Cross-Examination of the Toxicologist in DUI Drugs Cases

DUI 201

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Attorney Resources and Presentations

L&H – DUI Case Update

Statutory Speedy Demand (Redacted)

Brief – Withdrawal Consent

Withdrawal of Consent (Template)

Blood Test Discovery Motion

ORR – GBI – Blood

Motion to Suppress (Warrantless Search)

Defense of Drinking Drivers – 2021

DDD – CLE 12.21

MTS – SEARCH WARRANT

Dodd Winter Meeting

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https://tinyurl.com/y3oanma9

Montana CLE Materials

DRE – Montana.pptx

My Goals

To help you identify some of the core cross-examination topics for toxicologists

To help you understand how this looks in practice

Medical issues and prescribed medications combine to make many of these cases winnable…

5	A Uh, I would say that the average individual would
6	be impaired at this level. This is an exceedingly high level
7	of Zolpidem. It's actually - - Based on the references that I
8	have, it would be considered at toxic level, and there's
9	actually reports where a level lower than this has actually
10	been lethal.

JURY VERDICT

We, the jury, find the Defendant, [redacted].

NOT GUILTY, (Guilty or Not Guilty) of **Count 1, DUI (LESS SAFE)(DRUGS)**, in the above-referenced case.

JURY VERDICT

We, the jury, find the Defendant, [redacted].

NOT GUILTY, (Guilty or Not Guilty) of **Count 2, DUI (LESS SAFE)(DRUGS)**, in the above-referenced case.

JURY VERDICT

We, the jury, find the Defendant, [redacted].

GUILTY, (Guilty or Not Guilty) of **Count 3, FAILURE TO MAINTAIN LANE**, in the above-referenced case.

What are the central cross-examination topics?

1. **Presence/Consumption v. Impairment.** This is often the heart of the defense. Unlike alcohol, most drugs lack established per se impairment thresholds supported by controlled studies. A positive result for THC-COOH, for instance, tells you almost nothing about impairment at the time of driving—it's an inactive metabolite that can persist for weeks.

2. **Therapeutic vs. Impairing Levels.** For prescription medications, the detected level may fall squarely within therapeutic range.

3. **Pharmacokinetics.** Explore absorption, distribution, metabolism, and elimination. When was the sample drawn relative to driving? For many drugs, blood levels at the time of the draw don't reflect levels at the time of driving—and unlike alcohol, there's often no scientifically accepted method for retrograde extrapolation.

4. **Tolerance.** Chronic users of many substances—prescription medications, cannabis, benzodiazepines—develop significant tolerance.

5. **Limits of the test.** Urine and inactive metabolites.

Major Cross-Examination Chapter 1: Presence/Consumption v. Impairment – The Fundamentals

- You would agree that detecting a substance in someone's blood and determining whether that substance impaired them are two different questions?
- The blood tests can tell us what substances were present in the sample?
- And it can tell us the concentration of those substances at the time the sample was drawn?
- But the laboratory analysis itself does not tell us whether the person was impaired?
- To determine impairment, you would need information beyond what the lab report provides?

Major Cross-Examination Chapter 1: Presence/Consumption v. Impairment – No Per Se Threshold

- For alcohol, there's a substantial body of controlled research correlating blood alcohol concentration with specific impairment of driving-related skills?
- That research has been conducted over decades, involving thousands of people?
- And that research forms the scientific foundation for the .08 per se limit?
- No comparable body of research exists for [drug at issue], does it?
- There is no scientifically established blood concentration of [drug] above which all individuals are impaired, is there?
- You cannot point to a peer-reviewed study that says a level of [X ng/mL] impairs driving in all people, can you?
- In fact, the published literature acknowledges that no per se limit for [drug] has been validated the way alcohol limits have been?

Major Cross-Examination Chapter 1: Presence/Consumption v. Impairment – People are all different

- People respond differently to the same drug at the same concentration, don't they?
- A dose that might significantly affect one person could produce little noticeable effect in another?
- Factors like body weight, metabolism, genetics, and prior exposure all influence how a person responds to a drug?
- Two individuals with identical blood concentrations could exhibit very different levels of impairment—or no impairment at all?
- You did not examine my client?
- You have no way of knowing how my client individually responds to [drug]?

Major Cross-Examination Chapter 2: Therapeutic vs. Impairing Levels – If you have a therapeutic blood level

ESTABLISH YOUR POINT OF REFERENCE

- You're familiar with Winek's Drug and Chemical Blood-Level Data?
- This is a standard reference in the field of forensic toxicology, isn't it?
- It's been published and updated for decades?
- Winek's compiles reported blood concentrations of drugs across three categories—therapeutic, toxic, and lethal—based on peer-reviewed literature and case reports?
- You would consider Winek's a reliable reference for determining whether a given blood concentration falls within therapeutic range?
- Toxicologists routinely consult Winek's when interpreting blood drug levels, don't they?

How do we learn what we need in a particular case?

MOTION IN LIMINE TO EXCLUDE LACK OF CONVERGENCE TEST EVIDENCE, ROMBERG TEST EVIDENCE, PUPIL SIZE EVIDENCE, REDDENING OF CONJUNCTIVA EVIDENCE, AND CORRELATION OF BLOOD TEST RESULTS TO ALLEGED IMPAIRMENT UNDER OCGA 24-7-702

Comes Now, the Defendant in the above-styled case, by and through the undersigned counsel of record, and moves in limine to exclude from evidence the following:

1. evidence that the Defendant's eyes failed to converge upon a stimulus,
2. evidence gathered as a result of the Romberg test,
3. evidence of the defendant's pupil size and attempts at correlating pupil size to impairment,
4. evidence of reddening of the defendant's conjunctiva and attempts at correlating this to impairment,
5. other physical manifestations and observations of the defendant that purportedly correlate to impairment by drugs, and
6. attempts to correlate blood test results to impairment by drugs.

The Defendant moves to exclude from evidence each of these items pursuant to OCGA 24-7-702 and the holding of *Daubert v. Merrell Dow Pharmaceuticals Inc.*, 509 U.S. 579 (1993).

RESPECTFULLY SUBMITTED, this 21st day of July, 2025.

What sources do they rely upon?

A Well, part of our training at the GBI covers therapeutic ranges, but those are, you know, basically from the references.

Q Are you familiar with the Winek's Chart?

A I am.

Q Is Winek's also one of those charts that you would recognize as being an authority?

A Yes.

Winek's Drug & Chemical Blood-Level Data 2001

Prepared by: Charles L. Winek, Ph.D., Wagdy W. Wahba, Ph.D., Charles L. Winek, Jr., B.S. (Pharm.), M.S., and Tracey Winek Balzer B.S. (Pharm.), M.S.

Units

Drugs and ch

Zolpidem (Ambien)	0.0003 - 0.0018	0.003 - 0.018

Drug and Chemical Blood Level Data - 2001

DRUG	Therapeutic or Normal		Toxic		Lethal	
	mg%	ug/ml	mg%	ug/ml	mg%	ug/ml
A						
Acebutolol (Spectral)	0.05 - 0.12	0.5 - 1.2	*****	*****	*****	*****
Acetaminophen (Tylenol)	1 - 2	10 - 20	15	150	>16	>160
Acetazolamide (Diamox)	1.0 - 1.5	10 - 15	*****	*****	*****	*****
Acetohexamide (Dymelor)	2.1 - 5.6	21 - 56	*****	*****	*****	*****
Acetone	*****	*****	20 - 30	200 - 300	55	550
Acetonitrile [met: to Cyanide]	*****	*****	*****	*****	0.077	0.77
Acetylsalicylic Acid [as met:	2 - 10	20 - 100	15 - 30	150 - 300	50	500
Salicylate-for analgesic use]						
Acetylsalicylic Acid [as met:	2 - 25	20 - 250	*****	*****	*****	*****
Salicylate-for rheumatoid arthritis]						
Actidil (Triprolidine)	0.0004 - 0.0044	0.004 - 0.044	*****	*****	*****	*****
Actifed (Pseudoephedrine)	0.050 - 0.077	0.50 - 0.77	*****	*****	1.9	19
(Triprolidine)	0.0004 - 0.0044	0.004 - 0.044	*****	*****	*****	*****
Actron (Ketoprofen)	0.5 - 0.15	5 - 1.5	*****	*****	*****	*****
Adalat (Nifedipine, Procardia)	0.0015 - 0.0162	0.015 - 0.162	*****	*****	*****	*****
Alcaine (Proparacaine)	*****	*****	*****	*****	1.5	15
Aldrin	0.00015	0.0015	0.00035	0.0035	*****	*****
Alfenta (Alfentanil)	0.010 - 0.12	0.10 - 1.2	*****	*****	*****	*****
Alfentanil (Alfenta)	0.010 - 0.12	0.10 - 1.2	*****	*****	*****	*****
Allegra (Fexofenadine)	0.018 - 0.021	0.18 - 0.210	*****	*****	*****	*****
Alphaprodine (Nisentil)	0.087 - 0.100	0.87 - 1.00	*****	*****	0.33	3.3
Alprazolam (Xanax)	0.0025 - 0.0102	0.025 - 0.102	*****	*****	0.0122 - 0.039	0.122 - 0.39
Aluminum	0.013	0.13	*****	*****	*****	*****
Amantadine (Symmetrel)	0.006 - 0.031	0.06 - 0.31	0.1 - 0.05	1 - 0.5	0.21 - 0.48	2.1 - 4.8
Ambien (Zolpidem)	0.0029 - 0.0272	0.029 - 0.272	*****	*****	0.05 - 0.112	0.5 - 1.12
Aminophylline (Theophylline)	1 - 2	10 - 20	3 - 4	30 - 40	5 - 25	50 - 250
Amitriptyline (Elavil)	0.012 - 0.025	0.12 - 0.25	>0.05	>0.5	0.2 - 2.0	2 - 20
Amitriptyline (Elavil)	0.012 - 0.025	0.12 - 0.25	>0.05	>0.5	*****	*****
[+met: Nortriptyline]						
Ammonia	0.05 - 0.17	0.5 - 1.7	*****	*****	*****	*****
Amobarbital (Amytal)	0.1 - 0.5	1 - 5	1 - 3	10 - 30	1.3 - 9.6	13 - 96
Amoxapine (Asendin)	0.0017 - 0.021	0.017 - 0.21	*****	*****	0.295 - 2.0	2.95 - 20
Amoxapine (Asendin)	0.02 - 0.04	0.2 - 0.4	*****	*****	*****	*****
[+met: 8-OH-amoxapine]						
Amphetamine	0.003 - 0.011	0.03 - 0.11	>0.05	>0.5	>0.1	>1
Amytal (Amobarbital)	0.1 - 0.5	1 - 5	1 - 3	10 - 30	1.3 - 9.6	13 - 96
Anafranil (Clomipramine)	0.01 - 0.045	0.1 - 0.45	*****	*****	*****	*****
Anaprox (Naproxen)	3.1 - 12	31 - 120	40	400	*****	*****
Analeridine (Leritine)	<0.05	<0.5	*****	*****	0.09 - 0.70	0.9 - 7.0

NOTE:

Divide the mg% level by 100 to obtain mg/mL Divide the µg% level by 100 to obtain µg/mL. To convert mg/L or µg/L to mg% or µg%, divide level by 10.

Examples:

1mg/L = 0.1mg%

3µg/L = 0.3µg%

µg is the representation for microgram (mcg).

Many therapeutic drugs are reported in nanograms/ milliliter (ng/mL). To convert the listed mcg/mL in this table to ng/mL, multiply the listed value by 1000. For example, digoxin concentration of 0.0022 mcg/mL would be 0.0022 x 1000 = 2.2 ng/mL. Put simply, you move the decimal point three places to the right.

Major Cross-Examination Chapter 3: Presence/Consumption v. Impairment – Pharmacokinetics

- The blood sample in this case was drawn at [time], correct?
- The alleged driving occurred at approximately [earlier time]?
- So there was a gap of [X hours/minutes] between the driving and the blood draw?
- During that time, the drug was being metabolized and eliminated from my client's system?
- For many drugs, blood concentrations can change significantly over that time period?
- You cannot state with scientific certainty what my client's blood concentration was at the time of driving, can you?
- Unlike alcohol, there is no generally accepted method for retrograde extrapolation of [drug] levels, is there?

Major Cross-Examination Chapter 3: Presence/Consumption v. Impairment – Pharmacokinetics

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- Unlike alcohol, there is no generally accepted method for retrograde extrapolation of [drug] levels, is there?

Pharmacokinetics – This ain't magic.

Q And you don't know what his level was at the time of driving, correct?

A I do not know what it was at the time he was driving.

Q How long does it take to absorb?

A Uh, absorption can be - - can vary upon a lot of things, so I can't really make an estimate of how long it would absorb.

Q What are the various things you would like to know in making a determination?

A Well, there's a lot of different factors as far as you know, age, gender, what someone's eaten, if they're experiencing certain health issues. I mean, there's a lot of - - just about anything you can think of could affect the time that it takes to absorb the drug.

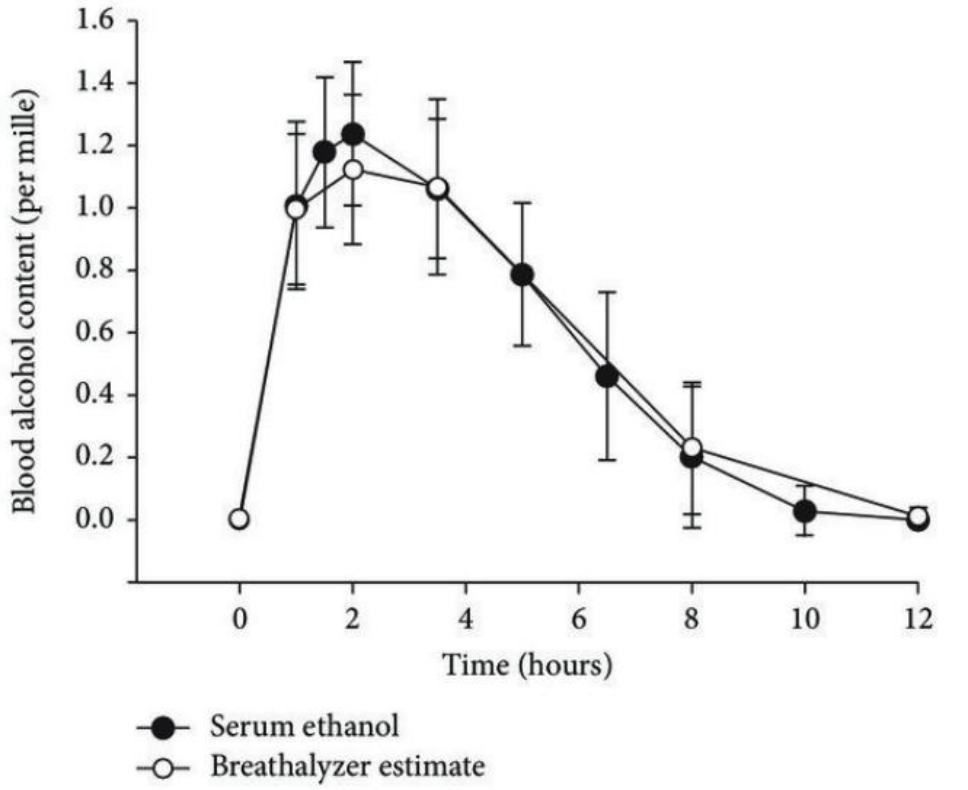
Q The time they took it, obviously?

A Yes.

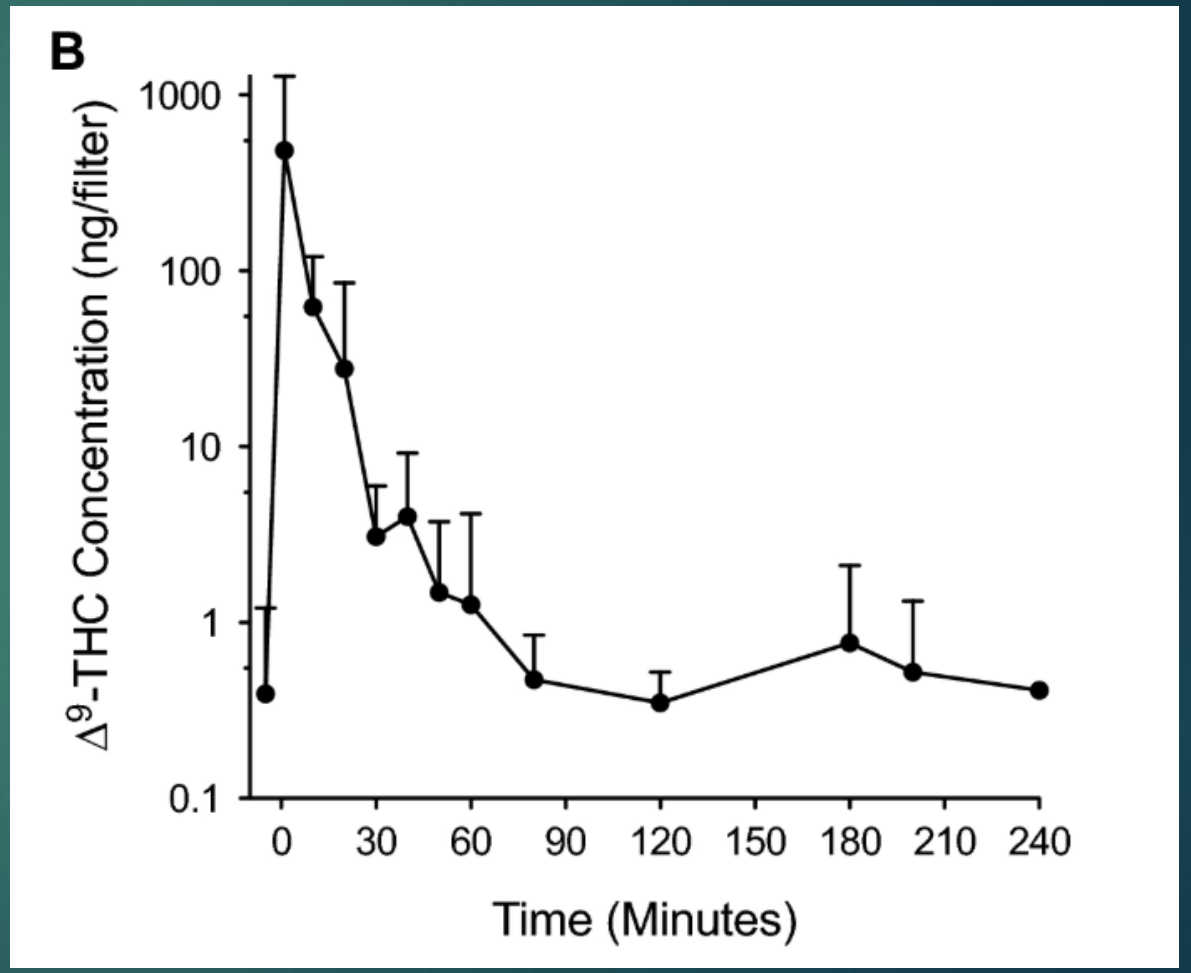
Q The time they took it relevant to the testing, correct?

A Yes, absolutely.

Pharmacokinetics – This ain't magic.



Elimination curve of ethanol following binge drinking of vodka amounting 4.28 mL/kg body weight as assessed by blood ethanol content and breathalyzer estimate.



Major Cross-Examination Chapter 4: Presence/Consumption v. Impairment – Tolerance

- You're familiar with the concept of tolerance?
- Tolerance means that with repeated exposure to a substance, the same dose produces a diminished effect?
- A person who uses [drug] regularly may function normally at a blood concentration that would impair a first-time user?
- Regular users may show little or no impairment at levels many times higher than what would affect a person that does not take the drug as frequently?
- You have no information about my client's history of use or tolerance level, do you?
- You cannot account for tolerance in forming any opinion about impairment in this case?

Major Cross-Examination Chapter 4: Presence/Consumption v. Impairment – Tolerance

Q The average individual that you're referencing, has that average individual been on Zolpidem for five years?

A Probably not. There is a degree of tolerance to be expected if someone is taking it every night for a long period of time. From the information that I've read, as far as Zolpidem goes, with reference to the Physician's Desk Reference, it's not necessarily a drug that's recommended to be used for long periods of time, it's more of a short term drug. But tolerance can develop if someone is taking it regularly like that.

Major Cross-Examination Chapter 4: Limits of the type of Test – Urine v. Blood (This is from the State's direct.)

A Well, it would hang around longer in the urine just because of how the body operates.

Q So blood would not hold -- blood would not hold a drug sample longer than urine?

A A drug, if it's found in the blood it would just make the time-frame shorter as far as was the person participating in active use of the drug or not.

With the urine it tells us that the person did use the drug, but it's not necessarily saying that it was impairing, if that makes sense.

Q It's not saying it was what?

A Impairing, if that makes sense.

Major Cross-Examination: Active v. Inactive Metabolites

BY MR. SESSIONS:

Q What I'm trying to figure out is, the metabolite that you actually observed that's out of the urine here, is that an active metabolite or is that an inactive metabolite?

A It's an inactive metabolite.

Q It shouldn't cause any sort of psychoactive effect upon the defendant?

A No.

Q What is the cut-off --

THE COURT: What did that question just mean?

MR. SESSIONS: Sorry, Your Honor.

THE COURT: Please explain. If you're asking me to rule, explain your question for me. You guys obviously understood it, but I

Major Cross-Examination: Active v. Inactive Metabolites

BY MR. SESSIONS (resuming):

Q What does it mean, the symptom psychoactive?

A If something is psychoactive then that means it's having an effect on the brain.

Q And the brain -- what it is that passes through the brain is what it is that affects the person's coordination and mental and physical faculties?

A Yes.

Q So if a metabolite that we're observing that is an inactive metabolite, that means that it is not affecting the person's mental and physical faculties?

A Exactly, yes.

Q And that is the metabolite that we observed in Mr. Hanks' urine whenever you tested it is an inactive metabolite?

A Yes.

Major Cross-Examination: Active v. Inactive Metabolites

Q Do you have any basis to say that there was active metabolites in the blood?

A I didn't test it so I have no basis to say that either.

Q And obviously the inactive metabolites would be in the blood longer than active metabolites would be, correct?

A Yes.

Q Is there any basis to even say that there were inactive metabolites in the blood?

A Since we didn't test it I have no basis to say that it's in his blood.

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