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Evidential Oral Fluid Testing

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Quantisal™ Collection Device



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Quantisal™ Collection Process




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Quantisal™ Collection Process

- Observation period – no food or beverage for 10 minutes
- Check the expiration date
- Instruct the subject to move their tongue back and forth to promote salivation





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Quantisal™ Collection Process

- Place collection device under tongue, close mouth
 - Tilt head down to promote collection
 - *Different* than the roadside screening collection process
- Remove once the indicator has turned **BLUE** or 10 minutes has passed




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Quantisal™ Collection Process

- Place the swab/collector in the transport tube containing the buffer solution
 - Do not stand the tube on any surface
- Ensure the tube is capped firmly – *loud snap* – triple check!
- Put tube back in plastic bag and send to lab




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Oral Fluid Drug Testing – New & Novel?

- Generally accepted in the relevant scientific community
- Analytical techniques are the same ones currently used to test for drugs in blood and urine
- Drug testing in oral fluid used in various sectors including federal workplace drug testing, pain management, impaired driving





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NYSP FIC OF Drug Screen

- LC-MS/MS screening method for 31 drugs and metabolites
 - Liquid/liquid extraction technique
 - Targeted screen
 - Does not differentiate THC isomers




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NYSP FIC OF Confirmations

- LC-MS/MS confirmation method for Δ -9-THC and Δ -8-THC
 - Not reporting Δ -8-THC in OF until blood method updated to match
- LC-MS/MS for other 30 drugs and metabolites

*Limited to only the Quantisal™ collection device
Only drug testing, not testing for alcohol*




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NYSP FIC Oral Fluid Testing Protocol

- Screen and confirmation(s) performed on independent samplings
- Different extraction techniques
- Different target MRMs monitored
- Different LC columns
- Matched deuterated internal standards for all compounds in all methods



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NYSP FIC Oral Fluid Testing Protocol

ANSI/ASB Standard 036, *Standard Practices for Method Validation in Forensic Toxicology*, 2019

- Validation provides objective evidence that a method is fit for purpose

ANSI/ASB Standard 054, *Standard for a Quality Control Program in Forensic Toxicology Laboratories*, 2021

- Demonstrates a method's continued fitness, ensures the validity of test results



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NYSP FIC Oral Fluid Testing Protocol

ANSI/ASB Standard 017, *Standard Practices for Measurement Traceability in Forensic Toxicology*, 2018


- Traceability provides confidence and reliability in test results

ANSI/ASB Standard 098, *Standard for Mass Spectral Data Acceptance in Forensic Toxicology*, 2023

- Sets minimum criteria for acceptance of data for various types of mass spectral techniques

ANSI/ASB Standard 113, *Standard for Identification Criteria in Forensic Toxicology*, 2023

- Establish a points structure to ensure sufficient discrimination and selectivity in reported toxicology results




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Scope of Testing

Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities, *Journal of Analytical Toxicology*

- Purpose:
 - ensure a comprehensive and consistent approach to impaired driving investigations
 - collect more uniform data on the prevalence of drugs in the driving population
- First published in 2007, updates in 2013, 2017, 2021
- Screening and confirmation cut-offs for blood, urine, and oral fluid




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Scope of Testing

Recommendations for Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities, *Journal of Analytical Toxicology*

- Tier 1 drugs
 - Included in all DUID testing
 - Represent the most frequently encountered drugs in DUID casework
 - Can be tested by commonly available instrumentation in crime labs
- Tier 2 drugs
 - Limited or regional prevalence, less frequently encountered
 - May require more advanced instrumentation not widely available
- Basis for development of a minimum standard




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Tier 1 Drugs – Oral Fluid

- Cannabis
 - Δ-9-THC
- CNS Depressants
 - alprazolam, clonazepam, 7-amino-clonazepam, diazepam, nordiazepam, lorazepam, oxazepam, temazepam
 - carisoprodol, meprobamate
 - zolpidem




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Tier 1 Drugs – Oral Fluid

- CNS Stimulants
 - methamphetamine, amphetamine, MDMA, MDA
 - cocaine, benzoylecgonine, cocaethylene
- Narcotic Analgesics
 - codeine, 6-acetylmorphine, morphine, hydrocodone, hydromorphone, oxycodone, oxymorphone, methadone, fentanyl, tramadol, buprenorphine
- NYSP FIC adds PCP




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Interpretation of Oral Fluid Results

- Qualitative result – positive or not detected
- Positive result is consistent with recent drug exposure
- Onset of detection depends on route of administration
 - Smoked, snorted, chewed immediate; IV very quick
 - Swallowed intact (pill) – delayed until equilibrates with blood




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Interpretation of Oral Fluid Results

- Why not quantitating drugs in Oral Fluid?
 - Blood concentrations ≠ Oral Fluid concentrations
 - Exact amount of OF collected variable (Quantisal™ 1mL ± 10%)
 - Exact amount of buffer variable (Quantisal™ target 3 mL)
 - Drugs taken by insufflation, inhalation, sublingual coat the oral cavity
 - Drugs have different partition ratios between blood and oral fluid



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Blood – Oral Fluid Correlation


[Traffic Inj Prev. 2014;15\(2\):111-8. doi: 10.1080/15389588.2013.796042.](#)

Comparing drug detection in oral fluid and blood: data from a national sample of nighttime drivers

T Kelley-Baker¹, C Moore, J H Lacey, J Yao

Results: 326 matched pairs of samples were both positive, out of which 247 (75.8%) were an exact match for all drug classes and 70 (21.5%) were positive for at least one common drug class
Overall, 97.2% agreement in paired samples

Conclusions: oral fluid and blood samples provided very similar information regarding recent drug intake... Oral fluid can be considered a reliable alternative to blood as a matrix for drug testing.



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Blood – Oral Fluid Correlation

Validity of oral fluid test for Delta-9-tetrahydrocannabinol in drivers using the 2013 National Roadside Survey Data

Huiyan Jin¹, Sharifa Z. Williams¹, Stanford T. Chihui², Guohua Li^{2,3} and Qixuan Chen^{1*}

Jin et al. Injury Epidemiology (2018) 5:3
<https://doi.org/10.1186/s40621-018-0134-2>

Conclusions: The oral fluid test is a highly valid method for detecting the presence of THC in blood but cannot be used to accurately measure the blood THC concentration.



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Blood – Oral Fluid Correlation

Screening for Drugs of Abuse in Oral Fluid—Correlation of Analysis Results with Serum in Forensic Cases*

Stefan W. Toennes[✉], Stefan Steinmeyer, Hans-Jürgen Maurer, Manfred R. Moeller, Gerold F. Kauert

Journal of Analytical Toxicology, Volume 29, Issue 1, January-February 2005, Pages 22–27,
<https://doi.org/10.1093/jat/29.1.22>
Published: 01 January 2005 Article history ▾

Results: 97% of oral fluid samples positive for any substance were also positive in serum




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NYSP Evidential Oral Fluid Pilot Program

- Goals
 - Allow stakeholders to become familiar with oral fluid
 - Identify any additional training needs or potential hurdles to broader implementation
 - Collect data




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NYSP Evidential Oral Fluid Pilot Program

- Collect blood AND oral fluid from same subject during the pilot
- Focused on misdemeanor DWAI-drug investigations
- Collection limited to DREs and other select Members

(Future implementation will be different)




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Future Implementation...

- Oral fluid testing in misdemeanor DWAI-drug cases
- Recommend collecting BOTH blood and oral fluid in FMVA/SPI investigations
- Collect oral fluid as soon as possible in the process
- Testing be available to all law enforcement agencies that submit to the SP Lab
- Eliminate urine in DWAI-drug investigations




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References

"Recommendations for the Toxicological Investigation of Drug-Impaired Driving and Motor Vehicle Fatalities – 2017 Update," B. Logan, A. D'Orazio, A. Mohr, J. Limoges, A. Miles, C. Scarneo, S. Kerrigan, L. Liddicoat, K. Scott, M. Huestis. *J Anal Tox*, 2018, 42:63-68.

ANSI/ASB Standards:
<https://www.asbstandardsboard.org/published-documents/>




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