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September 19, 2024

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To: Tara Maguire, Executive Director, Massachusetts District Attorneys Association
Jessica C. Stone, Director of Trainings, Massachusetts District Attorneys Association
MDAA District Attorney Point-of-Contacts

From: Kristen L. Sullivan, Chief Science Officer, Forensic Services Division, Crime Laboratory

Subject: Serum Conversion Factor Update

Serum conversions performed by the Massachusetts State Police Forensic Services Division Crime Laboratory (MSPCL) Toxicology Unit have historically used the conversion factors 1.18, 1.14 and 1.12 to obtain low, average and high blood ethanol results. These conversion factors were obtained from the following two journal articles:

> MT Barnhill Jr, D Herbert and DJ Wells, (2007), "Comparison of Hospital Laboratory Serum Alcohol Levels Obtained by an Enzymatic Method with Whole Blood Levels Forensically Determined by Gas Chromatography", Journal of Analytical Toxicology.
>
> Dominick A. Labianca, (2002), "Conversion of Serum-Alcohol Concentrations to Corresponding Blood-Alcohol Concentrations", Journal of Chemical Education.

In June of this year, the ANSI/ASB[1] approved and released the AAFS[2] Standards Board Toxicology Consensus Body document, "Best Practice Recommendations for Performing Alcohol Calculations in Forensic Toxicology" (ANSI/ASB Best Practice Recommendation 122, First Edition 2024). In 5.1.2.1 of this document, when referencing the conversion of serum ethanol values to a whole blood equivalent, it states "The range should be 1.13-1.19 serum (or plasma) to blood ratio."

On, September 17, 2024 the next revision of the Toxicology Unit Administrative Manual was released which updated the conversion factors used by the MSPCL to align with the ANSI/ASB Best Practice Recommendation 122, First Edition 2024 document. The conversion factors used are now 1.13 and 1.19 to obtain the range of whole blood ethanol values.

[1] American National Standards Institute/Academy Standards Board
[2] American Academy of Forensic Sciences

MSPCL Forensic Scientists will still testify to the ranges that have been previously used for performing this calculation, however, if a new report using the updated ranges is needed, please contact the Case Management Unit (MSPCLCMU@mass.gov) with a minimum of 3 weeks' notice and the lab will generate a report using the updated conversion factors. All new serum conversion requests will use the updated conversion factors.

Respectfully submitted,

Kristen L. Sullivan
Chief Science Officer

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