DEVELOPMENT AND FIELD TEST OF PSYCHOPHYSICAL TESTS FOR DWI ARREST

V. Tharp
M. Burns
H. Moskowitz

Southern California Research Institute
6305 Arizona Place
Los Angeles, California 90045

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twice to the right, looking at the eye on the side of the head to which he is moving the stimulus. On the first movement, the officer should observe whether or not the onset of the nystagmus occurs before 45 degrees with at least 10% of the conjunctiva (i.e., the white of the eye) showing. The 45 degree angle is easy to estimate as it splits the angle connecting the tip of the nose and the center of the ear with the middle of the head. Some individuals cannot deviate their eyes more than 45 degrees, so at least 10% of the white of the eye must show to ascertain that nystagmus is not occurring at the most extreme deviation for that individual.

The second movement in each direction should be faster (about 20 degrees per second) and the observer should note whether or not the suspect can follow smoothly and how distinct the nystagmus is at the maximum lateral deviation. The breakdown of the smooth pursuit and greater amplitude nystagmus at maximum deviation are also good signs of a BAC over 0.10%. Thus, the police offier has three eye signs to look for: (1) onset of nystagmus before 45 degrees; (2) the distinctness of the nystagmus at the maximum lateral deviation; and (3) the breakdown of smooth pursuit eye movements.

The gaze nystagmus test may not be applicable to individuals wearing contact lenses, since hard contacts may prevent extreme lateral eye movements. About 3% of the population will show early-onset nystagmus, and impaired balance, with no alcohol in their system. This nystagmus could be the result of drugs other than alcohol (e.g., barbiturates or phencyclidine), the result of brain damage, of illness (e.g., Korsakoff"s syndrome), or of unknown etiology.

Since police officers often arrest intoxicated persons after midnight, possible effects of fatigue or circadian rhythms on gaze nystagmus could be significant. Five subjects were individually checked for nystagmus each hour between 9 a.m. and 4 p.m. and between 5 p.m. and 4 a.m., at a BAC of 0.10% and without alcohol. Thus, subjects came to the laboratory four times: (1) between 9 a.m. and 5 p.m. with no alcohol; (2) between 9 a.m. and 5 p.m. at a maintained BAC of 0.10%; (3) between 5 p.m. and 4 a.m. when sober; and (4) between 5 p.m. and 4 a.m. at a maintained BAC of 0.10%.

Figure 3 illustrates the angle of onset plotted against time for all four conditions. Under sober conditions when no nystagmus was seen, the maximum lateral deviation was recorded. These data were divided into four-hour segments and analyzed with a fully repeated ANOVA, with the factors being alcohol and time. There was a significant alcohol effect on angle of onset with the drug decreasing the angle of onset by about 15 degrees. There was also a significant interaction between the effects of alcohol and time in that the alcohol dose decreased the angle of onset by an additonal 5 degrees (i.e., by 20 degrees) after midnight. In all cases the angle of onset had returned to the baseline level at about 9 a.m. the following morning , at which time the BAC was 0.02% or less and the subject had slept 5 hours. The average BAC