K25 Disposition of MDMA and Metabolites in Human Sweat Following Controlled MDMA Administration

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After attending this presentation, attendees will learn that understanding the disposition and excretion of methylenedioxymethamphetamine (MDMA) and metabolites in the sweat of MDMA (ecstasy) users is vital for interpreting sweat and hair testing results in drug treatment, criminal justice and workplace drug testing programs.

This presentation will impact the forensic science community by demonstrating how this experimental MDMA administration study indicates that sweat testing may be an effective and reliable method for monitoring ecstasy use. These data provide a scientific database for interpretation of MDMA sweat test results.

Placebo, low (1.0 mg/kg) and high (1.6 mg/kg) oral MDMA were given double blind in random order to healthy volunteers (n=16) with a history of MDMA use. Participants provided written informed consent to participate in this IRB-approved study and remained on a closed clinical research unit for at least three days after each MDMA dose. PharmChek® sweat patches (n=688) were worn prior to dosing, reflecting previously self-administered drug, and during and after controlled MDMA dosing. Patches were ana- lyzed by SPE and GC/MS for MDMA, methylenedioxyamphetamine (MDA), 4-hydroxy-3-methoxyamphetamine (HMA) and 4-hydroxy-3-methoxymethamphetamine (HMMA). Limits of quantification (LOQ) were 5 ng/patch except for MDMA (2.5 ng/patch).

MDMA was the primary analyte detected with concentrations up to 3007 ng/patch in 415 patches (60.3%). MDA was detected in 194 patches (28.2%) at concentrations <172 ng/patch, and HMA, and HMMA were not detected above the method LOQ. 234 patches (34.0%) were positive for MDMA at the 25 ng/patch screening and confirmation cutoffs, proposed by the Substance Abuse and Mental Health Services Administration (SAMHSA) for the detection of amphetamines. Four additional patches (0.6%) exceeded these cutoff concentrations for MDA, and only one was positive without con- current MDMA above the method LOQ.

MDMA was first observed in short-term patches worn from 0-2.5 h after low and high dose administrations. MDA was present in patches worn 0-6 h after dosing. Large intra- and inter-subject variability was observed in duplicate weekly patches applied for seven days. Median weekly MDMA concentrations were 137.5 ng/patch (5.8 - 894.0) and 376.6 ng/patch (14.7– 3007.7) following low (n=18) and high (n=23) doses, respectively.

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MDMA, Sweat, GC/MS

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