IN THE CIRCUIT COURT FOR CARROLL COUNTY, MARYLAND

STATE OF MARYLAND,	:	
v.	:	
CHARLES DAVID BRIGHTFUL,	:	Criminal No. K-10-040259
HARVEY ALEXANDER CARR,	:	Criminal No. K-10-040331
JENNIFER ADELINE FLANAGAN,	:	Criminal No. K-10-040167
RYAN THOMAS MAHON,	:	Criminal No. K-09-039370
CHRISTOPHER JAMES MOORE,	:	Criminal No. K-09-039569
VALERIE ANN MULLIKIN,	:	Criminal No. K-09-039636
RONALD DALE TEETER,	:	Criminal No. K-10-040300
Defendants.	:	Westminster, Maryland
	:	September 21, 2010

HEARING

WHEREUPON, proceedings in the above-entitled matter commenced.

BEFORE: THE HONORABLE MICHAEL M. GALLOWAY, Judge

APPEARANCES:

FOR THE STATE:

DAVID DAGGETT, Esq.
ADAM WELLS, Esq.
Carroll County State's Attorney's Office
55 North Court Street, P.O. Box 530
Westminster, Maryland 21157

FOR THE DEFENDANTS:

BRIAN L. DeLEONARDO, Esq.
DeLeonardo, Smith & Associates, LLC
215 Main Street, Suite 1
Reisterstown, Maryland 21136

ALEXANDER J. CRUICKSHANK, Esq.
Office of the Public Defender
101 North Court Street, Suite 140
Westminster, Maryland 21157

I N D E X

WITNESS	DIRECT	CROSS	REDIRECT	RECROSS	VOIR DIRE
For the State:					
Karl Citek	--	6(BD) 49(AC)	52(AW) 65(DD)	66(AC) 67(BD)	--
Michelle A. Spirk	78(DD)	--	--	--	85(AC) 118(BD)

EXHIBITS	FOR IDENTIFICATION	IN EVIDENCE
For the State:		
8	78	144
9	138	--
10	159	159
11	161	--
12	162	163
13	164	--
14	164	--

Keynote: "---" indicates inaudible in the transcript.

P R O C E E D I N G S

THE COURT: Mr. Wells?

MR. WELLS: Good morning, Your Honor. For the record, Adam Wells, W-e-l-l-s, on behalf of the State, calling State of Maryland versus Charles Brightful, Case No. K-10-40259; Harvey Carr, K-10-40331; Jennifer Flanagan, K-10-40167; Ryan Mahon, 09-39370; Christopher Moore, 39569; Valerie Mullikin, 393, excuse me 39636; Ronald Teeter, 40300.

David Daggett will also be present, spelled D-a-g-g-e-t-t, on behalf of the State.

MR. CRUICKSHANK: Good morning, Your Honor. Alex Cruickshank, C-r-u-i-c-k-s-h-a-n-k, Office of the Public Defender on the Public Defender's behalf and my clients.

MR. DeLEONARDO: And good morning, Your Honor. Brian DeLeonardo, D-e-L-e-o-n-a-r-d-o, specifically on behalf of Mr. Carr, specifically, as well as all the other clients by co-counsel status.

THE COURT: And where is Mr. Daggett?

MR. WELLS: He will be joining us very presently. He doesn't need to be here for us to start up, Your Honor.

THE COURT: All right. Now you are Batman and he is Robin. So --

MR. WELLS: Considering people actually call me Adam West frequently, yes, that actually --

THE COURT: There you go. There you go.

All right. Now, anything preliminarily before we resume the testimony of Dr. Citek?

MR. WELLS: Your Honor, preliminarily no. I just want to let the Court know that my witness has a time line. He has a flight out of Dulles. He has to be out of here by 2:30 at the outset.

THE COURT: All right. Well, we will see if we can accommodate the doctor's schedule. I know that Mr. Cruickshank and Mr. DeLeonardo will do their best to move things along.

All right. Recalling Dr. Citek.

THE CLERK: Good morning.

DR. CITEK: Good morning.

THE CLERK: Please remaining standing and raise your right hand.

Whereupon,

KARL CITEK

was recalled as a witness by the State and, having been first duly sworn, was examined and testified as follows:

THE CLERK: Please have a seat. For the record, please state your full name, spelling your first and last, and give your business address, please.

THE WITNESS: Karl Citek, K-a-r-l C-i-t-e-k, Pacific University, College of Optometry, 2043 College Way, Forest Grove, Oregon, 97116.

THE CLERK: Thank you.

THE COURT: Mr. DeLeonardo?

MR. DeLEONARDO: Thank you, Your Honor.

CROSS-EXAMINATION (Continued)

BY MR. DeLEONARDO:

Q Good morning, doctor.

A Good morning.

Q I want to pick up an area that we have not touched on, which is the walk and turn test and the one-leg stand. Now you would agree with me that the only tests that have actually ever been validated by the National Highway Transportation and Safety Administration, the only ones that have ever been validated have been HGN, walk and turn, and one-leg stand. Is that correct?

A Well, they have been subjected to research that standardized the particular clues, the particular indicators, that would be found. In that sense, yes, they are the validated field sobriety tests. But other field sobriety tests are available, are possible. They may not have been validated in exactly the same way.

But with regard to the DRE protocol, since the entire protocol was validated in the various validation studies as a whole, rather than each test individually, then the additional psychophysical tests that were involved in that, including the Romberg balance, finger to nose test, those would be considered validated, as well, not --

Q Well, if I recall your testimony yesterday, you said that you could not speak to the validity of the Arizona study, the L.A. study, and the Bigelow, the Hopkins study, initial study. Is that correct?

A Well --

Q Isn't that what you said yesterday?

A Well, what I said yesterday was that I had not reviewed those studies for the purpose of this.

Q Okay.

A So if you would like me to, I can take a few minutes to review that and then take a look at that. I have certainly read the Arizona study.

Q Well, but I thought you indicated yesterday that you could not speak to the validity of the studies and how they were done. Is that not what you said yesterday?

A I don't recall precisely that I said it that way, how they were --

Q I mean, in the interest of your plan, I mean, I am happy to go through all of them, if you want. But, I mean, yesterday you indicated, did you not, that you could not speak to them, that the only thing you had done was a summary in the report that was submitted to the Court. Isn't that right?

A Well, fine. In the interest of time, I will --

Q Okay.

A -- stay with that.

Q Okay. But the field sobriety tests that had been previously validated were those three that I mentioned. Correct?

A Yes.

Q And in fact, even the DRE manual says those really are the only validated tests. Correct?

A If there is wording like that in the manual --

Q (Examining document.)

And while I am looking for that, initially the Romberg test was in fact one of the initial tests that was considered as part of the standardized field sobriety. Is that correct?

A I believe that was one of the additional tests, yes.

Q And they discarded that from use and did not validate it. Isn't that right?

A Well, not as part of the SFST protocol.

Q That's right.

A Correct.

Q They actually -- that was one of them they didn't. And they also rejected finger to nose. Isn't that right?

A Well, I wouldn't say so much rejected. I think the conclusion of the validation studies for the standardized field sobriety test was that the most accurate, the most efficient studies, the tests that gave the most information were the three that had been validated. It was not that the others did

not work or were rejected. It's that they did not add any additional information for the purpose of roadside testing.

Q So they did not actually make that one of the three that were used. Right? They did not validate them. They --

A Right. They were just --

Q -- rejected them from further consideration. Correct?

A Well, again, not -- I wouldn't use the term rejected. They just took the top tests that were the ones that were the most accurate for the intended purpose. And they decided to go with the top three, being HGN, walk and turn, and one-leg stand. If they had decided to go with the top five, they might have included those.

Q Oh, okay. So let's go to the this thing. Tell us what -- who created the Romberg test?

A From my understanding, it was originally developed in the 1930s by a neurologist by the name of Dr. Romberg. I believe he was out of Sweden or such.

Q 1930s?

A I believe it was, yes.

Q Was it -- are you aware of a Dr. Moritz Heinrich Romberg?

A Yes, I believe so.

Q Born in 1795. Awful old to be investing a test in the 1930s, wouldn't you think?

A Well, certainly. So I don't recall if it was developed by Dr. Romberg or by someone using his principles.

Q So it was named somebody else Dr. Romberg.

A It could certainly be.

Q You don't really understand --

A I don't --

Q -- how it was created. Do you know why it was created?

A Well, yes. It was a neurological assessment.

Q It was essentially, was it not, to detect spinal lesions in the thyroid brain stem function. Correct?

A That would be neurological assessment, yes.

Q It was never designed to actually detect impairment by drugs or alcohol. Correct?

A Maybe not initially, no.

Q Okay. And in fact, the Romberg test, as used in the medical community, how is it performed?

A As I understand it, as I've been taught, there are a couple of --

Q Have you ever performed it?

MR. WELLS: Objection, Your Honor. If he could be allowed to answer?

MR. DeLEONARDO: I apologize.

THE COURT: Let him answer.

MR. DeLEONARDO: I will withdraw that.

THE WITNESS: Thank you. As I understand it, there are a couple of variance of the test. The standard Romberg test involves having the subject, the patient, stand with feet together and arms crossed across the chest with eyes closed to establish balance. There is also a heightened Romberg test, in which the subject stands with feet heel to toe and the arms crossed across the chest, again with eyes closed.

BY MR. DeLEONARDO:

Q Well, let me ask you this: Is it not true that the test is initially conducted by individuals standing together with their hands by their side, and they are asked to close their eyes and see if they demonstrate a sway? Isn't that the Romberg test?

A Well, that is the Romberg test as used by the DREs. And again, it may be --

Q Well, that is the original --

A It may be the original, as part of that. I don't recall the exact protocol of that. But I know there are variants.

Q Well, you testified yesterday that the way they do it is consistent with how it is done in the medical community, did you not? Generally accepted?

A I believe I testified that all of the tests that are used are similar or consistent with it. It doesn't mean they're exactly identical to how they're done in the medical

community.

Q But if you are not even sure how they are done in the medical community, then how can you testify to that?

A Well, again, at this point, that is not something that I reviewed recently. But in my initial review of it, it seemed to make sense that it was similar enough to how tests are conducted, how the tests are conducted in a neurological examination or elsewhere, that convinced me from early on.

Q There is a second part to the Romberg test in the medical community, is there not?

A I'm not sure.

Q Well, isn't it true that in the medical community, not only do they have a person do that with their eyes closed once, but they also have them do that with their eyes opened to get a baseline. Correct. Do you understand --

A Yes.

Q -- what a baseline is?

A Yes.

Q And a baseline is they want to be able to see what the person's ability to do it with their eyes open so that they can compare how the person does it with their eyes closed, to see if there really is an impairment of a neurological system. Correct?

A Well, certainly. Yes.

Q And that is something that is not in the DRE

protocol, is it?

A No, it is not.

Q There is nothing that gives you a baseline on how someone performed on a Romberg test. Right?

A Correct.

Q And they don't even do the Romberg test correctly. Isn't that true?

A Well, I wouldn't say they don't do it correctly. They don't do it following the same protocol that a neurologist would use.

Q They have you tilt your head back. Isn't that right?

A Yes.

Q That is not part of the medical community's Romberg test, is it?

A No.

Q They have you count or estimate 30 seconds. Correct?

A Yes.

Q That is not part of the medical community's assessment, is it?

A No.

Q They -- and as you indicated earlier, if the loss of balance went away in that position, when their eyes were open, it would indicate something very different. Is that right?

A It certainly could, yes.

Q Now has -- you would agree with me that a person who is sitting in that position with their head tilted back and their eyes closed, that would naturally produce some sway in most people would it not?

A No, it would not.

Q None at all.

A Not noticeable, no.

Q And you know this from your personal experience in administering Romberg. Right?

A Yes.

Q You do.

A Yes.

Q And you have admitting like the DRE protocol. Right?

A Yes.

Q Do you use this in your practice?

A When I need -- if I were to need to, yes, I have done that with patients. I have done several neurological evaluations like that on a couple of patients where I thought that something may be unusual.

Q And did you use the DRE version or the version that is used by the rest of the medical world? Which version do you use on your patients?

A I believe when I did it, it would be -- let me think

back when that was. Certainly with a baseline, with the eyes open, just to see what would happen there. And I would actually do it very similar to the DRE version with the head tilted back, because that would give me more information.

Q You said you would do it similar. Well, the DRE doesn't check for baseline, does it?

A Well, in that sense, no. But for the second part to actually test, to test I would ask the patient to tip his head back.

Q So you when you are actually making an assessment, you would require a baseline. But the DRE doesn't need one?

A I didn't say that. I'm just saying they don't use one. They don't do that as part of the protocol.

Q Well, would you in your suggestion ask that they add a baseline test to actually see if there is a difference?

A I certainly could do that.

Q But you have not done it in the last 14, 15 years. You haven't suggested that.

A I have not.

Q It is also true in the Romberg, they actually don't actually instruct the person not to sway. Correct? The Dre? They don't tell them: Don't sway or try not to sway?

A It is not part of the instructions.

Q So a person doesn't know that they are being evaluated based on sway, do they?

A If they're not told, no, they would not know that that's how they're being evaluated.

Q And again, you would -- in addition, the estimation of the 30 seconds, you said yesterday that you would see whether or not it was within 30 seconds plus or minus 5 seconds. Correct?

A That follows the DRE protocol, yes.

Q It does. So that is how -- that is the judging criteria that the DRE protocol uses?

A Correct.

Q And that is in the manual.

A It should be in the manual, yes.

Q All right.

A I believe they might word it as normal is between 25 and 35 seconds.

Q I show you again the 2010 DRE student manual that we looked at yesterday, section 4, page 16. That is where they discuss Romberg. Is that correct?

A Yes.

Q And what are the instructions in terms of rating how much a person could be outside of the time line in estimating?

A (Examining document.)

For some reason, it is not in this section. And I don't understand why.

Q So there is nothing in the manual to tell, the DRE,

how long they should give a person to determine whether or not they are failing to estimate time properly. Is that correct?

A Well, there's nothing in section that you've opened for me. So I have not looked through the rest of the manual. And --

Q Is there another section that would be in?

A They have practical examples in section 15. But as far as instructions go, I don't see it immediately. So that must be a failing of this manual, because I know it has been in previous manuals.

Q 2007?

A I believe so.

Q Okay. Would you like to look at that manual, the same section?

A Certainly.

Q (Handing document to the witness.)

A Thank you.

(Examining document.)

Well, from this, I don't see it in here either. So unless it is only in the instructor manual and the students are provided that within the class itself, I'm not sure why it is not in here.

Q The 2010 instructor manual, do you want to look at this, too?

A I'll be happy to.

Q (Handing document to the witness.)

A (Examining document.)

Well, I'm sorry. I don't see it in here either.

Q Is that a suggestion you will be making to the program?

A Certainly.

Q Now we talked earlier about what was validated. There is a definitional section in the manual. Is that correct?

A Yes.

Q It defines what a standardized field sobriety test is. Is that correct?

A Yes.

Q And what does it say for that?

A For that it says that there are three FSTs, namely horizontal gaze nystagmus, HGN, walk in turn, and one-leg stand. "Based on a series of controlled laboratory studies, scientifically validated clues of alcohol impairment have been identified for each of these three tests. They are the only," with "only" underlined, "standardized field sobriety tests for which validated clues have been identified."

Q So, number one, as we discussed earlier, those are the only validated clues, even according to the manual, the only validated tests. Right?

A Yes.

Q And they are the only ones that are validated. And they are only validated for alcohol. Isn't that true?

A For standardized field sobriety testing.

Q But that is what you are using as part of this, is it not?

A Yes.

Q And you know by the manual itself it says they are only validated, those three are the only ones validated. And they are only validated for alcohol. Correct?

A Well, for -- yes.

Q Now as to the one-leg stand, in the standardized field sobriety test, the person is asked to pick a leg, are they not?

A Yes.

Q And in the original research, is it not true that one of the reasons for that was to -- because some people may favor a leg. And they wanted to give them a fair shot at showing balance. Correct?

A Correct.

Q Now in the drug recognition expert program, they asked them to use both legs. Is that right?

A Yes.

Q So they are again deviating from what the previous validated test was. True?

A Well, they're only deviating by doing the test

twice, once on --

Q They are doing it on each leg. Right?

A -- each leg. Yes.

Q And if they show imbalance on each leg, that would count as uncoordinated. Correct?

A That would certainly add to that opinion.

Q But in the original validation studies, it was specifically designed to be one leg for the very reason that someone -- a lot of people may not be able to do both legs that way. Is that true?

A Correct.

Q So again, that is another deviation. Would you agree?

A It is a deviation. But in this particular case, I would say it would be a deviation that would favor the suspect.

Q Oh, it would. Is if they are unable to do balance on one leg, but the other, that would favor them?

A Yes, because that might give the DRE reason to think why would the suspect be able to balance on one, and not the other.

Q So you are telling me that DREs are instructed that if they can do it on one, and not the other, not to count that as uncoordinated or not to count that against them. Is that what they are told?

A Well, they're instructed to count the clues that

they observe each time and then take into account what they observed.

Q Are they instructed that being able to do it one way or not the other would be an indication of a neurological problem?

A I doubt that is in the manual, but I know that that is the intent.

Q Well, it doesn't say it in the manual. Correct?

A Probably not.

Q It doesn't tell them to not count clues, if it is only one leg, are they?

A No, it does not.

Q And in fact, is it validated at all, what you are telling me, that one leg versus the other in the medical community? Is that a validated test for drug impairment?

A As a test for drug impairment? No.

Q Okay. Now as to the scoring system, would you agree -- well, let me change it this way. Let me go here.

We talked about -- let me move to the eyes. We talked about smooth pursuit. And we talked about that it can be caused by various medical conditions. Correct?

A Certainly.

Q It can caused by therapeutic levels of drugs. Correct?

A Yes.

Q Now when an officer is instructed on the HGN, the way the matrix is set up is that HGN is either present or not present. Is that correct?

A Well, the individual clues are being identified as being present or not present.

Q But in the matrix, the box HGN, it doesn't break out smooth pursuit versus nystagmus, does it?

A On the -- you mean on the face sheet that the officer --

Q On the matrix.

A On the matrix, no. And what they're referring to there would be the minimum criterium of four clues.

Q Well, does it say that in the manual?

A But that it -- certainly the scoring procedure is in the manual, the scoring --

Q It is?

A It's referred to in the field -- it's referring to the standardized field sobriety test manual, which the officers already should know by this point. So they're using the same criterium. In the matrix, HGN, where it says "HGN present" would be equivalent to four clues or greater being present.

Q So when you -- when you are saying that, we already know they have deviated from the standardized field sobriety test with the one-leg stand. Correct?

A Well, in your words, yes.

Q They have already deviated when it comes to the Romberg test. Correct?

A In your words, yes.

Q Well, I am asking. Do you agree?

A The way you present it, yes.

Q Okay. You would also agree they deviated finger to nose. That is not something that is used in standardized field -- that is not a validated test, is it?

A Well, not according to the definition of the standardized field sobriety tests that are included within that manual.

Q Are the DREs on finger to nose instructed how many times they can miss before they count it as a clue? In other words, if I miss one time doing the finger-to-nose test, is that present for spacial, to do my spacial relations?

A Well, each arm, each hand, each finger is tested three times. Each side is tested three times. So they would indicate how many times total would be missed and how the subject actually performed the test.

Q But I am asking you, what do they do with that information? Are they told how many times a person could miss before you count it as a clue?

A Well, there are many things to look at, many things to consider. If the subject uses his pad rather than the tip of his finger, if the subject touches the side of his nose or

moves in a searching patter to find his nose --

Q What does that mean?

A That he can't do it automatically, easily, quickly, readily.

Q Well, that is documented, validated research in the field?

A As part of the DRE protocol, I understand that it is.

Q I am asking you -- we are here to try to figure out whether or not this is a genuinely accepted and reliable thing in the field of medicine. Can you tell me of one single study that you know of that validates that as a proper test?

A No, I do not.

Q And you have been doing this for 15 years. And you don't know of a single test that validates that.

A Not in the medical community, no.

Q And certainly not the clues that you indicated. Correct?

A I'm sorry?

Q Those clues -- obviously the test has it. Certainly missing has not been validated. Correct?

A Well, the test hasn't been validated.

Q Now in addition to that, you can also have situations, can you not, where a person has a disorder that will actually exhibit -- they will have smooth pursuit, but

they can even have maximum distinctive sustained maximum deviation. Correct?

A Yes.

Q One of them, for example, is multiple sclerosis. Correct?

A I believe I used that example yesterday, yes.

Q And so you would agree with me that that is something that they should be instructed on. I mean, if they are not told exactly how many clues you have to have, that if they are making this medical distinction between someone who has medical problems and a drug problem, that is an important component for them to know. Right?

A Yes.

Q And so that is explained to them in the manual?

A I don't believe that it is, no.

Q And so that is another shortfall of this manual, would you agree, and the training?

A Yes.

Q Have you ever recommended that they insert that? Because you specifically know about that, don't you?

A Yes, I have recommended that.

Q And they have ignored your request?

A I wouldn't say ignored, but it takes time to make these changes.

Q Well, how -- it takes 15 years?

A Sometimes, yes.

Q Well, certainly you testified, did you not, back in 2006 that you thought that everything they were doing was correct, did you not?

A Can you be a little bit more specific with the question, please?

Q Sure. Did you previously testify in Nebraska that when you were asked a question about whether or not all the tests they were doing were correct, you said, "Yes. They do them correctly and properly." Isn't that right?

A For the purpose of the DRE protocol, as the protocol was established. I don't think it was --

Q So they are doing what they say they are going to do.

MR. WELLS: Objection. If he could be allowed to finish with his answer.

THE COURT: Sustained.

THE WITNESS: If I remember the question correctly, it was with respect to how the DRE protocol and how the tests were defined and described and how those procedures were defined. I don't believe that it was with reference to how they are conducted in clinical practice.

BY MR. DeLEONARDO:

Q So when you testified yesterday that what they do is consistent with the way -- everything they do has been around

forever, it's what we do in the medical community, and all of that, you are saying that is really not what you were saying?

A Well, by "consistent with," I don't mean exactly the same. I mean it is very similar. And that holds true for the eye tests, as well.

Q Okay. Let's talk about the eyes. Are they instructed -- well, we already established that they are not instructed about how to distinguish between MS and other conditions, correct, of the eye?

A Correct.

Q You would also agree that there is nothing discussed about any other conditions, like, for example, the effect of diabetes on smooth pursuit. Right?

A Correct.

Q That is also not discussed. And can you explain the effect of diabetes on smooth pursuit?

A Diabetes, if someone is having a hypoglycemic attack, they're low in blood sugar, then that could reduce -- that could cause a lack of smooth pursuit.

Q And they are also not instructed for that, are you?

A Well, I'm pretty certain it is not in the manual, yes, not that specific.

Q Now is it not also true that there are age studies that show that as a person even reaches between 31 to 40, that actually they can start losing some of the smooth pursuit of

their eyes? Isn't that true?

A The smooth pursuit accuracy, the gain of the smooth pursuit, does decrease with age, yes.

Q And so are they instructed to account for age, when they are evaluating smooth pursuit and trying to eliminate medical causes and determinants of drug in a particular category?

A No, they are not.

Q Now yesterday we talked about the Heishman study. Right? And you expressed a concern that the levels of BAC they used were between .02 and .05. And you said that was not enough for any signs of impairment. Correct?

A Yes.

Q I mean, is that correct, that is what you said?

A Yes. Yes.

Q But you previously testified, have you not, that the first indications of impairment can actually show up between .02 and .03 blood alcohol content, haven't you?

A Yes, I have.

Q Did that change between 2006 and yesterday?

A No, and I still stand by that.

Q Okay. So you would agree then that the ranges of .02 to .05 would be even better than what you said can start showing impairment.

A Well, if I may explain. Studies have shown there

has been research done that indicates that lack of smooth pursuit can occur in some individuals at BACs as low as .02 to .03. That means that if someone does demonstrate lack of smooth pursuit, does exhibit that clue on each eye, that would be a total of two clues. At that low of a BAC, they should not demonstrate or exhibit the later clues distinct in sustained nystagmus maximum deviation, nor onset of nystagmus prior to 45 degrees, nor even vertical gaze nystagmus.

So yes, there are indicators. But if an officer were to do the HGN test on somebody at a BAC of .02 to .03 and only find those first two clues, according to the -- based on the DRE protocol, he would not check the box that HGN was present.

Q But you would agree with me you don't have to have HGN present, according to the DRE protocol, to find someone impaired by drug.

A Correct.

Q So again, the validity of the Heishman, it is testing exactly what they claim they can do, is it not?

A Well, it is testing for, again, going back to the Heishman protocol and how they established whether an officer, when their evaluators were correct in identifying impairment and identifying the cause of the impairment, it was testing individuals who had any non-zero amount, any non-zero level, of the particular drug that was ingested.

Q Now we talked about -- we talked yesterday, as well, about the issues regarding lack of convergence and the glasses, that they should be on for convergence. And you said that was only done in the 2010 manual. Right?

A I believe that --

Q That they should actually wear their glasses to do the lack of convergence test.

A I believe that was the change. Again, I've not reviewed the manual. But when I heard about the updates to the manual, that was one that was described to me.

Q And that was one of them that you said was actually -- you had -- that you had asked for that. Correct?

A I did not ask for that one specifically, but when -- when the revision was in the process of being made, I was consulted on that.

Q Well --

A What I had recommended earlier -- and this was about ten years ago -- was the change of the lack of convergence test in going from the bridge of the nose out to two inches.

Q Okay. So that was a change that also was made. Right?

A Yes.

Q Now you have talked about -- we talked yesterday about the blood pressure ranges being wrong. Correct?

A Well, being slightly different, yes.

Q And the pulses ranges being different. Correct?

A Yes.

Q And you suggested that those were things that should be corrected. Right?

A I'm not sure if I'd made that recommendation, but --

Q Oh. You think they should continue to do it wrong?

MR. WELLS: Objection. That is not what he said.

THE COURT: Sustained.

BY MR. DeLEONARDO:

Q All right. You actually have not only been able to make recommendations, but you have been involved in the actual reviews of these manuals, even before publication. Is that not true?

A In certain instances, yes.

Q So all these recommendations that you say, well, I would suggest that or that should have been done, how come you didn't do that, when you have been involved in the manual reviews?

A Because the final product was not my choice. It was just to do a review, to see that things appeared consistently. And I've not done that recently. So it's a recommendation like any other review.

Q So you didn't -- did you recommend it in 2006 for that version?

A Recommend which, please?

Q Did you recommend any of these changes, the Romberg, the walk and turn, the pulse, the blood pressure, any of these things we have discussed? Did you recommend any of these things be done to make sure that they can actually distinguish between medical impairment issues?

A I do not believe that I reviewed the manuals, the 2006 manuals. And I was not asked to review this current version.

Q You didn't review the 2006?

A Prior to publication?

Q Yes.

A I don't recall that I did.

Q Okay.

MR. DeLEONARDO: One moment, Your Honor.

(Pause.)

THE COURT: Okay.

BY MR. DeLEONARDO:

Q You said they don't always accept what you said. Let me ask if you recall. You said, "Do you believe that the drug evaluation and classification program, DRE program, avails itself to review by publishing information and making materials available for review by others that are outside of the program?"

You said, "As far as the manuals or, I'm not sure."

"Yes. It's the manuals, people to come in to

actually do reviews, participate, have DREs come in and conduct exams where people can have controlled studies, that kind of thing."

You said, "Yes.

"Have you participated in any of those things?

"In manual reviews, I have."

Is that correct?

A And that would have been prior to 2006 that -- I believe it was -- and I forget the exact dates of those earlier versions, whether it was 2000 or 2002. Yes, I have made suggestions. But that does not mean I reviewed the entire manual each time each time, but just sections of it, relevant sections for me.

Q You said -- "Do you believe that the DRE program that is sensitive to any refinements that might be -- that might occur because of people outside of law enforcement was coming in and making requests?

"Yes. And I have done that."

Correct?

A Yes. And in the case of lack of convergence, I had contributed to that, made that recommendation. And that time, they did follow the recommendation, which I and some of my colleagues made.

Q And in fact, in that particular hearing, you actually testified of changes that were going to be in the new

manual before it had even been released. Is that correct?

A That's possible.

Q And you were involved at that point in making recommendations to the technical advisory panel. Is that correct?

A And again, I don't recall if I had made recommendations to them. I don't recall that involved direct review of the product after it came out.

Q All right. Rebound dilation. You testified, I think, how that was extremely distinct, when it came to marijuana. Correct?

A That is one of the -- one of the possible causes, yes.

Q Were you taught that in optometry school?

A No, I was not.

Q Was there -- is there any published material anywhere in the world, besides you, that documents that?

A Besides what I have published? Well, again, just to be clear, we had published that as part of the 1998 review that we conducted.

Q So again, has anyone in the rest of the medical or pharmacological, toxicology world documented rebound dilation?

A I'm not aware of it, no.

Q So when you said that that was something that was readily considered to be accepted, it is only accepted by you

in the DRE program. Is that correct?

A Within the law enforcement community, yes.

Q Muscle tone. That is a major indicator in the DRE protocol, is it not?

A I believe it is.

Q How do you medical determine muscle tone?

A You could palpate muscles of the forearm or the arm. That's the easiest way to do it.

Q Just feel them?

A Just feel them, yes.

Q Well, how is DRE, with no prior medical training, supposed to distinguish whether someone has flaccid or rigid muscle tone?

A That, I think, would be relatively easy for anyone to distinguish.

Q Oh, you think. Would it surprise you that medical professionals in the field say it is something that should be relegated to strictly like neurologists?

A Well, it wouldn't surprise me, but I've heard other statements like that.

Q You have heard statements like that?

A But I don't think it would be difficult for a --

Q You don't.

A I don't think it would be difficult for a non-medical specialist to do that, no.

Q What does it mean to be flaccid?

A That the muscles are soft.

Q Someone who doesn't work out?

A Someone who doesn't work out, possibly.

Q So what does someone not working out have to do with drug impairment?

A Again, there you'd need to take into account the -- the DRE would need to take into account the body type, the overall physical appearance, the physical demeanor of the individual.

Q So if they look like they work out --

MR. WELLS: Objection. If the witness can be allowed to answer.

THE COURT: Sustained.

THE WITNESS: So if someone is overweight and has flabby arms, for example, then certainly the muscles could be considered flaccid, if they were normal.

BY MR. DeLEONARDO:

Q Seriously? That is what the DRE is doing, is figuring out whether someone is too fat to decide whether or not that is an indicated sign of impairment to drive?

MR. WELLS: Objection. That is not what he said.

THE COURT: Overruled. I think we have a question now. And that is the question.

THE WITNESS: Well, it is certainly something the

DRE would take into account or should take into account.

BY MR. DeLEONARDO:

Q All right. HGN. You said that HGN doesn't necessarily affect your ability to drive. Is that correct?

A It doesn't necessarily do so, but it is really -- the procedure of the test is going to be similar to, correlated to. And I'm sorry if I used the word consistent with, but I don't mean 100-percent correlation, when I say consistent, but correlated to how we use our eyes when we drive.

Q Okay. And but you said that someone could perfectly well drive with HGN at times. Is that true?

A Well, if someone would have the individual components, let's say someone has lack of smooth pursuit naturally, yes, they can compensate for it. If someone has gaze-evoked nystagmus naturally, yes, they can compensate for it.

Q All right. So again, nothing about HGN is equated to just drug impairment or just drug impairment so you can't drive, is it?

A I'm sorry. I'm not sure I follow the question.

Q There is nothing in the medical community, scientific community, that validates that HGN makes you unable to drive safely.

A No, not that I'm aware of.

Q And in fact, you talked about other causes. And you

sort of talked about a few. I am going to ask you about some others.

There is a number of medical literature that shows a wide number of potential causes for nystagmus other than drug impairment. Correct?

A Certainly.

Q And so you would agree with me that, for example, you can have problems with inner ear labyrinth. Correct?

A Yes.

Q Influenza. Correct?

A Possibly.

Q Strep throat. Correct?

A Possibly.

Q Vertigo.

A Well, vertigo is a symptom. So --

Q But it is a condition that someone could have. It can be caused by an inner ear problem. Correct?

A All of these things that you've mentioned so far would have relationship, would have problems, would cause problems with the inner ear. Yes.

Q Okay. Measles?

A Possibly.

Q Syphilis?

A Possibly.

Q Arteriosclerosis?

A Possibly.

Q Muscular dystrophy?

A Possibly.

Q We talked about multiple sclerosis. Right? Cortisol syndrome?

A Yes.

Q Brain hemorrhage?

A Depending on where the hemorrhage is, yes.

Q Epilepsy?

A Possibly.

Q Hypertension?

A That, I'm not aware of.

Q Motion sickness?

A Again, that is a symptom. So that would be an inner ear problem.

Q Sunstroke?

A Not that I'm aware of, no.

Q Eye strain?

A Not that I'm not aware of.

Q Eye muscle fatigue?

A There is a condition known as fatigue nystagmus, I believe I described yesterday, when trying to maintain your eyes at maximum deviation for an extended period of time. So yes, in that condition, yes.

Q Glaucoma?

A No.

Q Changes in atmospheric pressure?

A If it affects the inner ear, possibly.

Q Consumption of excessive amounts of caffeine?

A No.

Q Excessive exposure to nicotine?

A Nicotine will cause nystagmus in total darkness in some individual.

Q Aspirin?

A Only if you take enough aspirin to affect the inner ear function.

Q Do you know how much that is?

A That would be beyond the standard therapeutic dose, which is about 2,500 milligrams or 8 tablets per day. Greater than that, for extended periods.

Q If you doubled up because you ran into some other systemic medical problem that you were using the aspirin to kill the pain.

A If you doubled up and consistently used that for an extended period, at least a week or two, then, yes, that could affect your inner ear.

Q Circadian rhythms?

A No.

Q Acute trauma to the head?

A Depending on the location of the trauma, yes.

Q Chronic trauma to the head?

A Again, depending on where the trauma was.

Q Disorders of the vestibular apparatus and brain stem?

A Well, that goes back to what we said earlier about inner ear.

Q Cerebellum dysfunction?

A Yes.

Q Heredity?

A Yes.

Q Diet?

A Not that I'm -- well, as long as it doesn't include alcohol or any other intoxicants, no.

Q Okay. Exposure to solvents?

MR. WELLS: Your Honor, objection at this point. I think the point is made. He indicated that there are a number. If he is going to go through every possible one, I don't think that is necessary.

MR. DeLEONARDO: I am almost done, Your Honor. I just have a couple more.

THE COURT: How close?

MR. DeLEONARDO: Two more.

MR. WELLS: Why do you need to go through --

THE COURT: Two more? All right. We can tolerate two more.

BY MR. DeLEONARDO:

Q Eye muscle imbalance?

A You didn't let me answer on solvents.

Q Oh, I'm sorry. Go ahead.

A Solvents, as inhalants, yes, that would fall in the inhalant category in the DRE protocol. So, yes.

Q But that could also be an unintentional inhalant, right, by dry cleaning fumes?

A They are all considered inhalants for the DRE purposes.

Q Eye muscle imbalance?

A Possibly.

Q And that is something that like an ophthalmologist or an optometrist would notice in an eye exam. Correct?

A Yes.

Q Are the DREs instructed how to do that?

A Well, the protocol of the eye test, including the pre-test, again, deal with assessments similar to how we assess eyes clinically. But no, they are not going to be given instructions on eye muscle imbalance and exactly how the eyes work in that sense.

Q So when we look at this, would it surprise you that these were all indicators that our own Court of Special Appeals indicated was in the massive literature in the field of medical and science that showed that these were all possible causes?

MR. WELLS: Your Honor, I am going to object to the form of the question. I don't think I even understood what the question was.

MR. DeLEONARDO: I will rephrase.

BY MR. DeLEONARDO:

Q Isn't there a massive medical and scientific research out there that show that these are all possible causes?

A Well, first of all, there were some causes that I indicated no to specifically, directly. So no, I don't agree that that is a list of, and certainly not an exhaustive list or even --

Q No. I spared you the 287 page list.

A -- but a good list. Thank you. So certainly not --

Q That isn't like all of them, is it?

A It's not all of them, certainly not. Again, we can break down. For example, I fully disagree, and I have no idea where -- well, I do have some idea where, but not the ultimate source of the statements that glaucoma or caffeine, for example, cause nystagmus. There is no -- I've researched those within the medical literature and have found no medical references to that condition or use of that drug, caffeine, that would indicate that it would cause nystagmus.

With regard to most of the medical conditions, the inner ear problems especially and congenital problems, the

nystagmus will present differently than what an officer expects to observe with intoxication. It will present as resting nystagmus or it may present, for instance, with changes in head posture in a manner inconsistent with how testing is conducted.

Q And does the DRE, are they instructed as to those distinctions? You said resting nystagmus, for example.

A Well, again, this is the terminology that the DREs using, resting nystagmus. We would say nystagmus and primary gaze. If a DRE were to observe that, that is one of the pre-test checks for resting nystagmus. And if that is present, they should be instructed that they should not conduct the HGN test, because there would be no way to distinguish nystagmus caused by intoxication versus nystagmus that might be there for other reasons.

Q And that is in the manual?

A Again, I believe that might be in the SFST manual with regard to the presence of resting nystagmus.

Q All right. This is just to summarize. Now you agreed that as to the eye signs, they may or may not be there by drug. Correct?

A Yes.

Q There are other medical reasons that could cause that. Correct?

A Yes.

Q You would agree that the rates for blood pressure,

pulse, all that, that there is non-drug-impaired reasons to be there, as well. Correct?

A Yes.

Q And that the ranges are not, even when it is accepted in the medical community. Correct?

A Yes.

Q There is this matrix, but there is no set number of indicators that have to be present for the DRE to determine it is not a medical condition and that it is drugs. Correct?

A Correct.

Q So there is really no standard among DREs as to what you even have to have to find someone impaired by a drug. True?

A Correct.

Q I mean, for example, we talked yesterday about the marijuana. You could actually almost have almost every factor. And it could be completely not related to drugs. True?

A If you only looked at the objective indicators, yes.

Q Well, we talked to general indicators, too. Right? The fact that you may be hungry doesn't mean that you are on drugs. Right?

A Correct.

Q And so, again, just to summarize, the step two of this protocol is -- a medical rule-out is required. Is that right?

A Yes.

Q What standard of the opinion -- in other words, if you testify, you would be testifying to a reasonable degree of medical certainty in the field of optometry. Correct?

A Yes.

Q What is the standard they are using for rendering an opinion that someone is impaired by a drug and not a medical condition, and that they are unable to operate safely?

A In my opinion, it would be the consistency of the signs and symptoms and everything else that they have observed on the suspect, based on, and should be based on, the matrix. If they observe any differences from that or signs or symptoms that are not consistent with a particular drug or drug category, then they should take that into account. And that's where it becomes a judgment call.

Q Well, that is a slippery slope, though, isn't it? Because the absence of a sign, one, is an indicator. Correct?

A It could be.

Q And the fact that they pick a category and it is not there, they could argue this concept of poly drug now. Right?

A They could, yes.

Q In other words, if there is supposed to be an indicator, like, let's say, elevated blood pressure, right, they could actually say, well, I think there's two categories on board, a depressant and a --- so they counteract. That is

why your blood pressure is normal. Right?

A It's possible.

Q So, again -- and, of course, they are rendering this opinion prior to any toxicological results, as well. Correct?

A Certainly.

Q So let me ask you, in the field of optometry, would you make a diagnosis using these signs and symptoms and using these indicators, would you make a diagnosis prior to any toxicological results?

A I would certainly -- I would certainly request additional testing, if I thought that a condition were present. But let's -- just considering a diagnosis of anything, as a screening test, I would always want to go further, if I thought that a condition were present. In this particular scenario, if I thought it was drug impairment, then certainly I would want toxicological confirmation of that.

And unfortunately, the way the requirements for the law enforcement officers are set up, they don't have access to that prior to doing this type of testing.

Q So they are rendering opinion that even you would not render. Right?

A Well, to some extent, they're forced to.

Q Because they are forced to. Let me ask you this, too: Now you, when you look at this or in arriving at this result, you said that you would use it as a screening tool.

Right?

A Correct.

Q And that means that based on all of this, you certainly would not make a diagnosis. Correct?

A I could start to formulate a diagnosis, but it would not be conclusive until I had all the testing; in this case, until the toxicological results were in.

Q Now yesterday I asked you if it was being treated in the DRE field as a diagnostic tool. And you said yes. Correct?

A Yes. It's one tool.

Q But you would agree with me, would you not, that it really is not an appropriate diagnostic tool. At best, it would be a screening tool to request blood.

A Now whether you call it a screening tool or a diagnostic tool, again, I think at this point it's just semantics.

Q Oh, it is? There is not anything in the medical community that distinguishes screening tools from diagnostic tools?

A In some cases, a screening test could be diagnostic, in which case -- let me us a distinct example. In optometry, we measure a patient's eye pressure as a check for glaucoma. If that is elevated, that could be elevated for a number of reasons: fluctuations throughout the day, just an individual

pressure spike, or it could be a chronic elevation, which we certainly need to be aware of, as both a screening tool and a diagnostic tool. Because if it were elevated and it were elevated above a certain level, I would immediately ask for additional testing. I would conduct additional testing.

Q So you don't reach a conclusion based on that screening tool.

A Not on that one alone, no.

MR. DeLEONARDO: That is all I have, Your Honor.

THE COURT: Mr. Cruickshank?

MR. CRUICKSHANK: Just a couple questions.

CROSS-EXAMINATION

BY MR. CRUICKSHANK:

Q HGN, recently acquired onset, moving cicades, visual processing stops. We had talked about some articles dealing with that subject.

A Yes.

Q What are those articles?

A Well, as far as cicades go, the --

Q Just to clarify, because I know that kind of -- you talked about HGN and lack of smooth pursuit. And you distinguish between HGN, lack of smooth pursuit, if it was natural. Correct?

A Well, HGN encompasses the entire three subtest battery.

Q Right. And you broke it down and talked about smooth pursuit. Correct?

A Yes.

Q And you talked about somebody who, if they had lack of smooth pursuit naturally, is different from someone who has lack of smooth pursuit that was recently acquired. Is that correct?

A Well, on the recent acquired component of that, I was only referring to the nystagmus. So that would be the second and third components of the HGN test.

Q And then you stated that there were at least two articles, if I recall, about what you have just stated. Correct? That you relied on those articles.

A (No response.)

Q Let me see if can clarify a little more for you.

A Yes, please.

Q It is a correct statement that what you said yesterday was "HGN recently acquired onset will affect vision." Correct?

A And if I may clarify?

Q Sure. Go ahead.

A It's nystagmus. So if you're referring to HGN, you're referring to the entire three subtest battery. And I believe I said nystagmus of recent onset, acquired nystagmus.

Q All right.

A So just the nystagmus component alone of recent onset will affect vision.

Q You presented the issue, does HGN reduce vision or have no effect? Correct?

A Correct.

Q Both true, depending on type. You said that. Correct?

A Yes.

Q You talked about congenital. Correct?

A Yes.

Q And then you talked about recent onset. Correct?

A Yes.

Q And then you mentioned that there were articles pertaining to recent onset. Correct?

A There have been papers written about that, yes.

Q What are those papers?

A I don't recall off the top of my head. One was -- but I can tell you one was recently published. I believe it was a publication date of 2008. I do not remember the authors. But it dealt with pharmacological intervention to help reduce nystagmus of recent onset. And within that, they make the statement in the introduction, they make the statement that acquired nystagmus of recent onset does reduce acuity.

There is also a textbook, "*The Neurology of Eye Movements*." The authors are Leigh, L-e-i-g-h, and Zee, Z-e-e.

The most recent edition is the fourth edition from, I believe it is, 2006. On the section of -- on one of the sections that they have on nystagmus, they do say that acquired nystagmus -- and again, I'm paraphrasing here -- acquired nystagmus of recent onset reduces visual acuity. And they give examples and citations for that.

Q So the 2008 article, you don't remember the authors. Correct?

A If I were given a computer with access to the internet, I could find it.

Q Okay. And then we have the textbook by Leigh and Zee. Correct?

A Correct.

Q You studied neuro-ophthalmology to get your degree?

A No.

Q Did you read Dr. Miller's four-part treatise on neuro-ophthalmology?

A I don't believe that was one of our texts, no.

MR. CRUICKSHANK: No further questions. Thank you.

THE COURT: Redirect?

MR. WELLS: Thank you, Your Honor.

REDIRECT EXAMINATION

BY MR. WELLS:

Q Good afternoon, Dr. Zuk.

A Good afternoon.

Q Or, excuse me, Dr. Citek. I apologize.

Generally speaking, with regards to all of the things that Mr. DeLeonardo was talking about, he was going into very specific minutiae of very -- of each individual indicator. For instance, he said if somebody's temperature were off by one degree, would that be an indicator of an impairment, something along those lines.

A Yes.

Q Now this is a general test, is that correct, the whole DRE protocol?

A Okay. Now if there is just one indicator, do they base the entire opinion on just one indicator, or do they base it on other things?

A No. They'll base it on all of the indicators, as exhibited and demonstrated.

Q Okay. With regards to -- specifically, he talked about the -- he went through the matrix and started talking about the indicators for pulse, the blood pressure, if the pulse was off by one beat, or if the blood pressure was off by a very small amount, or if the degree of temperature was off by one small amount, those would be considered indicators under the matrix. Correct?

A Yes, they would.

Q Would the -- can they and do the DREs take into account the minute amounts of difference or variations from the

normal?

A yes, they should.

Q And how does -- explain to the judge, you know, how they would take that into account.

A Well, they would look at all the different indicators, first seeing if those, if the indicators that are present, are consistent with any of the categories and then also to the level at which those indicators are present. If there's only a slight deviation, if the pupil size is only out of range by half a millimeter in one of the findings, if the pulse is only off by one or two beats as one finding.

Depending, again, on all of the other information that is presented, that is available, all the other physical evidence, all of the other evidence about the individual and his appearance and his behavior, all of that should be taken into account. It's not -- to some extent, it's a judgment call. And experienced officers, I believe, can make those judgments and call the categories correctly.

Q So for lack of a better term, it would be like the totality of the circumstances.

A Yes.

Q Okay. Similar to field sobriety tests for use of alcohol on the side of a road.

A Yes.

Q So if they are just off by one specific thing or,

hypothetically, someone steps off the line once, that doesn't automatically indicate impairment. However, it is something they take into consideration.

A Yes.

Q Okay. Now pulse, you talked about the pulse, that there is a difference between counting 30 seconds or going 30 seconds once and doubling it versus counting 60 seconds full. It would make it off potentially by about four beats. Is that correct?

A At most.

Q Okay. Is that a huge amount? Does that make a huge difference?

A I don't believe so.

Q Mr. DeLeonardo talked about white coat hypertension. And that was specifically the fact that people get nervous, when they go into a doctor's office. And you equated also the fact that if you are rested and you are nervous, it may show in your pulse, as well. Is that correct?

A Yes.

Q Okay. How does the DRE protocol take that into consideration?

A At least as far as the pulse is concerned, it is measured three times throughout the evaluation, once toward the beginning, once toward the middle, once toward the end. So it is usually, from what I have observed and from what I know the

protocol is usually about, 10, maybe 15 minutes between each set of measurements. And usually individuals who might initially have some intrepidation or anxiety at the start of the test, very often that will be relieved during the test.

The DREs -- again, I don't know if this is in the manual. But as far as their training is concerned, I know that they are told to work with the suspect, address the suspect in as much of a non-confrontational manner as possible, to relieve any of that potential anxiety. And very often that will happen.

If the pulse, if the first pulse was up, if it was elevated for that reason, then -- and the DRE managed to establish a rapport with the suspect over time, then the other pulses should be decreased. It should not sustain.

And certainly if the first pulse is low, excessively low, there is no reason to think why it should raise during the other times.

Q So there are things within the protocol that take that into consideration, to handle that specific thing.

A Yes.

Q Okay. With regard to lack of convergence, there was discussion about whether or not you have to wear glasses for lack of convergence. And with lack of convergence, does it make a big difference, if you are wearing glasses or not? I mean, is that a huge issue?

A For most people, no.

Q Okay. Is it possible to use every test perfectly, exactly for every person on the planet? I mean, are these tests exactly mathematically 100 percent perfect for every person?

A No.

Q Is it possible to do that?

A I don't think that is even possible.

Q Okay. Generally speaking, however, are these tests generally accurate and useful in determining the impairment of people who may be under the influence of certain categories of drugs?

A I believe that they are.

Q Okay. With lack of convergence, also you indicated that previously it used to go to -- the test was to go all the way to the nose, to the bridge of the nose.

A To the bridge of the nose, yes.

Q To the bridge of the nose. I apologize. And also with regards to glasses, that they were not needed and now they shouldn't remain on. Is that correct?

A For those individuals who have a correction for seeing up close.

Q Okay. That indicates that the DRE protocol is aware of things and is -- well, what does it show? I mean, does it show that there is a change in the DRE protocol?

A That there -- that refinements have been made and will be made.

Q Now with regards to the training, there was a big deal made about the fact that this is taught not always by doctors. I mean, you know --

A Correct.

Q -- is that a big deal?

A I don't think so, because I believe for the purpose of the DRE protocol, what it seeks to do with regard to administration of the test and explanation of the test, they're all tests that can be described, administered, taught by non-medical professionals.

Q Specifically HGN, is that very difficult to teach?

A No, not at all.

Q Do you need to have a medical degree or a degree in, you know, a medical degree in order to teach it?

A I don't believe so, no.

Q For comparing pupil sizes, is that a very difficult test to do?

A Not at all.

Q The walk-and-turn test, do you need to be a neurologist to teach somebody how to perform that?

A No.

MR. WELLS: The Court's indulgence.

(Pause.)

BY MR. WELLS:

Q There was some discussion of the Romberg test and the fact that there was a lack of a baseline utilized in the DRE protocol.

A Yes.

Q Okay. What is the purpose of the Romberg test and the DRE protocol?

A It is twofold. Well, actually, there are multiple aspects that are evaluated. First is whether the suspect can maintain a sway with his eyes closed -- maintain his balance, excuse me, with his eyes closed. The second is to, in this modified protocol, to determine whether he can properly estimate the passage of time, a short amount of time, 30 seconds. And the third is to look if there are any physiological variations, such as leg tremors, body tremors, or eyelid tremors, when a suspect is just standing still and not moving.

Q Okay. Now if somebody is swaying, is that readily apparent?

A Yes, it should be.

Q Now the fact that there is a lack of baseline done in DRE protocol, is that fatal to the test and mean that the Romberg test is completely useless?

A I don't believe so, no.

Q Okay. How so?

A Well, if the -- there are three sensory systems that we use to maintain balance: the vestibular system, which is our inner function; the visual system; and our proprioceptive systems, touch sensation or feedback from the major muscles and the joints of the body. If one of those is lacking, then the other two need to compensate to allow someone just to maintain balance, just to stand still.

In performing the Romberg test as it is done by the DRE, they remove one of those components, namely vision, specifically peripheral vision just to assess how the other two work. It could very well be possible, and it is possible, it does sometimes occur during the HGN test, when vision is available, and a suspect stands in front of the officer, that the officer may observe sway during that test, as well. And that's with all three sensory systems being present.

So to that extent, we could consider that a baseline assessment was done.

Q Okay.

A Because either the officer during the HGN test, which would have been conducted prior to the Romberg test, the officer may have observed sway during that or may not have observed sway during that.

Q So again, they can use the totality of the circumstances.

A Yes.

Q It is not just one specific test, if it is done absolutely perfectly identically to the way it is done in other places. Does that necessarily invalidate any of the FSTs?

A I don't believe so, no.

Q The one-leg stand, it is done twice. Is that correct?

A Yes.

Q Is that fatal to the usefulness of the one-leg-stand test?

A I don't believe so.

Q There were some questions about whether or not the field sobriety tests and validation had been done and that it had only been done for alcohol. What is alcohol?

A Alcohol is a central nervous system depressant drug.

Q It's a drug. Correct?

A Yes.

Q Okay. So the fact that it is alcohol and not cocaine is not really that big a deal. Is that correct?

A Correct.

Q Can you explain that?

A Well, as a central nervous system depressant drug, alcohol is going to have an effect similar. We don't know the exact mechanisms, but it will have an effect similar on the central nervous system as other depressant drugs will.

Alcohol does have an additional effect on the inner

ear, on changing the viscosity of the fluid in the inner ear. But with regard to its effects on the cerebellum and the brain stem, for example, it will be very similar to, in some cases possibly identical to, the effects of other central nervous system depressant drugs.

So it's just one particular substance, one drug that is used. I think as I testified yesterday, a very easy drug to administer, a very easy drug to assess impairment on, because it can be used at impairment levels that are significantly below any fatal or lethal dose that might be given to a subject. That is not always true of the other drugs that could potentially be administered.

Q Is it fair to say that the field sobriety tests are just general observations to show whether or not somebody has a lack of coordination or showing some kind of impairment? Is that correct?

A Yes, that would be a fair assessment.

Q Okay. And is it also fair to say that certain drugs cause impairment; i.e., the inability to balance?

A Yes.

Q Okay. So just following a logical connection, isn't it obvious and apparent that other drugs would also cause all the other symptoms that are readily apparent through the walk and turn, one-leg stand, and the Romberg test?

A It is possible.

Q Okay. Now there was some discussion about specifically the muscle tone test. Is this a very difficult test?

A I don't believe so.

Q Just very briefly, what is it? What do you do, when they do the test?

A Well, as part of the DRE protocol, the officer will take the suspects arm as it is relaxed, maybe as the suspect is sitting, rather than standing, maybe with his arm on the table, and just feel the muscles of the arm with both hands to see what that muscle tone is. If it is rigid, if the muscles are clenched, it's going to be very obvious that they're tight, that the DRE can observe what he will classify as a rigid response.

If they're excessively loose and have no, for lack of a better term, I can't think of a synonym right now, but no tone to them, that they almost feel like Jello with no hard structure to them, that also would be readily apparent.

Q And what is the idea behind that? Like, as an example, a stimulant, what would that do with regards to muscle tone?

A As I -- a stimulant, for example, a central nervous system stimulant, would cause increased contraction of the muscles. Therefore, the officer would note rigid muscle tone.

Q Okay. And say hypothetically the opposite, a

narcotic analgesic?

A That would, if any, relax the system and cause a flaccid muscle tone.

Q Now is this also -- is this a testing for minutiae or is this, you know, gross variations one way or the other?

A It is gross variations.

Q And Mr. DeLeonardo went into a lot about all the other causes for, potential causes for, nystagmus. With regards to the horizontal gaze nystagmus test, how does that take into account all the other nystagmuses, generally speaking? I believe you touched on this in your direct. Just very briefly, does the HGN test take into account, and help the officer differentiate between -- I don't want to use the term artificial, because it is probably the wrong term, but causes of nystagmus other than ingestion or impairment through drugs?

A It does so. And as I testified earlier, many of the conditions other than intoxication, many of the medical conditions, such as vestibular system problems or congenital conditions or other diseases that cause nystagmus, most frequently will cause nystagmus either in primary gaze, straight ahead gaze -- the officer would note that as resting nystagmus -- or, especially with vestibular system problems, it would cause nystagmus only when the head is moved away from an upright position, so when the head is tilted to the side or maybe tipped to the back, a testing position that is

inconsistent with how the officer conducts the test.

Many of the environmental conditions, for example, that we touched on yesterday, also would cause nystagmus either in the resting position, straight ahead position, or it would require a test condition that is inconsistent with how the officer conducts the test.

For example, rotational and post-rotational nystagmus will only occur when the subject is spinning and then stops spinning. The officer does not spin the suspect around.

MR. WELLS: Do you have anything?

MR. DAGGETT: I just have one question, Doctor.

REDIRECT EXAMINATION

BY MR. DAGGETT:

Q We have heard a lot of questions asked of you about the specific indicators, going through whether it is pulse, blood pressure, muscle rigidity, et cetera, et cetera. We haven't heard a lot of questions about the overall observations of an impairment.

How important is the overall observations of impairment in the scheme of things?

A I think it is critical. Again, the officer, when conducting the evaluation, will take all of those components into account, the first of which is simply the appearance, the behavior, the demeanor of the suspect.

Q So if a person does not appear to be impaired, but

they suffer from a number of these general effects --

A Then they probably would never have been tested to begin with. They probably would never have been stopped, arrested, and subjected to this evaluation to begin with.

Q Okay.

THE COURT: Recross?

MR. CRUICKSHANK: A couple of questions.

RECROSS-EXAMINATION

BY MR. CRUICKSHANK:

Q The brain stem, that is part of the neurological system?

A Part of the central nervous system, yes.

Q You have never had a course in neurology.

MR. WELLS: Objection. Asked and answered.

MR. CRUICKSHANK: I don't believe so.

THE COURT: You don't think it has been asked?

MR. CRUICKSHANK: Well, I don't believe it was.

THE COURT: All right. I will allow it. Overruled.

THE WITNESS: An understanding of the central nervous system?

BY MR. CRUICKSHANK:

Q To get your O.D., you took neurology.

A We had courses. We did have anatomy and physiology courses that did deal with neurology, yes.

Q And to get your O.D. and your degree in visual

science, you had classes in neuro-ophthalmology.

A Well, they were not neuro-ophthalmology classes, but they -- there were classes that discussed the functioning of the central nervous system that is critical to our understanding of how vision works.

Q So the neurology of the eye book from Leigh and Zee, that is a neuro-ophthalmology book, isn't it?

A It may be used in that context, as well, that one of the earlier editions was one of the standard text that we used.

Q The edition today.

A I'm sorry?

Q The edition today that you mentioned.

A Again, I was in school, in optometry school, from 1989 to 1993. So I believe we used either the second edition or the third edition, whatever was available at the time. The current edition is the one from more recent, I believe 2006.

Q Okay. Thank you.

MR. DeLEONARDO: Very briefly, Your Honor.

RECROSS-EXAMINATION

BY MR. DeLEONARDO:

Q Mr. Wells asked that a DRE can actually deviate from this and make a judgment call as to what is appropriate. Is that what you are saying? So that, in other words, if it is one point above impulse, they would not cause that as an indicated sign?

A Well, it might count as an indicator. But the DRE would take, should take, everything into account and see whether it is consistent with, if it is just slightly different from, just slightly outside of the normal range, as defined by the protocol, or greatly outside of the range.

Q So how above the range should they be given leeway?

A I can't answer that. I don't know.

Q And you actually have had some medical training. Right? And you can't give me an answer on that?

A It will depend on the individual circumstances.

Q Now as to pulse, he pointed out, "Well, they measure pulse three times." Isn't it true that any one of those readings, if it is deemed elevated, would count as an indicated clue?

A Yes, it would.

Q And would you diagnose a person based on one blood pressure?

A I would not.

Q In fact, blood pressure can vary even 20 to 30 points within a matter of minutes, can it not?

A Yes, it can.

Q And so you would think that if blood pressure is such a major indicator in the matrix, why don't they do that three times?

A And that is one discussion that I know has been

ongoing, to see whether they can work a second blood pressure measurement into the protocol.

Q That is part of the changes coming some day.

A Yes.

Q And if I understood you, the DRE is instructed that to combat white coat hypertension to talk nice to them. Is that what you were saying?

A Well, essentially, yes.

Q And that is in the manual, talk nice to them.

A I think as I said earlier, I'm pretty sure that is not in the manual. But I know that is -- I know what the DRE instructors, whom I know personally, I know that is the approach that they take with the students.

Q And you said you didn't see any benefit or any reason why a police officer could not instruct that. Is that right?

A I don't see any reason why, correct, why a non-medical professional could not instruct that.

Q But you have indicated for the last, you know, yesterday and today that, really, other than that one-and-a-half page that I showed you, there is really no discussion as to what other medical causes could exist and what effect they could have on the person during this examination, is there?

A Well, it may not be present in the manual, no.

Q So you still think an officer could cover that

adequately.

A And I believe just in general terms of how they are taught, as I -- if they observe impairment on an individual, but it does not, for whatever reasons, it does not match any one or combination of categories, then they can draw the conclusion that it is a medical rule-out.

Q But you would agree with me that most, the vast majority, of medical conditions would in fact match a category, would it not?

A But then it comes back down to whether the evaluation would have been initiated in the first place.

Q Right. And that was my next point. You said that the differences that an officer knows this person has already been arrested, based on another officer's opinion, before they do this evaluation. Correct?

A Yes.

Q And that is a critical component, in your opinion, for the DRE to be reliable. Is that correct?

A Well, it's one of the components that the DRE takes into account in formulating his opinion.

Q But you agreed with me yesterday that confirmation bias is a huge concern in the scientific community, is it not?

A Certainly.

Q So when this DRE is told: Yeah, I thought this person was driving badly, and, you know, I found prescription

medication in the car, you would agree with me that that has the substantial risk of creating a confirmation bias at a subsequent evaluation. Right?

A The risk is there.

Q And when that DRE is sitting there weighing whether or not he is going to consider that this is enough of an indicator, that that is going to have an effect on whether they find someone is actually impaired and unable to drive or not. Isn't that true?

A Well, in the situation of prescription medications for a particular condition, using that scenario that you just presented, the DRE does have access, either electronically or in paper form to something like *The Physicians' Desk Reference*, something similar to that. And if he is not sure of why somebody would have a particular prescription, for what purpose, for what medical condition, he could look it up within that and confirm that with whatever statements he gets from the suspect. If the suspect says that he has a particular condition and those are the medications that he's using, that he's taking for that condition, he can confirm that with the PDR or any other reliable source.

Q Again, those statements are being used, and that is the type of confirmation bias the scientific community is concerned about, is it not?

A Well, in science and in medical reports, yes. But,

again, we have to come back to, we have to remind ourselves to, the purpose of the DRE protocol, the purpose of doing this in the first place. It is not to establish what effects a particular drug has. It is not to establish what compound or synergistic effects combinations of drugs have. It is ultimately for a legal purpose, to determine whether or not someone should be arrested and the legal process continue.

Q So that officer, with the confirmation bias that would be at risk, is making a determination this person is impaired by a drug and not from a medical condition. Right?

A That could be, that could be the opinion. And that is what then would authorize the officer to ask for a chemical sample, to be confirmed or discredited by the toxicology.

Q But you would agree with me, would you not, that even if it is not in the blood or urine, that drug recognition experts believe they could still testify that it was present in the person and impairing them?

A There can be various reasons as to why it might be in the toxicological example. And you'll have to ask a toxicologist about those specifically.

Q Right. So even if it comes back as not being present or indicated in their blood or urine, that drug recognition expert, you believe, could still come in, using this matrix, using the confirmation bias, and testify that someone is not only impaired by a drug, what category, and that

it is a medical rule-out. Is that what you are saying?

A And it is a medical rule-out?

Q Yes, they ruled out medical. Yes.

A I mean, they ruled out medical, not that it's a medical rule-out.

Q That's what I meant, yes.

A Yes. Okay. That's what I thought you meant.

Q That's what I meant.

A At that point, yes, I believe the officer should be able to testify to that. And it would be the Court's decision as to how much weight to give that evidence. I think it should be admissible, but certainly won't be the only thing that the Court would rely on.

Q But you, in your field, would not come into court and do that. Isn't that true?

A Correct.

Q Thank you.

MR. DeLEONARDO: That is all I have.

THE COURT: All right. We will recess for lunch until 2:00 o'clock. This room will be secure.

Dr. Citek, you have a flight to catch.

THE WITNESS: Yes, I do, Your Honor.

THE COURT: And what time is your flight?

THE WITNESS: It is at 6:00 p.m. out of Dulles.

THE COURT: Why Dulles?

THE WITNESS: It was the only direct flight I could get from Portland, Oregon.

THE COURT: Well, I am sure you are flying first class, in any event. Right?

THE WITNESS: That would be nice.

THE COURT: So you have a direct flight back to Portland.

THE WITNESS: Yes, I do.

THE COURT: All right. Well, have a good trip. Thank you for your testimony. And try to think fondly of Mr. DeLeonardo.

THE WITNESS: I already do. Thank you, Your Honor.

MR. WELLS: Thank you, Doctor.

(Witness excused.)

MR. DAGGETT: Did you say will be secured?

THE COURT: Yes. This room will be locked. We will resume at 2:00 o'clock.

THE CLERK: All rise.

(Whereupon, a luncheon recess was taken.)

A F T E R N O O N S E S S I O N

THE CLERK: Silence in court. All rise.

THE COURT: Be seated, please.

MR. DAGGETT: Your Honor, we are back on the record for the afternoon session of the DRE motions hearing. I believe Your Honor indicated I don't need to call all the cases. But David Daggett and Adam Wells are present for the State, D-a-g-g-e-t-t, Wells common spelling.

MR. CRUICKSHANK: For the record, Alex Cruickshank, C-r-u-i-c-k-s-h-a-n-k, Office of the Public Defender on behalf of the Public Defender's Office and the Public Defender's clients.

MR. DeLEONARDO: And Brian DeLeonardo, D-e-L-e-o-n-a-r-d-o.

THE COURT: For scheduling purposes, I have been reminded by my ever-vigilant assistant, Ms. Imler, that I have a meeting scheduled on Friday at 1:30 involving a lot of people from the county on the issue of the courthouse security. So my question is: Does that create a problem for anyone, if I am not available in the afternoon?

MR. CRUICKSHANK: Judge, I think that it could potentially create a problem, if we can't get through the experts that we have. We might run over into Friday. Dave and I had spoken --

THE COURT: Now we have Tuesday.

MR. CRUICKSHANK: Yes, Your Honor, we do. And that is going to be our expert for the most part. But we do have the ability to call some of the State's witnesses out of order. There are two DREs. And potentially they can go on Wednesday. We are thinking later on in the week.

MR. DAGGETT: Well, just to be clear, we are actually calling his witnesses out of order. We would be pushing ours -- because he has an expert coming --

MR. CRUICKSHANK: That's correct.

MR. DAGGETT: He has an expert coming in on Thursday.

THE COURT: Right.

MR. CRUICKSHANK: Tuesday.

MR. DAGGETT: So we are going to let him --

MR. CRUICKSHANK: Thursday. You're right.

MR. DAGGETT: We are going to let his expert testify on Thursday. And then we should be finished our other expert by tomorrow. And then we have two local people, who we can squeeze in whenever we can squeeze them in after the fact or whatever. It may be on Tuesday. It may be on next Wednesday morning.

THE COURT: Right. Well, given the fact that we took yesterday and part of this morning to do one --

MR. DAGGETT: It will be fast.

THE COURT: I have no idea -- of course, you have a

much better handle on how long the other experts will take. Although one -- I am sure it is very difficult to predict how long cross-examination will take. So we will see how things go.

MR. DAGGETT: It just sounds like Friday, though, is going to be out is what it sounds like to me.

THE COURT: Well --

MR. DAGGETT: If there is drug court in the morning and then --

THE COURT: Drug court in the morning. Friday morning is definitely out. But I was thinking I would come in and sit in the afternoon. But this meeting has been scheduled for some time. I suppose I could prevail upon one of the other judges to attend, but let's see how things go.

MR. DAGGETT: So are we ready to jump back in right now?

The State would call Michelle Spirk.

THE CLERK: Please remain standing and raise your right hand.

Whereupon,

MICHELLE A. SPIRK

was called as a witness by the State and, having been first duly sworn, was examined and testified as follows:

THE CLERK: Please have a seat. For the record, please state your full name, spelling your first and last, and

give your business address, please.

THE WITNESS: Michelle Ann Spirk, M-i-c-h-e-l-l-e S-p-i-r-k, 2323 North 22nd Avenue, Phoenix, Arizona, 85023. And that is Arizona Department of Public Safety, the Central Regional Crime Laboratory.

THE CLERK: Thank you.

MR. DAGGETT: This is all here as --

THE CLERK: Thank you. This will be State's No. 8.

(The document referred to was marked for identification as State's Exhibit 8.)

DIRECT EXAMINATION

BY MR. DAGGETT:

Q Ma'am, this is State's Exhibit No. 8 for identification. I am going to show you that and ask if you could indicate to the Court what that is a copy of. (Handing document to the witness.)

A This is a copy of my current CV or curriculum vitae.

Q And that is up to date?

A Let me check the date. (Examining document.)

Yes. That was updated August 2010.

Q Now, Ms. Spirk, could you tell the Court where you are currently -- I know you said your address. But where exactly -- what exactly is that? And what do you do?

A I am the toxicology technical supervisor at the

Arizona State crime laboratory system. It's actually the Scientific Analysis Bureau. And we have four state crime laboratories in different sections of Arizona.

Q And what are some of your duties and responsibilities?

A I'm responsible overtly for the quality of our 30-plus toxicologists that are practicing in the four crime laboratories. And that would be in the area of blood and breath alcohol and urine and blood drug screening. Overtly that would be the analysis, the quality, of both our qualitative and quantitative analyses, our testimony from our criminalists, making sure that we have consistency in our four laboratories, that things are done the same way in all the labs, and that they're done with a high degree of quality and accuracy.

Q And what is your educational background?

A I have a bachelor of science degree in biology from Creighton University in Omaha, Nebraska. I have a master's of science degree in medical sciences and biochemistry from the University of Nebraska Medical Center. I have about half of a Ph.D. in molecular biology. I did not complete that course of instruction. And I also have a teaching certificate in secondary education in biology and chemistry.

Q And what is your work history, your employment history, related to this particular field?

A I've done medical research in Nebraska at the Liver Study Unit. And that was at the molecular level, looking for the effects of ethanol on the liver. Spent about four years doing that. And since that time, I have been with the Department of Public Safety, working in forensic toxicology. And that's for over 20 years now.

Q What is the difference between toxicology and forensic toxicology?

A Well, toxicology is really the study of different chemicals, how they can affect the body, whether that be therapeutic and there's a desirable effect, whether that be therapeutic and there would happen to be desirable effects, but also some side effects that would be negative, or whether it's an illicit drug, something that's taken for an abuse potential, but cause many undesirable effects on the human body. That's basically looking at toxicology and pharmacology.

When you're talking about forensic toxicology, you're really looking at the application of that to the law. So concept of per se laws, impairment laws, interpretation of a case, how does that science, how it can be translated and communicated in a legal setting.

Q And, ma'am, ultimately I am going to ask the Court to find you to be an expert in the fields of toxicology and pharmacology. You explained toxicology. Explain pharmacology.

A Well, pharmacology has more of a clinical concept or

medicinal concept. And that's, again, is just the issue of some kind of a substance being taken into the human body. And one of two things can happen and does happen. The human body can break that substance down, that pharmacological agent. To the human body, a drug or any kind of an agent is identified as being not self. And it's going to go ahead and absorb the drug. And it's going to distribute the drug, metabolize it, and eliminate it. And typically, it's always trying to make it more water soluble, so it can be eliminated from the body.

The other thing that happens is it's called pharmacodynamics. And that would be the effects of this pharmacological agent on the human body. So it could be something as simple as causing pupils to constrict or a heart rate to accelerate. Or in an antibiotic, it may decrease the titer of different bacteria, a whole host of different things.

But basically, the body does something to address the non-self, the drug, to get rid of it. Even if it's a good drug, it tries to get rid of it. And then that drug is going to have an effect on the human body. It may be good. It may be a side effect. It may be something not so good. But that's what's happening pharmacologically.

Q And have you ever testified in other courts across the country as an expert in toxicology or pharmacology?

A I have, yes.

Q In what jurisdictions?

A I've testified, I stopped counting after about 600 times. I testify quite frequently in the State of Arizona. I've also testified, I believe, in approximately 10 other states.

Q Now obviously you are here in relation to the DRE program. What is your involvement with the DRE program?

A I'm fortunate to have practiced forensic toxicology in Arizona. I started my work in forensic toxicology in 1990. And my mentor in the crime laboratory was a gentleman by the name of Eugene Adler. And he was one of the forensic toxicologists that worked with Richard Studdard and Tom Page from Los Angeles County and helped to really put the program together.

He's also an individual that coauthored one of the DRE validation studies, which is referred to as the Arizona Field Study. And Gene Adler was my mentor. He was the person who basically taught me toxicology, when I came out of the medical school setting.

So very early on, my first year of employment with the Department of Public Safety, I was able to attend DRE school and was -- have always been heavily involved in the program since the early 1990s.

Q And by "heavily involved," what types of things have you done and do you currently do?

A I sit on our state's DRE steering committee. We

have monthly or bimonthly meetings. I've taught at four of the national conferences. I teach at our very active DRE program in Arizona. Toxicologists are always present in the DRE instruction school. And I'm one of the toxicologists that teaches there.

I typically provide some kind of in-service training. Our DREs have to attend mandatory in-service training hours. So I will oftentimes, when I lecture to toxicology peers across the nation, I'll take that same material back to Arizona. And I will train our DREs, something like atypical antipsychotics or, you know, something that another different kind of prescription drug that potentially cause impairment. So I've been very involved in their training.

I'm just one of the individuals that is known, at least in our state, as having a great interest in the program. And I'm, I think, a go-to person for toxicology, if there's a question about that.

And I do -- I've been fortunate enough to have been able to teach in several non-specific DRE areas, like at the National Judicial College in Reno, Nevada. And I always have part of my teaching be about the DRE program, when the lecture is on drug-impaired driving.

I have taught at the National District Attorneys Association. I teach for the California Department of Justice.

Just a number of different schools and agencies. And it's typically on the subject of forensic toxicology. But if it involves drug-impaired driving, I always make it a priority to include part of the lecture on the drug recognition program.

Q Now does any of your both employment history and your work with the DRE program involve clinical research? I mean, for instance, are you -- you are familiar with, I guess, the program, the research studies that relate to the DRE program.

A Yes. The validation studies?

Q Validation studies. Thank you. That's the word I am looking for. What was your involvement with those?

A I can tell you that when the Arizona validation study had come out, I had just started my career. And other than being somebody that, you know, kind of looked on with history, I really had nothing overtly to do with that study, other than, you know, appreciating it.

There was a study later on, several years later -- I don't remember the exact date -- where there were questions about whether HGN could be administered accurately to a person who was not sitting up or standing up, if they were lying down. And I know that we participated in that study in Arizona. Dr. Marcelline Burns came. And there were a number of DREs. And a publication resulted from that overtly showing that HGN could be successfully administered in a person who was lying

down, which is oftentimes very helpful, if there's some kind of injury involved or the person's being transported.

That's a study I can think of that I was involved in.

Q What about your familiarity with what has been -- and I am just going to use a shortened amount, the Bigelow, LAPD, Minnesota, Heishman, and Shinner and Schneckman, are you familiar with those?

A With the major DRE validation studies, yes, I am.

MR. DAGGETT: Your Honor, at this point in time, I am going to ask to have Ms. Spirk qualified, certified, as an expert in toxicology, pharmacology, and the DRE program, and also in her analysis of validation studies.

THE COURT: Voir dire?

VOIR DIRE EXAMINATION

BY MR. CRUICKSHANK:

Q Good afternoon.

A Hello.

Q You defined forensic toxicology as the application of science to the law.

A Correct.

Q And you would say that forensic toxicology is what you call interpretive toxicology.

A I don't believe I limited it to that, but I believe that that was part of my definition, yes.

Q Interpretive toxicology, what drugs are doing in the human body, that would be what interpretive toxicology is. Is that correct?

A I think that that's an area that you could define or look at it. For me, interpretive toxicology is looking all the facts, the complex facts, in a forensics case and coming up with an opinion about ultimately was this a situation of impaired driving. And if the jurisdiction you're in prefers that you don't provide an opinion, that that would be for the trier of fact, which is the case in some jurisdictions, then the interpretation would be talking about things that are consistent with impairment and coming up with a list of things.

And that's what we do very frequently in Arizona. We won't give the ultimate opinion, but we'll talk about all the difference signs and symptoms and facts that are consistent with different drugs that were found in a DUI drug case. To me, that's what I think of as far as an interpretation goes.

Q Well, let me ask you if this is a correct statement. Do you remember testifying in Butler County, Pennsylvania?

A I do.

Q Okay. And is it fair to say when you were testifying in Butler County, Pennsylvania, "Because we are asked to apply the science to the law, hence the name forensic toxicology, another aspect of what we do, I see this more now than maybe 15 or 20 years ago, is to do what's called

interpretive toxicology. So we may talk more about what exactly are these drugs doing to the body."

A Yes. And as I said, I don't -- I'm not saying that what you asked me isn't accurate. I'm just saying that an interpretation is bigger than that.

Q All right. Now you went to undergraduate school. And you got a bachelor of science degree in biology.

A Yes.

Q All right. Now you went to University of Nebraska Medical Center. Correct?

A For graduate school, yes.

Q The Medical Sciences Interdepartmental Area Graduate Program, that is what you participated in. Correct?

A Yes.

Q Okay. And the Interdepartmental Program allows you to pursue a graduate education in one academic field. Correct?

A I'm not sure I understand the question.

Q You got a degree in one field. Is that correct?

A (No response.)

Q The way it was stated, when you said you got your degree, you said you had a degree in biochemistry. Correct?

A Yes.

Q Do you have any other degree from the University of Nebraska?

A It might be a little confusing, because it's the

interdepartmental degree that allows you to, rather than, say, just getting a degree in physiology, you can survey a number of different courses. The courses that I had the most emphasis in was biochemistry.

So what I was told, when I relate my education, that I should it's the Medical Sciences Interdepartmental Degree with an emphasis in biochemistry. And that's how the school told me I should relay the degree.

MR. CRUICKSHANK: If I could just approach the witness?

THE COURT: Yes.

BY MR. CRUICKSHANK:

Q Let the record reflect I am showing you what appears to be procedures governing the admission and progress of students in the Medical Sciences Interdepartmental Area Graduate Program at the University of Nebraska. And if you will just follow along with me, and you can -- "Allows a student to pursue graduate education in the research area of an advisory in one of the participating departments leading to a degree." Is that correct?

A It is. But what is the context of this? I mean, I got my degree a long time ago. And this --

Q I know. I know. That's what I am asking you. So when they are saying that you got your degree -- you are saying that you got more than one degree. Is that what you are

saying?

A No.

Q Okay.

A I did not say that. I did not intend to say that.

Q Okay. It is fair to say that you did not get a degree in clinical research.

A I would agree with that, yes.

Q And in order to get your Medical Sciences Interdepartmental Degree, you had to complete a master's thesis in your area of research. Is that correct?

A Yes.

Q Okay. And your thesis was in the area of biochemistry. Is that correct?

A Yes.

Q Okay. And in the most general sense, the topic of your thesis involved knee cartilage. Is that also correct?

A It overtly involved prostaglandins, which is a hormone.

Q Okay. So when we look at your resume and you relate your master's thesis, it involved hormones. And it involved knee cartilage generally. Is that correct?

A Condrocytes, yes.

Q Okay. And that would be -- what are condrocytes? Go ahead and explain that, if you could.

A Condrocytes -- it's been awhile. Condrocytes are

the components that make up cartilage in articulating joints, such as your knee, that move back and forth, that tend to wear out. And fatty acids and prostaglandins, which are hormone-like substances, play a role in the degeneration of cartilage. So this research tried to look at rheumatoid and osteoarthritis and see if there would be some knowledge to be gained or therapies from looking at this.

Q Thank you. So the topic of your master's thesis was not on the general effects of drugs in the human body.

A No.

Q And your master's thesis didn't apply the science of pharmacology.

A I think it did a lot with pharmacology. We looked at the drugs that are very commonplace today, the non-steroidals and their effects of prostaglandins. Part of the reason people take non-steroidals is for the effects on --

Q So the answer is yes.

A Yes, I think it did involve pharmacology.

Q And in order to get your degree, you needed to participate in a seminar. Is that correct? Did you participate in a seminar?

A I honestly don't remember anymore -- it's been over 20 years -- exactly what I did to complete that degree.

Q If you participated in a seminar, it would have been in your field. And that would have been biochemistry.

Correct?

A I don't know.

Q Okay. Is it fair to say that, as someone who applies science to the law, you don't have a degree in any area of clinical research that involves the effects of drugs on the human body?

A I'm thinking about your question. You asked if I had a degree in --

Q Do you have a degree in any area of clinical research that involves the effects of drugs on the human body?

A (No response.)

Q Well, let me ask this: You don't have a degree in clinical research. Correct?

A I'm not even sure that they give degrees in clinical research.

Q Well --

A I mean, the degree that I have involved clinical research.

MR. CRUICKSHANK: Well, if I could just approach one more time --

THE COURT: You can move freely about the well, Mr. Cruickshank.

MR. CRUICKSHANK: Thank you.

BY MR. CRUICKSHANK:

Q The program at the University of Nebraska offers a

program, a degree in clinical and transitional research. Okay?

A I see that.

Q All right. So that is my question: Did you get a degree in clinical research?

A No.

Q Okay. And as a forensic toxicologist, you don't hold a degree in toxicology. Is that correct?

A No.

Q Bachelor of science degree in toxicology.

A No.

Q Master's of science degree in toxicology.

A No.

Q Ph.D. in toxicology.

A No.

Q As a forensic toxicology, you don't have a degree in forensic toxicology. Is that correct?

A No.

Q Bachelor of science degree, master of science degree.

A In forensic toxicology?

Q Yes, ma'am.

A No.

Q And you would agree with me that there are two main areas of pharmacology, that being pharmacokinetics and pharmacodynamics. Is that correct?

A Yes.

Q Okay. And would you agree with me that clinical pharmacodynamics is a branch of pharmacology that studies the physiological effects of drugs on the human body?

A Would you repeat that, please?

Q Is the branch of pharmacology that studies the physiological effects of drugs on the human body.

A Is that pharmacodynamics?

Q Yes.

A Is that the question? Yes.

Q Okay. And pharmacokinetics would be the branch of pharmacology concerned with the rate at which drugs are absorbed, distributed, metabolized, and eliminated by the body.

A My only subtle disagreement would be your definition seems to limit it to the rate. I don't think of pharmacokinetics as only being the rate of those four factors. That would -- other than that, I would agree.

Q And so when you were at the University of Nebraska, you studied pharmacokinetics.

A I did.

Q How many credits did you receive in pharmacokinetics?

A It wasn't a class called pharmacokinetics, but there were classes where we learned different things, for example, Michaelis-Menten enzyme kinetics --

Q So --

A -- which are exactly --

Q -- the answer to my question is you didn't have a class at the University of Nebraska in pharmacokinetics. Correct?

A I -- I'm trying to answer your question accurately.

Q Well, let me rephrase it then. Did you get college credit for a class at the University of Nebraska specifically on the area of pharmacokinetics?

A Yes, that was the main, the main source of a class. But the class was not titled pharmacokinetics.

Q What was the class title?

A I don't even remember.

Q At the University of Nebraska, speaking of pharmacodynamics, did you get college credit for a course on pharmacodynamics?

A Same answer as before, not a course that was titled pharmacodynamics, but there were certainly courses about the effects of drugs on the human body.

Q And would that be the same course as you took with pharmacokinetics?

A No.

Q So there were two courses, one on pharmacokinetics and one on pharmacodynamics.

A There were at least two courses. There may have

been more.

Q Three?

A I have no idea.

Q And as a forensic toxicologist, you apply the science of pharmacodynamics to the law. Is that a fair statement?

A I'm hesitating because that was not my statement. And I'm --

Q Well, I am asking you, as a forensic toxicologist, someone who applies science to the law, do you apply the science of pharmacokinetics to the law?

A I can only answer that by saying not overtly, but indirectly, yes.

Q As a person who is an interpretive toxicologist, do you opine on how pharmacokinetics affects drug action on the human body?

A Would you repeat that, please?

Q Sure. As an interpretive toxicologist, do you opine, do you give opinions, on how pharmacokinetics affects drug action on the human body?

A Yes.

Q And have you ever studied pharmodynamics in a clinic with real patients, live human beings?

A Did you mean pharmacodynamics?

Q Yes.

A Have you ever studied pharmacodynamics in a clinic setting?

A At the University of Nebraska Medical Center, I worked in the orthopedics area. And there was a clinic. And we did get samples from the clinic. And we did have research studies that involved clinic patients. So in that respect, the answer would be yes, we were involved in a clinic.

Q So that research that you did was under NIH. Is that correct?

A The largest grants were under NIH. There were other grants by Medtronics and other --

Q Let me just get to your resume then, just to clarify. On your resume there are two dates, two sets of dates, for research. From May of 1981 to October of 1983 is one. And it says, "Responsible for conducting studies on NIH grant investigating the molecular mechanism of ethanol toxicity in the liver." So that is one opportunity on your resume for NIH grant. Right?

A Yes.

Q Okay. And the other one on your resume is from October of 1983 to September of 1986 stating, "Full responsibility for conducting studies on NIH grant investigating the role of" -- and we talked about this before. And I will mispronounce the word, so I am not even going to try -- "and cartilage. Right?

A Yes.

Q So your resume states that you were involved in two NIH grants during the period of time you were at the University of Nebraska. Is that correct?

A That is correct, but --

Q Okay.

A But that's not the extent of --

Q Well, you have answered my question.

A All right.

Q Mr. Daggett can redirect you.

MR. DAGGETT: I don't think she has. I think she has the right to explain what she is trying to say, Your Honor.

MR. CRUICKSHANK: I am not trying to cut her off, Your Honor. I am just trying to --

MR. DAGGETT: Well, you did cut her off.

THE COURT: It is just happening accidentally?

MR. CRUICKSHANK: Absolutely. It is just part of my training.

THE COURT: I will let the witness complete her answer.

THE WITNESS: Thank you, Your Honor.

My only addition was that -- perhaps I misunderstood your original question. But just because those are the two grants that are emphasized in my CV does not mean that that is the only work that I participated in while I was at that place

of employment for a number of years.

BY MR. CRUICKSHANK:

Q So other grants that you participated in, other clinical research opportunities you participated in, you decided to leave that off your CV.

A At this point in my career, my CV is rather long. And I have minimized that. And purposefully selected one of those opportunities, because it dealt with ethanol research. There were other things that I did during that period of employment.

Q Well, let's just focus on what is on your resume then. Now as someone who has done research for NIH, conducted studies for NIH, you are familiar with the term "principal investigator," are you not?

A Yes.

Q And a principal investigator is an individual designated by the grantee to direct the grant project. Is that a fair statement?

A Yes. It's the person who sought funding and was awarded funding there, the head, the person responsible for the grant.

Q Okay. And the NIH grant from May of 1981 to October of 1983, were you the principal investigator?

A No.

Q And the NIH grant from October of 1983 to September

of 1986, were you the principal investigator?

A No.

Q Are you familiar with the NIH term "progress reports"?

A Yes.

Q Okay. Is it fair to say that is periodic, usually annual reports submitted by a grantee and used by NIH to assess progress, is that a fair statement?

A Yes.

Q Okay. Are you familiar with the term "co-investigator"?

A Yes.

Q All right. On the two grants we talked about, were you the co-investigator on either one?

A No. I was a graduate student.

Q Thank you. Are you familiar with the NIH term "human subject"?

A. Yes.

Q. NIH defines human subject as a living individual about whom an investigator, conducting research, obtains data through intervention or interaction with the individual. Is that a fair statement?

A Yes.

Q So you are saying that you did clinical research on human subjects in the area of orthopedics. Correct?

A I'm concerned that there is misinterpretation here. What I said was that, when you asked me about that particular NIH grant, which was overtly not done on human subjects, I spoke of another grant that we had with Medtronics and that there were multiple ongoing grants, which is common for university professors to have multiple grants, that I had worked on additional grants, some of which were laboratory animals, some of which were human subjects.

So I'm -- I want to be sure to --

Q Well, I want you --

A -- answer you accurately.

Q Sure. And I want to be sure, too. Because the only level of accuracy I have is the CV you submitted to the Court. And the CV you submitted has only given us an indication of two opportunities for research while you were at the University of Nebraska. That is what it states. Isn't that correct?

A (No response.)

Q That's what it states. Isn't that correct?

A (No response.)

Q There are two NIH grants. One says that you were fully responsible for conducting studies. And the other says that you conducted studies. Correct?

A I can tell you that my CV is accurate. I had never intended that my CV would in detail reflect everything that I had done 20-plus years ago, while I was in graduate school.

Q Well, let me ask you this question: The State has offered you as an expert in clinical research. Would you agree that it would be important to put on your CV every time you conducted clinical research, if you are being offered as an expert?

A No. I think my CV is appropriate. And I think it accurately reflects --

Q Thank you.

A -- what I was doing in my twenties in Nebraska.

Q So the two NIH grants that are listed on your CV did not involve clinical research. Correct?

A I'm -- I want to think about this for just a moment. My recollection at this point in time is that they both involved animal studies.

Q Thank you.

A If there is some small segment of it that involved human blood, et cetera, from a clinical side, it was not the main focus of the study. And it's not something that I was not directly involved in.

Q Do you have a doctoral degree in medicine?

A No.

Q Do you have a doctoral degree in medicine in which you have taken a course on clinical pharmacology?

A Is that the same question? I don't have a --

Q It is the same question. Have you ever taken a

course in clinical pharmacology for credit at a university?

A I have had courses where that was a component of them, but not where that was the title of the course. I have taken courses since then, but not for credit.

Q And you --

A So the answer to your question would be no.

Q So it is fair to say that you have never engaged in a clinical rotation with patients.

A No, I have not.

Q You have never had the opportunity to engage in a field where you observe -- strike that.

Would you agree with me that human physiology is the study of how human body systems function in the most general sense?

A Yes.

Q Okay. Cardiovascular system, digestive system, immune system, nervous system, reproductive system, respiratory system, skeletal, lymphatic, urinary, those are some of the body systems. Correct?

A Yes.

Q And if you would please tell the Court how many classes in human physiology you had while at the University of Nebraska.

A I had at least one class of human physiology. And there were a number of classes where human physiology was

certainly a part of that.

Q Have you ever taken a class on the physiology of the cardiovascular system and the effect that CNS depressants may have on the cardiovascular system?

A I've not had a class where the only subject was the cardiovascular system. But I have had a class, I believe more than one class, where the cardiovascular system was a part of the class and the effects of drugs overtly on that system were part of the class.

Q Where did you take that class?

A I would have had those classes at Nebraska. I would have had those classes at Creighton University. I would have had those classes at Midwestern University, which is an osteopath school in Glendale, Arizona. And then there would be a number of classes and workshops when I attend national conferences, where there are --

Q Well, I am just --

A -- opportunities for learning.

Q Okay. And so at Creighton, when you got your bachelor of science degree in biology, you had a specific course on human physiology and the effect of CNS depressants in human physiology generally.

A No. I tried to go -- perhaps I did not do a good job. I tried to go out of my way to explain that I have never had a class specifically on the cardiovascular system and the

effects of drugs on the cardiovascular system. I've not had a class specifically on that. But it has been part of other classes.

Q Human physiology, CNS depressants, did you have a course as an undergraduate and the effect of CNS depressants on human physiology?

A I don't think that they offer courses like that. So no.

Q No. Okay. You attended Midwestern University.

A No, I did not attend Midwestern University. We have a contract at our state crime laboratory where we have a very nice osteopath school. And the professors come and provide ongoing training for us. These are M.D.s, osteopaths, D.O.s, and individuals with Ph.D.s, who come and provide us with training.

Q The course that you took at Midwestern University, you didn't receive college credit for. Correct?

A No.

Q So the courses that you took at Midwestern University you would characterize as continuing education classes?

A Yes.

Q Is there a reason why the class you took from April to June of 2004 is not characterized as a continuing education class on your resume?

MR. DAGGETT: Your Honor, if we don't move this thing along, we are going to be here for a month. It is an objection, I guess, but this is just terribly, terribly slow.

MR. CRUICKSHANK: I'm sorry it is slow. I am just trying to ask -- excuse me, Your Honor -- I am just trying to ask as many necessary questions as I can in order to ensure the Court that this is a witness who is an expert in pharmacology, forensic toxicology, and clinical research. And to do that, it may take some time. But I apologize.

THE COURT: All right. Well, as a practical matter, none of those subjects are subjects that I am well versed in. So I don't have any frame of reference, per se, as to what questions would necessarily be relevant or not relevant. So as we go along, maybe that will become clearer. But I will overrule.

BY MR. CRUICKSHANK:

Q So the question again was, the class you took from April to June of 2004 at Midwestern University, that is not on your resume as a continuing education class. Is that correct?

A I'm sorry I'm not able to follow you.

Q Would you like a copy of your resume?

A Yes. Yes.

Q (Handing document to the witness.)

A What class?

Q It is the one from April to June of 2004 on your --

A Can you show me where you are --

Q Sure. It is easier if I sit down. So --

(Examining document.)

Sorry about that. I am looking at page 15 of your resume. And it is basic pharmacology and general effects, general drug effects, Midwestern University, Department of Pharmacology.

A And the question?

Q Is that a continuing education class?

A (No response.)

Q Did you receive college credit in the School of Pharmacy?

A No, I did not receive college credit in the School of Pharmacology. I'm looking at what this is listed under. I think it's listed under "Professional training."

Q Right. And then the next one under "Professional training" was the one that you recently took. And that lists a class from Midwestern University. And it says "Continuing education." Is that correct?

A Yes.

Q Thank you.

THE COURT: Why don't we leave a copy of the CV with Ms. Spirk so she can refer to it?

BY MR. CRUICKSHANK:

Q I mean, it is a fair question to say that you never

had to defend a master's thesis in the area of pharmacokinetics, isn't it?

A Well, I certainly defend a master's thesis, but I'm trying to remember if pharmacokinetics, how big a role that did or didn't play in it. Frankly, I really don't remember.

Q When you look at your resume going forward from 1990, you started testifying as an expert in pharmacology, is that correct, according to your resume?

A I don't think my resume --

Q Well, just -- if you could just answer --

A -- says exactly when I did my first expert testimony. But it would have been shortly thereafter.

Q Well, let me just take a look, because I think it -- oh, here it is. Okay. Let me take a look.

(Examining document.)

January of 1990, criminalist one through three. Do you see that on page two?

A Yes.

Q Okay. "Expert in DUI drugs, including drug analysis, pharmacology, pharmacokinetics, and general effects of drugs on human physiology and performance." Right?

A Yes, but my -- where I am objecting is the fact that you prefaced this by saying I wasn't provided expert testimony in January of 1990.

Q Well, let me --

A This just says from the period of 1990 through 1999.

Q That's fine. So from the period of 1990 to 1999, you are holding yourself out to the Court as an expert in pharmacology. Correct?

A Yes.

Q Okay. And an expert in pharmacokinetics. Correct?

A Yes.

Q And an expert on the general effect of drugs on human physiology and performance. Is that correct?

A Yes.

Q Okay. And that is without a degree in pharmacology. Is that correct?

A Yes.

Q Okay. And a degree in pharmacology, is that a PharmD? Is that what they call a PharmD?

A Well, you could be a pharmacist --

Q Okay.

A -- and have a BS in pharmacy and have expertise. You could have a PharmD and have expertise. I mean --

Q When you went to Midwestern, excuse me, when you attended the classes at Midwestern, they offered a degree in pharmacy. Is that correct?

A I have no idea.

Q Okay. At Nebraska, between August of 1986 to January 1987, you were a Ph.D. candidate. Is that correct?

A Yes.

Q So you were a Ph.D. candidate for about five months. Is that also correct?

A Hold on just a second.

(Examining document.)

Yes. It was from August through January.

Q All right. You never completed your Ph.D. dissertation.

A I did not.

Q You never wrote a Ph.D. dissertation in the area of pharmacology.

A No. In fact, I was in a molecular biology program.

Q So is it fair to say that from 1980 until today, you have not received one college credit on a class devoted specifically to pharmacology?

A I'm thinking. Just one moment, please.

(Examining document.)

So your question is have I basically ever in my secondary education taken a class that was specifically pharmacology?

A Yes, for college credit.

Q I don't believe I have ever taken a class that the title was pharmacology, no.

A And you teach DREs pharmacology. Is that correct? Actually, let me rephrase that. This August you taught at the

Arizona DRE in-service. Right?

A Yes.

Q All right. And you taught DREs on the subjects of identified poly-pharmacies. Is that correct? Page eight of your resume.

A Well, that was -- it was overtly over atypical antipsychotics. And because they are an adjunct therapy, if you see the commercials on TV, they say when an antidepressant isn't enough, add Abilify, which is an atypical antipsychotic. The concept behind that was polypharmacy. And that's what the reference was. It was overtly on atypical antipsychotics.

Q Well, I just want to -- and I just want to get back to basics here, what is on your resume. And it is fair to say that your resume talks about identified poly-pharmacies. That is part of the title of what you taught. Right?

A Yes. And I just provided an explanation for that.

Q Thank you. And that was without one class in college specifically devoted to pharmacology.

A Yes.

Q And it is generally accepted in the DRE community to teach DREs about that subject without having one college course devoted specifically to pharmacology.

A I don't think I can say it's generally accepted. I can tell you that I'm considered to be a qualified expert in the area. I have decades of experience practicing in this

field. I'm editing two textbooks on this field and writing chapters in the field. I have considerable expertise and experience in this field.

I don't think that there is any consensus from individuals who teach DREs that you should do without a knowledge of pharmacology, if that's the implication.

Q You would have to agree, though, that a class devoted to pharmacology would certainly be helpful, when you are teaching DREs on polypharmacy, don't you think, a college course?

A I think the more education, the better. I never miss an opportunity to participate in a workshop or continuing education. I think the more education, the better. But I have a graduate degree. I have an undergraduate degree. I participate in continuing education. And I have a wealth of practical experience. Those are my credentials.

Q So as someone who is an expert in what you call interpretive toxicology, you don't have any clinical research experience, as defined by any NIH. Is that correct?

A I'm not even sure what the NIH definition of clinical research is.

Q You worked under an NIH grant at Nebraska. Correct?

A I did.

Q All right. And we talked about the two opportunities for research that are on your CV.

A Yes. But I still don't know the definition.

Q I am going to get that for you. And I have the entire NIH grant policy statement here. And you can look at that, if you need to. But what I have done is I have just gotten a glossary of terms from the NIH entire package. And I have that for you, if you want to look at that. (Handing document to the witness.)

So there is a definition there of clinical research. And it is fair to say that clinical research is research on human subjects. Is that correct?

A I'm sorry. I'm overwhelmed by the pile that you've handed me.

Q I'm sorry.

A The definition that you were asking me that I already have told you I didn't know, did you want to point it out to me in here?

Q Sure, I will. Because you said you knew what the definition was for a principal investigator. Correct?

A No, I didn't say I knew the definition. I said I was familiar with what an investigator, I think you said a lead investigator or a primary investigator and a co-investigator was. And I said I was familiar with that. But I certainly could not spout out the NIH definition of it.

Q All right. Well, let me help you. I am looking at NIH grants policy statement revised December 1, 2003. Is that

a fair statement, except for all the scribble on the front?

A That appears to be what's on the cover, yes.

Q Okay. And if you want to read through this, or if you want to look at it --

THE COURT: Read through what? That stack?

MR. CRUICKSHANK: I am not going to -- I am just giving it for -- to make sure she has the whole thing, if she wants to read through it. If the witness wants to read through it, Your Honor, they certainly can. But I am turning to the page, page seven. And page seven has, in the glossary, a definition of clinical research.

BY MR. CRUICKSHANK:

Q And so I am asking you if, pursuant to that definition, you have done clinical research.

A I'm going to take a moment and read this.

Q Sure.

A (Examining document.)

MR. CRUICKSHANK: And just for clarification, I am asking if the witness has done clinical research pursuant to NIH policy because of what is on the resume.

THE COURT: That's fine. When you said, though, that she could have that to look through, I think Mr. Daggett will be up on his feet very quickly. And I would agree that that goes well beyond what we have time to accomplish.

THE WITNESS: One moment, please.

(Examining document.)

I fail to understand the relationship between the definition here of a clinical trial for NIH and what is listed in my resume, which says that --

BY MR. CRUICKSHANK:

Q Well, ma'am, I am looking at the one before that, that talks about clinical research. That is before clinical trial.

A Same point.

Q Okay.

A Clinical research definition by NIH, in response to the statement that I had full responsibility for conducting studies on NIH grant investigating the role of prostaglandins in the articular cartilage disruption associated with arthritis, I didn't say I was the principal investigator. I didn't say I was the lead investigator. I didn't say I was the co-investigator. I was in my early twenties. It was a wonderful learning opportunity. I learned the scientific method. I learned how to conduct research.

Q Well, that's great. But my question to you was --

MR. DAGGETT: She is in the middle of an answer, Your Honor.

THE WITNESS: I never said that I received it. I applied for, received an NIH grant. I was under the direction of a Ph.D. and several M.D.s. I think it accurately describes

exactly what I did.

MR. CRUICKSHANK: Okay.

THE WITNESS: And it was a valuable thing for me to do. And I don't see that it has anything to do with this.

MR. CRUICKSHANK: All right.

THE WITNESS: I'm sorry.

BY MR. CRUICKSHANK:

Q So it is fair to say you didn't do clinical research at the University of Nebraska pursuant to what is on your resume.

A I disagree vehemently. I was involved in a practice that conducted --

Q Well, ma'am --

A -- clinical research. I participated in it. I wasn't in charge of it. I wasn't the lease investigator. I absolutely agree with you upon that. But it isn't as if my resume is false or it inaccurately describes what I did. And it's also relevant.

Q Thank you. As an expert who applies science to the law, have you ever given a CNS depressant to a patient other than alcohol?

A Well, I don't have my M.D. So if I were to do that, that would be illegal.

Q Okay. As a forensic toxicologist, have you ever given a narcotic analgesic to a patient?

MR. DAGGETT: Object, Your Honor. Obviously if he is going to go through each one of these seven categories, she is not a doctor, she cannot do it.

MR. CRUICKSHANK: I am not going through the categories, Your Honor. I am asking about her qualifications in pharmacology.

THE WITNESS: A pharmacologist couldn't do that either.

BY MR. CRUICKSHANK:

Q A clinical pharmacologist?

THE COURT: Whoa. This is not a back and forth.

THE WITNESS: Excuse me.

THE COURT: We have an objection. And your purpose in asking about each one of these is what, Mr. Cruickshank?

MR. CRUICKSHANK: It is about her expertise in pharmacology.

THE COURT: And your question is with regard to each one of these, whether she has ever given --

MR. CRUICKSHANK: Your Honor, I am not going through the drug categories. I am asking her specific questions that someone who is an expert in pharmacology would apply to the practice of pharmacology. I am just trying to see what knowledge this person, excuse me, this expert has in pharmacology.

Because, Judge, at the end of the day, this is a

witness who is going to interpret pharmacology and the effects of drugs on the human body driving.

THE COURT: Is your question, when you say has she given a CNS depressant to someone, is that -- when you say has she given, are you saying or asking has she given it in the same sense as a pharmacist would give it?

MR. CRUICKSHANK: That could be interpreted as such, yes.

THE COURT: Well, how else could it be interpreted?

MR. CRUICKSHANK: It could be interpreted as -- may I ask the witness a question -- as clinical pharmacology in a clinical setting.

THE COURT: All right. Where she was involved in some research?

MR. CRUICKSHANK: Yes, Your Honor, clinical research.

THE COURT: All right. I will allow it. Overruled.

BY MR. CRUICKSHANK:

Q Have you ever given a CNS depressant to a patient while involved in clinical research?

A No.

Q Have you ever given a drug, any drug, to a patient while involved in clinical research?

A I don't understand your "have you given." You mean prescribed it?

Q Have you, as --

A Handed it to them? I don't understand.

Q Have you treated a person with a CNS depressant?

A It's my understanding that the only individuals who are allowed to treat and dispense medications to a patient is someone with a medical degree. Even a PharmD cannot prescribe and administer drugs to someone unless it's in conjunction with a medical doctor. And to answer your question, no, I have not.

Q Thank you.

MR. CRUICKSHANK: No further questions.

MR. DeLEONARDO: I will be relatively direct, Your Honor, and brief.

VOIR DIRE EXAMINATION

BY MR. DeLEONARDO:

Q Just to make sure and to summarize what I understand, as a toxicology, you are that -- you are not that by degree, but by, you are saying, employment. Correct?

A No, that's an oversimplification.

Q Well, when you got your position in the Arizona lab, the only requirement was that you have some science degree. Correct?

A No. There's actually a requirement that we have 30 semester hours of chemistry, that we have a degree in some hard science.

Q And that biology would follow. Right?

A Or chemistry -- well, biology, as long as you had an additional 30 semester hours of chemistry. But yes, you're correct.

Q So then you took that position and basically in toxicology, you are essentially testing whether it is material or whether it is substances. Correct? That is the job of the toxicologist. Right?

A I didn't understand the material or substances part of that.

Q Well, in other words, a toxicologist, in the position you are in, you may, for example, pull items for testing to determine what it is. Correct?

A Are you talking about like a solid dose drug?

Q It could be a drug or it could -- I mean, some toxicologists or criminologist would be.

A That's a different area. That -- solid dose drugs is a unit called controlled substances. And it's different from toxicology. Toxicology is going to be a biological matrix, like blood, urine, vitreous humor. And what you're describing is part of the crime lab, but it's a different area.

Q The crime lab. Right. That is what I wanted to clarify. So essentially your career is testing blood, testing urine. Correct?

A Or other biological substances, yes.

Q Fair enough.

A Yes.

Q And so your entire training is essentially determining whether something is present or not present or determining what it is. Fair?

A No.

Q That is not what you -- that is not what a toxicologist does?

A No, that's part of it. But you said "your entire training" is this.

Q Oh, I'm sorry.

A That's part of it.

Q Your work, your work career, is that. That is what you do, as part of your job.

A That's part of it, but that's not all that we do. Because then we have to go to court and talk about those findings.

Q Okay. I want to get to that now.

A Okay.

Q So you have described this term "interpretive toxicology." Is that right?

A Yes.

Q Is there any organization that is described as an interpretive toxicology organization? Like is there a -- like we have the, you know, American Academy of Toxicologists, for example. When we have interpretive toxicology, is there a

division of that?

A No. It's -- it's a process. That would be like saying there's a division of testing toxicology or a -- no, not that I'm aware of.

Q Where did you learn, where were you -- is there any toxicology book that talks about the field of interpretive toxicology?

A I think that there are, actually.

Q Can you tell me where they are?

A I'm hesitating because I'm having a hard time remembering a title to tell you. But I can tell you that we put on a workshop in 2004. And the title of the workshop was Interpretive Toxicology. And --

Q But that is you, as forensics toxicologists.

A Well, no. We brought in experts from Canada and all over the United States. And everyone talked about interpretive toxicology. And they were people that were leaders in the field. I'm fairly certain that there have been publications since then in other workshops that used the phrase, the title interpretive toxicology. It's not something that isn't utilized.

Q What are you doing, as an interpretive toxicologist? Tell me what you are doing.

A To me, someone might have a slightly different take on it, but to me, the concept of interpretive toxicology means

that you're going to look at all the evidence forensically in a DUI drug case. You're going to look at the driving behavior, excuse me, the driving behavior, the probable cause, the first individual on scene, witness statements, arresting officer, standardized field sobriety tests, a DRE exam, the toxicological results, if there was polypharmacy, more than one drug, drug-drug interactions, if there was alcohol on board, the whole big picture of everything that happened.

And you're going to identify if the laboratory findings are consistent with the different signs and symptoms, things that are consistent, things that are inconsistent with it, things that make sense, things that don't make sense.

And in some jurisdictions, depending upon where you are at, they may ask: What is your opinion? Is this an impaired driver? In other jurisdictions, they may say: All we want to know is what's consistent. It's up to the judge or the jury to be the ultimate trier of fact. We don't want your opinion.

That's part of that toxicological interpretation, looking at all the evidence, looking at does it fit or does it not fit, is it a good case, not --

Q So this is a -- if I could get back to the question.

A Yes.

Q So this is a creation of law enforcement. Is that correct?

A I think it's used mostly in the criminal justice situation, but I don't think it is a creation, because I've seen it utilized in medical examiner cases, where it's not really related to law enforcement. I've seen it utilized in different kinds of toxicology. I don't think it's only involved in where you look at all of this information and come up with consistencies.

Q So how does the American Academy of Science view this concept of you coming in and discussing something that is consistent with? Do you know?

A I'm not sure what you mean by how do they view it. I'm a member of the American Academy.

Q Well, are you aware -- you are a member. Right?

A Yes.

Q Are you aware of a publication put out "Strengthening Forensic Science in the United States"?

A I've not read it, no.

Q Well, you certainly are at least familiar that Congress commissioned the study to look into the flaws of forensic science, including toxicology, are you not?

A Are you talking about the NAS report?

Q Yes.

A Okay. Yes, I'm familiar with that.

Q Okay. And did you happen to read the discussion on approving methods, practice, and performance in the field of

forensic science?

A I've attended several workshops and had lots of discussions on the NAS report. I have not read it cover to cover. So I --

Q All right. Well, let me ask you -- well, I mean, this is your entire field. You haven't taken the time to review the entire document?

A I've not read the entire document, no.

Q Let me ask if you agree with this. "There is a critical need in most fields of forensic science to raise the standards for reporting and testifying about the results of investigations. For example, many terms are used by forensics examiners in reports and in court testimony to describe findings, conclusions, and the degrees of association between evidentiary material. Such terms include, but are not limited to, match consistent with identical, similar in all respects testing and cannot be excluded as the source of. The use of such terms can have a profound effect on how the trier of fact in a criminal or civil perceives an evaluates evidence. Yet the forensic science disciplines have not reached agreement or consensus" --

MR. DAGGETT: Objection.

BY MR. DeLEONARDO:

Q -- "on the precise meaning of any of these terms."

MR. DAGGETT: This is not relevant. It is not a

question.

MR. DeLEONARDO: I am getting to it, to see if she agrees with it.

BY MR. DeLEONARDO:

Q "Although some disciplines have developed vocabulary and skills to be used in reporting results, they have not become standard practice. This imprecision in vocabulary stems in part from the paucity of research in forensic science and the corresponding imitations in interpreting the results of forensic analysis."

Do you agree with that?

A I can't answer that question yes or no. I can comment, but I can't answer that yes or no.

Q Okay. Comment.

A My comment is that when they're talking about matches, et cetera, the real areas of forensic that were at issue with the NAS were those of latent prints and different disciplines that involve match criteria. In fact, if you read the entire report, toxicology is one of the disciplines that fared very well and generated very few criticisms and comments from the NAS report.

And it was other --

Q Other than aspect. Correct?

A I'm sorry?

Q Other than the aspect of testifying in court that

something is consistent with. Correct? That was the criticism among all of them. Correct?

A That's not my understanding, no. My -- I didn't read anything that talked specifically about toxicology testimony and there being a problem with the fact that there was words like match and consistent with. I know that those applied specifically to latent prints was a big issue, and even somewhat DNA.

Q Because there, again, you are making an assumption based on -- you are taking an analysis of an item, and you are not really saying it is this. You are just saying it is consistent with. Correct? Whether it is fingerprints or blood results. True?

A Yes. But the bulk of their criticism had to do -- it wasn't just the concept of matching. It was how do they make a match, what went into the criteria, the history behind the match. It was quite involved.

Q Well, let me ask you this, then. What do you need to see in a case to determine something is consistent with? For example, would you agree with me that eye signs can be caused by a number of medical conditions? Correct?

MR. DAGGETT: Your Honor, this is not qualifications.

THE COURT: I would tend to agree. I think we have gone beyond --

MR. DeLEONARDO: Fair enough. Let me just see if I can ask a couple, then, of qualifications, just to make sure. I think a lot of it has been established, but I just want to make sure of this point.

BY MR. DeLEONARDO:

Q When you were involved in the studies, you said you were involved, you learned about scientific method. Is that correct?

A Which -- I want -- which studies?

Q Early on you said one of the values of the studies that you got was you learned the value of scientific method. Is that right?

A I think I was talked about when I was at work and at graduate school and that --

Q Well, I am just --

A Okay. I just want to be clear. Yes.

Q I just wanted to -- I am just asking. Okay?

A Yes, I did make that statement.

Q Now let me ask you, you also understand the value of peer-reviewed documents. Correct?

A I do.

Q And the fact that it needs to be subject to outside peer review. Correct?

A I understand the concept, yes.

Q Okay. And publications. Have you ever been asked

to peer review any documents in any of the fields of pharmacology, medicine, any of those, toxicology, anything?

A Yes.

Q Okay. And what were the fields were?

A *The Journal of Analytical Toxicology*.

Q So only in the field of toxicology. Is that correct?

A Yes.

Q All right.

MR. DeLEONARDO: That is all I have, Your Honor.

THE COURT: All right. Ms. Spirk has been tendered by the State as an expert in pharmacology, toxicology -- and what was the third area?

MR. DAGGETT: Clinical research.

THE COURT: Clinical research. All right. Do you wish to be heard?

MR. DAGGETT: And also DRE, Your Honor. I will submit on everything that she -- I believe she testified to what her qualifications are. And I believe her qualifications are enough to reach that level before this Court.

MR. CRUICKSHANK: My first point is I don't understand, comprehend, how it is that you become an expert in pharmacology without one single course devoted exclusively to pharmacology. To get the degree in pharmacology, you have to go to school for four years, maybe more, and get a degree in

pharmacology. That is your measure of expertise.

This is a witness that has no college credit devoted to the area of pharmacology, yet wants to opine on the physiological connection between drugs and the effect on the human body, which is pharmacodynamics. That just seems absurd to me, with all due respect to the witness.

The issue of clinical research, why did I choose the definition of clinical research from NIH? Because on the witness's resume it says she was involved in NIH research. And she is being tendered as someone involved in clinical research. Certainly NIH can be thought of as a baseline for the definition of what clinical research is, certainly when that witness being tendered is being offered in clinical research and has done work for NIH.

This is a witness that has done no clinical research, clinical research being defined as patient-oriented research, clinical research being defined as research involving living individuals. And certainly that is what we are talking about here today. We are talking about the effects of drugs on human performance and driving.

And certainly, if you are going to talk about the validation studies, if you are going to review any of the literature on the DRE protocol in the area of clinical research, you are talking about live human beings. And this witness I do not believe meets the qualifications as an expert.

And yes, the witness did state that she had other opportunities for research not on the CV. Certainly this is a witness who has an extensive CV.

This is also a witness who is being asked by the State to be an expert in clinical research. Therefore, if you are going to be tendered as one, you should certainly show that on your resume. And that is not present.

MR. DeLEONARDO: Your Honor, I just have a brief comment. The only thing I would say is just we are being offered up research that has already been dealt with. The pharmacology, it is a difference. I mean, essentially we are talking about someone who has a history of testing items and determining what the concentrations are and what is present.

That is very different than what is being tendered. She is being tendered to come in and talk about the effects of drugs on the different systems of the body. It was one thing, at least, with the optometrist, who had had some training at least in those areas. Although I would still argue it was not sufficient. But at least had training in those areas to understand the physiology of the body. I have heard absolutely no training that would justify that in Ms. Spirk.

And essentially coming in and talking about what effect it is going to have on the eyes, on blood pressure, on heart rate. And all that, I think, is a real significant issue.

And as to the interpretive toxicology, again, essentially we are talking about a lull enforcement area of law. And we are here to do a Frye-Reed hearing. We are looking at whether or not what is being done is in fact generally accepted.

And so to bring essentially someone who, frankly, in my opinion, and I think the Court would bear out, is a quasi DRE, essentially what we are doing is we are allowing them to justify themselves with themselves. And I think that is a real issue. And I think why the education and the outside research and the experience from an accredited university is so significant, because the experience I am hearing is all from the community of law enforcement-related forensic toxicologists and DREs.

THE COURT: All right. I am going to accept the witness as an expert in the area of toxicology.

MR. DAGGETT: Your Honor, we had -- there were four categories. The DRE program, as well, was one.

THE COURT: Do you want to be heard on that?

MR. DeLEONARDO: I would say as to that the same thing, Your Honor. Because essentially, if she is testifying as to the validity of the matrix, that necessarily involves pharmacology, medicine, optometry, none of which she is qualified for.

THE COURT: Well, I think you can object, if you

feel that we get into an area that would cross over.

MR. DAGGETT: I know there are two drug recognition experts on the list, too, that could testify as to the other, but that's fine.

THE COURT: All right. Let's proceed.

DIRECT EXAMINATION (Resumed)

BY MR. DAGGETT:

Q What is your -- I might have asked you this earlier. If I did, I apologize. But your experience with the DRE program, your current relationship with the DRE program in general, what is that?

A I think we did cover that. But just to highlight, I am part of our state-wide steering committee. We do have regular meetings of all the program managers for DRE in Arizona. I participate in the mandatory DRE in-services. I teach at the DRE schools as an instructor. I've taught at the four of the national conferences.

I believe I have already testified that I teach very frequently nationally to judges, prosecutors, other forensic toxicologists. And whenever I lecture on drug-impaired driving, I always include a component regarding the drug recognition expert program.

Q And speaking of drugs, what is a drug What is your definition?

A A drug is really any substance, any chemical, that

has some effect, when ingested into the human body. And, again, I think -- I'm hesitant to repeat myself. I don't know if you want me to. But I think I've already testified that there can be the whole gambit of drugs. Drugs can be therapeutic. They can be helpful. They can be illicit drugs. They can be therapeutic drugs with side effects, et cetera. There is quite a comprehensive gambit of what a drug can be.

Q And as far as the DRE program goes and the definition of a drug, what is that?

A It's a more narrow, simplistic definition. And it's any substance that, when ingested into the human body, will decrease the ability to operate a motor vehicle safely.

Q What does it mean to be impaired by a drug?

A Impairment, it's very important to think of impairment in terms of a relationship to a specific task. And --

MR. CRUICKSHANK: I am going to object --

MR. DeLEONARDO: Objection.

MR. CRUICKSHANK: -- only from the standpoint, Your Honor, if she is talking about what the DRE program defines it as, that's fine. If she is talking about overall what impairment would be, I think we are getting into those areas we shouldn't.

MR. DAGGETT: As a toxicologist, certainly she can talk about that.

THE COURT: I will overrule.

THE WITNESS: Impairment overtly is a measurable decrease in the ability to perform a specific task. And I've already emphasized how important it is to recognize which task you're talking about. So if you take an example, something we're all familiar with, alcohol impairment, you could talk about the ability to sit upright in a chair versus the ability to operate a motor vehicle versus the ability to fly an airplane. And at varying concentrations and levels of alcohol, you can see that there would be different levels associated with each one of those tasks.

BY MR. DAGGETT:

Q Are you familiar with the basic drug categories and the history of the drug categories?

A Yes.

Q Tell the Court what that is. I know we heard something yesterday from Dr. Spirk about that, but what is the history of the categories?

A Back in the mid 1970s in Los Angeles County, there were some very vigilant officers with good observation skills that, when they looked at impaired drivers, they noticed that there were certain signs and symptoms that they saw over and over again. And they started to see, when the tox reports came back from the laboratory, that there were certain signs and symptoms that were consistent with certain kinds of drugs.

One of the examples that they talk about a lot --

MR. DeLEONARDO: I am going to object again, Your Honor. I think she is essentially vouching for the ability of them to make findings. And I think that is the issue that I have. When you are validating the DRE program and she is saying they were really good at doing this and you could find consistent symptoms, that is the problem. I mean, this is -- that's going outside, in my opinion, what she is qualified to do. I think Your Honor has ruled she is qualified to be a toxicologist. The field of toxicology is testing, corroborating, checking concentrations, not determining whether someone is impaired or whether an officer can determine someone is impaired.

MR. DAGGETT: She already told you what her history was with the DRE program, her involvement with the DRE program. And that is why we are here, obviously. So certainly I think if she is not permitted to give that opinion, then --

THE COURT: Well, the question, as I understood it, was with regard to the various drug categories. Okay? And I am assuming this is kind of a lead in. I mean, it is kind of a history of how it began. So I don't see this as really anything that is objectionable.

MR. DeLEONARDO: And again, I would withdraw the objection, as long as the Court is only using it as historical, not accuracy.

THE COURT: Right. Right. I think, you know, I think -- and I understand what you are saying, Mr. DeLeonardo. I mean, yes, we have somebody who works apparently, as with the preceding with, with law enforcement and in training and teaching people who are then certified as drug recognition experts. And I understand what you are saying, that effectively she is vouching for the science, which is what we are really here about. So I understand that. But I don't think that when we get into this kind of narrative, that that really is an issue.

Go ahead.

THE WITNESS: Thank you, Your Honor. I'll be brief.

My only point was to try, as you accurately described, to try to show just with a small lead-in what had happened historically. And that was that these officers noticed in a very easy, simple example, as something they called the bar bounce. You tended to see with barbiturates being confirmed later on in the blood or urine that there was a bounce to the pupils, a bounce to the eyes.

And that was something that was noticed back in the 1970s. And because of this, they started to sort of just keep their eyes open and look for different things that ultimately would be consistent with certain kinds of drugs.

From those observations, those simple observations, they came up with the seven categories of drugs. What's

interesting about these different DRE categories of drugs is, if you were to look at many of the pharmacology books that are available today, you would see --

MR. CRUICKSHANK: Objection.

THE COURT: I will sustain.

BY MR. DAGGETT:

Q The seven categories.

A The seven categories are not new and different categories. They are categories that have been seen before.

MR. CRUICKSHANK: Objection. She is testifying as to what is a new and novel category in the field of pharmacology. Again, I think that is --

MR. DAGGETT: Your Honor, I disagree. And if we are going to have these objections every time, we are never going to get through. She is not testifying as an expert in pharmacology. She is testifying as to toxicology, the categories that --

THE COURT: I will overrule.

THE WITNESS: Maybe a better approach is to say that if you were to look through the tables of contents of books, you would see a great -- of pharmacology books today -- you would see a significant similarity between what's present, as the different categories in these table of contents, as you would see in the categories in the DRE program. There's quite a bit of similarity there.

BY MR. DAGGETT:

Q And how were those drugs specifically placed in the seven categories? And what are the seven categories?

A They're CNS, central nervous system stimulations, central nervous system depressants, hallucinogens, inhalants, cannabis, narcotic analgesics. And originally, it was PCP, or phencyclidine. But several years ago, that was updated to a category called narcotic -- excuse me -- called dissociative anesthetics, which includes additional drugs that are dissociative anesthetics, such as ketamine, in addition to just the PCP. And those are the seven categories.

Q And did you create -- did you, using both your training and also your research, did you create a -- well, I will show you this, and then you can tell me.

MR. CRUICKSHANK: Your Honor, I am just, as a foundational objection, if this -- if we are using the chart that is in the DRE protocol -- and I think that has been already introduced -- if we are introducing the chart that has been modified by the witness, and it describes general effects and also include effects on driving, again, I think that is outside the field of toxicology.

THE CLERK: State's 9.

(The document referred to was marked for identification as State's Exhibit 9.)

MR. CRUICKSHANK: She is not using the -- she has added a category, effects on driving, onto this. I mean, this is what we are talking about. And this is not proper testimony.

MR. DAGGETT: It can be consider pharmacodynamics, Your Honor.

MR. CRUICKSHANK: And the other, excuse me, Your Honor, just one other, the other objection I would have is the rule of completeness about where this information came from, effects from driving. If it came from another document, I think that is important.

MR. DAGGETT: Your Honor, I would be more than happy to show the document to -- and ultimately, it is being presented to the Court to have a general chart, I guess, in front of you. And I will be more than happy to --

THE COURT: This has been marked for identification?

MR. DAGGETT: Identification only. I think we --

THE COURT: All right. Well, let's see where this goes. All right. I will overrule for the time being.

BY MR. DAGGETT:

Q State's Exhibit No. 9 for identification, I will ask you to take a look at that and explain what that is. (Handing document to the witness.)

A This is a four-page chart or spreadsheet that I put together in 2006. And in the first column, it's basically got

the seven categories of drugs. In the second column, it gives some examples of those drugs, so we have a concept of which drugs are we talking about in these categories. The third column are some of the general effects. So these would be things that may or may not be part of the DRE evaluation, just comments about effects that they have on the human body, physiological effects. And then the final column are effects on driving by those drug categories.

All the information that was present in this chart came from this publication, which is from NTSA, the drugs in human performance fact sheets. And I happened to be present in Seattle when the group of scientists got together to put together this textbook or this text. And I can tell you that the individuals that participated in this are absolutely the leaders in the field of toxicology.

MR. CRUICKSHANK: Your Honor, I am going to object again. Then they should have brought in the leaders in the field of toxicology. She is basically writing a list, adding things to the DRE protocol under general effects, extrapolating from a document as to what all the effects on driving would be, many of which are either -- were not even as testified to yesterday and were certainly -- there is not even a likelihood of what the effect would be.

So again, I don't understand why this would be introduced, when Your Honor already has the DRE chart. This is

a chart she made, she added to, on not only what effects would be seen on the body, but what effects would be --

THE COURT: Well, let me ask a question. When we have a case involving Dr. Levine, the state toxicologist, quite often he comes in and testifies as to the effects on an individual. Now, I have accepted Ms. Spirk as an expert in the area of toxicology. Independent of where she got these effects, whether she got them out of the booklet that she referenced or whether it is based upon her own training, knowledge, and experience, isn't she, as a toxicologist, qualified to testify on those effects?

MR. CRUICKSHANK: And, Your Honor, may I answer that question?

THE COURT: Yes. I don't ask a question unless I am looking for an answer.

MR. CRUICKSHANK: Yes, Your Honor. Well, we are talking about diazepam. And the information comes from the NTSA fact sheets, drugs and human performance fact sheets. And what is important is that this witness is a toxicologist. This witness is not an expert in pharmacodynamics or pharmacokinetics.

And if you were to look at page 29 of the NTSA fact sheets about diazepam, it is talking about pharmacodynamic properties and pharmacokinetic properties. And so if we have an issue of an expert, who is mixing and matching expertise she

has and doesn't have in the creation of this chart, I would also say that if we compare that chart to what we have on these NTSA fact sheets, the rule of completeness is at issue here, because we have all sorts of things on the NTSA fact sheets that are not contained within this example. And it could be misleading.

But most importantly, Your Honor, it is outside her area of expertise, if we are going to talk about what is exactly on the NTSA fact sheets.

MR. DeLEONARDO: And if I could just speak directly to Your Honor's question about Dr. Levine, what I would say, and having had him as a witness before, as well, I think there is arguments that may not have been made against Dr. Levine, because he also tends to testify consistent with, which has not clearly been frowned on by the Academy of Sciences.

I also would say --

THE COURT: What has been frowned on?

MR. DeLEONARDO: The idea of coming in and testifying something is consistent with as that as something in the past he has tried to do. I actually have made that argument against him on that very issue before.

I would also say that, apart from that, Dr. Levine has different experience and has background that Ms. Spirk does not. And therefore, I think we would be comparing apples and oranges.

THE COURT: Well, I want retract something I said. Okay? Dr. Levine has come in and testified on the effects of alcohol, i.e., if someone has a blood alcohol content of .13 and then relating that back in time to try and ascertain what the likely blood alcohol content level would have been at the time of the accident. But I don't believe he is able to testify as to -- if marijuana, for instance, is found in a urine sample, I don't think he can testify as to the effects in a very specific way. He can testify perhaps generally as to how marijuana or some other substance might affect someone. But I think the ability to -- well, the ability to do what he is able to do with regard to alcohol content.

Because effectively, as I understand it, there is no similar correlation at this point in time from which an expert can do the same thing with some other substance other than alcohol.

MR. DeLEONARDO: And the only added thing I would add to that, Your Honor, just one last item, the only thing I would add to that is what is also different is that that is a hearing that would be on a guilt-innocence phase of testifying. We are mounting the Frye challenge to the underlying assumptions and assertions being made in this very document.

So essentially, you have to have someone from outside of the field that they are involved with, this, you know, little grouping of forensic toxicologists, DREs, to

justify the program. You cannot use people in the program to say, no, this is what you find to justify themselves.

And so even apart from Dr. Levine and what generally may occur, what I would say is we are in a Frye hearing. And that is a very different situation.

THE COURT: I am going to take a recess. I would like to see counsel in chambers.

THE CLERK: All rise.

(Whereupon, a brief recess was taken.)

THE CLERK: Silence in court. All rise.

THE COURT: Be seated, please.

MR. DAGGETT: Your Honor, based on --- at this point make a motion to enter State's Exhibit No. 8, which was the CV of Ms. Spirk.

THE COURT: All right. State's Exhibit 8 is admitted.

(The document marked for identification as State's Exhibit 8 was received in evidence.)

MR. DAGGETT: And based upon the Court's -- what we talked about in chambers, the State is going to make a motion at this time to enter State's Exhibit No. 9, which was the flowchart, I guess, for lack of a better term, that Ms. Spirk prepared.

MR. CRUICKSHANK: We are going to object.

THE COURT: All right. I am going to reserve ruling on the admissibility of State's Exhibit 9.

MR. CRUICKSHANK: And just to be clear, Your Honor, we had a standing objection as to -- my understanding of Your Honor's ruling is that she could testify as to the possible effects of a drug, but not the effect on driving. We would maintain the standard -- a standing objection as to even the effects.

THE COURT: All right. So noted. And we will grant a continuing objection.

BY MR. DAGGETT:

Q What are the -- what separates one category of drugs from another?

A Well, there are signs and symptoms that are part of the evaluation that are also really just common sense, if you're looking at the administration of a drug and then watching what happens to the human body. A good way to think about the signs and symptoms is that sign are things that are really overt. You may see something like a change in pupil size. You may see sweating. You may see dry, clammy skin. Those would be signs. They're things that are readily apparent to an observer.

Symptoms are something that require the subject to describe something that they're experiencing or feeling. So if

they feel anxious or if they feel depressed, those kinds of things would be examples of things that are symptoms. So by looking at these different signs and symptoms, most drugs will fit into certain categories. And these seven categories that we've discussed are based upon different associated signs and symptoms.

Another quick comment. People like to think of the signs and symptoms as being, and the categories, as being something a little bit more like a signature, as opposed to, say, a fingerprint or something very specific.

If you look at administering drugs to different people, you're going to see that they won't have identical signs and symptoms. There will be some variations, some variability, in how the person presents.

And so as far as an analogy goes, it makes a lot of sense to think of these categories and these signs and symptoms as being signatures of a different category of a drug. And that allows a little bit of room for variation, which we have as individual human beings. Whereas if you think about it in terms of more like a fingerprint or something very specific, it doesn't work as well.

Q And are there any particular drugs that cross categories?

A There are. There are actually a number of drugs. If you think about hallucinogens, hallucinogens can oftentimes

look like a strong stimulant. So if you have a stimulant at a high concentration, it can have some of the signs and symptoms of hallucinogens.

Another one that we see that people are fairly familiar with is a stimulant drugs. Stimulants have the upside, when they're being absorbed and distributed, and then they have the downside, when they're being eliminated, which is longer in the time course of the drug.

And if you look at the elimination side or the longer time course of a stimulant, you'll see many of the signs and symptoms that are typically associated with, say, a narcotic analgesic. You can actually see constricted pupils in the downside of a stimulant.

So if you were to tease apart and look at any one of these individual signs and symptoms, you could make a misidentification. There are other assignable causes for different signs and symptoms. What you're really focusing on is the totality of the evidence and everything together and how it fits together.

Q What is the role of the test in the DRE protocol, the test of the tox test, I guess?

A Well, it's the twelfth step of the evaluation. But that doesn't mean it's, you know, it's the last one given, so it's the least important. It really is a role of corroboration. So there are all these other different signs,

symptoms, behaviors, things that are noted, things that go into the development of the DRE's opinion. And the twelfth step, or the toxicology confirmation, it either corroborates the opinion or it doesn't. And it is really an essential and an important part of the DRE evaluation.

Q In what sense?

A Well, I know that there are cases sometimes where perhaps a subject may refuse, may not provide a sample. And I know there have been cases where some of the different signs and symptoms and things noted by the DRE, they're still interesting evidence, but in terms of the weight of that evidence and the importance of the program and of the opinion, if there's no corroboration, it's really the final result that says whether or not the opinion of the DRE was correct.

And so it really is a very important component of it. But, you know, on the flip side of that, if all we had was the toxicology result, and we didn't have any of those signs and symptoms that were documented, we didn't know about driving behavior performance on field sobriety tests, performance on the evaluations, any physiological signs and symptoms, if none of that information was present and we were attempting to assess whether this was an impaired driver or was there consistent signs and symptoms with driving impairment, it would be very difficult to do.

It's not like alcohol, where we have volumes of

studies that we know that a person at a .08 or greater is an unsafe driver. We know that because there's enough literature in publications and scientific evidence to tell us that. We don't have that same level of information on drugs other than alcohol.

So having these documentation and evidence that exist along with the corroboration of the toxicology test result is really critical to being able to come to a good conclusion, a supportable conclusion.

Q As far as the toxicology analysis goes, I mean, how was that done?

A In all forensic crime laboratories -- and I'll be very brief about this. We could discuss it for a long time, but I know time is of the essence -- there are two tests that are done. And the first one is a broad screening test. And it's just like it sounds. It's, really, it's an immunoassay. And it's done to really narrow the focus. It will tell us if there's a negative test result there. And it will also narrow a stand to a certain category or categories of drugs that may be present.

What's very important to realize about the screening test is that they're fallible. They can be wrong. And we can have false positives with screening tests. That's why you shouldn't see a report based only upon a screening test unless it's a negative.

Step two, which is by far the more important of these two tests, is the confirmation test. And that is typically done with either a GC or an LC mass spectrometer. And that's considered to be the gold standard of testing. It's very much like a fingerprint of a drug or metabolite. If there's a positive test result there, you absolutely know that that drug or metabolite was confirmed and was found.

That test can be either qualitative, and it was either the drug or metabolite's present or not present, or it can be quantitative. And the report can tell you how much of it was present. It's depending upon the capabilities of different labs in the United States.

But that two-test system is what's done in forensic toxicology. There is a screening test and then followed up by a confirmation test.

Q But unlike alcohol, the levels of the narcotics in the bloodstream, that is not -- that doesn't equate to, say, like a .08 in alcohol. I mean, it's different. The different levels are different for different people. The effects are different. Is that correct?

A That's absolutely correct, yes.

Q So we heard some talk -- I don't think it has come up this afternoon since you have been here, but we heard about the gold standard. What would be the gold standard for testing of a narcotic?

A Well, it's interesting. Up until just a few years ago, the gold standard uniformly was GCMS or gas chromatography-mass spectrometry. But recently there's been some new devices out. And they're similar. They still do a separation. And they do a positive identification of drugs. But they're LCMSMS. So it's a liquid chromatograph-mass spectrometer mass spectrometer. And we were lucky enough to get a grant in our laboratory. We got four of these.

And what's nice about these is that with certain prescription drugs being able to be more sensitive and to be able to see at a lower concentration, a lower level of the drug. Or if, perhaps, maybe it's a drug-facilitated sexual assault, and you don't get testing for a number of days, being able to see very low levels of drugs can be helpful in certain toxicology applications.

So people are saying now that these LCMSMS instruments are like the platinum standard. But that doesn't negate the fact that the GC mass specs are absolutely up to the task. When you get a confirmation with the proper QC, you know that that drug or metabolite is there.

Q Now you are familiar with some of the DRE validation studies that have been done.

A Yes, I am.

Q Okay. And are you familiar with them as part of your employment?

A I am, yes.

Q And do you rely on the results of the studies in your role as a forensic toxicologist?

A I do, yes.

Q And are the results of the studies relied upon by the forensic toxicology community in general?

A Yes.

Q And are they viewed as reliable studies by the forensic toxicology community?

A Yes, I --

MR. CRUICKSHANK: Objection.

THE WITNESS: Excuse me.

THE COURT: I'm sorry. Repeat the question.

BY MR. DAGGETT:

Q Are they viewed as reliable studies by the forensic toxicology community?

MR. CRUICKSHANK: Your Honor, I am objecting because essentially that, again, we are on a Frye standard. And I guess my issue is that she was proffered to be qualified in the field of research, which necessarily mean validity, design, and whether it is accurate and reliable results. And so if the testimony that we are going down is going to be she is going to testify that these studies are great, they prove this, they prove that, again, I think that was part of the proffer. Your Honor, they only put her in toxicology, not research or

validity of design.

Because it is a Frye hearing, the standard is very different. It is, you know -- that is an issue is whether or not -- I mean, it is a contested issue whether those studies are legitimate. And I don't think she was qualified in that.

THE COURT: Well, let me ask a question. We heard a lot of testimony yesterday about various studies. And there was a lot of cross-examination about those studies. What does one have to do to be qualified to talk about the studies?

MR. DeLEONARDO: Well, I think yesterday, although we objected and certainly argued that as to the CV, what he did have is he had participated in peer-reviewed research, design, orchestrating them, and setting them up. So I think it was very different that, although we objected, that it was at a very minimal level. At least that was something that had actually been done by him and had been published in major peer-review journals. Certainly had at least the one that had and another one that was already in submission.

So Your Honor did accept him in the field of research and research design. I mean, that is actually a real issue, is someone who has experience in doing that. There was a lot of discussion about the types of research and what was done. Again, that is why there is a difference, I think, in who can and who can't testify on research issues when we are at a Frye hearing.

We are talking about the validity of these studies. That is a very different issue than yes, this is what it said and we relied on it. That's a very different issue.

MR. CRUICKSHANK: Just contextually --

THE COURT: Well, let me, before you jump in, Mr. Cruickshank, let me hear from Mr. Daggett.

MR. DAGGETT: Well, I believe she said she was involved with peer review, if I recall. If I recall correctly, she said she was.

THE COURT: Well, let me ask a question. Are you going to be asking her to comment on the validity of the study or just what the study found?

MR. DAGGETT: It is going to be probably a little bit of both, sorry, probably a little bit of both.

THE COURT: That's all right. That's all right.

I am going to overrule.

BY MR. DAGGETT:

Q Describe why the studies are important to you, as a toxicologist.

A Well, any time that I'm going to consider a program, such as the DRE program, I want to know the basis of the program. I want to know that it's been looked at in terms of is it well designed, is it effective, does it answer the questions that it was intended to answer, and does it do it in a way that appears to be generally free from bias.

And these are the kinds of things that I would look to in validation studies. I do have ongoing research right now, and have participated in other kinds of toxicological studies, where we look at the same kinds of questions. Even when we do our day-to-day analytical work, we have quality assurance. We have controls. We have to have appropriate QA/QC in order to be able to report something out.

It's not really so dissimilar. Anytime you're looking at science, it really is overtly the scientific method that we all once learned about early on. The scientific method is something that we continue to use all the way through upper echelons of science. And it just means basically is something well designed, is it free from bias, does it answer the questions it's supposed to answer.

And I think that these validation studies are very significant, because they do show the DRE program is capable of doing what it was set forth to do.

Q Well, specifically, I guess there were really a series of five or six, I think, that we heard discussion of. One was the LAPD study. And then there was the Hopkins Heishman. I guess the Heishman was done at Hopkins. Are you familiar with that?

A Yes.

Q What -- in a brief overview of the LAPD, and very briefly, of the LAPD study, what was that?

A The LAPD study is the first of the three primary DRE validation studies. That was in 1984. And -- excuse me. Were you asking me about the LAPD?

Q Yes, please.

A Okay. Because the first study was actually the Johns Hopkins. But the LAPD was the second study. So, I'm sorry, you caught me off-guard there.

Q Well, in that case, we will go ahead and start with --

A It doesn't matter to me which one we start with.

Q We will start with the Hopkins one.

A Chronologically speaking, the first study was the 1984 Johns Hopkins study. And that was the one that really followed these officers in the field, noting some consistent signs and symptoms with certain drugs that came back on the tox reports.

The next step of that was -- and that was probably almost a good ten years of observing these kinds of things. But it became good enough that NTSA and NIDA, National Highway Traffic and Safety Administration and NIDA, sponsored a study at Johns Hopkins, which is, as most people are aware of, is a very prestigious medical center.

The principal investigator was Richard Compton, who is a person that does a lot of work in this area. And in -- again, it was in 1984. And it was a lab evaluation of the DRE

evaluation procedure.

What they basically did, very quickly, is they administered --

MR. CRUICKSHANK: Objection. May I just be heard briefly? I am not sure if the witness is reading from notes, if her --

THE WITNESS: No, I'm not. I have some scratches here for dates and things, but I'm not reading, no.

MR. CRUICKSHANK: Thank you. Sorry to interrupt.

THE WITNESS: They administered certain drugs and drug doses to volunteers at the medical center. And they were evaluated by four separate police officers from LAPD, who were also DREs. And these DREs did their evaluations independently. So they were not doing this in a group. And they didn't have cues from the other three DREs in the study.

There were four different categories, actually three different categories, four different drugs that were administered. It was marijuana, or cannabis, diazepam, and secobarbital or secobarbital, which are CNS depressant drugs, and then amphetamine, which is a central nervous system stimulant.

They were given, all those categories were given at two dose levels, a low and a high dose, with the exception of the secobarb, which was just given at a single high dose. And basically they come up with, or came up with, rather, three

sort of broad results from that study, that the drug recognition experts had correctly identified 95 percent of the drug-free subjects as being unimpaired. So individuals who had not been provided with any of the drugs were 95 percent or greater identified as being unimpaired by the evaluators.

Secondly, that the drug recognition experts correctly identified 98.7 percent of the high dose subjects as being impaired, and that the DREs had correctly identified the category of drugs for 91.7 percent of the high dose subjects. So not only did correctly identify them as being impaired -- this is, again, with the dose subjects -- by they had identified 91.7 percent of them with the correct of the seven drug categories.

BY MR. DAGGETT:

Q Now are we still talking about the 1984 Hopkins study? So it was the LAPD officers that came east to participate in that.

A That's correct. Yes. The officers with the experience from California.

Q So they came -- so they are the ones, the actual ones.

A Yes. And that's the brief overview. Then there are two following studies. And then Heishman study was conducted later.

THE CLERK: State's 10.

(The document referred to was marked for identification as State's Exhibit 10.)

MR. CRUICKSHANK: No objection on the study, except the previous objection as to qualifications to discuss.

MR. DAGGETT: I think, Your Honor, probably at this point, instead of showing it for identification --

MR. CRUICKSHANK: I will stipulate.

MR. DAGGETT: -- probably the simplest thing to do -- and this is would be State's Exhibit No. 10. This is the report of the 1984 -- so May of 1985 report, the 1984 Hopkins LAPD study. That is State's Exhibit No. 10.

THE COURT: All right. State's 10 is admitted.

(The document marked for identification as State's Exhibit 10 was received in evidence.)

BY MR. DAGGETT:

Q And the next one?

A Chronologically speaking, the next study was the one you referred to earlier, the LAPD case study. And this was by Bigelow and others. And this was in 1985, a year after the Johns Hopkins study. This involved 173 cases. And it was done in conjunction with the NTSA, the National Highway and Traffic Safety Administration.

It last approximately three months in duration, this particular field study did. And it was an independent lab analysis of blood specimens that had been performed for individuals arrested by LAPD and then examined by the DREs for drug-impaired driving.

There were four main conclusions from that particular field study. And they were significant conclusions. They were that when the DRE said that drugs other than alcohol were present, they were detected 94 percent of the time, that DREs correctly identified at least one drug other than alcohol in 87 percent of the suspects that were evaluated.

This was significant in the fact that somewhere slightly over 50 percent of these suspects actually had more than one drug category on board. So they were a polypharmacy situation, which obviously makes that identification more challenging.

When the DREs identified a suspect as impaired by a specific drug category, the category was detected 79 percent of the time in the suspect's blood.

And then finally that in almost 50 percent of the suspects, the DREs were entirely correct in identifying all the categories. So even when there was polypharmacy on board, they were able to correctly confirm more than one drug category in those suspects.

THE CLERK: State's 11.

(The document referred to was marked for identification as State's Exhibit 11.)

MR. DAGGETT: I make a motion to enter State's Exhibit 11 in evidence.

MR. CRUICKSHANK: No objection.

MR. DAGGETT: And that was the -- for the record, that is the 1985 LAPD/Bigelow, I guess, for lack of a better term.

MR. CRUICKSHANK: Actually, that would be the 173 LA study.

MR. DAGGETT: 173 LA study. BY MR. DAGGETT:

Q And chronologically speaking, the next one?

A The next one was in 1994. And that was the Arizona DRE validation study. This was done by Marcelline Burns and Eugene Adler. And this is the most comprehensive of the studies and involved approximately 500 cases. This was over about a 4-and-a-half, or 53 months, year period. So it was a little bit longer than the 173 LAPD study.

They examined the DRE records for 500 suspects, who had been evaluated in the Arizona normal course of criminal justice enforcement for drug-impaired drivers, and looked at the corresponding lab results for the suspects' toxicology results. So it was a retrospective study. In other words, during a normal course of business where 500 drug-impaired

drivers had been evaluated, sent to the normal crime laboratory for analysis, then those results had been pulled and looked at as a packet of 500 cases for this field study.

They came up with five major conclusions from this field test. And those are that the DRE program is a valid method for identifying and classifying drug-impaired drivers; that the DREs recognized drug impairment and identified the drugs by category, which caused the impairment; that the observable signs and symptoms are associated with specific drugs and specific drug categories. Again, they were looking at 500, approximately 500, cases. That monitoring the DRE opinions and lab results would facilitate the program management.

So they felt that having a corroborative role by toxicology, having the program looked over with an oversight, what was a good thing for the program. And that the DRE program requires scientifically sound support by the laboratory and that that was a critical component of the continued productivity and health of the program, was to have that confirmation by the toxicology laboratory.

And those were the four main components.

THE CLERK: State's No. 12.

(The document referred to was marked for identification as State's Exhibit 12.)

MR. DAGGETT: Your Honor, I would make a motion to enter State's No. 12.

MR. CRUICKSHANK: No objection.

THE COURT: It will be admitted.

(The document marked for identification as State's Exhibit 12 was received in Evidence.)

BY MR. DAGGETT:

Q Now Ms. Spirk, what was the next one?

A Well, if there's no objection, the next two studies were done and published by Dr. Heishman, Stephen Heishman. And they were not really considered validation studies. But they're certainly important published studies concerning the DRE program. And they were in 1996 and 1998.

Q Let's begin with the 1996 one. And these were just called the Heishman studies, I believe.

A Yes. And from my point of view, I don't -- I don't see a big difference between the two. The main difference between the two was that in the first study, they were looking at a certain group of drugs. They weren't looking at all seven categories. They were looking at a certain group of drugs.

And then in the second study, it was really an identical study, but they just included a different group of

drugs. Other than that, they came up with similar conclusions from the two.

Q And the first one in 1996, what were the groups of drugs that they used?

A You know, I actually would have to pull the original publication out. I'm not sure I brought it with me.

Q Mr. --- is probably coming in right now.

A I think it's still in your office. I'm sorry.

THE CLERK: Two different?

MR. DAGGETT: Yes. I am trying to figure out which one of these is the earlier -- hang on a minute.

THE CLERK: Okay.

(Pause.)

THE CLERK: State's 13.

(The document referred to was marked for identification as State's Exhibit 13.)

THE CLERK: State's 14.

(The document referred to was marked for identification as State's Exhibit 14.)

BY MR. DAGGETT:

Q I hand you State's Exhibits No. 13 and 14. Thirteen, I believe, is the earlier of the two. Fourteen should be the latter of the two chronologically speaking.

(Handing documents to the witness.)

A Okay. Thank you.

Q If I am incorrect, please tell me. And we will just note that. We don't have to necessarily change the ID number.

A (Examining document.)

Yes, you have that correct.

Q All right. Now the drugs that were tested, or the categories that were tested, in 1996 --

A It's laboratory validation study of drug evaluation in classification program: ethanol, cocaine, and marijuana.

Q So alcohol, cocaine, and marijuana. And the second one --

A The second one in 1998 is alprazolam, which is a benzodiazepine or a CNS depressant --

Q Okay.

A -- D-amphetamine, codeine, and marijuana.

Q All right. Let's go with the 1996.

A For both of these studies, the stated goal of the evaluation of the study was to identify the most critical stages of the evaluation to see if there could be any areas for improvement. By looking at the DRE evaluation, the 12-step program, and by identifying the different criteria in that program, Dr. Heishman's goal was really to determine if there were some key features that were more important than others,

and if there certain areas that there as something that could be done to improve the overall effectiveness.

And that was really the stated goal of both of these studies. And again, the whole concept there was that there would be appropriate predictive values, so that they would be able to better opine the different categories of drugs that were causing different signs and symptoms.

Q And their findings?

A The -- what was interesting about these studies was some of the decisions that were made. I think that they're valuable studies. And -- but some of the decisions that were made were interesting.

I think the primary one was that they used an abridged or shortened version of the DRE program. So even though their stated goal was to try to figure out which of these steps were more important, which steps bore more relevance to being able to predict a category, instead of using -- which I'm sure that Your Honor has heard that this is a standardized and systematic program, and that it's very critical that it be done the same way, they purposefully used a shortened version of the program, an abridged version. So that's a little confusing in terms of the experimental design and the model of the study.

One of those abridges was that there was no subject interview. So there was no opportunity for the DRE, which is a

big part of the evaluation, to speak and work with the subject, to interview and to talk to them, no opportunity for any admissions to be made. None of that occurred in these particular studies, which is quite different from what happens in the normal evaluation.

Another thing that they did was that they -- and you can almost tell this from the title of the studies -- is they included ethanol or drinking alcohol as a standalone category. And that's -- that's interesting in that this is overtly a situation where we're looking for drug-impaired drivers.

Probably another really key feature in their decision making in the study design was choosing low drug dose levels. Especially in the cannabis or THC and the cocaine, individuals that are in the field of using these drugs typically use a higher concentration or maybe a concentration that we would say is consistent with an abuse level. These are not concentrations that were used in this study. They purposefully used lower concentrations.

So it made the concept of duplicating what the DREs were doing, or from just a practical point of view, what do we see or what is seen by individuals in the field, who are abusing drugs. It was a decision that was inconsistent with what's normally seen.

The DRE evaluations also were what we call an acute

evaluation. They happened -- they started about ten minutes after the drugs were administered. In the Johns Hopkins study, depending upon the drug, they were started either one hour or even two hours after the drug was administrated, administered rather. And these were administered ten minutes later.

Now, you know, with certain drugs, for example cannabis, that's probably not such a big deal, because cannabis effects are very quick. But it was an interesting choice to have it be so quick and then to try to have the evaluation. That, again, it's inconsistent with what an officer would normally see in the field. I'm not saying it never happens, but it's less likely than an officer would be doing an evaluation on somebody ten minutes after they had ingested the drug. So just another interesting choice in the experimental design.

Another thing that was interesting was they gave false information to the participants in the study. They indicated to them that there would be individuals with polypharmacy, with more than one drug on board, and told them to look for that, to expect that. In fact, no one was given more than one drug. So --

Q Why would they do that?

A I have absolutely no idea why that was done. I suspect that there was some rationale, some reason for that.

But nothing occurs to me. And I've heard other individuals ask that same question, is that -- or make a comment that it's unusual and it's not typical in a study to intentionally mislead someone and tell them that this is going to happen.

It might be one thing if they had said a possibility exists where you may or may not see this. But they indicated that there would be polypharmacy, and then there were no subjects with polypharmacy.

One of the things that was interesting about the conclusion of the study was that they did find that the five best predictors for the ethanol and the cocaine were both consistent with the medical community and what they published as their diagnostic criteria for cocaine signs and symptoms, as well as for ethanol signs and symptoms.

So even with these comments that I've made about the design of the study, they actually did pretty well in making their predictions.

The DRE program, it grew from a need to provide legal documentation of the drug-impaired driving and that there's this need for a standardized method. And my impression from -- I've actually spoken to one of the authors, Denny Crouch, who works in Utah, is that --

MR. CRUICKSHANK: Objection.

MR. DeLEONARDO: Objection.

BY MR. DAGGETT:

Q You are not going to be able to say what he said.

A Oh, I'm sorry.

Q That's fine.

A Excuse me. Let me say that -- I'm trying to think of a way to phrase this. Strike that. Never mind.

But I don't -- I think there is a tendency -- this is my opinion -- that these articles are overtly negative and overtly problematic. And there are some issues with that. But they're not entirely that way. They do show that even with some of the interesting choices they made in the study design, that the DREs were still able to make some predictions, and that the program was still useful.

Q Predictions or findings?

A Well, in terms of making a category, a prediction of the category that was ultimately confirmed.

Q Okay. So you are not really basing it on a prediction, you are basing it upon their observations and what they -- is that correct?

A Absolutely, yes.

Q Okay. That was the -- did you go through both of those or just the first one? That was the -- you kind of lumped them together.

A I lumped them together, because I, frankly, didn't find a lot of difference between the two.

Q That's what I thought you did.

MR. DAGGETT: So I will just make a motion to --

MR. CRUICKSHANK: No objection.

MR. DeLEONARDO: No objection.

MR. DAGGETT: And these are --

THE COURT: Thirteen or --

MR. CRUICKSHANK: Actually, let me double check.

MR. DAGGETT: Thirteen is the earlier of the two Heishman studies. Fourteen is the latter of the two.

BY MR. DAGGETT:

Q Now do you keep in Arizona, where you work or -- are statistics kept there? Do you keep those?

A Yes.

Q And explain to the Court what you do, what type of stats are kept, and the importance of that.

A It's -- this is done both at the national level, my understanding is, at the state level, and then different agencies will also participate in this. And the importance is that when a DRE makes a prediction or does an evaluation and expresses an opinion on the category of drug that is present, it's important that obviously the 12 steps of the toxicology happens.

And there needs to be records of how often a DRE's predictions or his expression of the category of drug that's involved is correct, how often it's supported, how often it's not supported. And I know in Arizona we have consistently

scored in the high eighties. We have occasionally been in the low nineties. But for the most part we roll along with about an 87-, an 88-percent correlation, which is very good.

We have another large agency, besides our state agency in Arizona, which is Phoenix PD. And they have a consistent correlation. We've always felt that that's probably because we have similar drugs being used, a similar group of DREs with, you know, similar training. And that it's very consistent kind of statewide program.

Q So when you say consistently scoring in the high eighties, low nineties, are you talking about consistently the opinion of the DRE, when they do their evaluation, in relation to the tox, the blood results that are actually received?

A Yes. Exactly.

Q That's what you are talking about.

A Yes.

Q And if one is correct 90 percent of the time or consistently they score 90 percent of the time, does that mean they are wrong 10 percent of the time?

A No. And that's a really important question and one that gets asks frequently. It isn't the concept that if your correlation is 90 percent, that the other remaining percent or 10 percent of the time that you're wrong. One needs to consider that there are a lot of situations in these evaluations that have to be looked at.

There are literally thousands upon thousands of different drugs. And there is no crime laboratory in the world that's capable of confirming and analyzing every drug that's out there. There are new drugs that come out that we don't yet have standard for. So that's one area to think about is just the whole myriad of different drugs that are available.

Another issue is with delays in obtaining specimens. Sometimes, when you have a large state, you're not always able to get a specimen in a timely manner. And by the time it may come to the laboratory, even though impairment may have been documented, the phlebotomy may have happened too late. You not be able to confirm a drug that has a short half-life. Those kinds of things exist.

There are medical rule-outs. There are individuals who refuse. I mean, there are just a lot of reasons why there may not be always a positive toxicology correlation. And I actually would be uncomfortable, if there were a jurisdiction or a state that had 100- or a near 100-percent confirmation. Something about that would sound off to me, because of knowing of all these other different circumstances that exist. I don't think it's a situation where you would ever achieve, nor should you expect to have, a perfect correlation.

Q Now are you familiar with the -- obviously you testified earlier that you are familiar with the DRE -- or are

you familiar with the DRE training, I guess? I think you are familiar with the program, but are you familiar with training itself?

A Yes, broadly.

Q Okay. And how are you familiar? And we are almost done here, but what is your involvement, as far as training and things like that go?

A Well, I mentioned earlier, testified earlier, that I'm part of the steering committee, that I participate in the schools. And there is a toxicology section that I will not every time teach, but I frequently participate in, that I participate in the DRE in-services, which are mandatory continuing education training.

I've also attended the DRE school and gone to certification nights. For safety reasons, non-sworn personnel are not allowed to be actual DREs. And I'm not allowed, again for safety reasons, to conduct a DRE evaluation. But I certainly can observe and have watched a number of them and again routinely participate in the training of our officers and attend our in-service meetings, et cetera.

Q In your opinion to a reasonable degree of scientific certainty, could a non-medically person, with receiving the full training of the DRE program, make the necessary observations to give an opinion on drug use and impairment?

A Yes. Absolutely.

Q Are you familiar with the DRE matrix?

A Yes, I am.

MR. DAGGETT: And I believe we have -- did you put that in or did Adam put that in?

MR. CRUICKSHANK: Adam put it in. I think it was No. 1.

MR. WELLS: I did. I think it is Exhibit 1.

MR. DAGGETT: Well, one is Citek's --

MR. CRUICKSHANK: Well, it is two then.

MR. WELLS: Two. It is the laminated --

MR. CRUICKSHANK: Yes. It was a laminated card.

MR. DAGGETT: No. 5, guys.

MR. CRUICKSHANK: Oh, well.

BY MR. DAGGETT:

Q State's Exhibit No. 5, are you familiar with that? (Handing document to the witness.)

A Yes.

Q And what is that?

A It's a two-sided, laminated copy of, on side, the 12-step DRE evaluation, steps 1 through 12 and some cryptic comments about each step. And then on the other side, what's commonly referred to as the symptomology matrix for the DRE program.

Q And what is the importance of the matrix?

A The matrix, it's really kind of a little bit the heart and soul of the whole program. It gives on here the seven categories. It gives the general indicators, the different signs and symptoms that the DREs would expect to see. It gives the clinical signs and symptoms with the eyes, the pulse, et cetera. And then it's got some additional information like duration of effects of the drugs, usual method of administration, overdose signs and symptoms. And it gives a few exceptions on the bottom. And it also gives the normal ranges of things, so that if you happen to have a moment where you don't remember the normals, they're n there, as well.

It's important with this matrix to realize that it should never be viewed as a checklist. It's not something where, if someone was administered, say, a CNS stimulant, that you could come by and say: Oh, well, there I see this, this, and I don't see this, and I see this. And it's going to be a perfect little checklist. And everything on there should be overtly demonstrated by this individual.

You know, it's very important to look at this for what it is. We're looking at for the DRE to make an opinion about a certain category. They really are looking at the totality of the evidence and how it fits together and whether or not they believe they're seeing perhaps a polydrug use, where they might be two different categories, or perhaps the

well-documented downside of a certain category, like a stimulant.

So they really do have to be knowledgeable. They have to understand this. This isn't something simple where you just go through and check off a few things. And you say, oh, there's the answer, that's what it is. There's really much more to it than that.

Q And what about in the broad scheme of a DRE evaluation, how important is observable signs of impairment?

A Now are you talking about, say, the original officer on the scene or --

Q No. I am talking about --

A -- are you talking about with the DRE?

Q I am talking about when the DRE --

A Oh, I think it's critical. I think being able to see -- the reason I hesitated is you said observable signs and symptoms of impairment. You know, some of these signs and symptoms are things that are consistent with certain categories. But they're not necessarily -- I'm hesitating a little bit.

It's, again, it's the totality of this evidence that we're looking at. And it's important that it all fits together and helps to support whatever that opinion will be. And then ultimately the toxicology needs to corroborate that opinion. And all of that information, excuse me, all of that information

together is what allows the ultimate opinion of was this or was this not an impaired driver.

Q And is it, to your knowledge, based on your training through the program, is the DRE, the one doing the observations, are they free to make a separate and distinct finding from what the original arresting officer made?

A Absolutely. Of course. As a matter of fact, that's part of the training is that -- even though you would have spoken with the first officer of the scene and talked about perhaps what the driving behavior was, that's part of the information you're processing and thinking about. If you conduct your evaluation and you don't see something that's consistent with that, or you just don't see the impairment, you absolutely must document the way that you've seen it and have an independent conclusion that supports your observations. That's critical.

Q So I guess their task, for lack of a better term, is to make an independent conclusion, as opposed to rubberstamp the original arresting officer's observations. Is that accurate?

A I think that is accurate. My only additional comment would be, if they're going through these conclusions and they're noting signs and symptoms and they're seeing signs and symptoms indicative of a certain drug category, and they're going down that path of having an opinion, they're also trained

that they should be looking at, well, were there any other witness statements, did they do something in their driving behavior that also supports this, and looking at the totality of all that, as well.

But your original question, if what they see isn't consistent with that, they're still duty bound to document that.

Q Just, trust me, two or three more questions.

How has the complexion of the program itself changed over the years, if you know?

A I do know. And I think this has been -- it's been very interesting for me to watch over the last two decades what's happened with the DRE program. I'm old enough that when I was in my late twenties, and I had just started at the crime laboratory, and I went to different meetings, I remember specifically going to a meeting at UCLA. And there was a presentation on the DRE program. And it was not received well. And there were a number of scientists, people in high levels of forensic toxicology, who had very caustic comments. And it was a little bit of a debacle. And the concept really was, oh, this is rogue cops going out there and trying to be physicians. And it was not received well.

And I have seen a tremendous change from that 20-plus years ago in terms of now you go to meetings, and a presentation may be made on something that really isn't overtly

anything to do with DRE. It's about the presentation I gave on atypical antipsychotics, Abilify, those kinds of drugs. And without fail, almost every toxicologist will do case studies, will talk about the DRE results, will talk about what was seen on this drug in the DRE community, how they will present in a DRE evaluation.

When people give presentations on forensic toxicology to younger toxicologists, how do you handle yourself in court, what kind of evidence do you consider, I've never seen a presentation in the last ten years that hasn't embraced and talked about the importance of the DRE evidence and how it can take a drug concentration that's very difficult to say anything about to a case where you can now say, here's ten factors that are consistent with the drug that I found, et cetera, that kind of information.

And it's gone from a situation where I saw a program that was not embraced, that people were suspicious of, and I've seen it morph into a program over a long time something that is embraced by the leaders in the field, by people with Ph.D.s, people with M.D.s, researchers, who consider it to be really an essential component of drug-impaired driving.

Q And in your opinion, has that matrix that you have there, has that been -- is that accurate and has been commonly accepted?

A Yes.

Q One last question, ma'am. Briefly backing up to your Arizona studies, in which you said high eighties to ninety, low nineties, were there situations in those, I guess, during the -- of those stats that you guys kept in which the DRE found that there was no impairment which was inconsistent with what the original officer said?

A Absolutely. And there have always been cases where there was some, you know, some years more than others, but where there was some kind of real significant medical situation on board that just was not caught by the first few officers that were on the scene and, during the evaluation, was discerned. And that always -- I know people felt very good about that, when it happened.

Q Thank you, ma'am. I don't -- I think we are pretty much done for the day, unless the Court has some questions. I know we are going to save the other part until tomorrow.

THE COURT: We will save cross for tomorrow. My goal is to start at 9:45 tomorrow. And we will be across the street in the historic courthouse, unfortunately, Madame Clerk. That means --

THE CLERK: I get to bring it all with me.

THE COURT: -- you are going to have to lug all this stuff over there.

THE CLERK: That's fine. Thank you.

MR. DeLEONARDO: I was going to say, Your Honor, unfortunately for me, I have to lug all my stuff over.

MR. DAGGETT: Well, you have enough help. I mean, come on.

MR. DeLEONARDO: I mean, you know, I am just looking out for me.

THE COURT: Yes. But you are probably going to sleep over there tonight. You probably have your pajamas in there.

MR. DeLEONARDO: Actually, strangely, you are probably right, Judge.

THE COURT: All right. Here you go, Madame Clerk.

THE CLERK: Thank you.

THE COURT: You are spoiling me.

Just for my own curiosity, we are going to finish with Ms. Spirk tomorrow. I am sure we are all confident of that. And then what is next on the agenda?

MR. WELLS: We have Dr. Zuk, a general practitioner of medicine.

THE COURT: All right.

MR. WELLS: I think we need to finish with him tomorrow, also.

THE COURT: Now are we -- is the State thinking that -- when is the State thinking it will conclude its --

MR. DAGGETT: We would have been done by a little

bit after lunch on Thursday. But we have to let the defense go on Thursday morning, sometime on Thursday, because they have an out-of-state. So --

THE COURT: All right. There you go.

THE CLERK: Thank you.

MR. CRUICKSHANK: So 9:45 across the street.

THE COURT: Yes.

THE CLERK: All rise.

(Whereupon, the hearing was adjourned, to reconvene on September 22, 2010, at 9:45 o'clock, a.m.)

C E R T I F I C A T E

CompuScribe hereby certifies that the attached pages represent an accurate transcript of the electronic sound recording of the proceedings heard on September 21, 2010, in the Circuit Court for Carroll County in the matter of:

Criminal No. K-10-040259
STATE OF MARYLAND
v.
CHARLES DAVID BRIGHTFUL

Criminal No. K-10-040331
STATE OF MARYLAND
v.
HARVEY ALEXANDER CARR

Criminal No. K-10-040167
STATE OF MARYLAND
v.
JENNIFER ADELINE FLANAGAN

Criminal No. K-09-039370
STATE OF MARYLAND
v.
RYAN THOMAS MAHON

Criminal No. K-09-039569
STATE OF MARYLAND
v.
CHRISTOPHER JAMES MOORE

Criminal No. K-09-039636
STATE OF MARYLAND
v.
VALERIE ANN MULLIKIN

Criminal No. K-10-040300
STATE OF MARYLAND
v.
RONALD DALE TEETER

By:

_____ _____

Gail A. Williams, Transcriber Date