K48   The Perilous Practice of Predicting the Past: Does Retrograde Extrapolation Accurately Predict Prior Blood Alcohol Level?

Ronald L. Moore, Esq., JD*, 15635 Alton Parkway, Ste 120, Irvine, CA 92618

After attending this presentation, attendees will better understand the accuracy of retrograde extrapolation in predicting prior blood alcohol levels in arrested subjects.

This presentation will impact the forensic science community by challenging the accuracy of predictions of Blood Alcohol Concentration (BAC) often made by forensic scientists in court using data from arrested subjects.

Retrograde extrapolation is often used in criminal prosecutions to predict the alcohol level at the time of driving for people arrested for Driving Under the Influence (DUI). The calculations are based on either a blood or breath test taken at a later time. The accuracy of these predictions is often vigorously challenged in legal proceedings. A considerable body of literature exists on alcohol metabolism that is often used to substantiate or undermine such calculations. Much of this data is from laboratory studies rather than under real-world testing conditions.

In the present study, data was collected from the case files of two southern California law firms with significant DUI defense case loads. Cases selected for the study were those where arrest reports indicated that the subject submitted to a pre-arrest breath test at roadside, which was then followed by either a blood or breath test after arrest. A total of 234 cases qualified: 160 males and 74 females, with an average age of 33 years (range 17 to 79 years). A comparison was made between the average of the pre-arrest results to the average of the post-arrest results to determine the direction of alcohol metabolism (rising or falling) during the intervening period and the magnitude of the change over the interval. On average ,it took 28 minutes from driving to the first field breath test and, on average, an additional 45 minutes to complete the post-arrest chemical test. Of the 234 subjects, the blood alcohol level went up or remained the same in 108 subjects and went down in the remaining 126 subjects. In addition, calculations were made using typical retrograde extrapolation procedures to estimate the BAC at the time of the first chemical tests based on the time and results of the second set of chemical tests (using an elimination rate of 0.015g% per hour, applied to the time difference between the pre-arrest tests and the post-arrest tests). Fully 75% of the predicted BACs were higher than the actual BAC measured by field breath test. There was a significant difference between the likelihood of overestimating the field BAC based on whether the post-arrest test was blood or breath. If the second test was blood, 86% of the BAC estimates were higher than the field breath test, while if the second test was breath, only 65% of the estimates were higher than the field breath test. This presentation will graphically present this data and give further statistical treatment.

Retrograde, Extrapolation, BAC

* Presenting Author