

Adolescent problem behavior and problem driving in young adulthood.

Bingham CR; Shope JT. *Journal of Adolescent Research* 19(2): 205-223, 2004. (36 refs.)

Motor vehicle crashes are the leading cause of death among drivers younger than age 35, making problem driving behavior among young drivers a significant public concern. Effective intervention requires a better understanding of the antecedents of problem driving. Problem behavior theory, social control theory, and Kandel's model of substance use development were used to predict young-adult problem driving (i.e., drug-, drinking-, and risky driving). Using a longitudinal sample of 1,845 young adults, path analysis showed that drinking-driving and drug-driving were predicted by adolescent marijuana use, as well as greater alcohol misuse and tolerance of deviance. Risky driving was predicted by greater alcohol misuse, less cigarette smoking, greater tolerance of deviance, and better school performance during adolescence. These results highlight the qualitative difference between substance-related driving behavior, which is socially proscribed, and risky-driving behavior which is more normative. Implications for prevention are discussed. Copyright 2004, Sage Publications Inc.

Decreasing number of young licence holders and reduced number of accidents. A description of trends in Sweden.

Murray A. *Accident Analysis and Prevention* 35(6): 841-850, 2003. (17 refs.)

The role of alcohol is an important factor in motor vehicle accidents in many countries, particularly concerning fatal accidents. Efforts to reduce alcohol related crashes in recent years has been the adoption of the "Scandinavian model." In the Scandinavian countries it is an offence to drive with a blood alcohol level beyond a certain limit. In Sweden there are two blood alcohol concentrations (BAC) limits. A lower limit for drunken driving and a higher one for aggravated drunken driving. The lower limit changed from 50 to 20 mg% on the 1 July 1990 and the higher from 150 to 100 mg% on the 1 of February 1994. Thus, the lower limit was implemented already when the age cohort born in 1972 became 18 years old and was effective for both age cohorts, but the higher limit was not implemented until the earlier age cohort became 22 years old. It means that only the later age cohort had this stricter limit for aggravated drunk driving. Because of the strict alcohol policy, the number of alcohol related accidents are less in Sweden than in many other countries. However, in fatal accidents and in accidents leading to serious injury alcohol is still an important factor in Sweden. The proportion of accidents that are alcohol related (the driver is suspected of being under the influence of alcohol) in the two age cohorts are presented by severity of the injury and which indicate a greater percentage of alcohol related accidents among fatalities and accidents leading to serious injury than among accidents leading to minor injury and a greater

percentage for men than for women. Alcohol related fatalities for women born in 1977 was the only exception. The small number of fatalities for women makes these percentages uncertain. Comparing the men born in 1972 and 1977, the percentage of alcohol related accidents decreased from 16.5 to 12.0% among fatalities, but on the other hand it increased from 12.9 to 15.0% among accidents leading to serious injury. The percentage of alcohol related accidents among those leading to minor injury stayed almost the same. The percentage of alcohol related accidents of those leading to serious or minor injury was very much the same for women in both age cohorts. Thus, the proportion of alcohol related accidents did not change in a systematic way either for men or women. This means, that there is no indication, that the reduction in accident rates can be explained by a decrease in drunk driving. A reduction of car driving and an accompanying reduction of drunk driving seems a more probable explanation. Copyright 2003, Elsevier Science.

How do zero tolerance drunk driving laws work?

Carpenter C. *Journal of Health Economics* 23(1): 61-83, 2004. (34 refs.)

This paper provides the first comprehensive analysis of the effects of "Zero Tolerance" (ZT) Drunk Driving Laws-which set very low legal blood alcohol limits for individuals under age 21-on self-reported alcohol use and drunk driving using data from the 1984 to 2001 Behavioral Risk Factor Surveillance System (BRFSS). I estimate two-way fixed effects models of alcohol-related behaviors of 18-20-year-olds that can condition on unobserved differences across states that may be correlated with determinants of drinking and drunk driving, and I use 22-24-year-olds as a control group. Results indicate that the laws reduced heavy episodic drinking (five or more drinks at one sitting) among underage males by 13%. This result is supported by models that use variation in treatment intensity induced by differences in body weight. I find mixed evidence of ZT effects for females, and no robust effects on drinking participation or drunk driving for either sex. Copyright 2004, Elsevier Science BV.

New Mexico's 1998 drive-up liquor window closure. Study I: Effect on alcohol-involved crashes.

Lapham SC; Gruenwald PJ; Remer L; Layne L. *Addiction* 99(5): 598-606, 2004. (21 refs.)

Aims: To determine the spatial relationship between drive-up liquor window locations and alcohol-related traffic crashes for 2 years before and after New Mexico banned drive-through alcohol sales. Design: Current liquor licenses, crash data, roadway information and US Census data were used in this analysis. Cross-sectional and longitudinal regression analyses were applied to the entire state, and to Albuquerque only. Findings: Of all NM liquor licenses, 189 (9%) included drive-up sales, which co-occurred with on- or off-premise licenses (94%). The rate of non-pedestrian alcohol-related crashes relative to

non-pedestrian total crashes showed an increasing trend prior to closure and a decreasing trend after the closure. Cross-sectional analyses in Albuquerque revealed that the percentage of alcohol-involved crashes was not related to densities of on- or off-premise outlets per kilometer of roadway, or to percentage of drive-up outlets. Statewide, the percentage of drive-up outlets was not significantly related to the percentage of alcohol-related crashes within census tracts but was associated positively with the percentage of alcohol-related crashes in surrounding census tracts. There was no statistically significant relationship between number of drive-ups and percentage of alcohol-related crashes in either longitudinal model. Conclusions: Despite the declining rate of alcohol-related crashes following closure of drive-up liquor windows, both in Albuquerque and statewide, regression models using spatial data do not demonstrate definitively an association between the decline and the closure of the drive-up liquor windows. Copyright 2004, Society for the Study of Addiction to Alcohol and Other Drugs.

Hallucinations with zolpidem and fluoxetine in an impaired driver.

Coleman DE; Ota K. *Journal of Forensic Sciences* 49(2): 392-393, 2004. (11 refs.)

A 54-year-old male was observed driving erratically. The subject displayed both horizontal and vertical nystagmus and poor balance on field sobriety tests (FST's). Further observations included slow movements, breathing, and speech, extremely poor coordination, lack of convergence, and pupils with slow reaction to light. The subject related he was seeing roadway lines doubled and felt a hallucinogenic effect. Breath alcohol results were negative. Blood tests found zolpidem and fluoxetine in addition to hydrocodone at therapeutic levels. This case is presented as an example of hallucinogenic effects from the combination of zolpidem and serotonin reuptake inhibitors. Copyright 2004, American Society of Testing Materials.

The contribution of alcohol to serious car crash injuries.

Connor J; Norton R; Ameratunga SA; Jackson R. *Epidemiology* 15(3): 337-344, 2004. (20 refs.)

Background: Alcohol impairment of drivers is considered the most important contributing cause of car crash injuries. The burden of injury attributable to drinking drivers has been estimated only indirectly. Methods: We conducted a population-based case-control study in Auckland, New Zealand between April 1998 and July 1999. Cases were 571 car drivers involved in crashes in which at least 1 occupant was admitted to the hospital or killed. Control subjects were 588 car drivers recruited on public roads, representative of driving in the region during the study period. Participants completed a structured interview and had blood or breath alcohol measurements. Results: Drinking alcohol before driving was strongly associated with injury crashes after controlling for known confounders. This was true for several measures of alcohol consumption: for self-report of 2 or more 12-g alcoholic drinks in the preceding 6 hours compared with none, the odds ratio (OR) was 7.9 (95% confidence interval = 3.4-18); for blood alcohol concentration 3 to 50 mg/100 mL compared with <3 mg/100 mL, the OR was 3.2 (1.1-10); and for blood alcohol concentration greater than 50

mg/100 mL compared with <3 mg/100 mL, the OR was 23 (9-56). Approximately 30% of car crash injuries in this population were attributable to alcohol, with two-thirds involving drivers with blood alcohol concentration in excess of 150 mg/100 mL. Equal proportions of alcohol-related injury crashes were attributable to drivers with blood alcohol concentrations of 3 to 50 mg/100 mL as those with levels of 51 to 150 mg/100 mL. Conclusion: Evidence about the proportion of crashes attributable to drivers at different blood alcohol concentrations can inform the prioritization of interventions that target different groups of drivers. These data indicate where there is the most potential for reduction of the injury burden. Copyright 2004, Lippincott, Williams & Wilkins.

Neurological injury and death in all-terrain vehicle crashes in West Virginia: A 10-year retrospective review. (review).

Carr AM; Bailes JE; Helmkamp JC; Rosen CL; Miele VJ. *Neurosurgery* 54(4): 861-866, 2004. (19 refs.)

OBJECTIVE: The purpose of this study was to profile all-terrain vehicle crash victims with neurological injuries who were treated at a Level 1 trauma center. METHODS: We retrospectively reviewed trauma registry data for 238 patients who were admitted to the Jon Michael Moore Trauma Center at the West Virginia University School-of-Medicine after all-terrain vehicle crashes, between January 1991 and December 2000. Age, helmet status, alcohol and drug use, head injuries, length of stay, disposition, and hospital costs were studied. Death rates, head injuries, age, helmet use, and safety legislation in all 50 states were compared. RESULTS: Eighty percent of victims were male, with an average age of 27.3 years. Only 22% of all patients were wearing helmets. Alcohol and/or drugs were involved in almost one-half of all incidents. Fifty-five of 238 patients sustained spinal axis injuries; only 5 were wearing helmets. One-third of victims (75 of 238 victims) were in the pediatric population, and only 21% were wearing helmets. Only 15% of victims less than 16 years of age were wearing helmets. There were a total of eight deaths; only one patient was wearing a helmet. CONCLUSION: In the United States, all-terrain vehicles caused an estimated 240 deaths/yr between 1990 and 1994, which increased to 357 deaths/yr between 1995 and 2000. Brain and spine injuries occurred in 80% of fatal crashes. West Virginia has a fatality rate approximately eight times the national rate. Helmets reduce the risk of head injury by 64%, but only 21 state's have helmet laws. Juvenile passengers on adult-driven vehicles are infrequently helmeted (<20%) and frequently injured (>65%). We conclude that safety legislation would save lives. Copyright 2004, Congress of Neurological Surgeons.

The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes.

Drummer OH; Gerostamoulos J; Batziris H; Chu M; Caplehorn J; Robertson MD; Swann P. *Accident Analysis and Prevention* (36): 2, 2004. (45 refs.)

study was conducted on 3398 fatally-injured drivers to assess the effect of alcohol and drug use on the likelihood of them being culpable. Crashes investigated were from three Australian states (Victoria, New South Wales and Western Australia). The control group of drug- and alcohol-free drivers comprised 50.1% of the

study population. A previously validated method of responsibility analysis was used to classify drivers as either culpable or non-culpable. Cases in which the driver "contributed" to the crash ($n = 188$) were excluded. Logistic regression was used to examine the association of key attributes such as age, gender, type of crash and drug use on the likelihood of culpability. Drivers positive to psychotropic drugs were significantly more likely to be culpable than drug-free drivers. Drivers with Delta(9)-tetrahydrocannabinol (THC) in their blood had a significantly higher likelihood of being culpable than drug-free drivers (odds ratio (OR) 2.7, 95% CI 1.02-7.0). For drivers with blood THC concentrations of 5 ng/ml or higher the odds ratio was greater and more statistically significant (OR 6.6, 95% CI 1.5-28.0). The estimated odds ratio is greater than that for drivers with a blood alcohol concentration (BAC) of 0.10-0.15% (OR 3.7, 95% CI 1.5-9.1). A significantly stronger positive association with culpability was seen with drivers positive to THC and with BAC greater than or equal to 0.05% compared with BAC greater than or equal to 0.05 alone (OR 2.9, 95% CI 1.1-7.7). Strong associations were also seen for stimulants, particularly in truck drivers. There were non-significant, weakly positive associations of opiates and benzodiazepines with culpability. Drivers positive to any psychoactive drug were significantly more likely to be culpable (OR 1.8, 95% CI 1.3-2.4). Gender differences were not significant, but differences were apparent with age. Drivers showing the highest culpability rates were in the under 25 and over 65 age groups. Copyright 2004, Elsevier Science.

Effects of MDMA (ecstasy), and multiple drugs use on (simulated) driving performance and traffic safety.

Brookhuis KA; de Waard D; Samyn N. *Psychopharmacology* 173(3-4): 440-445, 2004. (30 refs.)

Rationale. The effects of MDMA on driving behaviour are not clear, since the direct effects of MDMA on cognitive performance are reported as not generally negative. Objectives. To assess in an advanced driving simulator acute effects on simulated driving behaviour and heart rate of MDMA, and effects of polydrug use. Methods. A group of young participants who had indicated that they regularly used MDMA were asked to complete test rides in an advanced driving simulator, shortly after the use of MDMA, just before going to a party. They were tested again after having visited the "rave", while they were under the influence of MDMA and a number of different other active drugs. Participants were also tested sober, at a comparable time at night. Separately, a control group of participants was included in the experiment. Results. Driving performance in the sense of lateral and longitudinal vehicle control was not greatly affected after MDMA, but deteriorated after multiple drug use. The most striking result was the apparent decreased sense for risk taking, both after MDMA and after multiple drug use. This was clear from gap acceptance data, while the ultimate indicator of unsafe driving, accident involvement or even causation, was increased by 100% and 150%, respectively. Conclusions. Driving under the influence of MDMA alone is certainly not safe; however, driving back (home) after a dance party ("rave") where MDMA users regularly combine MDMA with a host of

other drugs can be described as extremely dangerous. Copyright 2004, Springer-Verlag.

Alcohol consumption and problems among road rage victims and perpetrators.

Mann RE; Smart RG; Stoduto G; Adlaf EM; Ialomiteanu A. *Journal of Studies on Alcohol* 65(2): 161-168, 2004. (29 refs.)

Objective: Road rage has generated public concern; however, data on the causes of this behavior have not been available. We examine the alcohol consumption correlates of road rage victimization and anti-perpetration based on a population survey of adults. Method: Data are based on the 2001-2002 Centre for Addiction and Mental Health Monitor, a repeated cross-sectional telephone survey of Ontario adults aged 18 and older ($N = 2,610$). Logistic regression analyses were performed with drinking measures (Alcohol Use Disorders Identification Test [AUDIT] consumption, dependence and problems) and demographic factors as independent variables. Results: In the past year, 44.4% of respondents reported that someone shouted, cursed or made rude gestures at them, 6.0% were threatened with damage to their vehicle or personal injury, and 5.2% had someone attempt to or actually damage their vehicle or hurt them. Over the same period, 32% admitted shouting, etc., at someone, 1.7% threatened someone, and 1.0% attempted to or actually did damage someone's vehicle or hurt someone. Univariate analyses revealed several significant relationships between road rage and alcohol measures. Multivariate analyses revealed that the AUDIT alcohol problems measure was most consistently associated with measures of road rage victimization and perpetration, including reporting attempting or actually hurting someone or attempting or actually damaging his or her vehicle. Conclusions: These data indicate there is a significant relationship between alcohol problems, as measured by the AUDIT, and road victimization and perpetration. Further work must be undertaken to identify the mechanisms involved. Copyright 2004, Alcohol Research Documentation, Inc.

The effect of Victim Impact Panels on DUI rearrest rates: A five-year follow-up.

Rojek DG; Coverdill JE; Fors SW. *Criminology* 41(4): 1319-1340, 2003. (35 refs.)

Victim Impact Panels (VIPs) were introduced by Mothers Against Drunk Driving (MADD) in 1982 and have since spread throughout the United States in an attempt to reduce drunk driving. The objective of a VIP is to expose DUI offenders to the pain and suffering caused by drunk driving without necessarily condemning the DUI offender. The few scientific evaluations of the effectiveness of VIPs have produced mixed results. The present investigation draws on evidence from a quasi-experimental design and a five-year follow-up to probe further the effects of VIPs on DUI recidivism. Results show that 33.5% of the comparison group, but only 15.8% of the VIP group, were rearrested over the five-year period. Discrete-time event history analyses suggest that VIPs are associated with a 55.7% overall decrease in the hazard of rearrest; the VIP effect is strong in the first two years but then wanes dramatically. Methodological threats stemming from the study's design are considered. The implications of the differing styles of VIP and the resultant

outcomes are also discussed. Copyright 2003, American Society of Criminology.

Maintenance therapy with synthetic opioids and driving aptitude.

Schindler SD; Ortner R; Peternell A; Eder H; Opgenoorth E; Fischer G. *European Addiction Research* 10(2): 80-87, 2004. (32 refs.)

Aims: To assess the influence of methadone and buprenorphine maintenance treatment on the driving aptitude of opioid-dependent patients. **Design:** Prospective, open label, outpatient maintenance, single-blind (investigator) study. **Participants and Setting:** Thirty opioid-dependent patients maintained on either methadone or buprenorphine were recruited from the drug-addiction outpatient clinic in Vienna. **Measurements:** The traffic-relevant performance dimensions of the participants were assessed 22 h after receiving synthetic opioid maintenance therapy, by a series of seven tests constituting the Act & React Test System (ART) 2020 Standard test battery, developed by the Austrian Road Safety Board (ARSB). To test for additional consumption of illicit substances, blood and urine samples were taken at the beginning of the tests. **Findings:** The patient group only differed from control subjects in two of the ART 2020 Standard tests. During a task to test the subject's attention under monotonous circumstances (Q1 test), patients had a significantly greater number of reactions ($p = 0.027$) and a significantly higher percentage of incorrect reactions than control subjects. When driving in a dynamic environment (DR2 test) patients had a significantly longer mean decision time ($p = 0.029$) and mean reaction time ($p = 0.009$) compared with control subjects. Interestingly, when separated into treatment groups, the mean decision and reaction times of buprenorphine-maintained patients in the DR2 test did not differ from controls, whereas patients maintained on methadone showed significantly prolonged mean decision ($p = 0.009$) and reaction times ($p = 0.004$). In this same test, patients who had consumed additional illicit drugs had a longer mean reaction time compared with control subjects ($p = 0.036$). **Conclusion:** The synthetic opioid-maintained subjects investigated in the current study did not differ significantly in comparison to healthy controls in the majority of the ART 2020 Standard tests. Copyright 2004, Karger.

Snowmobile trauma: 10 years' experience at Manitoba's tertiary trauma centre.

Stewart RL; Black GB. *Canadian Journal of Surgery* 47(2): 90-94, 2004. (31 refs.)

Introduction: According to the literature, the increased recreational use of the snowmobile has resulted in an increasing number of musculoskeletal injuries. We wished to examine whether previously described risk factors continue to be associated with snowmobile trauma and to identify previously unrecognized risks and specific patterns of injury. **Methods:** We carried out a chart review of all snowmobile-related injuries over

a 10-year period at the Health Sciences Centre in Winnipeg, the only level 1 trauma centre serving the Province of Manitoba, with particular attention to the risk factors of suboptimal lighting, excessive speed and alcohol consumption. **Results:** We identified 480 injuries in 294 patients, and 81 (27.6%) of these patients died. Collisions accounted for 72% of the injury mechanisms. Of the injuries sustained, 31% occurred on roads. Excessive speed was a risk factor in 54% of patients, suboptimal lighting in 86% and a blood alcohol level greater than 0.08 in 70%. Musculoskeletal injuries accounted for 57% of those recorded. There were also brachial plexus injuries (3%) and knee dislocations (2%). To our knowledge, this is the largest study detailing injury associated with recreational use of snowmobiles in Canada. **Conclusions:** Because snowmobile trauma is caused principally by human errors, it is potentially preventable. Efforts aimed at prevention must focus on the driver, who controls the common risk factors. The danger of snowmobiling while intoxicated must be emphasized. Trail-side monitoring is likely to be ineffective, as the majority of accidents do not occur on designated snowmobile trails. Copyright 2004, Canadian Medical Association.

Driving under the influence of khat-alkaloid concentrations and observations in forensic cases.

Toennes SW; Kauert GF. *Forensic Science International* 140(1): 85-90, 2004. (25 refs.)

The use of the herbal stimulant khat (*Catha edulis* FORSK) is maintained by immigrants from countries where it is part of their cultural life (Arabian Peninsula and eastern Africa). In western countries the drug and its effects are largely unknown and no experience in evaluating impairment symptoms due to the khat-alkaloids, e.g. cathinone, cathine and norephedrine exists. Blood and urine samples from khat users involved in 19 cases of suspected driving under the influence of drugs were analysed and correlated with the results of medical examination and police officer reports. In 3 cases impaired driving and in 10 cases marked impairment of psychophysical functions was observed such as effects on the nervous system (slow pupil reaction to light, dry mouth, increased heart-rate), trembling, restlessness/nervousness, daze/apathy/dullness, impairment of attention, walking and standing on one leg. However, the alkaloid concentrations assayed in blood did not correlate with the impairment symptoms. Apart from an acute phase of indirect sympathomimetic action the development of habituation and withdrawal symptoms must also be considered in explaining the diversity of effects observed. From these results it can be concluded that chewing khat may severely impair driving ability, but may also be without noticeable effects. Copyright 2004, Elsevier Science Ireland, Ltd.