

Best Practice Recommendation for Performing Alcohol Calculations in Forensic Toxicology



WHAT IS AN AAFS STANDARD FACTSHEET?

The AAFS produces clear, concise, and easy-to-understand factsheets to summarize the contents of technical and professional forensic science standards on the OSAC Registry. They are not intended to provide an interpretation for any portion of a published standard.

WHAT IS THE PURPOSE OF THIS STANDARD?

This best practice recommendation provides a framework to conduct calculations related to alcohol (ethanol) consumption and alcohol concentrations.

Numerous factors must be considered when performing alcohol calculations. Recommendations are provided for calculating a reasonable range that encompasses the value of interest, which can then be applied to the question at hand while accounting for any assumptions.

The principles and practices outlined in these recommendations may also apply to postmortem scenarios, but there are additional variables to be considered that are outside the scope of this document.

WHY IS THIS STANDARD IMPORTANT? WHAT ARE ITS BENEFITS?

Forensic science practitioners (FSPs) are frequently requested to perform calculations related to alcohol. Adherence to this best practice recommendation will improve the quality and consistency of this type of work and is intended to help mitigate cognitive bias.

Basic background information on alcohol pharmacokinetics – absorption, distribution, and elimination – is provided.

Recommendations are provided for performing the most common alcohol calculations. Providing reasonable estimations requires FSPs to be conservative, knowledgeable about the limitations, and thorough in their work.

HOW IS THIS STANDARD USED, AND WHAT ARE THE KEY ELEMENTS?

This best practice recommendation can be used by FSPs working for a forensic science service provider (public or private) or as independent forensic consultants; they can be applied to matters related to criminal and/or civil proceedings.

All aspects of alcohol pharmacokinetics are considered in the calculations to provide reasonable and appropriate estimates. Recommendations for assessing if the subject is in the post absorptive phase, along with ways to address that are included. Options are presented for using population ranges or individualizing the volume of distribution. A minimal range for the elimination rate is provided.

The calculations are for blood alcohol. Conversion ratios are provided for serum/plasma, and the calculations can be applied to breath.

Quality assurance measures such as written protocols, documentation, and technical review are recommended. Performing calculations during live testimony is discouraged due to the inherent risks.

The best practice recommendations apply to performing the calculations. Recommendations related to the subsequent expert testimony that may result from those calculations are addressed in ANSI/ASB 037, 1st Ed., 2019

Illustrative examples are provided in an informative annex.

