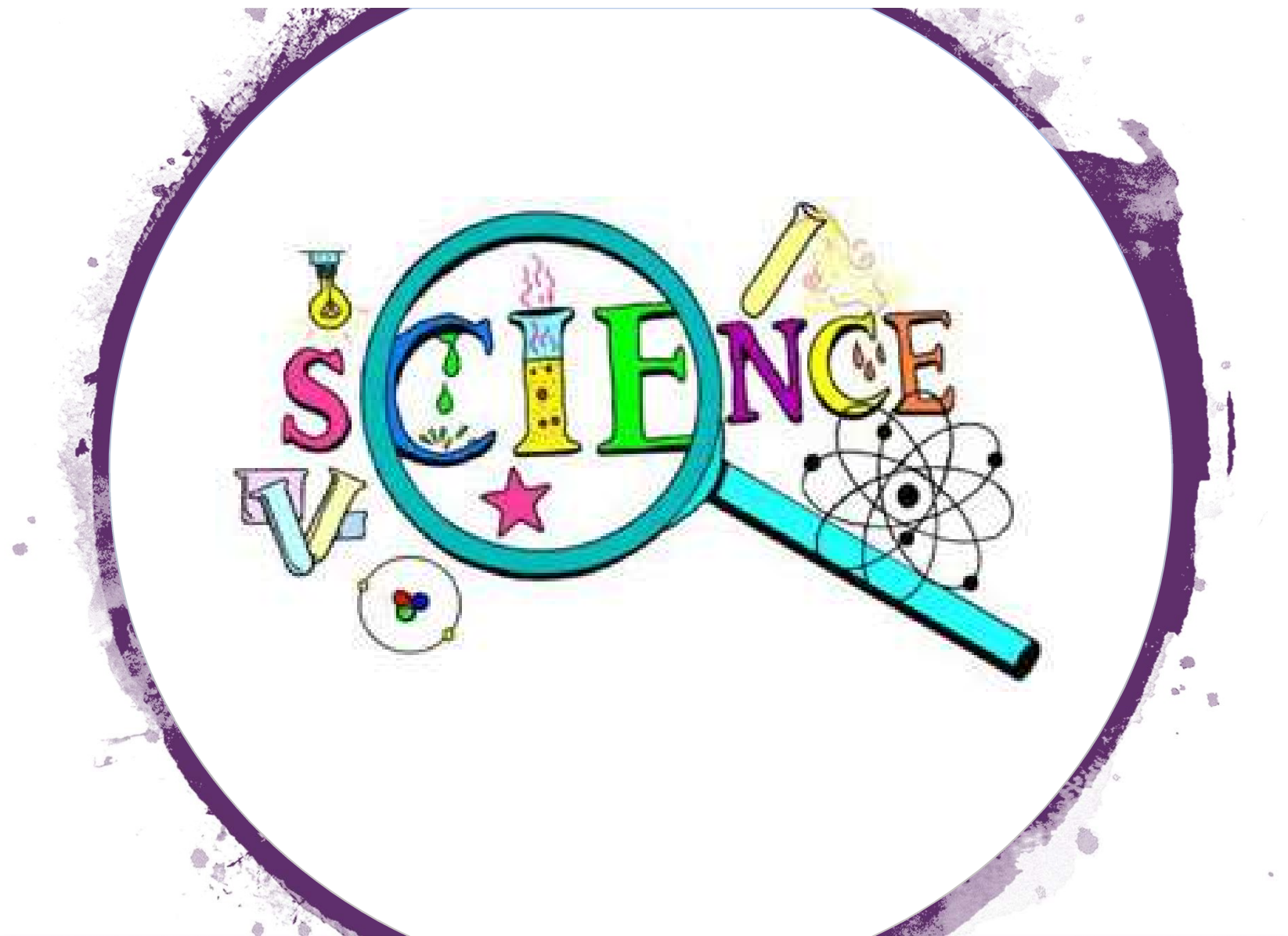


300+ TYPES OF EDIBLES



MARIJUANA HASH & CONCENTRATES





- HYDROXY -THC & 11-HYDROXY-THC:
 - The main psychoactive metabolites of cannabis that *make you high & impairs your ability to drive*
- CARBOXY-THC:
 - The main secondary metabolite of THC and is NOT psychoactive (thus not impairing*)



**BIGGEST
MISCONCEPTION**



There has to
be THC in the
blood for the
user to be
impaired by
marijuana

Marijuana is LIPOPHILIC
(FAT Soluable)



HOW DOES MARIJUANA WORK IN THE BODY?



Marijuana is ingested



Impairment peaks quickly and then levels out



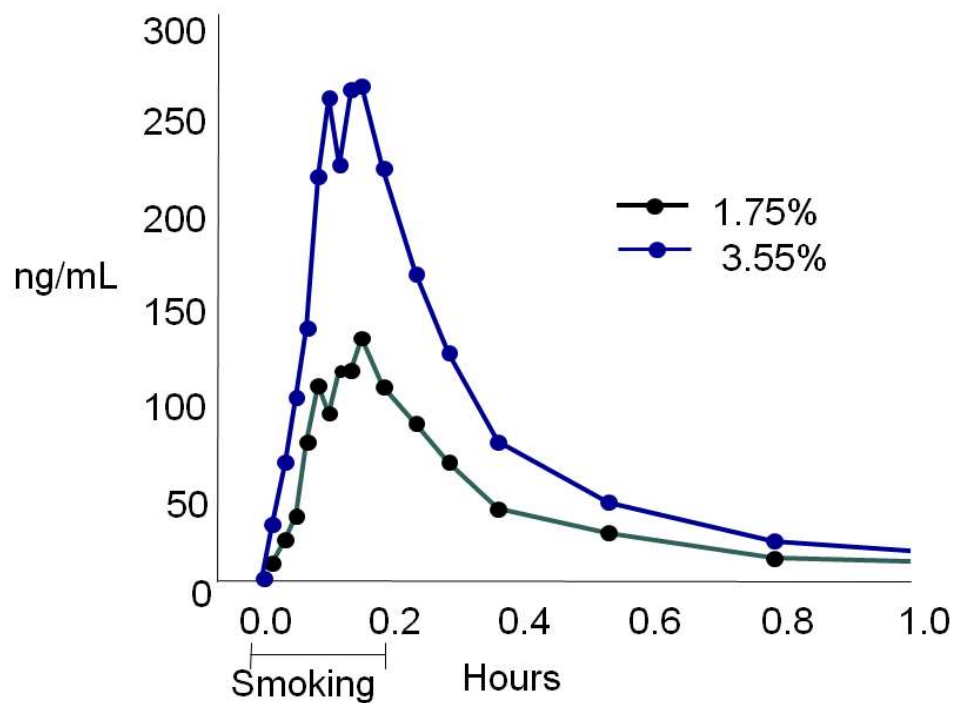
THC binds to the fat receptors in the body/brain



THC crosses the "blood/brain barrier" quickly

Cannabinoid Pharmacokinetics

Smoked THC Time-Concentration Curve



- THC concentrations fall:
- To about 60% of their peak within 15 minutes after the end of smoking.
- To about 20% of their peak 30 minutes after the end of smoking.

Courtesy Marilyn Huestis, Borkenstein Drug Course, 2012

Cannabis Effects on Driving Lateral Control with or Without Alcohol Hartman, R.L., et al. (2015)



The first study to evaluate the effect of THC with and without alcohol on SDLP



Cannabis Effects on Driving

- Decision-making
- Divided attention
- Visual search
- Focus, concentration
- Process changes
- Reaction Time
- Road tracking,
vehicle control



Blood Collection

Measured THC concentrations

Measured BrAC

TIME INTERVALS COLLECTED AT END OF FIRST PUFF


- 10min
- 25min
- 60min (during drive time)
- 1 hr 25 min (immediately post drive time)
- 2 hr 18 min
- 3 hr 18 min
- Additional intervals ending with 8 hr 18 min*




Rate of Decrease of THC in the Blood

10min  25min = **73.5% (75.1%)**

25min  60min = **85.3% (87.3%)**

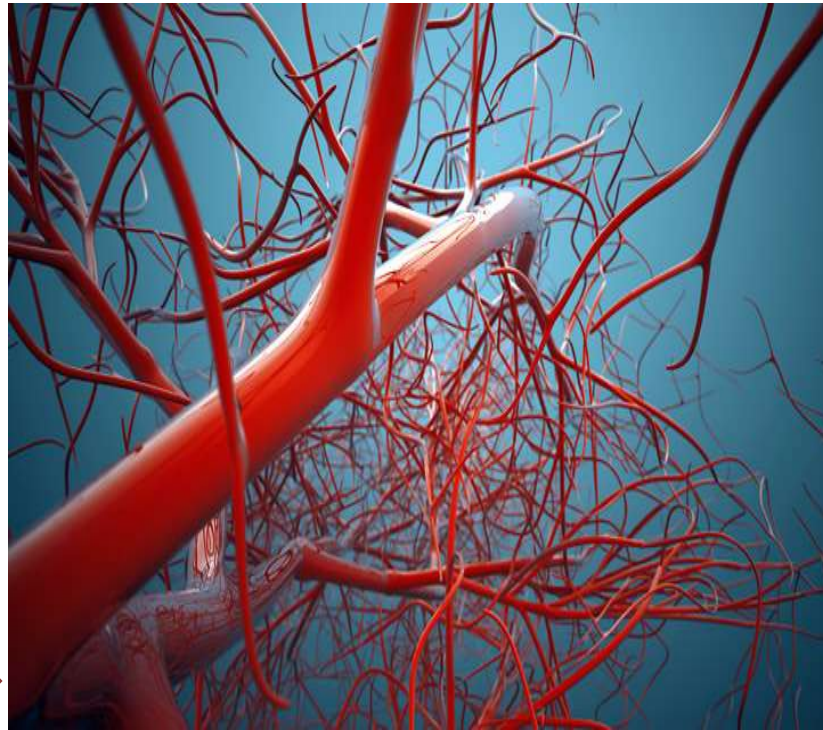
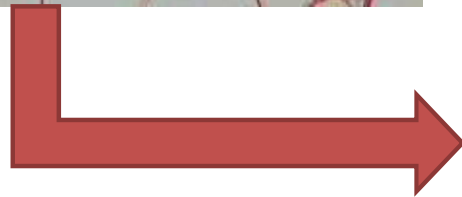
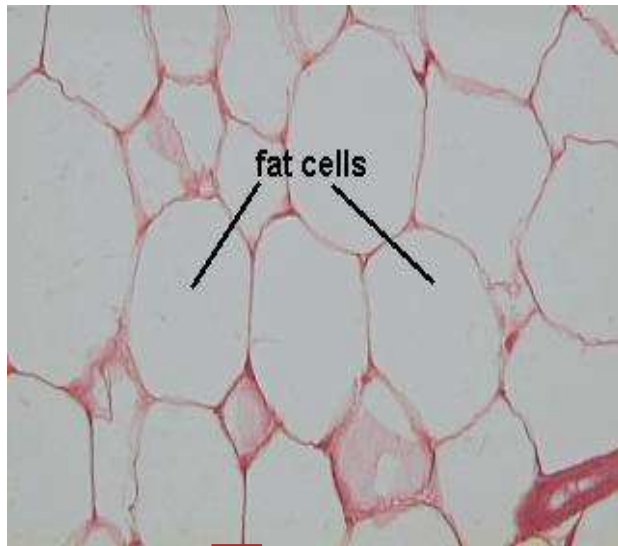
60min  1h 25min = **90.3% (91.3%)**

1hr 25min  2h 18min = **94.6% (95.5%)**

2h 18min  3h 18min = **96.9% (97.9%)**

Making a Come Back.....

Release of THC fat stores back into the blood





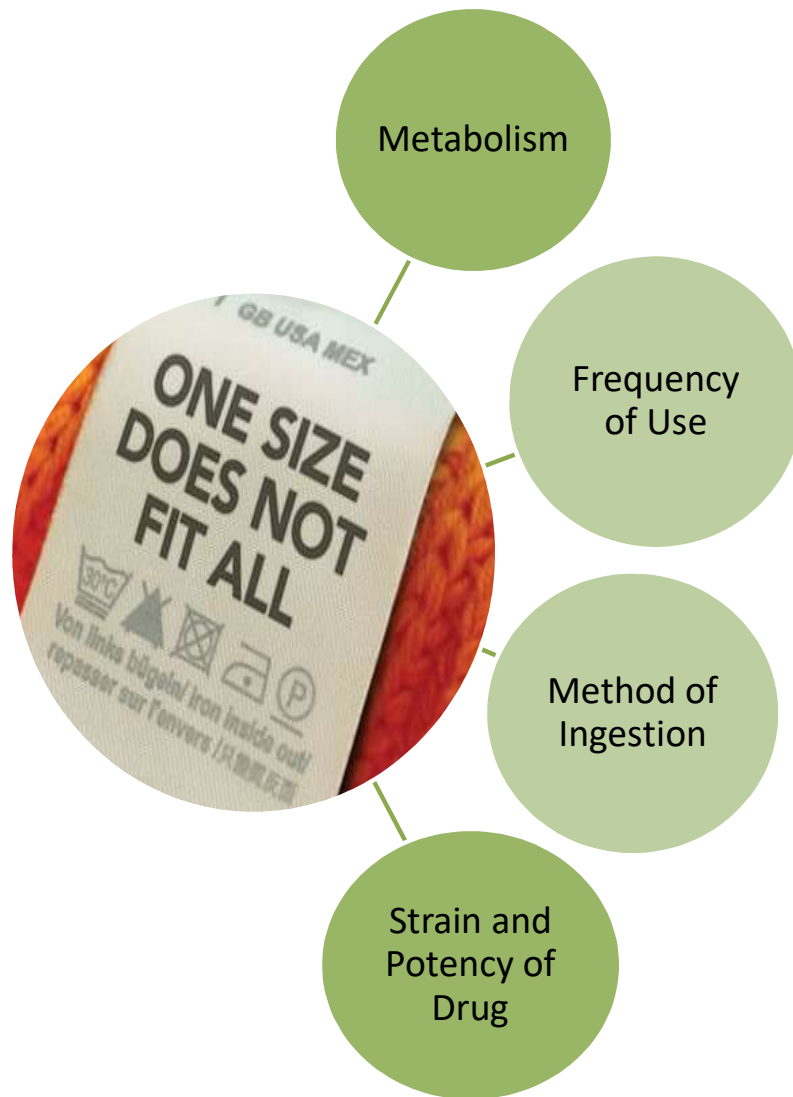
Chronic Frequent Cannabis User Studies

- Association between residual concentrations & impairment
- Serum concentrations of 2-5 ng shown to impair driving
- Prolonged impairment of psychomotor function only partially recovered over 3 weeks of abstinence
- Chronic users are tolerant to some, **but not all**, effects of cannabis

- Impact of Prolonged Cannabinoid Excretion in Chronic Daily Cannabis Smokers' Blood on Per Se Drugged Driving Laws - Bergamaschi, et. al. (2013)
- Psychomotor Function in Chronic Daily Cannabis Smokers during Sustained Abstinence – Bosker, et. al. (2013)
- Reversible and Regionally Selective Downregulation of Brain Cannabinoid CB1 Receptors in Chronic Daily Cannabis Smokers – Hirvonen, et. al. (2012)

Continued
psychomotor
impairment after 3
weeks of abstinence
in chronic frequent
users, suggesting the
ability to drive is
impaired at the time
of these low blood
THC concentrations

- Phase I and II Cannabinoid Disposition in Blood and Plasma of Occasional and Frequent Smokers Following Controlled Smoked Cannabis – Desrosiers, et. al (2014)



HUGE number of variables influence how much THC is stored and for how long it is detectable in the blood. Many variables affect overall impairment

- Tramadol
- Zolpidem
- Oxycodone/Oxymorphone
- Immunoassay drug screening tests for the following drugs or classes of drugs gave a positive indication:
 - Cannabinoids
- Analysis confirmed the presence of the following substances:
 - Tetrahydrocannabinol (THC) – 2.0 +/- 0.4 ng/ml at a coverage probability of 95.45%
 - 11-hydroxy-delta-9-tetrahydrocannabinol (11-OH-THC) – 1.4 +/- 0.3 ng/ml at a coverage probability of 95.45%
 - 11-nor-delta-9-tetrahydrocannabinol-9-carboxylic acid (THCA) – 99 +/- 28 ng/ml at a coverage probability of 95.45%
- Analysis performed using immunoassay and LC-MSMS.

The disposition of this evidence is as follows: The evidence will be retained until otherwise authorized.

End of Report

In the past.....

- ▣ Odor, Slurred speech, bloodshot eyes.....
- ▣ 4+ Clues HGN
- ▣ 2+ Clues Walk and Turn
- ▣ 2+ Clues One Leg Stand



The hazy reality...

Tolerant marijuana impaired drivers may perform better on the physical portions of the walk and turn and one leg stand SFST'S than alcohol only impaired drivers.

With marijuana impairment we need to look further than the three SFST'S validated clues.

Marijuana impaired drivers will NOT have traditional HGN.



BOOZE vs. BUD

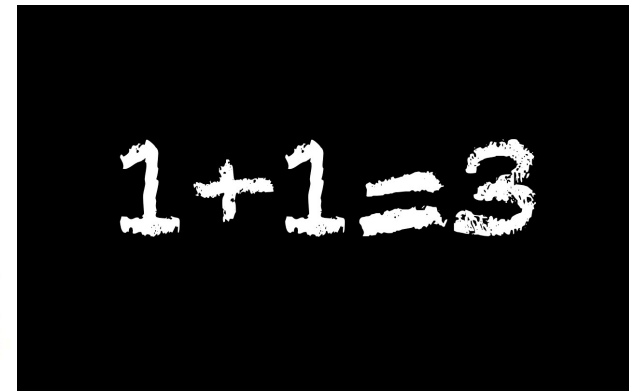
Mental vs. Physical Impairment

- There is a “disconnect” with the way most Police Officers, District Attorneys, and juries want to relate impairment under alcohol with impairment under Marijuana.....
 - There is ***no way*** to equate .08 alcohol = 5ng



Marijuana & Alcohol

65% of “heavy” drinkers also smoke marijuana



Marijuana and alcohol have an ADDITIVE effect on driving impairment

FATAL CRASH RISK:

- Alcohol alone 13 times higher than a sober person
- Alcohol & Marijuana 24 times higher than a sober person

A 2-Year Study of Δ^9 -tetrahydrocannabinol Concentrations in Drivers: Examining Driving and Field Sobriety Test Performance Declues, Perez, Figueroa, Forensic Sciences 2116

- **Study looked at police reports and DRE evaluations of THC positive samples**
- **Looked at basis of stop, FSTs, and indicators of impairment**
- **Looked for a correlation with blood THC concentrations, driving pattern, and FST performance on DRE and non DRE evaluations**



INDICATORS CONSISTANT WITH DRUG CATEGORIES							
MAJOR INDICATORS	CNS DE-PRESSANTS	CNS STIM-ULANTS	HALLUC-INOGENS	PHENCY-CLIDINE	NARCO-TICS	INHALANTS	CANNABIS
HORIZ. GAZE NYSTAGMUS	PRESENT	NONE	NONE	PRESENT	NONE	PRESENT	NONE
VERTICAL NYSTAGMUS	PRESENT (HIGH DOSE)*	NONE	NONE	PRESENT	NONE	PRESENT (HIGH DOSE)*	NONE
LACK OF CONVERGENCE	PRESENT	NONE	NONE	PRESENT	NONE	PRESENT	PRESENT
PUPIL SIZE	NORMAL (1)	DILATED	DILATED	NORMAL	CONST-RICTED	NORMAL (4)	DILATED (6)
REACTION TO LIGHT	SLOW	SLOW	NORMAL (3)	NORMAL	LITTLE OR NONE VISIBLE	SLOW	NORMAL
PULSE RATE	DOWN (2)	UP	UP	UP	DOWN	UP	UP
BLOOD PRESSURE	DOWN	UP	UP	UP	DOWN	UP/DOWN (5)	UP
BODY TEMPERATURE	NORMAL	UP	UP	UP	DOWN	UP/DOWN/NORMAL	NORMAL

*High dose for that particular individual

1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

Top 9 Reasons for Driver Contact

<u>DRIVING BEHAVIOUR</u>	<u># OBSERVED</u>	<u>% of TOTAL</u>
Speeding	61	24.0
Unable to maintain lane pos.	59	23.2
Ran red light or stop sign	33	13.0
Unsafe lane change	22	8.7
Collision	21	8.3
Going too slow	17	6.7
No headlights at night	14	5.6
No turn signals	14	5.6
Driving the wrong way	13	5.1

HGN

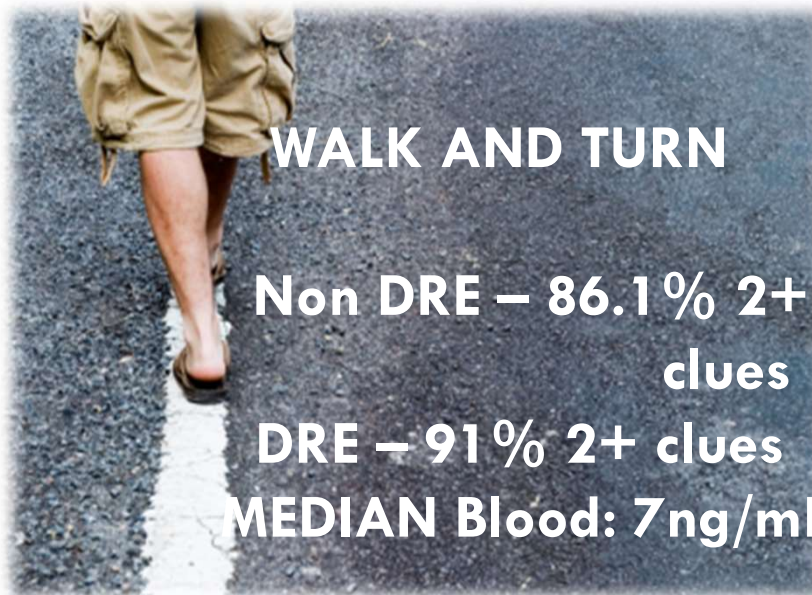
78.6% had 0 clues

12.3% had 2 clues



LOC – 86.1%

Lack Of Smooth Pursuit present in 1/3



INVESTIGATION RESULTS

- Speeding was number one reason driving behavior observed
- **1/3 had lack of smooth pursuit.** Suggestion that LSP was related to THC ingestion at 55 and 105min post smoking – consistent with Papafotiou study (2004)
- **LOC is a strong indicator of THC present in the blood**
- **Walk and Turn** was the most effective to evaluate THC impairment (greater demand to divide attention than OLS?)
- Romberg test not as useful as half were within acceptable range
- Finger to nose averaged 4 misses regardless of THC concentrations

INVESTIGATION RESULTS

- When multiple tests are used, “officer can be **certain** they are making a correct decision to arrest.”
- Whether the assessment of impairment by FSTs was done by a DRE officer or not, the information from such tests was equally useful. **Field sobriety tests are sensitive to impairment by marijuana.**
- The study did not find a correlation between performance on field sobriety tests and the concentration of THC tested in whole-blood samples.

***** High limit of quantification (2ng/mL) in the study. A lower LOQ would add impaired drivers to the study**



- 302 Marijuana Only Cases
- 87.4% males – 12.6% females
- 21yo median age range
- Time of arrest to eval – 47.5 min
- Time from arrest to blood – 61 min
- THC range 1-47ng/ – 6ng/mL median

Roadside and Evaluation Observations

Most frequent observations:

- ✓ Odor of marijuana (on person / in vehicle)
- ✓ Red, bloodshot, watery eyes
- ✓ Dilated pupils
- ✓ Difficulty performing SFSTs
- ✓ Eyelid tremors
- ✓ Body tremors
- ✓ Carefree attitude



Signs and Symptoms observed during personal contact

- Impaired memory & comprehension
- Disorientation
- Euphoria
- Relaxed Inhibitions
- Altered time and distance perception
- Lack of concentration
- Jumbled thought formation
- Drowsiness
- Mood changes
- Red bloodshot eyes
 - Formerly Reddened Conjunctiva
- Flecks of green vegetation or burnt residue in the mouth





Signs and Symptoms observed during personal contact

- Difficulty with balance
- Difficulty in thinking and problem solving
- Slow reaction time
- Difficulty in registering, processing, and using information
- Fatigue, sleepiness, lethargy, memory problems
- Concentration and sustained attention/vigilance
- Loss of peripheral vision



WITH
MARIJUANA

“Generally” Pupils should be dilated with recent marijuana use.

however.....

Some chronic users pupils will not dilate.

USE DEMONSTRATIVES!



Horizontal Gaze Nystagmus Mental Impairment

Difficulty keeping head still

Reminded multiple times to follow stimulus

Body tremors

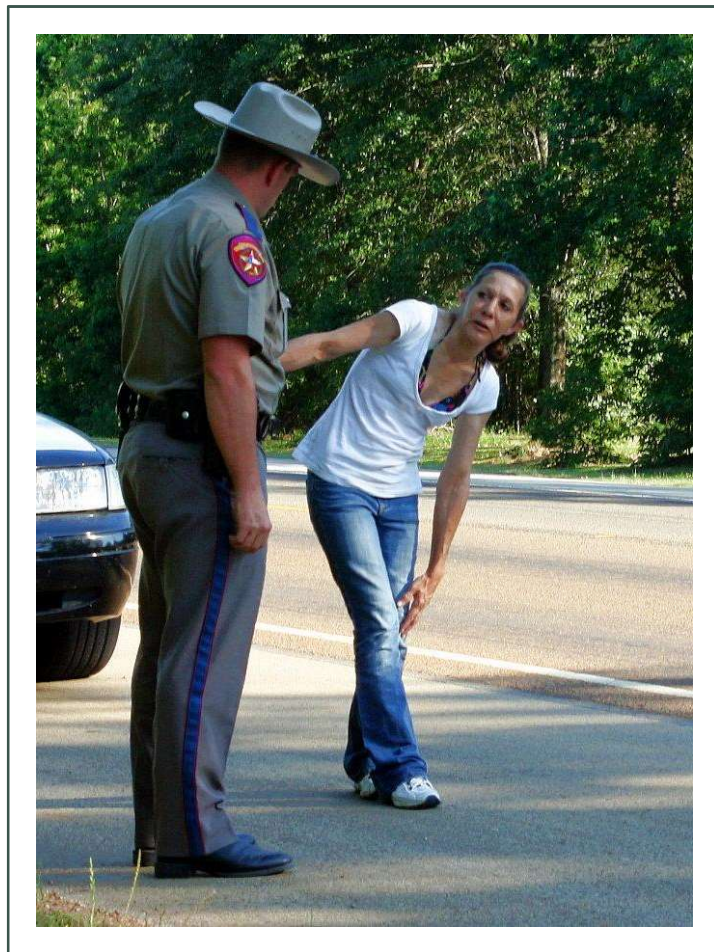
Forgetting to maintain, or relaxing from the instruction position.

If the only substance that is impairing the person is marijuana you may see some movements in the eye while looking for HGN but this movement is not HGN.

Walk and Turn

Mental Impairment

- Needs reminding to maintain the instruction position.
- Needs reminding to watch feet/count steps out loud.
- Forgets how many steps to take/when to do the turn.
- Needs Officer to repeat the instructions.
- Unresponsive or slow to respond to corrective instructions.
- Inappropriate affect



One Leg Stand

Mental Impairment

Leg tremors

Forgets to look at foot

Mistakes in counting

Need to repeat instructions

Unresponsive, or slow to respond to corrective instructions

Inappropriate affect

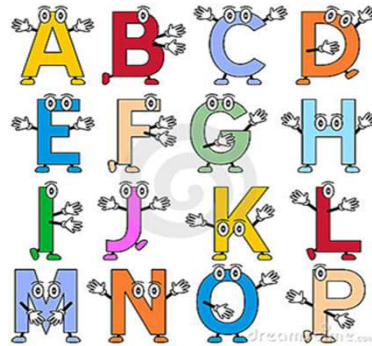


Additional Tests

- Lack of Convergence
- Modified Romberg
- Finger to Nose
- Alphabet
- Counting

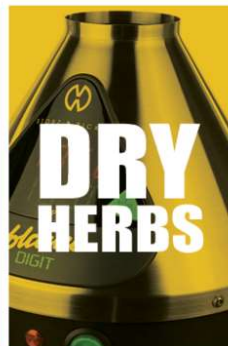



The finger-to-nose test.



Questions to ask during your investigation...

- Have you used any marijuana or marijuana products?
 - What did you use to smoke or vaporize it?
 - Dabs? Budder? Shatter? Oil?
 - Did you consume any edibles? How much? When?
 - Sativa, Indica, or Hybrid???
 - Why do you use it?





Additional questions to ask...

- What's the name of the cannabis you used?
 - What type of cannabis is it?
 - What kind do you like?
 - What's the THC level?
- Describe the high you feel?
- Based on a scale of 1-10, 1 being completely sober and 10 being as stoned as you have ever been, what would you rate yourself right now? Rate weed?
- Do you think you're safe to drive?

