

12 GAMMA-HYDROXYBUTYRATE (GHB) CONFIRMATION IN URINE

12.1 Summary

12.1.1 Gamma-Hydroxybutyrate (GHB) is an endogenously occurring metabolite that is hypothesized to have a role as a cerebral neurotransmitter. When taken illicitly, GHB acts as a central nervous system depressant. GHB has been marketed illicitly in health stores and gyms as a steroid alternative for body-building and as a tryptophan replacement for weight control and sedation. One teaspoon of GHB powder is dissolved in water for a typical oral dose (2.5g or 35mg/kg in a 70kg adult). This makes GHB easy to use as a potential “date rape” drug in sexual assault cases. Effects of GHB include drowsiness, euphoria, dizziness, nausea, visual disturbances, and unconsciousness. These effects are usually manifested within 15 minutes following administration and persist for about 3 hours on average. The half-life of GHB is approximately 27 minutes, making the detection of exogenous GHB difficult. Endogenous (naturally occurring) levels of GHB have been determined to range up to 6.6mcg/mL (6600ng/mL) in healthy adults. Due to GHB’s rapid metabolism and half-life elimination, blood and plasma concentrations reach endogenous levels between 3-6 hours after a moderate recreational dose and the drug is undetectable in urine by 12 hours post administration. For the above reasons, NIRCL’s GHB testing policy is as follows:

12.2 Policy and Testing Protocol

12.2.1 All drug facilitated sexual assault (DFSA) cases shall undergo urine alcohol testing and routine drugs in urine confirmation. GHB analysis is not included in the routine testing of urine samples at NIRCL.

12.2.2 For GHB analysis to be conducted on DFSA urine samples, the following criteria shall be met:

12.2.2.1 Urine was collected within 12 hours of the sexual assault

12.2.2.2 Urine collected was the first void since the sexual assault occurred

12.2.3 If the criteria outlined in 12.2.2 are met, a conversation shall be conducted between NIRCL scientists and law enforcement to determine if GHB analysis is required. If it is determined that GHB confirmation is required through this collaborative process, the urine sample shall be sent to NMS Laboratories for quantitation.

12.3 References

12.3.1 Baselt, Randall C. *Disposition of Toxic Drugs and Chemicals in Man*. 9th ed. Seal Beach, CA: Biomedical Publications, 2011. 744-747.

12.3.2 *Relationship Between Postmortem Urine and Blood Concentrations of GHB Furnishes Useful Information to Help Interpret Drug Intoxication Deaths*. J Anal Toxicology (2018) 42: 587-591

12.3.3 <https://www.nmslabs.com/tests/9326U#overview> GHB Urine Screen, NMS Laboratories