Driving High, the Emerging DUI

The Role of Drug Recognition Experts

DRE Cannabis Case Study

Chuck Hayes

International Association of Chiefs of Police

Western Region DEC Program Project Manager

Drug Impaired Driving

- Creating many challenges
- Underestimated
- Understanding and recognizing impairment is critical
- Increased roadside detection training needed
- MJ legalization equating to more impaired drivers

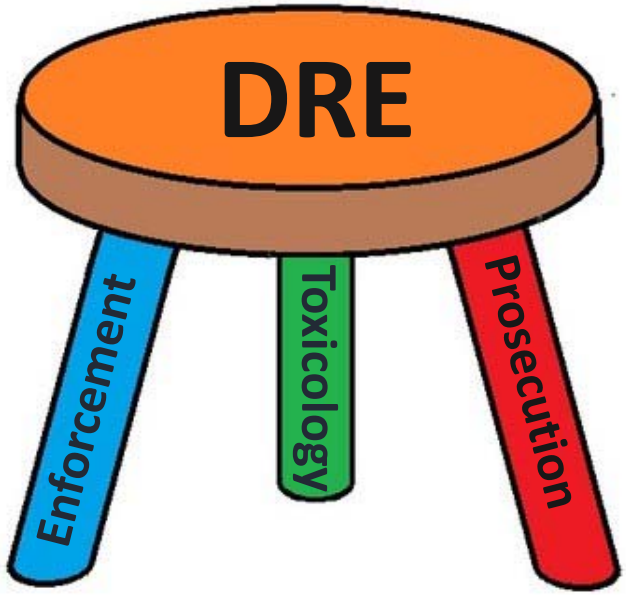
Impaired Driving Countermeasures

Standardized Field Sobriety Testing (SFST)
"The Foundation"

Advanced Roadside Impaired Driving Enforcement (ARIDE) – *"Intermediate Level"*

Drug Recognition Expert (DRE) – *"Advanced Level"*

Combatting DUID – A Teamwork Approach



Drug Evaluation Classification (DEC) Program

- ✓ NHTSA / IACP program
- ✓ All 50 states plus DC in the program
- ✓ Over 8,000 DREs nationally
- ✓ Over 1,500 in Canada

Drug Recognition Expert

- ✓ Highly trained officer that provides expertise and assistance in drug-impaired driving investigations
- ✓ Provides “Post-Arrest” investigation assistance
- ✓ Requested when impairment is not consistent with BAC

The DRE Protocol

Standardized and systematic method of examining a DUID suspect to determine:

(1) Whether or not the suspect is impaired; if so,

(2) Whether impairment is related to drugs or a medical condition; and if drugs,

(3) What category(s) of drugs are the likely cause of the impairment

Drug Categories Predicted by DREs

(2018 National Enforcement Evaluations)

1. Cannabis – 13,215
2. CNS Stimulants – 11,716
3. Narcotic Analgesics – 9,502
4. CNS Depressants – 8,730

13,230 (42%) of all DRE enforcement evaluations, DRE predicted poly-drugs

36% of all evaluations with toxicology results were positive for poly-drugs

Source: 2018 DEC Program State Coordinator Annual Reports

DUI Cannabis – It's Complicated

DUI Alcohol

Alcohol is alcohol

Established impairment levels

Impairment indicators well established

Known effects on driving

Crash risk well established

DUI Cannabis

MJ – Complex drug

Impairment levels vary

Impairment indicators vary

Effects on driving debated

Crash risk varies/unknown

"Drug Recognition Expert (DRE) Examination Characteristics of Cannabis Impairment"

Hartman, Richman, Hayes, and Huestis,
Accident Analysis and Prevention, April 2016


Contents lists available at ScienceDirect

Accident Analysis and Prevention

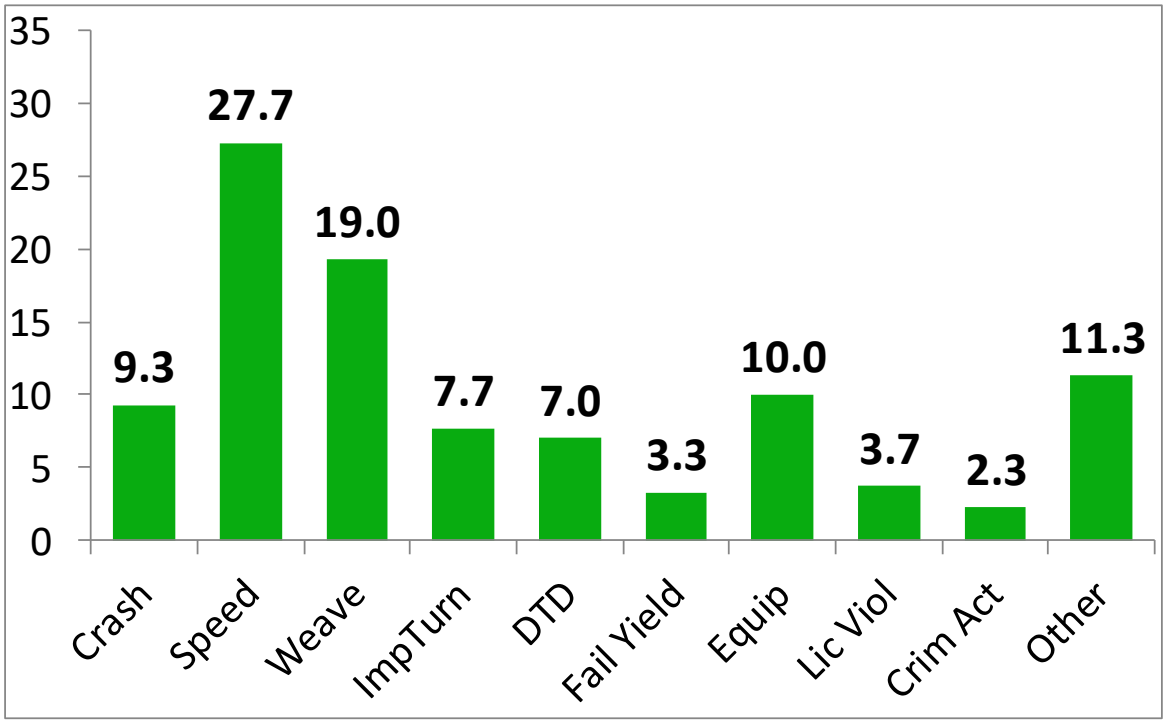
journal homepage: www.elsevier.com/locate/aap

Drug Recognition Expert (DRE) examination characteristics of cannabis impairment

Rebecca L. Hartman[a], Jack E. Richman[b], Charles E. Hayes[c], Marilyn A. Huestis[a,*]

"302 DRE Cannabis Case Study"

Reason for the Traffic Stop Results



72% of the cases involved one or more moving violation

Eye Indicators – Cannabis Impaired Cases

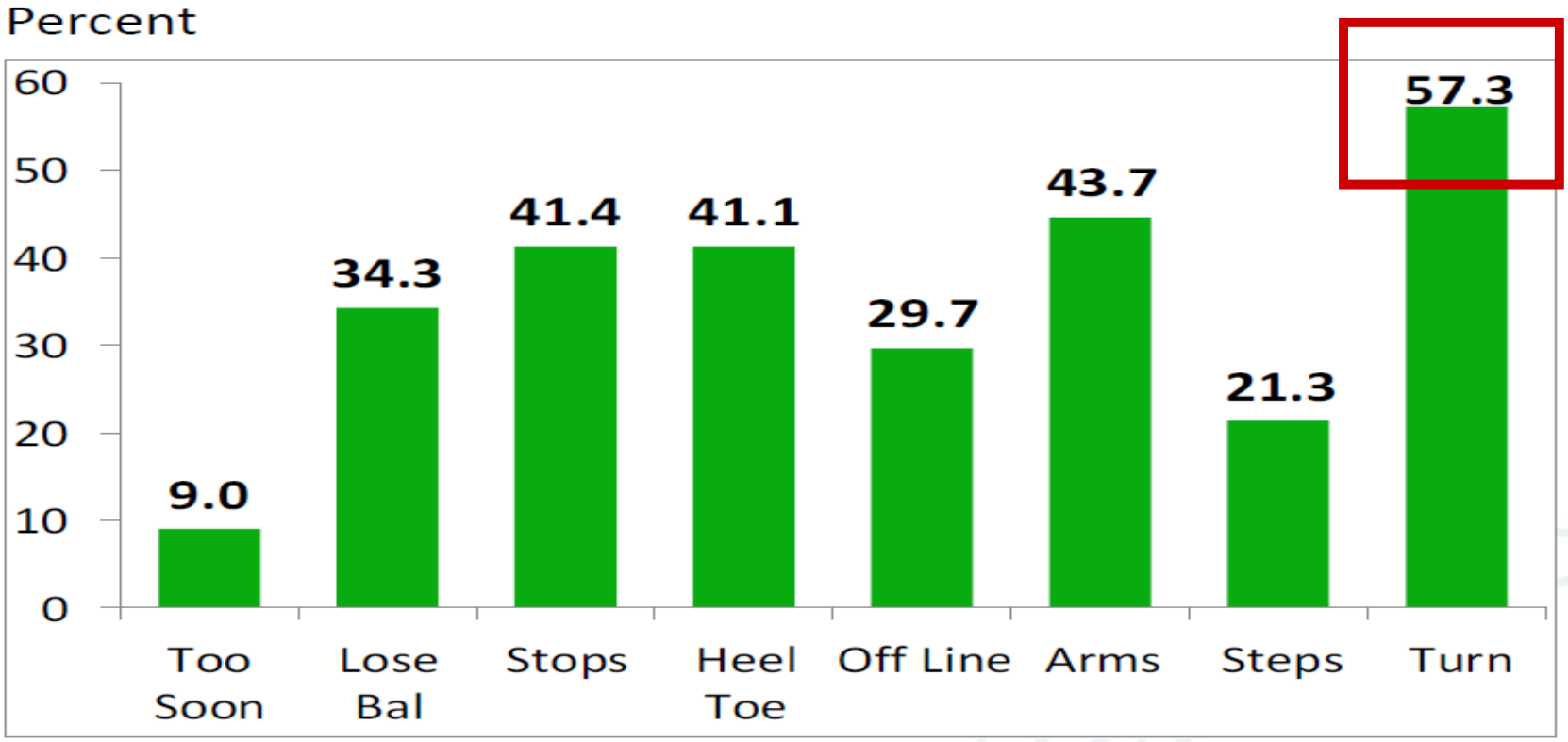
Horizontal Gaze Nystagmus:

- Observed in less 3% of cases

Vertical Gaze Nystagmus:

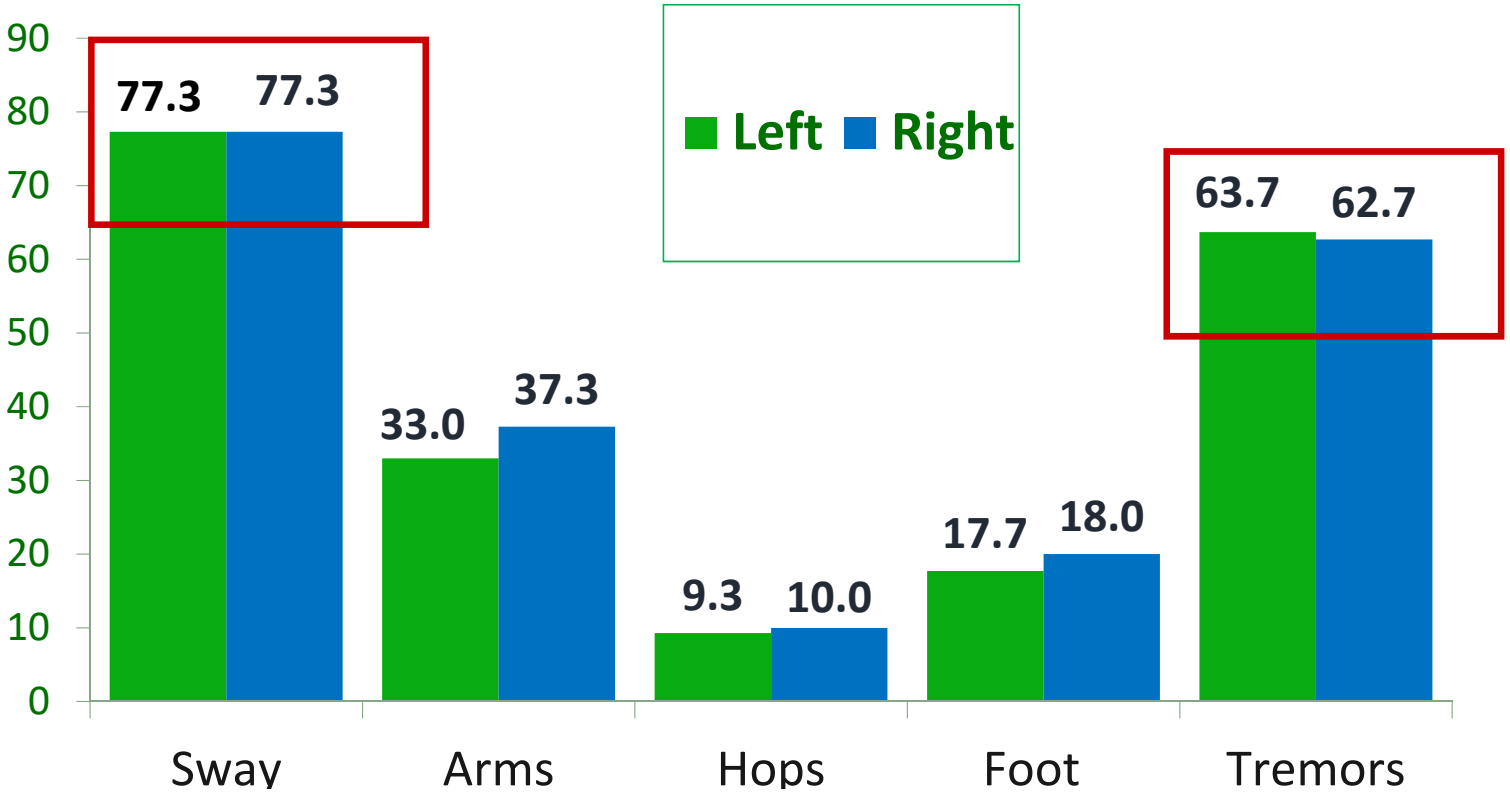
- Not observed in confirmed or control cases

Walk and Turn Test Clues



Average: 3 clues (Out of 8) **Control Cases: Average - 0 Clues**

OLS Clues/Observations



DRE Observations Reported

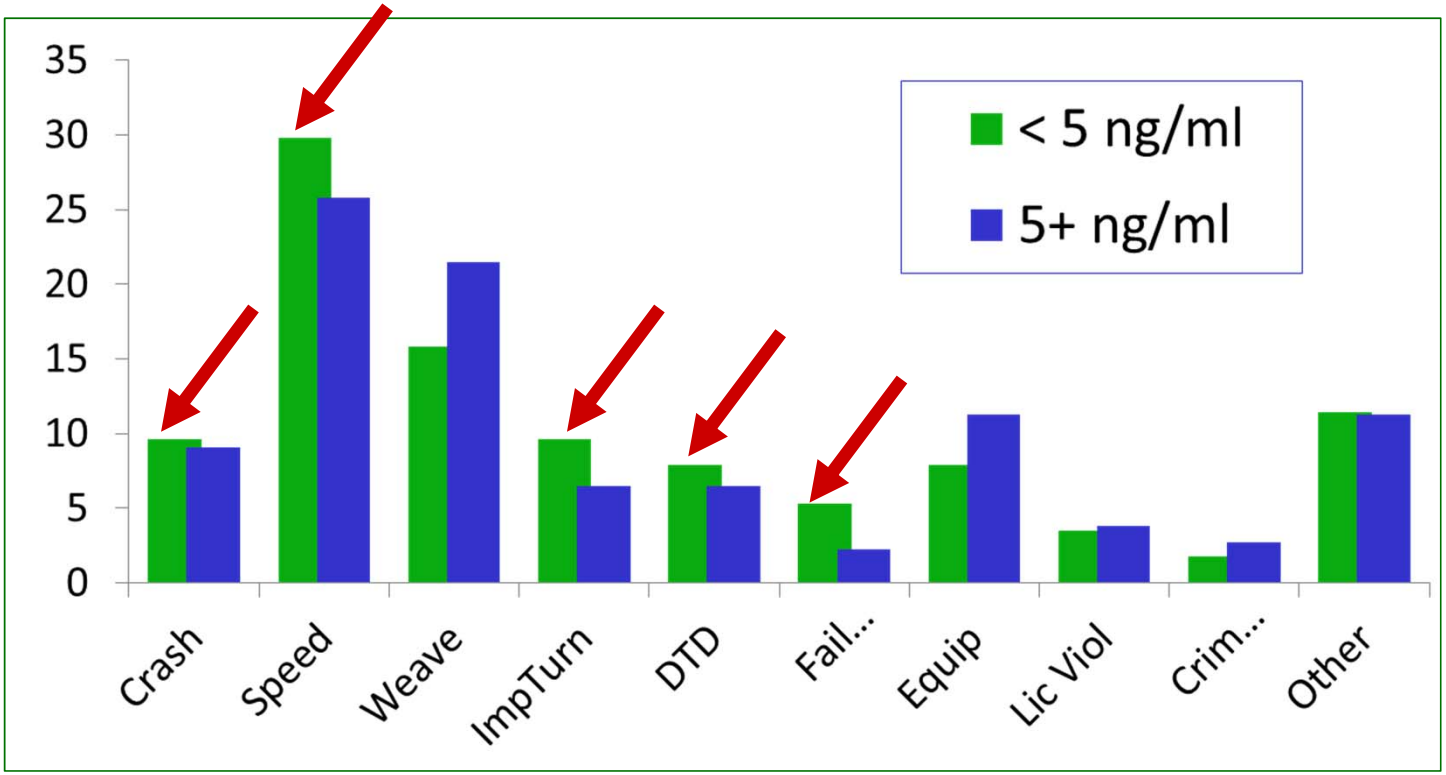
Common indicators/observations:

- ✓Slow, lethargic movements
- ✓Difficulty with concentration
- ✓Difficulty following instructions
- ✓Greenish coating on tongue
- ✓Raised taste buds on tongue
- ✓Dry mouth

302 Case Study Blood Level Results

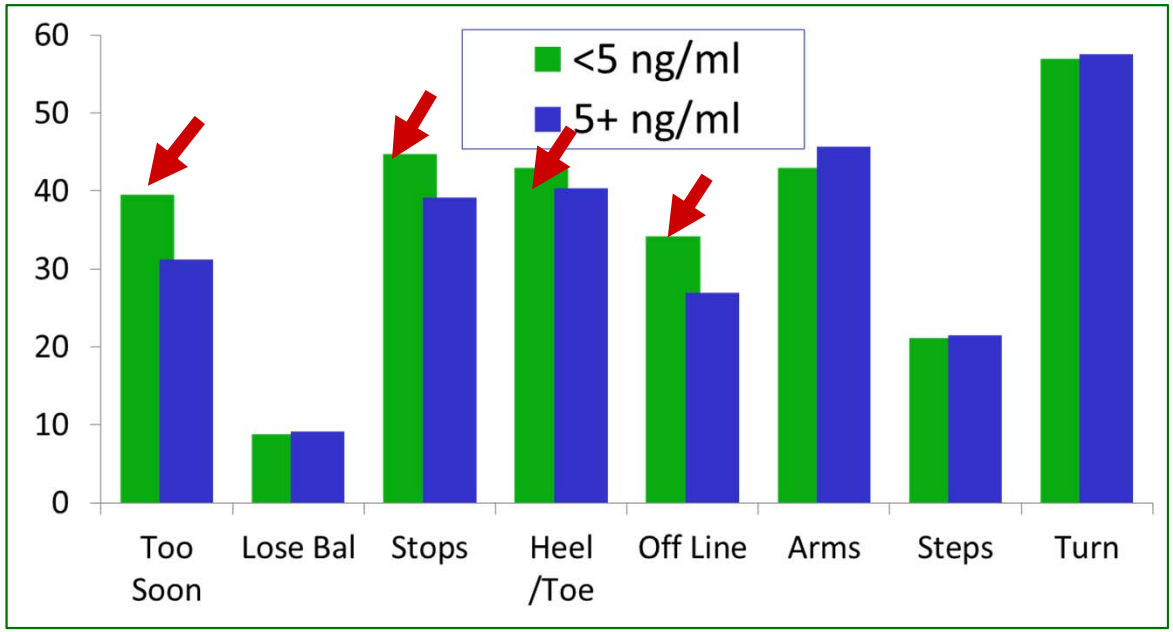
Above – Below
5 ng/mL THC
Observations/Indicators

Traffic Stop: Below/Above 5 ng/mL THC



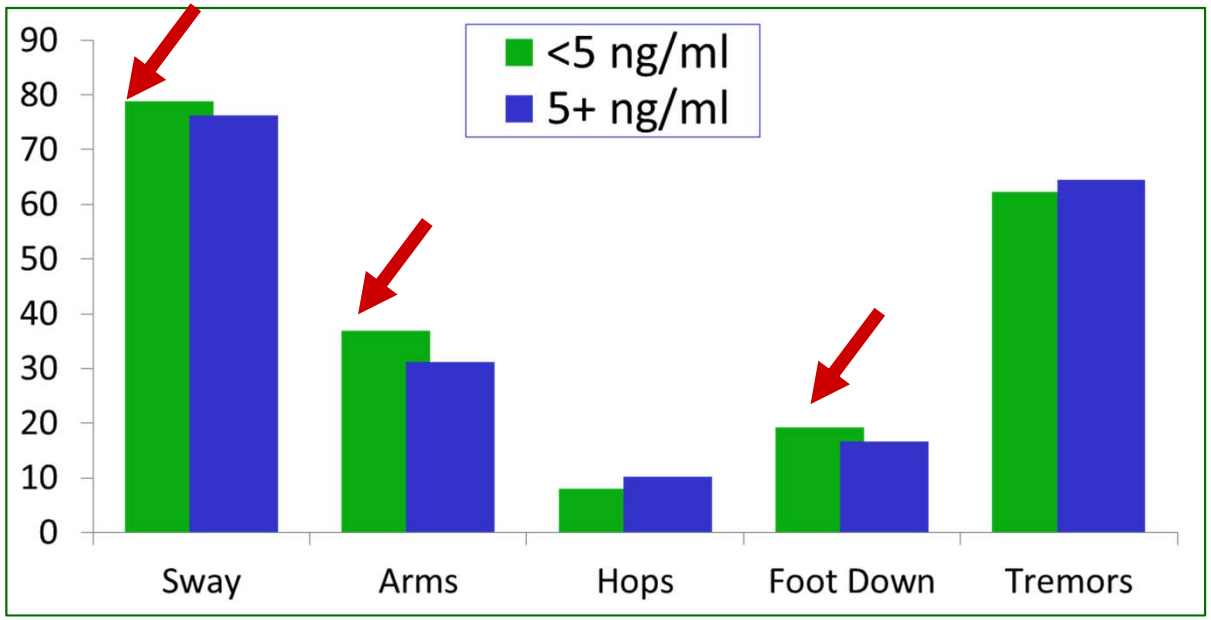
Five reasons occurred more frequently in below 5 ng/mL cases

W&T Clues: Below/Above 5 ng/mL THC



Four clues occurred more frequently in below 5 ng/mL THC cases

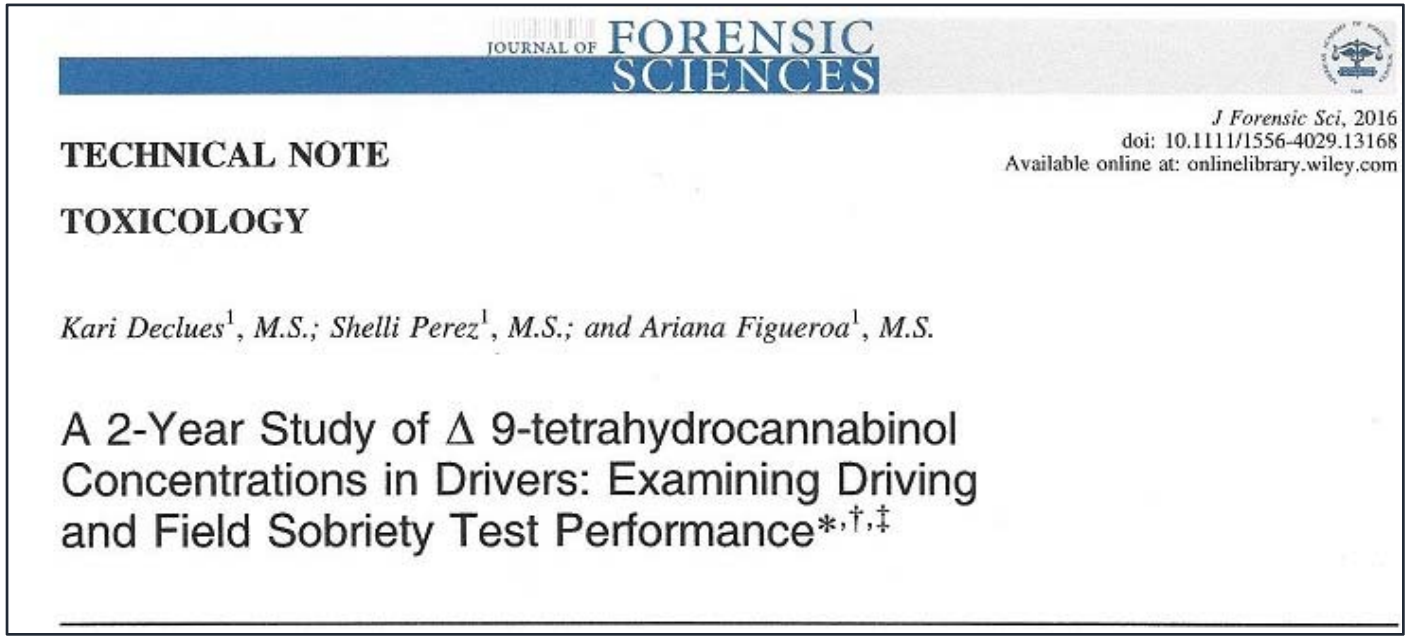
OLS Clues: Above/Below 5 ng/mL THC



Three clues occurred more frequently in below 5 ng/mL THC cases

302 DRE Cannabis Case Study Conclusions

- ✓ Combined observations on psychophysical and eye examinations produced best indicators of impairment
- ✓ Observed impairment indicators support SFST, ARIDE & DRE
- ✓ No significant differences impairment indicators between <5 and >5 ng/mL THC blood level cases



JOURNAL OF FORENSIC SCIENCES

J Forensic Sci, 2016
doi: 10.1111/1556-4029.13168
Available online at: onlinelibrary.wiley.com

TECHNICAL NOTE

TOXICOLOGY

Kari Declues[1], *M.S.; Shelli Perez*[1], *M.S.; and Ariana Figueroa*[1], *M.S.*

A 2-Year Study of Δ 9-tetrahydrocannabinol Concentrations in Drivers: Examining Driving and Field Sobriety Test Performance*,†,‡

- Determined sensitivity of DRE and non-DRE psychophysical tests in identifying MJ impairment
- Identified the most common driving indicators for the evaluated drivers
- Used 363 California DRE and non-DRE DUI-Cannabis cases (116 DRE drug influence evaluations)

Driving Indicators – CA Two-Year Study

1. Speeding - 24%
2. Unable to maintain lane position (SDLP) - 23%
3. Disobeyed traffic sign/signal - 13%
4. Unsafe lane change - 8.7%
5. Crash - 8.3%
6. Driving too slow - 6.7%
7. Driving without headlights - 5.6%

Our Challenges

Increased roadside detection training for police officers

368 ARIDE classes scheduled in 2019

+

Increased DRE trained police officers

86 DRE Schools scheduled in 2019

=

Toxicology testing and reporting backlog

Thank you!

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Oral Fluid Testing in Toxicology

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Assistant Professor and Director of Graduate Programs

Department of Forensic Science, Sam Houston State University

soft-tox.org/oral-fluid-faq

Society of Forensic Toxicologists, Inc.

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ORAL FLUID FAQ

In response to the increase in interest of the use of oral fluid in DUID casework the SOFT/AAFS Drugs and Driving Committee created an Oral Fluid Subcommittee in 2013. The Subcommittee has compiled a Frequently Asked Questions (FAQ) document to provide answers to some of the common questions that arise when considering oral fluid testing. You may email the Subcommittee Chair, Dr. Christine Moore, at CMoore@immunalysis.com with any questions regarding the FAQ.

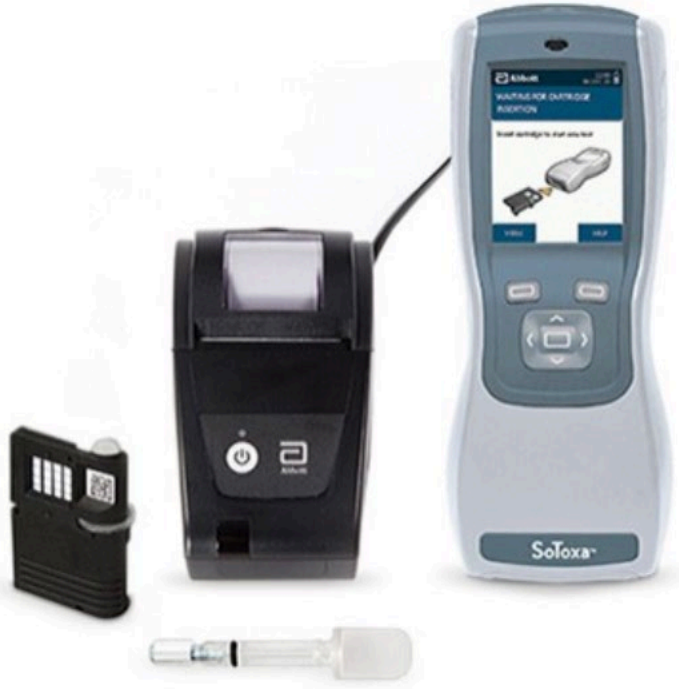
Click here to download the Oral Fluid Subcommittee's FAQ on Oral Fluid testing

Oral Fluid Drug Testing

Roadside Screening (Probable Cause)

Confirmation (Evidentiary)

Roadside or POCT Devices



Specification Comparison

	Alere SoToxa	Draeger DT5000	Randox MultiSTAT
Time to complete (min)	5	10	17
Size	Small	Medium	Large
Number of targets	6	7	21

Cutoffs (ng/mL)

Target	Alere SoToxa	Draeger DT5000	Randox MultiSTAT
Cocaine	**30**	**20**	**20**
THC	**25**	**5**	**10**
Opiates	**40**	**20**	**10**
Benzodiazepine	**20**	**15**	**20**
Methamphetamine	**50**	**35**	**50**
Amphetamine	**50**	**50**	**50**
Methadone	**NA**	**20**	**4**

Oral Fluid Screening Device Comparison

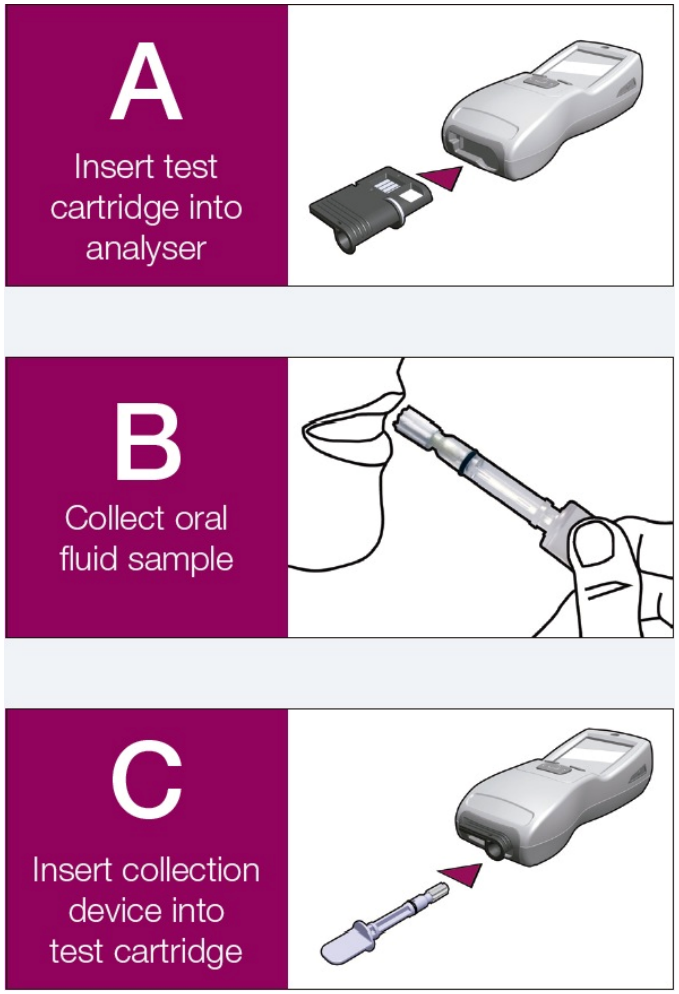
Alere SoToxa

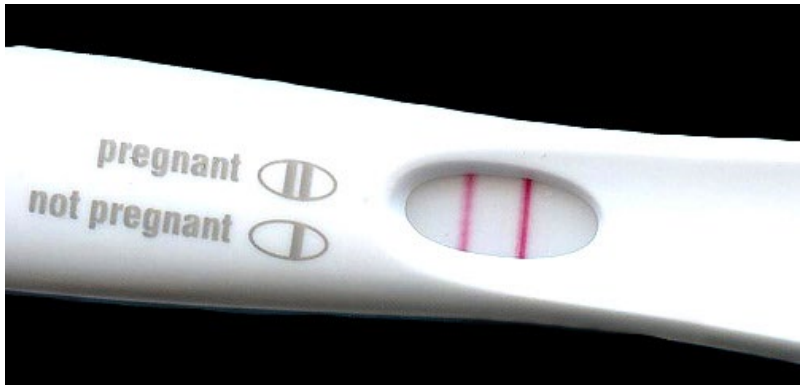
- Lateral Flow Immunoassay
- Handheld Device
- Automated Operation
- Electronic Readout
- Printout
- Six Drug Panels
  - Amphetamine, Benzodiazepines, Cocaine, Methamphetamine, Opiates, THC

Dräger Drug Test 5000

- Lateral Flow Immunoassay
- Portable Device
- Automated Operation
- Electronic Readout
- Printout
- Seven Drug Panels
  - Amphetamine, Benzodiazepines, Cocaine, **Methadone**, Methamphetamine, Opiates, THC

How Does It Work?





- Lateral flow device

Specimen Comparison: Window of Detection

Applications, advantages, disadvantages

Current Drug Testing Approaches

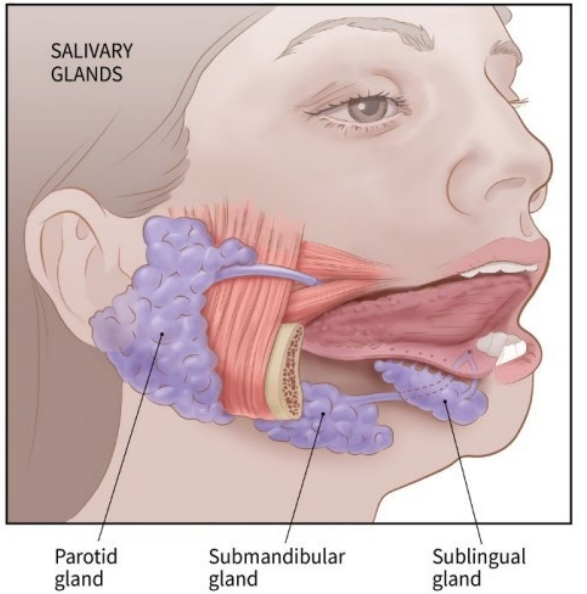
- Blood
  - Closest relationship to brain concentrations
  - Targeting parent drug for detection
  - Invasive collection
    - No on-site capability
  - Time delay for collection
  - Limited detection window

Current Drug Testing Approaches

- Urine
  - No relationship to brain concentrations
  - No relationship between urine concentration and effect
  - Targeting metabolites for detection
  - Relatively non-invasive collection
    - Limited on-site capability
  - Time delay for collection
  - Broad detection window

Oral Fluid 101

- Saliva
  - Major glands: submandibular, parotid, sublingual
- Production: 500-1,500 mL/day
- Salivary Composition
  - Water (99.5%), enzymes, electrolytes, mucus, Epithelial cells, bacterial cells
- Oral Fluid Composition
  - Composite mixture of saliva, gingival crevicular fluid, buccal and mucosal transudates, cellular debris, bacteria, and residues of ingested products (e.g. food, drugs).



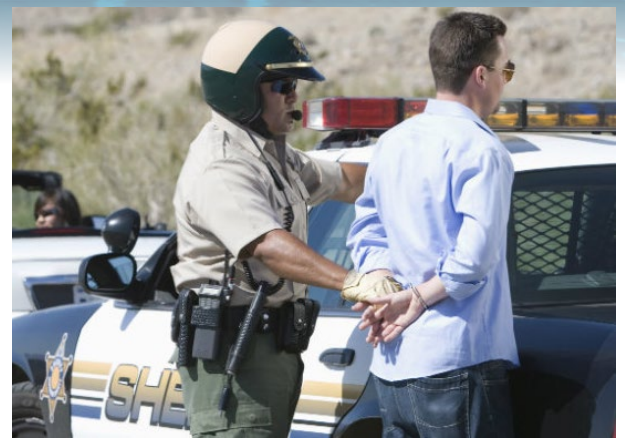
Oral Fluid 101: Role of Saliva

- Moistening food as we chew, taste, swallow.
- Enzyme amylase: breaks down select starches into maltose and dextrin, initiates fat breakdown, and starts digestion
- Fights germs in your mouth and prevents bad breath.
- Saliva's calcium and phosphate content restores those leached substances to tooth enamel, prevents tooth decay & gum disease.
- Right before a person vomits, the brain signals the salivary glands to increase saliva secretion.
- This decreases oral acidity, protecting the mucosa and teeth from acidic emesis.

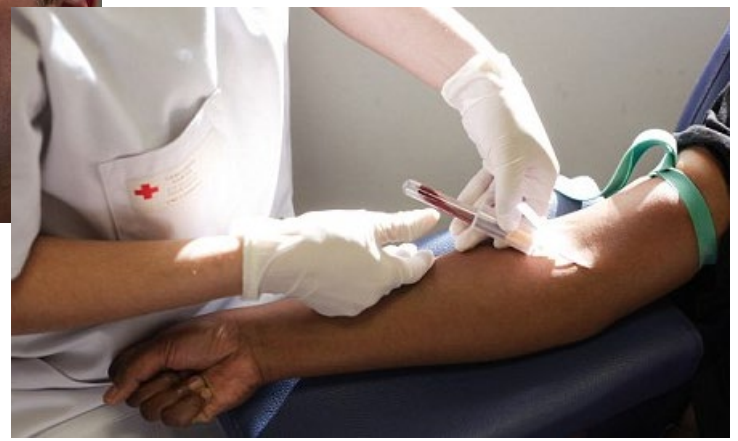
Benefits of OF Testing

- Rapid, simple, non-invasive
- No medical professional required, saves time, $
- On-site screening devices are available
- Difficult to adulterate, same-sex observed collection not req'd
- Parent drug &/or metabolites reflects recent drug use
- Most drugs concentrate in OF compared to blood
- Specimen taken proximate to time of driving, crash, workplace accident, etc.

Specimen taken proximate to time of driving: *How close?*



1. Roadside – immediately after arrest
2. Prior to DRE evaluation
3. After DRE evaluation
4. After search warrant, simultaneously with blood at hospital



- Considerations
  - Consent
  - Implied Consent Law
  - Search Warrant
  - Case Law
  - Discuss with your TSRP

How long for drugs to appear in OF?

- Bottom Line: Onset depends on Route of Administration
- Routes
  - Smoke, inhaled, snorted, or taken as edibles – appear rapidly in OF
    - Buccal cavity contamination/**contribution/ coating**
  - Oral Capsules – generally do not contaminate oral mucosa
  - IV (detected within minutes, e.g. Cocaine)
- Chemistry matters
  - Acidic, neutral, or lipophilic drugs may not be readily detectable in OF

Limitations of OF Testing

- Salivation decreases after stimulant, opioid, MJ use, potentially extending time req'd for obtaining adequate specimen volume
- Some drugs do not partition well into OF, creating detection challenges
  - Benzodiazepines (Xanax, Valium)
- Total OF-elution buffer volume (2-4 mL)
  - Typically low and may restrict number of confirmatory tests
- Roadside devices do not typically allow confirmation testing of the same specimen that is screened
- OF testing is not currently common to most forensic labs
  - Proper instrumentation, Method development and validation

Is OF testing reliable and valid?

- Multiple published studies:
  - (1) Reliability of field OF drug on-site screening devices
    - Manufacturers' instructions
    - Operators must be fully trained
  - (2) Laboratory confirmatory methods for drugs in OF
- Generally accepted analytical techniques
- Proper cutoffs and scope of analysis
- Validated
- Proper controls

Does a 2nd specimen need to be collected?

- Yes. Roadside field testing devices - Immunoassay-based & require an independent confirmatory test
- OF roadside screening devices establish probable cause, but the collection of a second evidentiary specimen in required
- OF specimen collected as the evidential specimen proximate to the time of driving, or suspected impairment
  - Rapid decline in drug blood concs
  - Time required to collect a blood specimen can inhibit the ability to obtain a confirmation in a sample collected later in the process

Confirmatory Samples

- Confirmation specimens should be collected in appropriate tubes/devices
  - Mechanisms for demonstrating adequate volume
    - Color change
    - Other volume indicators
- Avoid extreme temperature for an extended time period
- Best practice to collect an OF confirmation specimen?
  1. Passive (preferred)
  2. Stimulated
  3. Expectorant

Are drugs stable in OF?

- Factors:
  - Drug
  - Collection device
  - Elution buffer
  - Storage conditions
- Timely analysis of OF sample due to instability of some target drugs
- OF collection device manufacturers should provide specific storage instructions and stability data

Is there a recommended deprivation period?

- Yes – 10 minute.
- Without food, drink, smoking
- Reduced risk of interference from potentially inhibiting substances
- Deprivation v. Observation

What about passive exposure to cannabis?

- Possibly; several studies showed THC to be present in OF of individuals passively exposed to environments with high levels of cannabis smoke.
- Let's review the studies.
  - Niedbala & Cone. JAT. (2004).
  - Niedbala & Cone. JAT. (2005).
  - Cone. JAT. (2015).
- Consider the following:
  - Severe, intentional exposure, …realistic?
  - Detection times and cutoffs/LODs
  - Are these individual impaired?

What about passive exposure to cannabis?

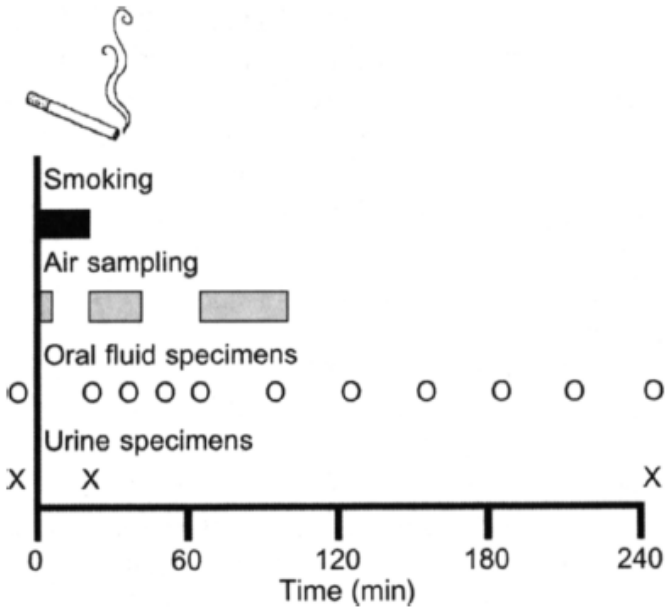


Figure 1. Time line of smoking cannabis, air sampling, and collection of oral fluid and urine specimens from active cannabis smokers and passive subjects. Specimen collection times are based on the start of cannabis smoking.

Table II. GC–MS–MS and EIA Results for THC in Oral Fluid and for THCCOOH in Urine of Four Passive Subjects in the Presence of Five Cannabis Smokers*

	Passive #1		Passive #2		Passive #3		Passive #4		Mean (*N* = 4)	
Minutes‡	OF† GC–MS–MS (ng/mL) (EIA)	Urine GC–MS–MS (ng/mL) (EIA)	OF GC–MS–MS (ng/mL) (EIA)	Urine GC–MS–MS (ng/mL) (EIA)	OF GC–MS–MS (ng/mL) (EIA)	Urine GC–MS–MS (ng/mL) (EIA)	OF GC–MS–MS (ng/mL) (EIA)	Urine GC–MS–MS (ng/mL) (EIA)	OF GC–MS–MS (ng/mL) (SEM)	Urine GC–MS–MS (ng/mL) (SEM)
–5 (–25)	0 (–)	0 (–)	0 (–)	0 (–)	0 (–)	0 (–)	QNS (–)	0 (–)	0 (0)	0 (0)
20 (0)	6.3 (+)	0 (–)	8.4 (+)	0 (–)	12.3 (+)	0 (–)	26.4 (+)	0 (–)	13.4 (3.9)	0 (0)
35 (15)	0 (–)	NS	6.9 (+)	NS	5.1 (+)	NS	7.2 (+)	NS	4.8 (1.4)	NS
50 (30)	0 (–)	NS	0 (–)	NS	3.6 (+)	NS	4.2 (–)	NS	2.0 (1.0)	NS
65 (45)	0 (–)	NS	0 (–)	NS	0 (–)	NS	1.1 (–)	NS	0.3 (0.2)	NS
95 (75)	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (0)	NS
125 (105)	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (0)	NS
155 (135)	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (0)	NS
185 (165)	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (0)	NS
215 (195)	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (–)	NS	0 (0)	NS
245 (225)	0 (–)	0 (–)	0 (–)	0 (–)	0 (–)	3.4 (–)	0 (–)	0 (–)	0 (0)	0.9 (0.7)

* EIA results are shown in parentheses. The EIA cutoff concentrations were 3 ng/mL for oral fluid and 50 ng/mL for urine. The GC–MS–MS LOQ/LOD for THC was 0.75 ng/mL and for THCCOOH was 1.0 ng/mL. Oral fluid concentrations are multiplied ×3 to correct to neat oral fluid.
† Abbreviations: OF, oral fluid; SEM, standard error of the mean; –, negative; +, positive; NS, no sample; and QNS, quantity not sufficient.
‡ Timed from start of smoking. Time shown in parentheses indicates time following cessation of cannabis smoking.

Niedbala & Cone. JAT. (2004).

Should labs do quantitative testing in OF?

The 3 No-no's

1. For many drugs, particularly when smoked, vaped or snorted, OF drug concs do not predict concurrent blood drug concs
2. Not recommended to estimate drug concs in whole blood from OF drug concs or vice versa
3. Not possible to correlate a quantitative drug conc. in OF, blood or urine directly to degree of impairment

For these reasons….

OF Testing Recommendations

Recommended practice:

- Qualitative (present or negative) methods recommended since there is not a direct correlation b/t concs in OF and blood in most cases due to a variety of factors
  - Oral cavity coating from recent use, unknown exact volume of confirmation fluid specimen, individual variability in PK and PD
- Quantitative measurement of drug concs for research purpose
  - Developing a better understanding of typical OF drug concs in various populations
  - Helps with the development of screening devices with the appropriate sensitivity

Applications

- Pain Management
- Workplace Drug Testing
- DUID

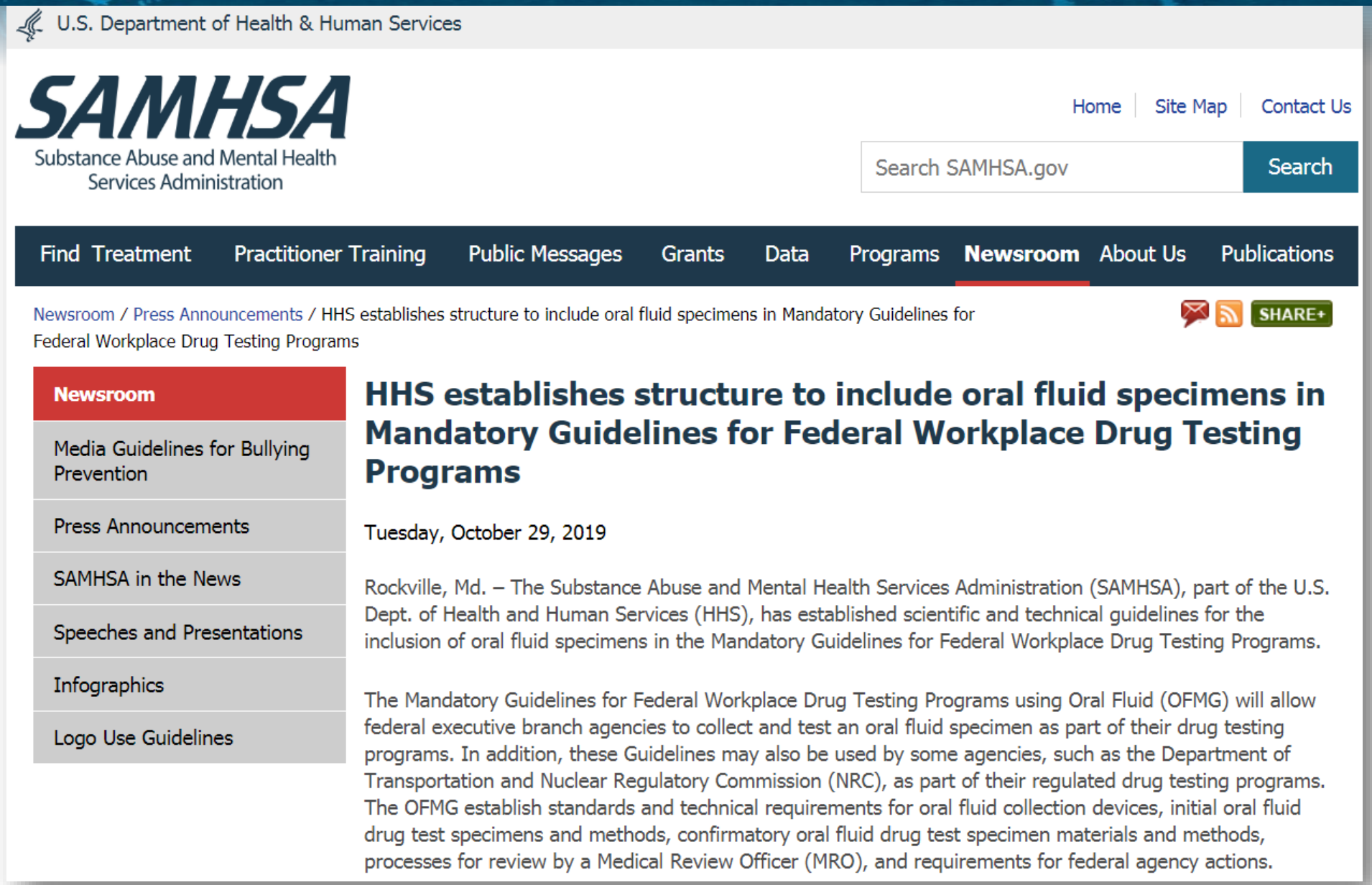
OF and Pain Management

- Analytical challenge due to limited specimen volume & large number of drugs to test
- OF produces comparable results to urine tests
  - Except lower detection rates for hydromorphone, oxymorphone & benzodiazepines in OF compared to urine
- Cost of OF analysis is predicted to continue to decline
- Integrity of OF test more reliable than urine due to observed collection
- OF more reliable in detecting 6-AM
- OF levels similar to blood following IV abuse, but may be substantially higher than blood following smoking
- Urine contains high analyte concentration & longer detection, but interpretation limited to past exposure & highly susceptible to adulteration
- Greater proportions of parent drugs in OF than urine & a hydrolysis step often needed for urine may not be needed for OF

OF and Pain Management

- Clinicians should avoid predicting plasma drug levels from OF
  - Inter- & intra-person variabilities
  - Physiological conditions
  - Dosing regimen
  - Sample collection process
  - Drug recovery from collection devices
  - Collected oral fluid volume
  - Drug stability
- OF testing should be used in conjunction with other established strategies such as pill count, patient self-report, responsible prescription practice, & risk assessment

OF and Workplace Drug Testing



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Newsroom / Press Announcements / HHS establishes structure to include oral fluid specimens in Mandatory Guidelines for Federal Workplace Drug Testing Programs

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HHS establishes structure to include oral fluid specimens in Mandatory Guidelines for Federal Workplace Drug Testing Programs

Tuesday, October 29, 2019

Rockville, Md. – The Substance Abuse and Mental Health Services Administration (SAMHSA), part of the U.S. Dept. of Health and Human Services (HHS), has established scientific and technical guidelines for the inclusion of oral fluid specimens in the Mandatory Guidelines for Federal Workplace Drug Testing Programs.

The Mandatory Guidelines for Federal Workplace Drug Testing Programs using Oral Fluid (OFMG) will allow federal executive branch agencies to collect and test an oral fluid specimen as part of their drug testing programs. In addition, these Guidelines may also be used by some agencies, such as the Department of Transportation and Nuclear Regulatory Commission (NRC), as part of their regulated drug testing programs. The OFMG establish standards and technical requirements for oral fluid collection devices, initial oral fluid drug test specimens and methods, confirmatory oral fluid drug test specimen materials and methods, processes for review by a Medical Review Officer (MRO), and requirements for federal agency actions.

OF and Workplace Drug Testing

- Split collection (simultaneously or serially)
- Each OF specimen is tested (required) for marijuana and cocaine;
  - Authorized to test for opiates, amphetamines, and phencyclidine
- An initial drug test may be: immunoassay or MS-based
  - Confirmatory must be MS based

SAMHSA OF Cutoffs

Initial Test Analyte	Initial Test Cutoff	Confirmatory Test Analyte	Confirmatory Test Cutoff
Marijuana (THC)	4 ng/mL	THC	2 ng/mL
Cocaine/Benzoylecgonine	15 ng/mL	Cocaine Benzoylecgonine	8 ng/mL 8 ng/mL
Codeine/ Morphine	30 ng/mL	Codeine Morphine	15 ng/mL 15 ng/mL
Hydrocodone/ Hydromorphone	30 ng/mL	Hydrocodone Hydromorphone	15 ng/mL 15 ng/mL
Oxycodone/ Oxymorphone	30 ng/mL	Oxycodone Oxymorphone	15 ng/mL 15 ng/mL
6-Acetylmorphine	4 ng/mL	6-Acetylmorphine	2 ng/mL
Phencyclidine	10 ng/mL	Phencyclidine	10 ng/mL
Amphetamine/ Methamphetamine	50ng/mL	Amphetamine Methamphetamine	25 ng/mL 25 ng/mL
MDMA/ MDA	50 ng/mL	MDMA MDA	25 ng/mL 25 ng/mL

OF and DUID

Journal of Analytical Toxicology, 2017;1–6
doi: 10.1093/jat/bkx082
Article

OXFORD

Article

Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities—2017 Update

Barry K. Logan[1,2,*], Amanda L. D'Orazio[1,3], Amanda L.A. Mohr[1], Jennifer F. Limoges[4], Amy K. Miles[5], Colleen E. Scarneo[6], Sarah Kerrigan[7], Laura J. Liddicoat[1], Karen S. Scott[3], and Marilyn A. Huestis[2,8]

DUID OF Cutoffs

Table II. 2017 Recommended scope and cutoffs in ng/mL for screening and confirmation in blood, urine, and oral fluid for Tier I compounds (all concentrations are in ng/mL)

Drug	Blood		Urine		Oral Fluid	
	Screen	Confirm	Screen	Confirm	Screen	Confirm
DRE category; cannabis						
THC	–	1	–	–	4	2
Carboxy-THC	10	5	20	5	–	–
11-OH-THC	–	1	–	–	–	–
DRE category; CNS stimulants						
Methamphetamine	20	20	200	50	20	20
Amphetamine	20	20	200	50	20	20
Alpha-Hydroxyalprazolam	–	–	–	50	–	–
Clonazepam	–	10	–	50	–	1
7-Aminoclonazepam	–	10	–	50	–	1
Lorazepam	–	10	–	50	–	1
High Dose Benzodiazepines	*50*	–	*100*	–	*5*	–
Diazepam	–	20	–	50	–	1
Nordiazepam	–	20	–	50	–	1
Oxazepam	–	20	–	50	–	1
Temazepam	–	20	–	50	–	1
DRE category; narcotic analgesics						
Codeine*	–	10	–	50	–	5
6-Acetylmorphine	–	5	–	10	–	2
Buprenorphine	1	0.5	5	1	1	0.5
Norbuprenorphine	–	0.5	–	1	–	0.5
Fentanyl	1	0.5	1	0.5	1	0.5
Hydrocodone*	–	10	–	50	–	5
Hydromorphone*	–	5	–	50	–	5
Methadone	50	20	300	50	25	10
Morphine	10	10	200	50	10	5
Oxycodone*	10	10	100	50	10	5
Oxymorphone*	–	5	–	50	10	5
Tramadol	100	50	100	50	50	10
O-desmethyltramadol	–	50	–	50	–	10

Drug	Blood		Urine		Oral Fluid	
	Screen	Confirm	Screen	Confirm	Screen	Confirm
DRE category; cannabis						
THC	–	1	–	–	4	2

Can OF Roadside Screening replace the DRE program

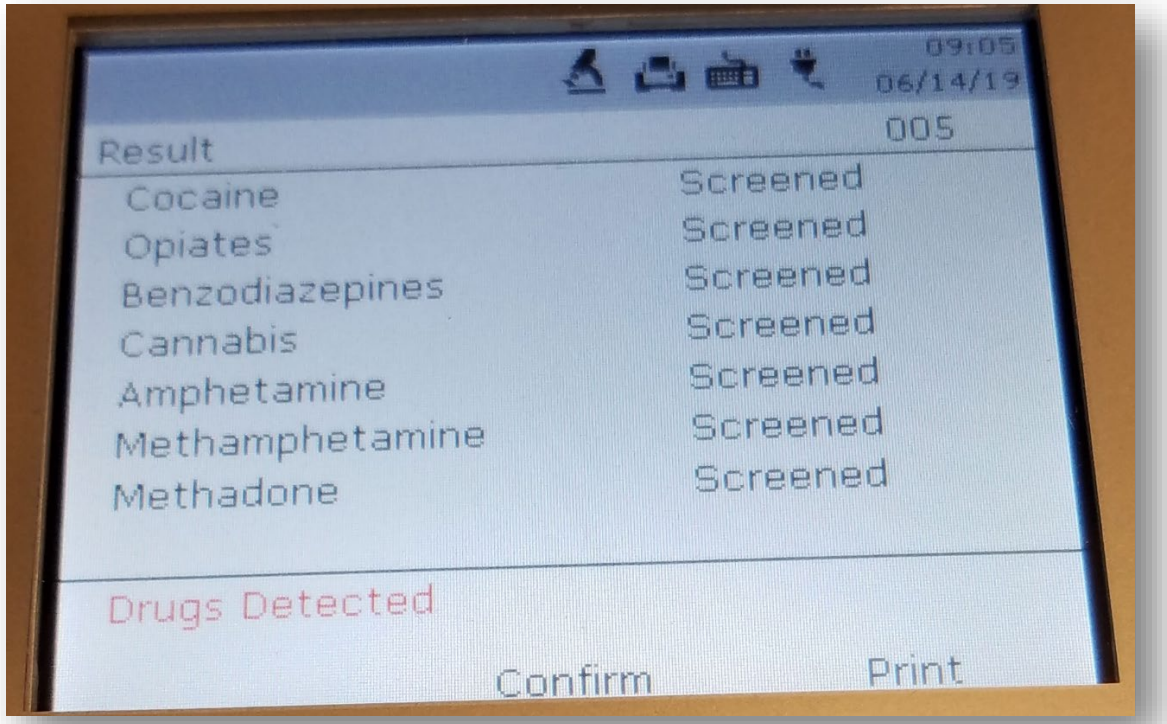
- No, OF testing is test of **drug use** *not* impairment
  - SFSTs, DRE Evaluation, Behavior noted, Poor driving = signs of impairment
- Result can be used to support the DRE officer's opinion about which drug(s) is/are responsible for the observed impairment
- OF drug testing is a tool that assists with DRE investigation, providing real time chemical test info that can be used by the officer in questioning the subject about their drug use
- SFSTs first, followed by the OF field test.

Can OF Roadside Screening replace the DRE program

- Step 11: DRE Opinion, Step 12: Toxicology (OF confirm)
  - Provides objective evidence of cause of impairment
- Current OF field tests do not test for all impairing drug classes:
  - Inhalants, some anticonvulsants, muscle relaxants, antidepressants, sleep medications, antipsychotics
- When a field OF test result is negative and there is objective evidence of impairment, a confirmation sample should be collected and sent to the lab for comprehensive analysis

Anticipated Challenges to OF Drug Testing

- OF conc. correlated to blood conc. and/or impairment?
- Appropriate window of detection?
- Environmental contamination?
- Passive exposure to THC = +OF?
- CBD ingestion = +OF THC?
- Screen creates bias to DRE?



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UNIVERSITY OF WISCONSIN–MADISON

THC Cases
Challenges

Analytical/Toxicology

- Testing capabilities
  - Toxicology vs Drug Chemistry
- “Drug of choice” for many drivers
  - Turn around time
  - Chronic vs novice users

The new ”face” of THC

Vaping

Edibles

Oils

Wax

What does THC on a toxicology report look like for blood?

Delta-9-THC (parent)

- Psychoactive component in THC
- Very short half life

11-Hydroxy-THC (metabolite)

- Equipotent to delta-9-THC at certain concentrations
- Very short half life

Carboxy-THC (metabolite) *Only reported analyte for urine*

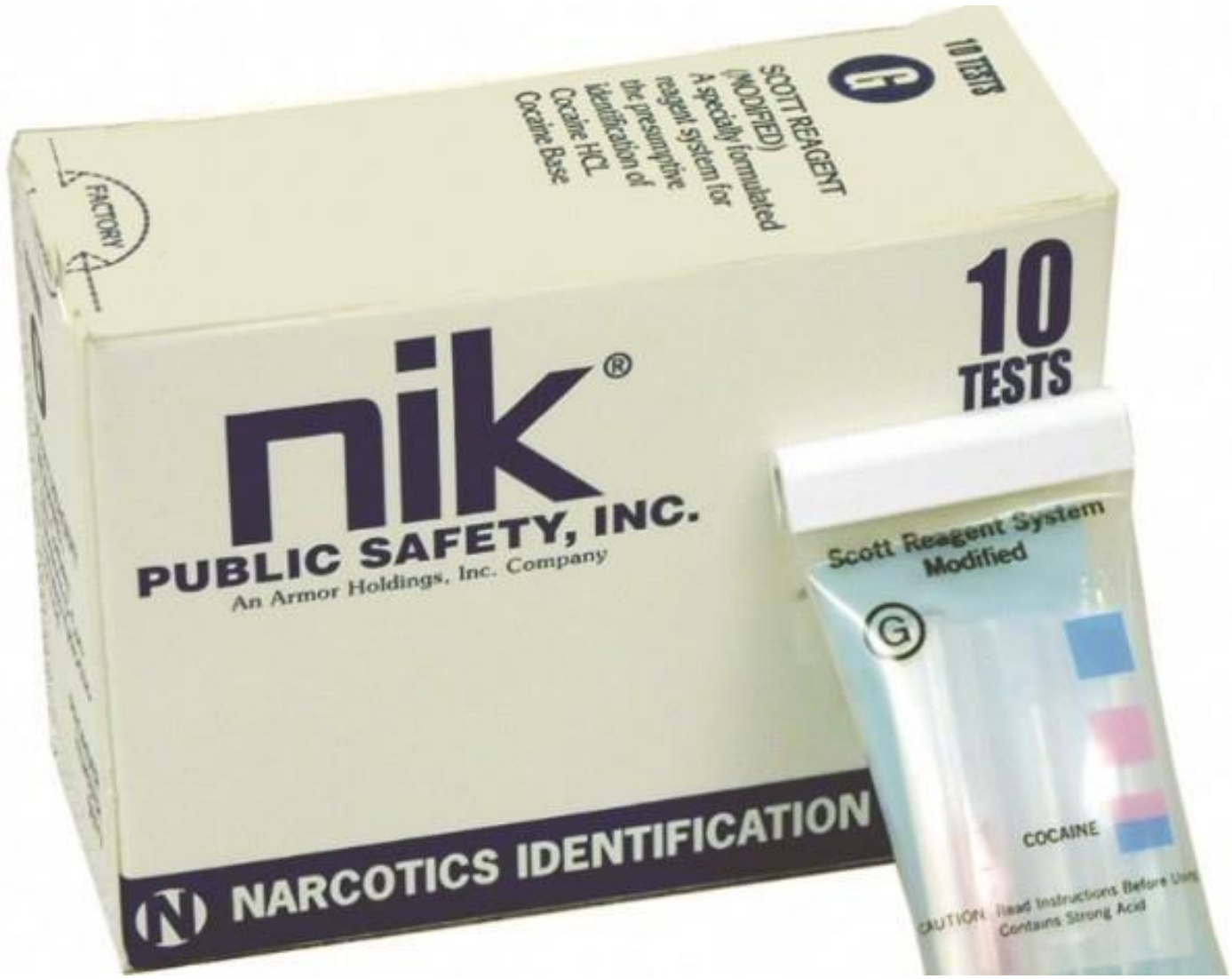
- No psychoactive impairment
- Longer half life

Interpretation of a THC case

- Take into account matrix collected
- Is *per se* a consideration in interpretation?
  - For example: WI – Delta-9-THC = Restricted Controlled Substance (RCS)
    - *Any detectable amount of delta-9-THC in blood*
- The use of DRE and other SFST information during interpretation
- Time from incident to draw is always an issue

CBD and Hemp are *NOT* THC

- Legal CBD and Hemp products are to contain less than 0.3% of THC
  - Truly legal products will not create a detectable amount of delta-9-THC in blood
- Law enforcement field test kits
  - Do not distinguish between CBD and THC
  - Laboratory testing required
- Zero regulation/oversight of products

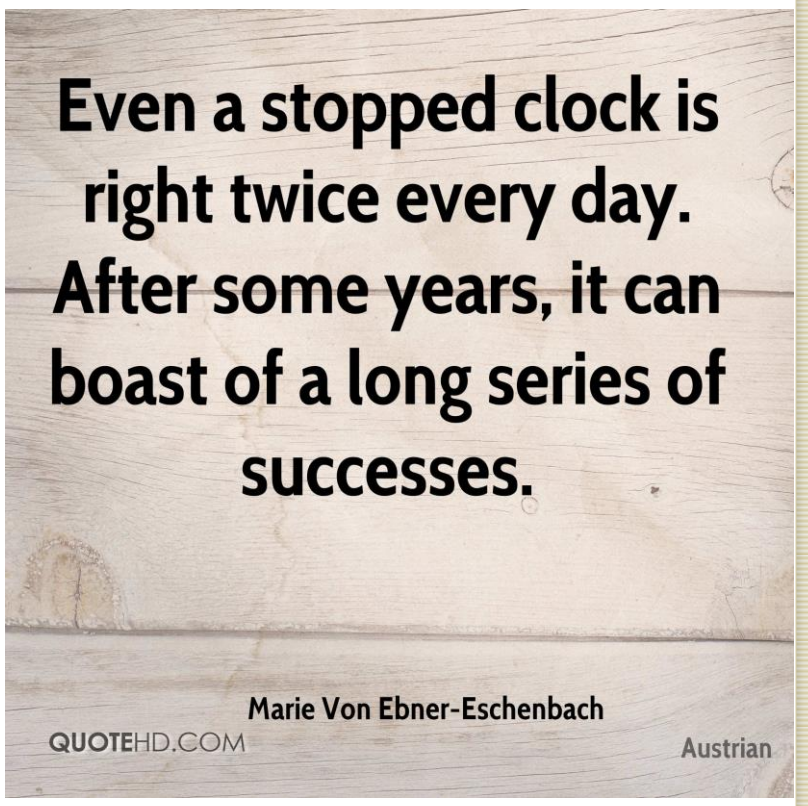

10 TESTS
SCOTT REAGENT
(MODIFIED)
A specially formulated
reagent system for
the presumptive
identification of
Cocaine HCL
Cocaine Base
FACTORY
10
TESTS
nik®
PUBLIC SAFETY, INC.
An Armor Holdings, Inc. Company
NARCOTICS IDENTIFICATION
Scott Reagent System
Modified
COCAINE
CAUTION: Read Instructions Before Using
Contains Strong Acid

Common THC and CBD Questions

- If I spend the weekend in the UP using THC, will I test positive on Monday?
  - Loaded question, many answers
  - Matrix
- If I use CBD, will I test positive on my employer's drug testing panel
  - Matrix
  - Testing type

Common THC and CBD Questions

- Is my CBD product FDA approved?
- I purchase my CBD product from a local retailer who says they test my product. It's safe, right?



Case History

Case History #1

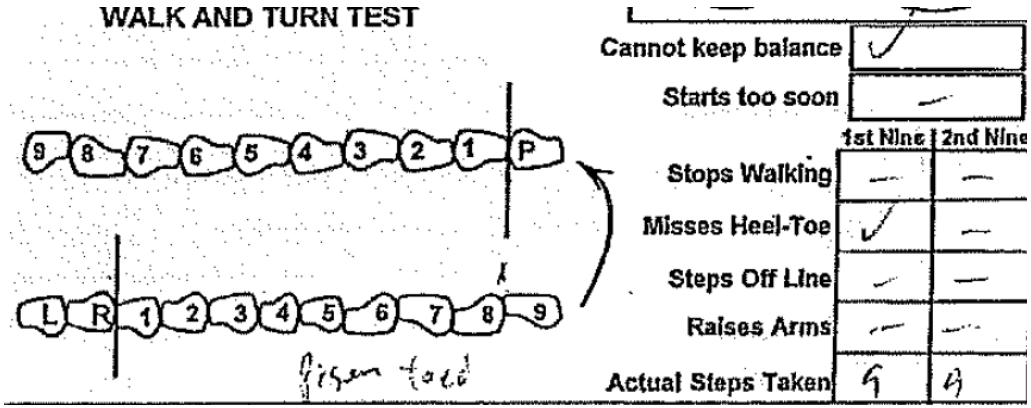
- 26 yo male, speeding violation, 8:54 PM
- Odor of marijuana as officer approaches
- Arresting officer performed SFSTs
  - HGN = no indicators
  - WAT = missed heel to toe many times
  - OLS = placed foot down numerous times
  - Noted eyelid tremors
- Called DRE for evaluation @ 10:38 PM

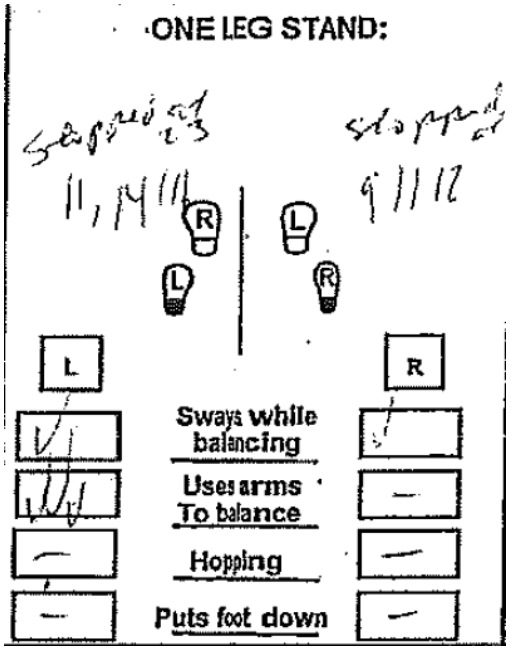
Case History #1 – DRE Eval

- Initial observations
  - Droopy eyelids
  - Appeared drowsy and was yawning several times throughout contact
  - Slow, lethargic coordination
  - Thick, slurred speech
  - Watery, bloodshot eyes

Case History #1 – DRE Eval

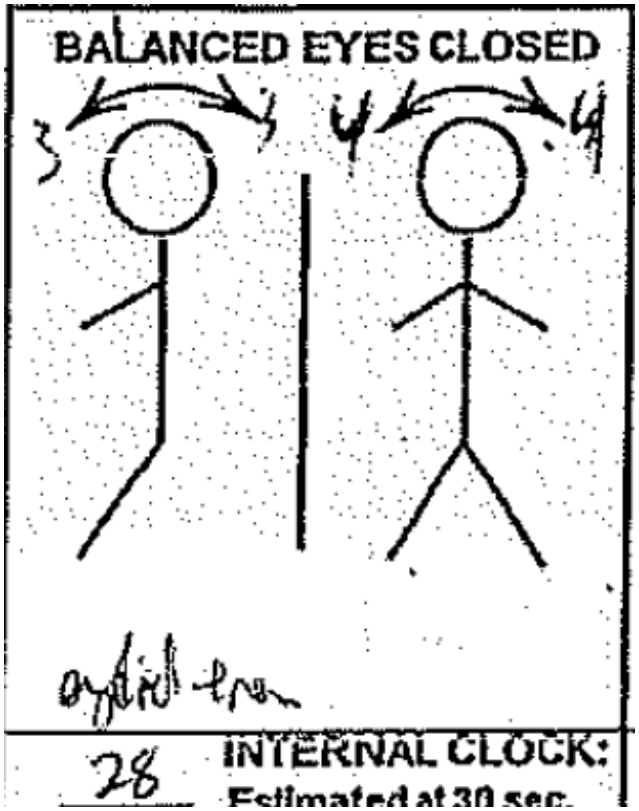
HGN:	Left Eye:	Right Eye:
Lack of Smooth Pursuit	none	none
Max Deviation	none	none
Angle of Onset	none	none





SFST results

Case History #1 – DRE Eval



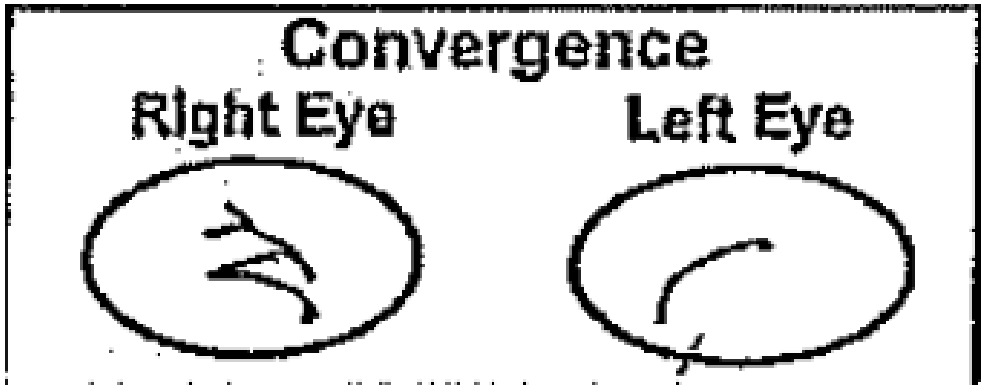
Eyelid tremors

BLOOD PRESSURE: 156 mmHg/ 112 mmHg TEMP 97.6 °F

PULSE & TIME:			
1.	94 BPM	2249	HAS
2.	96 BPM	2300	HAS
3.	92 BPM	2315	HAS

Case History #1 – DRE Eval

Pupil Size	Room Light	Darkness	Direct
Left Eye	5.0 mm	8.5 mm	5.0 mm
Right Eye	5.0 mm	8.5 mm	5.0 mm
Rebound Dilation ☐ Yes ☒ No		Reaction to Light: normal	



Case History #1 – DRE Eval

- Finger to Nose – very slow to respond, eyelid tremors
- DRE Opinion: Cannabis

- Results of SFSTs for DRE differed from arresting officer

- Time from stop to eval = approx 1.75 hrs
  - Time from stop to blood draw = approx 1.25 hrs

Case History #1 - Toxicology

- Blood alcohol (BAC)
  - None detected
- Comprehensive drug testing
  - Immunoassay screen
    - +THC
  - GC/NPD/MSD screen
    - No further drugs detected

Case History #1 - Toxicology

- THC quantitation and confirmation by LC/MS/MS

Delta-9-THC	**35 ng/mL**
11-hydroxy-THC	**14 ng/mL**
Carboxy-THC	**240 ng/mL**

Is this result representative of the concentration(s) at the time of the stop?

Case History #2

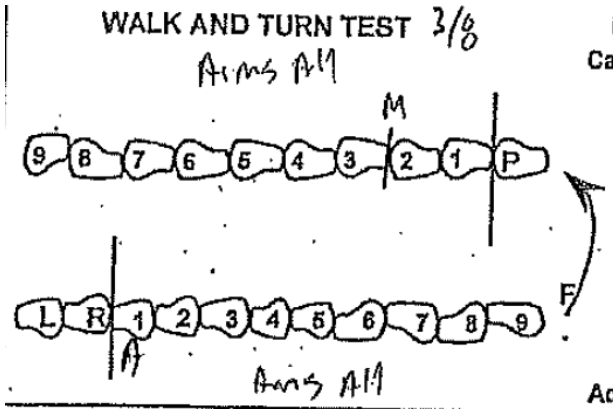
- 29 yo male, speeding violation, 12:57 AM
- Odor of marijuana as officer approaches
- Arresting officer performed SFSTs
  - HGN = no indicators
  - WAT = missed heel to toe many times, overall lack of coordination and balance
  - OLS = placed foot down numerous times
  - Noted eyelid tremors
- Called DRE for evaluation @ 1:30 AM
  - Evaluation began at 2:09 AM

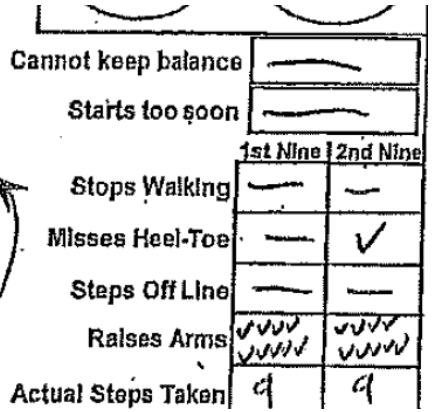
Case History #2 – DRE Eval

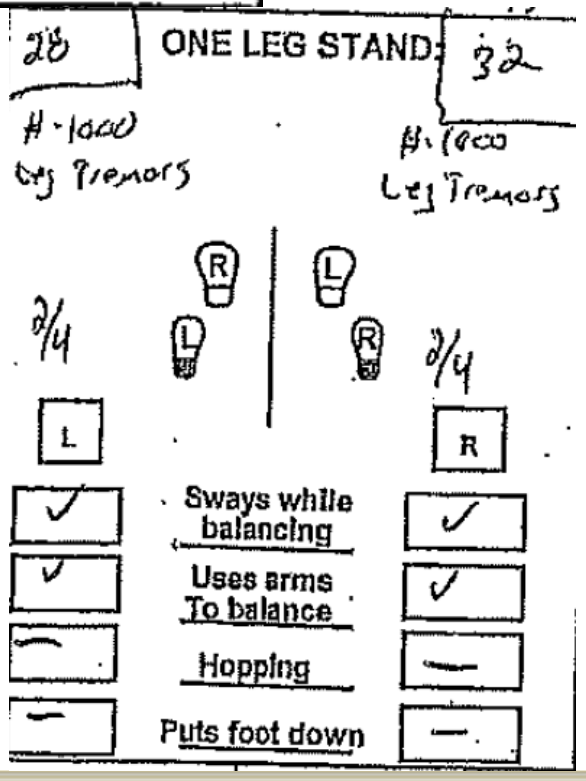
- Initial observations
  - Droopy eyelids
  - Eyelid tremors
  - Swayed while walking
  - Slow coordination
  - Rapid speech and talkative
  - Bloodshot, watery eyes

Case History #2 – DRE Eval

HGN:	Left Eye:	Right Eye:
Lack of Smooth Pursuit	None	None
Max Deviation	None	None
Angle of Onset	None	None

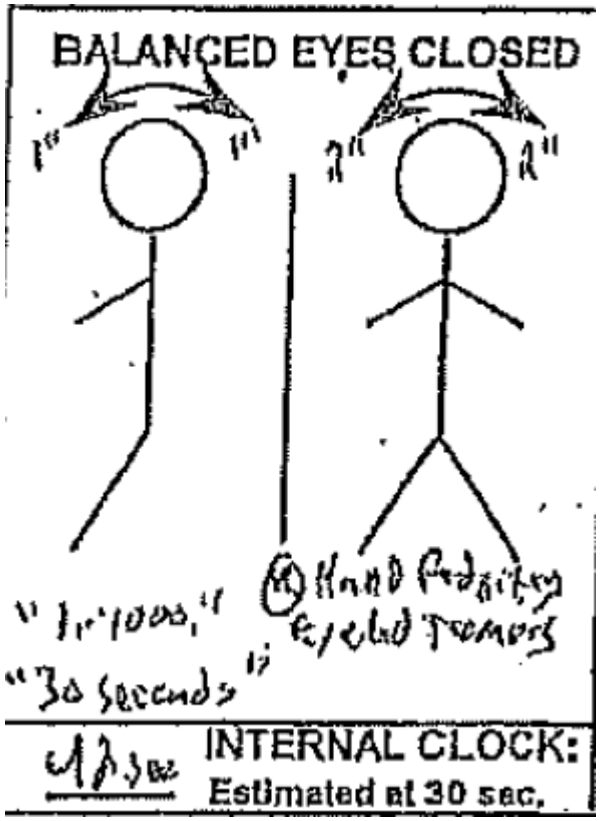






SFST results

Case History #2 – DRE Eval



48 seconds

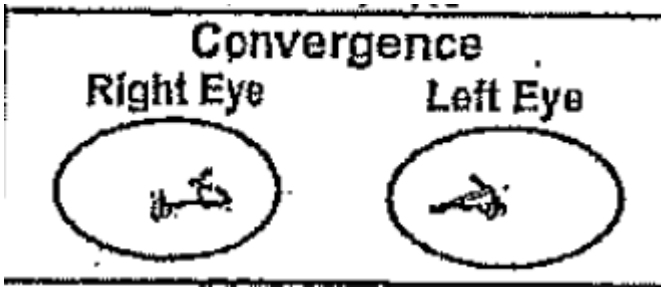
PULSE & TIME:
1. 72bpm / 0212hrs
2. 84bpm / 0232hrs
3. 76 bpm / 0247 hrs

BLOOD PRESSURE: 12[illegible] / 7[illegible]

TEMP 99.1 °F

Case History #2 – DRE Eval

Pupil Size	Room Light	Darkness	Direct
Left Eye	3.5 mm	8.0 mm	2.0-3.0 mm
Right Eye	3.5 mm	8.0 mm	2.0-3.0 mm
Rebound Dilation ☒ Yes ☐ No		Reaction to Light: PERRLA	



Case History #2 – DRE Eval

- Finger to Nose – very slow to respond, eyelid tremors, took several attempts to find nose
- DRE Opinion: Cannabis

- Results of SFSTs for DRE and arresting officer were similar

- Time from stop to eval = a little over 1 hr
  - Time from stop to blood draw = 1 hr

Case History #2 - Toxicology

- Blood alcohol (BAC)
  - None detected
- Comprehensive drug testing
  - Immunoassay screen
    - +THC
  - GC/NPD/MSD screen
    - No further drugs detected

Case History #2 - Toxicology

- THC quantitation and confirmation by LC/MS/MS

Delta-9-THC	**8.8 ng/mL**
11-hydroxy-THC	**3.9 ng/mL**
Carboxy-THC	**67 ng/mL**

Greater impairment than Case History #1, lower THC concentration

Interpretation of results

- Per se laws may dictate whether or not impairment testimony needed
- Cannot interpret test results based on laboratory report alone
- Route of administration and concentration may effect interpretation
- Timing is important

Thank you for joining us, we hope you enjoyed the webinar!

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