



Houston Forensic Science Center

INTEROFFICE MEMO

To: Quality Division

From: Melissa Henry, D-ABFT-FT, Supervisor - Toxicology
Corissa Rodgers, MS, D-ABFT-FT, Supervisor - Toxicology
Dayong Lee, Ph.D., F-ABFT, Manager - Toxicology

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Re: Updates to Analytical Manual v3.7 - GC-MS BSD and LC-MS/MS OPI1 analytical methods

This memo is to document changes to the GC-MS and LC-MS/MS drug analysis methods in the current Analytical Manual (v3.7). These changes are listed below and will be incorporated in the next Manual (v.3.8):

- 1. Section 17. Removal of nortriptyline from the urine Drug Screen and Qualitative Confirmation by Gas Chromatography-Mass Spectrometry analysis [BSD]**

Nortriptyline has shown the lowest instrument response since the validation. Its sensitivity has decreased even further over time to the point that the analyte is not consistently detected in cut-off calibrators and controls. Over four batches by four different analysts, 3 out of 4 cut-off calibrators and 5 out of 12 controls did not detect nortriptyline (see batches BSD_20220210_DM, BSD_20220316_ASG, BSD_20220322_KMY and BSD_20220414U_AAJ). Because the method cannot reliably identify nortriptyline, the analyte will be removed from the method until it can be revised and re-validated to detect the analyte reliably.
- 2. Section 23. Revision to the Opioids 1 Confirmation by Liquid Chromatography-Tandem Mass Spectrometry analysis [OPI1]**

Due to changes in LC-MS/MS instrument sensitivity and interferences leading to persistent calibrator and/or control failures, this method was modified to change the calibration models for several analytes. To address this issue, the following changes were made to the OPI1 method, and the revised method was successfully validated on May 9, 2022:

- All analytes: an additional calibration point at 15/75 ng/mL (norbuprenorphine, buprenorphine/morphine, oxymorphone, hydromorphone, o-desmethyltramadol, codeine, 6-acetylmorphine, oxycodone, hydrocodone, tramadol) was added.
- Morphine, o-desmethyltramadol, codeine, oxycodone, and tramadol: calibration model was changed from a quadratic curve with $1/x^2$ weighting factor to a linear curve with $1/x$ (morphine, o-desmethyltramadol, and oxycodone) or $1/x^2$ (codeine and tramadol). The calibration range changed from 5.0-500 ng/mL to 5.0-125 ng/mL. Mid-control, high control and internal standard concentrations changed from 100, 400, and 50 ng/mL to 30, 100, and 25 ng/mL, respectively.
- 6-Acetylmorphine: the calibration range changed from 5.0-500 ng/mL to 5.0-125 ng/mL. Mid-control and high control concentrations changed from 100 and 400 ng/mL to 30 and 100 ng/mL, respectively.
- Buprenorphine: the ion transition $468.3 > 55.1$ was removed due to interference. The quantifier ion transition was changed to $468.3 > 84.1$.