



Driving Under the Influence

Avoiding the Effects of Prescription Drugs on Driving Performance

by Linda L. Hill, MD, MPH

Acknowledgments: Dr. Hill would like to acknowledge the contributions of Thu Truong and Tiep Ly, PharmD candidates, Skaggs School of Pharmacy and Pharmaceutical Sciences, UC San Diego.

PRESCRIBED MEDICATIONS, over-the-counter (OTC) medications, and abused drugs, including alcohol, have the potential to interfere with the ability to drive safely. Physicians have a responsibility to their patients and the public to minimize this risk in their prescribing practices, their patient counseling, and in reporting to the Department of Motor Vehicles.

The potential for impaired driving differs by age group; younger drivers are more likely to drive impaired due to abused drugs, while older adults are more likely to be taking prescribed medication, and engage

in polypharmacy and the inherent drug interactions. A study by the AAA Foundation for Traffic Safety found that 78% of drivers 55 years old and older are using at least one prescription medication with the potential to impair driving. And only 28% of senior drivers were aware that their medications had this potential effect. Unfortunately, only half of these drivers (52% – 58% of women vs. 46% of men) have talked to a healthcare provider about the possible effect of these drugs on their ability to drive (December 2011 AAA survey).

Prescription medications will be reviewed here in an effort to raise awareness of drug-driving interactions and to reduce driving injuries, a major cause of disability and death across the age spectrum.

The classes of prescription drugs and their potential side-effects are outlined in

Table 1. The main side-effects that impair driving skills include drowsiness, confusion, hypotension and possible associated syncope, hypoglycemia, poor muscle tone or incoordination, and less common problems such as double vision, nausea, blurred vision, and memory impairment. For all drugs, minimizing use to only those needed, stopping drugs in a timely manner, and using the lowest dose to achieve the desired effect will help reduce side-effects. Patients need to be educated on the effects of medications on driving.

Anticonvulsants are used for treatment of seizures but have other indications, including migraine headaches, mood disorders, and neuropathy. Seizure disorders, when uncontrolled, can interfere with driving, of course, but anticonvulsants may cause drowsiness, confusion, ataxia, nausea, and double vision. The response to the medication varies by individual, and may not always be linearly correlated with dosage. Blood drug levels are helpful in some drugs, such as phenytoin, where high blood levels are correlated with ataxia.

Psychotropics are another example where both the medication and the disease being treated can affect driving safety. There is evidence that the crash rate in individuals with depression is three times higher than unaffected individuals. However, the

Table 1

	Drowsiness	Confusion, Poor Judgment	Syncope, Hypotension	Hypoglycemia	Poor Muscle Tone, Incoordination	Other side-effects	Offending agents	Recommended Alternatives
Anticonvulsants	X	X			X	double vision, neuropathy, nausea, ataxia	class effect	
Antidepressants	X		X				tricyclics, trazodone, mirtazapine, MAOIs	SSRIs, SNRIs, bupropion
Antiemetics	X	X	X		X	blurred vision	promethazine, metoclopramide, prochlorperazine, chlorpromazine	ondansetron
Antihistamines	X					blurred vision, hyperkinesia	diphenhydramine, chlorpheniramine, hydroxyzine, dimenhydrinate, meclizine	loratadine, cetirizine, fexofenadine
Anticholinergics	X	X					atropine / diphenoxylate, benztropine, oxybutynin, trihexyphenidyl, dicyclomine, belladonna alkaloids	
Antihypertensive			X				β blockers, calcium channel blockers, clonidine	ACEIs, ARBs, thiazide
Antiparkinsonians	X	X	X		X	dizzy, nausea, headache	trihexyphenidyl, benztropine, selegiline, rasagiline, ropinirole, pramipexole, rotigotine	entacapone, tolcapone, amantadine
Antipsychotics	X	X	X		X	tremor, nausea	class effect	
Anxiolytics	X	X			X	memory impairment	benzodiazepines, buspirone	
Chemotherapy	x	x			x	nausea, weakness	class effect	
Muscle relaxants	X	X			X	dizziness, nausea	class effect	
Narcotic analgesics	X	X			X	nausea	class effect	
Stimulants		X				emotional lability, tremor	amphetamine, methylphenidate	
Antidiabetics				X		nausea	insulin, sulfonylurea, glinides (repaglinide, nateglinide), exenatide, liraglutide	Metformin, gliptins (sitagliptin, saxagliptin, linagliptin), TZDs (pioglitazone, rosiglitazone)
α_1 antagonist			X				prazosin, terazosin, doxazosin	tamsulosin, silodosin
PDE-5 inhibitors			X				class effect	
Marijuana	X	X			X		marijuana, dronabinol	

treatments for depression may be associated with side-effects that interfere with driving as well. Even one psychotropic prescription drug increased the crash risk more than two-fold for drivers over 45 years of age, with dramatic increases to eight-fold for more than two CNS-affecting drugs. The tricyclic antidepressants have higher rates of hypotension and drowsiness, one of the reasons they are prescribed at night to help

Diabetes and diabetic drugs are associated with hypoglycemia, and diabetics should be cautioned to check their sugar before driving, and periodically on long trips.

There is evidence that the crash rate in individuals with depression is three times higher than unaffected individuals. However, the treatments for depression may be associated with side-effects that interfere with driving as well.



with depression-associated insomnia. They have been associated with a more than two-fold crash risk in the elderly. Anxiolytics, especially the benzodiazepines, can cause drowsiness, confusion, and amnesia, and may interfere with muscle tone and coordination, and 10mg of Valium have been found to be equivalent to a BAC of 0.10. Antipsychotics and psychosis, similarly, may both affect judgment, with the drugs causing nausea and drowsiness.

Diabetes and diabetic drugs are associated with hypoglycemia, and diabetics should be cautioned to check their sugar before driving, and periodically on long trips. While hypoglycemia is especially a risk during medication adjustments, it can occur at any time with changes in food intake, activity, or acute illnesses. Diabetic drugs have many interactions with other medications that can potentiate their hypoglycemic effects. In addition, diabetic patients are at risk of a myriad of eye diseases affecting vision and driving safety. Routine eye care and good glucose control play a role in mitigating that effect but don't eliminate the risk.

Chemotherapy can also impair driving

skills by increasing the risk of nausea, confusion, drowsiness, poor muscle tone, and dehydration, with associated hypotension and syncope. The frailness alone, associated with cancer and chemotherapy (and other treatments), reduces driving skill and increases crash risk. Individuals under acute care for cancer should be advised to find alternative transportation when the chemotherapy is associated with these common side-effects.

Narcotic analgesics, especially but not exclusively in the acute setting, are associated with impaired judgment, confusion, drowsiness, and nausea, all likely to impair driving safety. These individuals are at risk of being charged with "driving under the influence" if stopped for driving impairment, even if they have prescriptions for these drugs. Driving should be stopped when narcotics are first prescribed, and only resumed once the level of impairment is felt to be low enough not to interfere with safe driving.

While marijuana is often used illegally, the increasing number of prescriptions for medical marijuana is changing the patterns of impaired driving. Marijuana can affect driv-

ing through altered judgment, motor control, and concentration. The effects of marijuana may persist for hours after use, though the acute blood levels from use generally fall within four hours. When prescribing marijuana, driving timing should be discussed relative to use.

The effect of alcohol on driving safety is profound due to both the level of impairment and the high prevalence of use. Alcohol is estimated to be implicated in 60% of traffic fatalities, a greater influence than any other substance. While the standard BAC of 0.08 is considered the legal level of impairment, driving skill is reduced at lower levels as well. The designated driver should abstain from alcohol to avoid the effects, a practice that is even more important in the older driver.

Patients should understand the medications they are taking and whether they, in conjunction with their condition and OTC medications, can impair driving ability. With the majority of drivers 55 years old or older on one or more prescription medications, this has become a great safety concern. Healthcare providers should discuss possible interactions and effects with all patients on one or more prescription medications.

California is one of nine states requiring mandated reporting to the Department of Health Services for lapses of consciousness (see *San Diego Physician* article "Mandated Disease Reporting Requirements: A Roadmap"; Volume 98, Number 10) associated with an underlying condition. Lapses include loss of consciousness, dementia, seizures, or other conditions that cause a reduction in alertness. The list of reportable conditions in California has been recently updated and can be found at www.cdph.ca.gov/HealthInfo/Pages/ReportableDiseases.aspx. Conditions other than lapses of consciousness may also be reported if the physician feels the driver is at risk to themselves or others.

Resources for further information on the topic of medication, medical conditions, and driving include:

- Roadwise Rx: www.roadwiserx.com, sponsored by AAA
- The National Highway Traffic Safety Administration Report DOT HS 809 725, 2004.
- Medical Conditions and Driving: A Review of the Scientific Literature: DOT HS 809 690, 2005.
- <http://treds.ucsd.edu> SDP

Dr. Hill, SDCMS-CMA member since 2010, is clinical professor and director of preventive medicine residency in the Department of Family and Preventive Medicine at UC San Diego.