

How it works

Estimating Blood Alcohol Concentration

Problem: There is no single formula which takes into account all of the factors that affect alcohol metabolism.

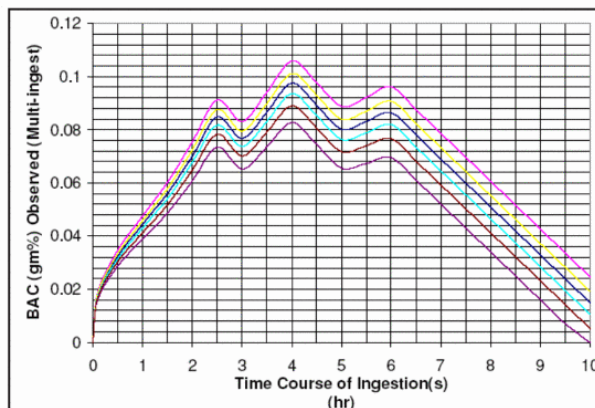
Forensic toxicologists and others involved in alcohol litigation are often faced with questions relating to the amount of alcohol in one's blood at the time of a particular incident, specifically those incidents when the individual was operating a vehicle (DUI). The science of alcohol metabolism has been studied over the last seventy-five years with little progress in the production of a single formula which takes into account all of the factors that affect alcohol metabolism. The complexity of alcohol metabolism results

in a number of uncertainties inherent in the manner in which alcohol affects the human body. These uncertainties in alcohol metabolism, however, may be accounted for by the use of all six of the formulae published between 1932 and 2007. While the use of these multiple formulae in estimating BAC accounts for the uncertainties in alcohol metabolism, the complexity of these formulae require detailed calculations requiring significant time allocations which are often still susceptible to human error.

Solution: Software that estimates blood alcohol concentration

In order to reduce the calculation time and the potential of erroneous estimations inherent with hand calculations of these formulae, practitioners may be interested in a new computer software program, BAC Tracker®, which automatically provides estimations of blood alcohol concentration using all six previously published formulae. BAC Tracker® is fully equipped to handle even the most challenging case scenarios with very little data input from the user. The user may further choose to manipulate data manually, or to rely on published default ranges in the broad rates of absorption, distribution, and elimination provided by the software which is consistent with those published in the literature.

The parameters required for data input are easy to obtain and include the individual's gender, age, weight, height, and either the number of drinks and either one of the following: rate of consumption during the scenario or a BAC/BrAC value at any time in the scenario. The software will automatically run the data against six different formulae which take into account the individual's gender, age, weight, height, body mass index, percent body fat, water content in blood, water content in fat-free body mass, total body water, two non-linear rates of absorption, and three separate rates of elimination. Further data manipulation can be applied to both the rate of absorption, depending on either the type and quantity of food in the stomach, or other factors affecting gastric motility, and the rate of elimination by applying broad or narrow ranges to account for inter- and intra-individual variations for comparative purposes. The final result is forty-two individual reports that can be printed or saved in PDF format for



BAC estimation using six previously published formulae accounting for the uncertainty in alcohol distribution in the human body

future reference. These reports provide graphical and tabular extrapolations which take into account the uncertainty in these theoretical calculations.

The use of BAC Tracker® in estimating blood alcohol levels, which takes into account multiple formulae, will supply the toxicologist with a higher degree of confidence and more accurate results in cases where there is a question of how much alcohol was present in the bloodstream at the time of a particular incident.

**For more information about the software,
go to www.bac-tracker.com.**