

Zolpidem Impaired Drivers in Wisconsin A Six Year Retrospective

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Zolpidem (Stilnoct™, Ambien™) Facts

- Non-benzodiazepine sedative hypnotic
- Used since 1986 (Europe) & 1993 (USA)
- Touted as #1 sleep aid in the USA
- Use only with 8 hours uninterrupted sleep
- Short term insomnia relief in 5 and 10 mg doses
- Therapeutic serum levels of 29 - 272 ng/mL
- Peak concentrations within 1.5 - 2.5 hours
- Short T_{1/2} = 1.4 - 4.5 hours
- Metabolized by liver, cytochrome P450 3A4
- Impairment similar to ethanol, CNS depressants

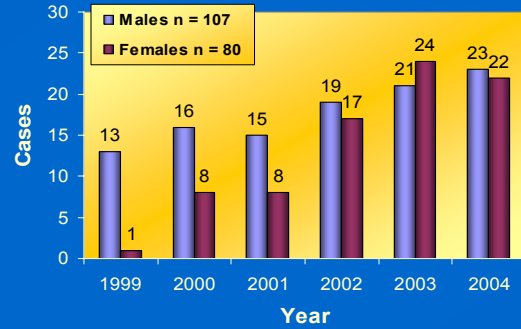
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Zolpidem Detection 1999-2004

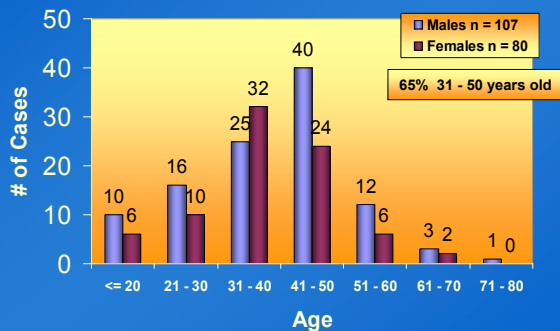
- **187 cases with zolpidem confirmed**
 - 8,121 whole blood specimens analyzed for drugs
 - >120,000 specimens tested for ethanol (OWI cases)
 - Drug testing cancelled when BAC > 0.10 g/100mL
- **Screening and confirmation process**
 - Basic liquid:liquid extraction is screened by GC/NPD and confirmed by GC/MSD
 - Quantitation: 2nd basic liquid:liquid extraction, flurazepam ISTD with analysis via Shimadzu GC/NPD

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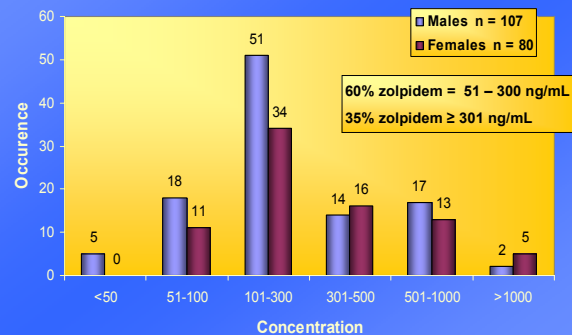
Zolpidem Use By Year - Males & Females (WSLH Data 1999-2004)

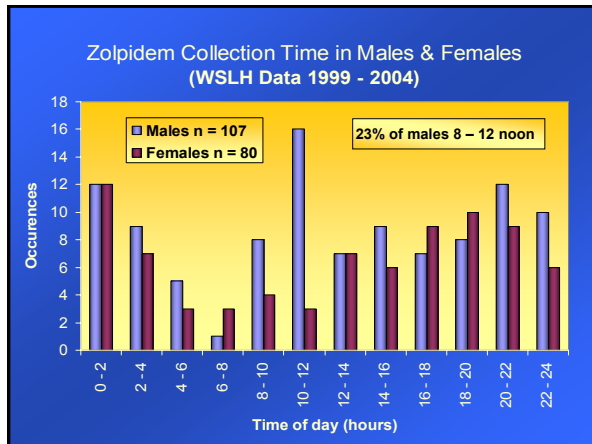


Zolpidem Use by Age - Males & Females (WSLH Data 1999-2004)



Zolpidem Concentration in Males & Females (WSLH Data 1999-2004)





- ## Poly Drug Use Patterns
- Ethanol found in 46 cases
 - “Non-ethanol” drugs found
 - One other drug = 35%
 - Two or more drugs = 51%
 - Benzodiazepine class in 42 cases
 - diazepam, alprazolam, clonazepam most popular
 - 55% males, 45% females
 - n = 4 cases of multiple benzos
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- ## Poly Drug Use Patterns
- carboxy-THC use in 30 cases
 - delta-9-THC use in 19 cases
 - males accounted for 80% of THC use
 - hydrocodone use in 27 cases
 - 37% males & 63% females
 - diphenhydramine use in 24 cases
 - 42% males & 58% females
 - propoxyphene use in 18 cases
 - 39% males & 61% females
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- ## Focus: Zolpidem Only
- Incident reports were evaluated from the 21 cases where zolpidem was the only analyte found.
 - Concentration (ng/mL)
 - Males: Mean = 414 (60 – 1200), n=15
 - Females: Mean = 580 (220 – 1100), n = 6
 - 57% of these results were in excess of expected single dose peak concentrations.
 - All 5 DRE evaluations correctly identified CNS depressant.
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- ## Zolpidem Only: At a Glance
- n = 15 males, 19-55 yrs old
 - (mean = 39, median = 40)
 - n = 6 females, 20-45 yrs old
 - (mean = 35, median = 38)
 - Difficulty completing field sobriety tests
 - Difficulty keeping eyes open to administer HGN tests
 - HGN administered 11 times, not present 3 times
 - Zolpidem levels 290, 430, 1200 ng/mL
 - Poor balance and coordination often required officer to stop field sobriety tests
 - Confusion and disorientation also common
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Zolpidem Only: Driving

Hitting stationary objects	52%
(light poles were preferred object)	28%
Speed: well below posted limits	38%
above posted limits	10%
Lane deviation	52%
Tires over curb / on sidewalk	33%
Hitting another vehicle	24%
Driving into ditch	19%
Driving wrong direction	14%

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Zolpidem Only: Impairment

- Eyes appeared to “look right through” officer
- Speech usually slow, slurred and unusually quiet
- Gait extremely unsteady with side to side and backward sway; often required assistance to stand
- Unable to remember poor driving/reason for stop
- Unable to remember officer instructions
- When noted, most subjects co-operated with officer
 - Exceptions: 2 drivers displayed rapid mood swings from co-operative to belligerent & aggressive within seconds.

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Officer Abuser

- Officer arrived at 5:30 AM
- Blood zolpidem @ 6:20 AM = 450 ng/mL
- Slurred speech, unbalanced/nearly fell
- Eyes glazed over, “looked right through” officer
- Subject claimed officer made things up
- Flat tire, then knocked down light pole & continued onto sidewalk with right side tires (no skid marks)
- Cooperative → Defensive, belligerent & aggressive
 - Kicked one officer in the abdomen

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Hansel, Gretel & Gasoline

- Time of driving 9:00 – 10:00 AM
- Officer dispatched @ 10:00 AM
- Officer observes gasoline pouring from bottom of vehicle; right side tires are on sidewalk
- Subject admitted taking one “lithium” sleeping pill @ 9:00 AM. (lithium not tested)
- Officer recovered Rx for zolpidem @ 10 mg
- Blood zolpidem @ 11:30 AM = 840 ng/mL

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1st Time User?

- Took 1 zolpidem 5:00 – 6:00 AM
- Officer dispatched 6:35 AM through citizen call
- Blood zolpidem @ 9:08 AM = 75 ng/mL
- Subject appeared groggy & complained of double vision
- Speech was slow and deliberate
- Left roadway during curve, traveled ~ 30' down into ditch and continued on another 70'
- Just started 3rd shift and was having trouble sleeping. Produced a sample blister pack with one tablet removed & claimed this was first use. Subject felt they could take one tablet and safely drive home.

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You say Unisom, I Say Zolpidem

- Took 4 Unisom tablets from 2:00 – 3:00 AM
- Officer arrived @ 7:04 AM
- Blood zolpidem @ 9:00 AM = 1200 ng/mL
- Eyelids droopy with a glassy, blank stare
 - HGN = 0 clues
- Speech slow, slurred & incoherent
- Drove against traffic 6 times with 3 near head-on collisions. In and out of ditch finally hitting wooden sign.
 - Stumbled onto highway to check sign knocked down
 - Subject was traveling to work and felt O.K. to drive

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Sidewalk Sightseer

- Officer observed subject driving @ 11:30 PM
- Subject described as “pill popper” by friend, but admitted no zolpidem use
- Officer recovered Rx for Zoloft (sertraline)
- Blood zolpidem @ 1:10 AM = 360 ng/mL
- “Vacant expression”, fascinated by the emergency lights
- Slurred speech, unable to stand without assistance, cooperative but incoherent
- Drove at very slow speed, faced wrong direction within lane, drove with all four tires on the sidewalk

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Hold My Keys, Please...

- No sleep for 36 hours
- Took 3 zolpidem @ 9:00 AM
 - Recanted claim of taking entire bottle of ibuprofen
- Officer arrived @ 3:44 PM
- Blood zolpidem @ 5:11 PM = 730 ng/mL
- Eyes appeared tired
- Speech slow, confused and quiet
- Drove over curb, grass median & sidewalk. Struck another car @ 10 – 15 mph then hid in apartment.
- Usually hides keys or asks someone to hold them while taking Ambien

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