



### **K45 Evaluation of On-Site Oral Fluid Drug Screening Using the Dräger Drug Test<sup>®</sup> 5000 and Affiniton<sup>®</sup> Drugwipe<sup>®</sup> in Suspected Impaired Drivers**

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After attending this presentation, attendees will be able to assess the utility of on-site oral fluid drug testing devices designed for use in the field and their ability to generate results that can later be confirmed in the laboratory in a preserved oral fluid specimen or a more traditional specimen such as blood or urine.

This presentation will impact the forensic science community by providing data on the utility and reliability of point-of-contact oral fluid drug tests in suspected impaired drivers. By comparing the presumptive roadside results to laboratory confirmation results, which is critical to ensure their admissibility in court, the overall accuracy of these field tests were determined.

The purpose of this project was to evaluate on-site oral fluid drug testing devices and compare the presumptive results to laboratory-based oral fluid confirmatory results as well as to blood or urine results in certain cases.

The ease of obtaining an oral fluid sample in the field proximate to the time of driving has made it an ideal specimen for roadside testing in drug-impaired driving investigations. Two point-of-contact oral fluid testing devices, the Dräger Drug Test<sup>®</sup> 5000 (DDT 5000) and/or the Affiniton<sup>®</sup> Drugwipe<sup>®</sup> (Drugwipe), were evaluated in two separate roadside studies. Subjects were recruited into the study after the conclusion of their arrest for suspected impaired driving. The officers followed their routine arrest procedures, including advisement of rights, field sobriety tests, portable breath test, blood sample or urine collection, and completion of the arrest paperwork before offering the subjects the opportunity to provide oral fluid samples for research purposes. Samples were collected for the DDT 5000 and/or Drugwipe devices following their individual manufacturer-recommended protocols. Following provision of the DDT 5000 and Drugwipe samples, participants were asked to provide an additional oral fluid sample collected with an Immunalysis Quantisal<sup>™</sup> collection device for laboratory-based confirmatory analysis. Both devices included tests for amphetamine, methamphetamine, cocaine, opiates, benzodiazepines, and THC. The DDT 5000 device also tested for methadone.

All oral fluid samples were analyzed to confirm the presence of target drugs routinely screened for in drug-impaired driving cases. The laboratory-based test was considered the “true result,” and the field test results for that subject were evaluated against that with each given matrix. The overall effectiveness of the field test was based on sensitivity, specificity, and accuracy for both the DDT 5000 and Drugwipe, relative to the laboratory-based confirmation result.

At one study location, the DDT 5000 was compared to laboratory-based oral fluid confirmations in a total of 79 cases. The overall sensitivity, specificity, and accuracy were 50.0%, 99.8%, and 94.8%, respectively. The overall sensitivity, specificity, and accuracy of the Drugwipe were 48.9%, 100%, and 93.8%, respectively. In comparison, the overall sensitivity, specificity, and accuracy of the DDT 5000 in 33 cases compared to confirmed analytes in oral fluid were 61.4%, 99.2%, and 87.7%, respectively at the other location. Additionally, the overall sensitivity, specificity, and accuracy of the DDT 5000 compared to compounds confirmed in blood were 72.2%, 98.6%, and 93.5%, respectively. In comparing the 16 cases where both blood and oral fluid were analyzed and using blood as the “true result,” overall sensitivity, specificity, and accuracy were 78.9%, 98.6%, and 94.6%, indicating good correlation between analytes confirmed in oral fluid to those confirmed in blood. For some drugs, prevalence was very low (e.g., amphetamines and methamphetamine), preventing meaningful calculations of sensitivity and specificity.

The use of oral fluid drug-testing devices, like the DDT 5000 and Drugwipe, offer the ability to rapidly obtain a screening result in the field at the time of a stop, which may provide useful data that can aid in the investigation of a drug-impaired driving case. Although the DDT 5000 and the Drugwipe devices had different cut-offs for individual drug classes within their scope, they performed comparably in terms of overall sensitivity, specificity, and accuracy in actual drug-using subjects. Although sensitivity will have to be improved for comprehensive detection of drug use in drivers, the current generations of devices are good tools for deterrence and minimizing the risk of false positive results.

#### **Oral Fluid, On-Site Testing, Drug-Impaired Driving**