



National Safety Council

Position/Policy Statement

Impairment at Low Alcohol Concentrations

Laboratory and epidemiological research indicates that the ability of many individuals is impaired for driving and driving related tasks at alcohol concentrations* below 0.08, and that for some individuals, impairment does occur at alcohol concentrations below 0.05. Therefore, at alcohol concentrations below 0.05, no statutory presumption regarding the presence or absence of alcohol influence should be made.

* Alcohol concentration means either grams of alcohol per 100ml of blood or grams of alcohol per 210 liters of breaths.

Approved by the Committee on Alcohol and Other Drugs, October 1987

Approved by the Policies and Issues Committee, May 1988

Approved by the HTSD Executive Committee, August 1988

Approved by the Highway Traffic Safety Division, October 1988

Approved by the Board of Directors, May 5, 1989

Resolution Regarding Impairment At Low Alcohol Concentrations

At its October 22, 1986 meeting, the Committee on Alcohol and Other Drugs reaffirmed its 1971 position that there is no individual, regardless of his previous experience with alcoholic beverage consumption, who is not impaired in his driving performance if his alcohol concentration is 0.08* or more. The Committee further affirms that many individuals show substantial impairment at much lower alcohol concentrations.

Evidence for such impairment can be found in both laboratory and epidemiologic studies. Regarding the former, a list of over 30 laboratory studies is attached (Appendix 1), all of which show that at least some individuals are significantly impaired in the performance of tasks believed relevant to driving ability at concentrations below 0.05. In particular, research involving split tasks – which replicate driving likely to be seen in heavy traffic – indicates impairment for many people at alcohol concentrations below 0.05 and for at least some individuals at concentrations as low as 0.02.

Opinion based on epidemiologic evidence about the alcohol concentration at which crash risk begins to rise has been influenced for many years by the original analysis of the Grand Rapids Study as published by Borkenstein et al in 1964 (Appendix 2, Reference 1). In that study no increase in crash risk was noted at concentrations below 0.05 and, in fact, drivers with concentrations below 0.05 and, in fact, drivers with concentrations around 0.03 were found on average to have a lower crash risk than did drivers with no alcohol at all. This apparent decrease in crash risk has become known as the “Grand Rapids Dip”.

More recent re-analysis of the Grand Rapids data, in which it has been possible to focus on the effects of alcohol on specific driver subsets rather than looking only at all drivers grouped together, have led researchers to reach rather different conclusions. According to these studies both very young and elderly drivers have increased crash risk at concentrations below 0.05 (Appendix 2, References 2, 3) as do drivers in heavy traffic (Appendix 2, Reference 3), and drivers who are infrequent drinkers (Appendix 2, Reference 4).

The last of these three studies is of particular importance because it not only shows that infrequent drinkers have an increase in crash risk above the average for all groups from the most infrequent imbiber to those who consume alcohol at least daily have a progressive increase in crash risk from their own group baseline crash levels as their alcohol concentrations increase. These data appear in Appendix 2.

* Alcohol concentration means either grams of alcohol per 100ml of blood or grams of alcohol per 210 liters of breath

The Grand Rapids Dip, therefore, appears to be an artifact resulting from different mixes of infrequent, moderately frequent, and very frequent drinkers at various alcohol concentrations. (The fact that crash risk with no alcohol varies from well above average to well below average probably is a reflection of different age and sex distribution and other variables rather than being a reflection of usual drinking patterns per se.)

The statutory pattern for many years, and the specific law of some states, has been that drivers with alcohol concentrations of 0.10 or higher shall be presumed to be under the influence of alcohol, that no presumption either way shall be made for drivers with concentrations from 0.05 up to 0.10 and that drivers with alcohol concentrations less than 0.05 shall be presumed not to be under the influence of alcohol.

In light of the research discussed above, the Committee believes that the legal presumption that all individuals are not impaired at concentrations less than 0.05 is inaccurate. We, therefore, take the position that at alcohol concentrations below 0.05, no legal presumption should be made regarding the influence of alcohol that will be applicable to all drivers.

APPENDIX 1

“ARTICLES WHICH HAVE REPORTED IMPAIRMENT DUE TO BAC LEVELS OF .04 OR LESS”*

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APPENDIX 2

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3. Zylman R. The variability of collision involvement at low blood alcohol concentrations: The Grand Rapids curve explained. BLUTALKOHOL. 9(1):25-32, Jan. 1972.
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(Chart from original document goes here)