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 20, 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.
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FOR THE DEFENDANTS:

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I N D E X

WITNESSES	DIRECT	CROSS	REDIRECT	RECROSS	VOIR DIRE
For the State:					
Dr. Karl Citek	71(AW)	154(BD)	--	--	
	24(AW)				
	35(AC)				
	43(BD)				

EXHIBITS	FOR IDENTIFICATION	IN EVIDENCE
For the State:		
1	25	25
2,3	28	30
4	133	133
5	136	--
6	143	143
7	144	144

KEYNOTE: "---" Indicates inaudible in transcript.

P R O C E E D I N G S

THE COURT: Mr. Daggett.

MR. DAGGETT: Your Honor, there are seven parties who are presently here for, I believe, for the initial part of this motions hearing. Counsel asked them to be present to I guess waive their presence for the rest of the week.

I will call them all together and I guess they can either stand on the first row or however you want to do it.

But, it is State versus Charles Brightful, K-10-40259; Harvey Carr, K-10-40331; Jennifer Flanagan, K-10-40167; Ryan Mahon, K-09-39370; Christopher Moore, K-09-39569; Valerie Mullikin, K-09-39636 and Ronald Teeter, K-10-40300. It looks like six of the seven are present.

MR. DeLEONARDO: Good morning, Your Honor, Brian DeLeonardo, D-e-L-e-o-n-a-r-d-o. Your Honor, I am sole counsel for Ms. Mullikin as well as Mr. Carr so I am there on their behalf. I am also co-counsel in the other cases.

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 other clients who are public defended clients, Your Honor.

MR. DeLEONARDO: Your Honor, we had them obviously be here today as a mandatory hearing to ensure that their presence, that they know that they had the right to be here

but we were going to make a request, if Your Honor would consider their presence for the duration of the hearing unless they so desire.

I believe all of them, like I said, if they wish to appear we would certainly be willing to do that but I did not want to have them have to sit here for five days listening to us.

THE COURT: All right so ordered, anyone of the named Defendants who wants to remain can remain obviously but if you do not wish to be present, your presence is excused for the remainder of this hearing.

MR. DeLEONARDO: Your Honor, there was some confusion that would also include next Tuesday because that was added and I think there was some confusion as to whether they had to be here Tuesday.

So, it would include the four days this week and next Tuesday it is my understanding.

MR. DAGGETT: My only, I guess my only concern is there are seven names called and only six people are here, I am not sure which one is not here but I assume that is Mr. Cruickshank's client if he could just indicate who that would be and that he, I am not asking for a warrant certainly I was just going to have him inform the Court that maybe he told the people the same thing.

MR. CRUICKSHANK: I did.

MR. DAGGETT: Who was the one who was not here?

MR. CRUICKSHANK: I think, ma'am you are Ms.?

THE DEFENDANT: I am Ms. Flanagan.

MR. CRUICKSHANK: Ma'am, you are Ms.?

THE DEFENDANT: I am Ms. Mullikin.

MR. CRUICKSHANK: Sir, you are?

THE DEFENDANT: Ryan Mahon.

THE DEFENDANT: Charles Brightful.

MR. CRUICKSHANK: It is Mr. Moore.

MR. DAGGETT: Christopher Moore is not present?

MR. CRUICKSHANK: That is correct. I spoke with him and told him to be here not sure why.

THE COURT: All right, well we will excuse him as well. All right, you all are free to resume your seat or leave if you prefer.

MR. DAGGETT: We did not say but David Daggett and Adam Wells for the State, D-a-g-g-e-t-t, W-e-l-l-s.

THE COURT: All right, anything preliminarily?

MR. DeLEONARDO: Well I guess Your Honor if I could just clarify, I have actually in one of the cases I have a privately retained client.

Typically in a co-defendant case, I would have the right to my own separate direct or cross and I just wanted to make sure that was the case.

I am not looking to repeat or go long or anything

like that, I just at least wanted to make sure that it was clear that I would have the right to cross individually for my clients.

THE COURT: Yes, I do not think there is any question about that.

MR. DeLEONARDO: Okay, thank you very much Your Honor.

THE COURT: Now for the record, it was mentioned let's see we are not scheduled now to conduct this hearing on Friday, is that correct?

MR. WELLS: Your Honor, it was my understanding that originally we were. I do know that we have Drug Court in the morning and I also know that we have a Drug Court graduation. I do not know, I know that the defense is concerned because they have their experts which have been scheduled I believe have the --

THE COURT: If anybody wants to, you said Tuesday was added?

MR. CRUICKSHANK: Tuesday was added for Dr. Gengo Your Honor and speaking with Mr. Daggett in reviewing what we have the State will more than likely finish on Wednesday which would leave Thursday available for our two experts Dr. Janofsky and Dr. Adams and then on --

THE COURT: Well I am not going to be available Friday morning.

MR. WELLS: Understood.

THE COURT: Okay, I will be available in the afternoon but not Friday morning.

MR. CRUICKSHANK: Understood, Your Honor. The only other thing that I would add Your Honor is we will just reserve on an opening. I think the motions that we filed is enough opening for the hearing we are having today and then if we have anything to add in closing we will do that after everybody's testimony.

MR. WELLS: Your Honor with regards to the State, we would wish to be heard with regards to an opening and additionally I believe we were scheduled this morning to have oral arguments with regards to the 16-205.1 issue and the fact that the DRE protocol was legislated referenced and is essentially legislatively adopted based on the statute. We do wish to be heard with regards to that argument.

MR. CRUICKSHANK: Well Your Honor signed an order regarding the 16-205.1 to the effect that the 16-205.1 did not stand for the proposition that the DRE protocol was accepted in Maryland.

I received that order at the same time that I received --

MR. DAGGETT: I do not think we did.

MR. WELLS: I do not think we ever got that order.

MR. CRUICKSHANK: You never got it?

MR. DeLEONARDO: I have a copy of the order.

MR. CRUICKSHANK: Your Honor ruled on that about two weeks ago.

MR. DeLEONARDO: On the September 7th, Your Honor indicated the Court finds that that alone did not equate to a legislative endorsement of the protocol.

MR. WELLS: We never received that.

MR. DAGGETT: We never received that, Your Honor.

MR. DeLEONARDO: So that is why we were just prepared to go forward today Your Honor.

THE COURT: I do not know why the State would not have gotten its copy.

MR. WELLS: That is what we were planning on doing first thing this morning, that takes care of that.

THE COURT: So I do not forget to mention this, we are in this Courtroom today but tomorrow we will be across the street in Courtroom 1, all right? Mr. Wells?

MR. WELLS: Thank you Your Honor. For the record, Adam Wells spelled W-e-l-l-s on behalf of the State and if I may with opening statements for the Frye-Reed hearing.

Your Honor, currently where we are at is there have been seven cases which have been consolidated by the defense to challenge the admissibility of the DRE protocol.

Long story short, the defense is alleging that a protocol which is approaching its third decade of use is new

and novel and to the science that it is based on which has science which has been in utilization since the 50's is not generally accepted within the scientific community.

Right now what we have to do is run through and go through with our experts and with everything else to show that Your Honor buy and the burden is on the State to show only by a preponderance of the evidence, it is not any other higher standard, that it is not new or novel scientific information and that it is generally accepted within the scientific community.

Now the first thing I will do is just generally go through the DRE protocol. The protocol itself is very simple, Your Honor, it is not rocket science it is nothing that is very difficult in its application or in its observation.

It is a 12 point systematic systemic protocol which uses very simple things, 1) information from the arresting officer which is conveyed to the DRE, 2) vital signs which is the taking of the pulse, the taking of temperature, blood pressure, very, very, very rudimentary very simple things.

It also uses basic psychophysical tests, the field sobriety tests which have been accepted, have been utilized and have been around for an extended period of time and are utilized generally, they are called neurological tests in the scientific community.

It also uses very simple eye operations, horizontal gaze nystagmus, vertical gaze nystagmus, lack of convergence, it has a dark room evaluation where they simply check to see how the eyes respond to the change in light. All these things are very simple. There is nothing really complicated with regards to any of these tests.

Once all that is done then the DRE then has the opportunity to have an interview with the Defendant and ask him simple questions and use that information as well.

After all that information, they take that, they synthesize it and they come up with an opinion as to whether or not they are impaired and by what category or categories of drugs that they are impaired by.

Finally they ask the Defendant to submit to a chemical test of their blood to determine whether or not or to corroborate what their opinion is as to what the level of impairment is of the Defendant or what drug that is in their system. That is it. It is really not very complicated.

Now first question with regards to Frye-Reed is that is this new or novel? Definitely not, not remotely. This program has been developed in the early 80's and is approaching its third decade of use in the country. It has been utilized in this state and it has been utilized in over 40 states in the Nation.

It was developed in the early 80's in Los Angeles

and all the underlying science is actually even older, HGN, lack of convergence, the psychophysical test, a lot of that dates back to the 50's. So this clearly, definitely not new or novel in the fact that it has been around forever and the science is even older than the program.

The second question is whether or not this is generally accepted within the scientific community. In a word, yes and I want to talk about the general acceptance standard as well.

One thing about that you are going to hear experts from both sides, our experts and the defense's experts and they are going to say that it is not, ours is going to say that it is.

With regards to general acceptance it does not mean universal claim, it does not mean that there cannot be some disagreement in some corners as to certain aspects or the program in general, it just means that it has to be generally accepted.

So the fact that there is a doctor that they have on their side that disagrees with certain aspects or the program in its totality really does not mean all that much and I want the Court to be aware of them.

We will have our experts and our doctors testifying as well, however, we also have more than just that. We have study after study after study after study, it has been

studied and gone over repeatedly since the 80's and all of the studies, some are stronger for DRE than others, but all of the studies generally endorse the program and find that they are reliable.

These studies are in two different categories, not that it makes that much of a difference, however some of the studies were done through NHTSA.

Clearly the Court is familiar with the National Highway Traffic Safety Administration, that is a body that has been around for a long time and runs through these scientific things on a regular basis.

It is a body that does not just publish things on a whim, clearly there is a lot of science that goes into it, those studies are done correctly and they are evaluated to make sure they are presented and done correctly.

There are also other studies, two of which will be presented I believe today by the doctor who actually wrote them, Dr. Citek who is present which was done and published in a peer reviewed magazine which also shows that it has been open to attack and review by everyone within his general practice, his realm of expertise which is optometry.

Now not just the studies and not just the experts we have even more than that to show that this is generally accepted within the scientific community.

They will have an expert that says they do not like

it. We have our experts that say that it is used, we have our science and our studies that say that it has been accepted.

Furthermore, we have the weight of numerous endorsements of different medical associations. We have some local, by local I mean regional medical associations, Florida has numerous medical associations that number in the hundreds if not thousands of doctors which have endorsed the DRE program.

We have the American Optometric Association which is obviously a national program. It has thousands of optometrists and there is a resolution which I will enter in through Dr. Citek which shows that that entire organization, thousands of doctors behind it, endorses the program.

The American Bar Association endorses the program. There is just numerous bodies of groups of scientists, individuals all of which support and endorse the DRE protocol. So clearly it is definitely generally accepted within the scientific community.

Finally Your Honor, there is also the case law. This is not the first time that this has ever been raised. In the nearly three decades that it has come through it has been challenged with numerous experts on both sides in a number of different states through a number of different standards.

Maryland uses the Frye-Reed standard and in other states they use the Frye-Reed standard and they also use the Daubert standard. But there are numerous states which have gone through this, have gone through contested challenges and have held that it is generally accepted.

I will go through a few of them, Arizona v. Johnson the Arizona Supreme Court rejected the application of Frye to the DRE testimony during oral argument in the Johnson case and declined jurisdiction to reconsider the Lower Court opinion.

The Frye standard does not apply to DRE testimony because as Chief Justice Stanley Feldman observed, "The component examination and procedures had been established for 50 years, thus they were not new or novel instead the DRE testimony was admissible as simple observations of physical signs and symptoms the drug influence."

Colorado, the Court held that the DRE process is not novel scientific evidence. In addition, the Court found that the 12 step DRE process does provide a trained officer with the ability to make a reliable opinion.

Williams v. Florida, the Court held that Frye is inapplicable to the DRE protocol because neither the protocol nor any of its subsets excluding specifically HGN, VGN and lack of convergence are scientific within the meaning of Frye.

According to the Court the DRE testimony and evidence is admissible because it is reasonably accurate, reliable and relevant. The Court went onto specifically address the more scientific aspects of the DRE protocol, HGN, vertical gaze nystagmus and lack of convergence.

Although those are quasi-scientific they are not new or novel and therefore the Frye standard does not apply to them either.

Hawaii, the Trial Court denied the Defendant's motion to suppress DRE testimony. The Court found that the scientific standard is inapplicable to the DRE protocol because the underlying procedures are technical, not scientific, and the procedures are not new or novel.

Hawaii follows Frye but it has adopted the Federal Rules and even under a combined Frye Daubert analysis, the Court concluded that the DRE witnesses can testify because the technique utilized by the DRE is relevant, reliable, trustworthy and valid.

I will use the Daubert but testimony discovered by Daubert because the DRE's testimony is not scientific in nature. Even under a Daubert analysis the Court concluded that DRE witnesses can testify because they met the Daubert factors.

State v. Claywater which is Minnesota, the Minnesota Supreme Court affirmed the Lower Court's ruling

that horizontal gaze nystagmus satisfies the Frye standard expressed and refused to address a different issue -- Court's indulgence.

Claywater held that the drug recognition evaluation is not a novel scientific discovery or technique and that DRE evidence is admissible.

There is nothing scientifically new, novel or controversial about any component of the DRE protocol itself. The symptomatology matrix used by the DRE is to reach their conclusions is not new and is generally accepted in the medical community as an accurate compilation of signs and symptoms of the various drug categories.

Your Honor the last one I will just touch on, clearly there is more I am not going to go through all of them but Oregon, the scientific nature of HGN is well established in case law as in Maryland with Schultz.

Other procedures performed in a DRE exam are also based on medical science, the results of which are compared to establish scientific research.

The Court found that universal acceptance is not necessary for admissibility and that the DRE protocol was generally accepted in a relevant scientific community.

There are other cases, there are other states. Recently I believe Washington, DC this year just had a DRE hearing and concluded that the DRE protocol is generally

accepted and not a new and novel science and is admissible in Washington, DC.

So Your Honor, clearly there is nothing new or novel here. This has been around for decades. The science is older than I am. The protocol itself has been used for going on three decades.

We have the studies which endorse it. We have the experts who will testify indicating that they use it and that it is not just law enforcement that utilizes it well. There are other outside uses for the DRE protocol and it is used.

Specifically there is a program that has talked to certain teachers and certain nurses at high schools so that when kids come in and they are under the influence they can run them through kind of an abbreviated version of the DRE protocol so that they can figure out what the person is on so they can respond appropriately.

Based on the case law, based on the endorsements, based on the underlying science, based on the statute, based upon the studies, this is not new or novel.

This is generally accepted within the scientific community and we would ask upon completion of the hearing that you deny their motion to suppress the evidence of the DRE testimony. That would conclude my opening statement.

MR. DeLEONARDO: Your Honor, Mr. Cruickshank had waived I do have a few comments, I am not going to take very

long but I think it is appropriate to respond to a few things.

Obviously in the course of this you are going to know more about the DRE protocol than you probably ever wanted to know so there is no sense going through all those details but what I will tell Your Honor is what I did not hear from Mr. Wells at all is where he indicated that the State of Maryland accepted the DRE protocol.

That is a pretty important point here especially in the light of the fact that our Court of Appeals as recently as 2007 noted that the proper tests for determining the admissibility under Frye-Reed is whether the basis of the expert opinion is generally accepted as reliable within the expert's particular field.

That is kind of an important point here because what you have seen that is different from a lot of the cases that have been raised by Mr. Wells is that there has been a recognition that a lot of things have been allowed to go and get a pass in the field of forensic science and law enforcement.

In fact, there was a report from the American Academy of Science that actually was extremely critical, it wrote a whole book about the fact that the lack of validity and the lack of reliability and demonstrated on a lot of this stuff that is being used. So it is certainly an area that is

getting a fresh look.

I would also, for example, by way of that in Oregon initially he was correct they did actually say that they were accepting it and then they recently issued an opinion when someone challenged one of the components of it saying, well we weren't necessarily validating all of the components.

So what you are seeing is that a lot of Courts, starting certainly with the Supreme Court in Dauber, but it has continued over the years and more recently has started to really take a really critical look of that.

If you look at like I said even our own Court of Appeals not only in that particular decision that I noted but even in the decision that the Court recently dealt with on the issue of HGN in State versus Blackwell I mean it specifically noted that if you are claiming a training, if you are claiming you were trained in a technique and you are coming in to discuss observations that are scientific in nature as a basis of your opinion, then you are an expert.

I mean you have to be properly qualified and your basis of opinion I would argue therefore is subjected to being reliable, if it is not reliable it is certainly not probative of anything in the Courtroom.

The other issue I think it is important to note on a lot of these too is while he says all these cases are, both sides have brought in experts and fought that is frankly just

not true, I mean I have looked at the transcripts of a lot of these cases and to be perfectly frank there are many on when there were no experts called.

Now I am certainly not saying that is all of them, there certainly were some that was the case, so I think we have to take a look at this at its own face because Your Honor is going to hear from some of the leading experts in the field and frankly not only country but the world.

We are going to hear from Dr. Janofsky who is extremely, extremely accomplished in his field from Johns Hopkins University. He has a long history in clinical research, he is going to basically say that these studies that he has taught they are all meaningless.

Frankly, several of them are not even peer reviewed and the ones that are show that there are really, some of them show a false positive rate of 40 percent and so I think when you get a chance to hear when someone is critically looking at these studies it is going to make a difference.

You are going to hear from Dr. Adams who used to be Wilmer Eye Institute Dean of Texas Tech Ophthalmology, he is certainly another leading person in the field. You are going to hear from Dr. Gengo a leading pharmacologist in the field. He has written extensively in the field of pharmacology and drugs and the effect on body and weight, you can draw from that.

The reason we do that is because I think at the end of this hearing, Your Honor, what you are going to find is that this protocol that they are attempting to use, he is right some of the principles underlying it have been around forever I mean blood pressure obviously that has been around forever, but it is the application of that kind of diagnostic test essentially.

That application of how they are trying to apply it which is new or novel not accepted in the medical community and frankly is completely not reliable.

By example or by analogy what I would say is, it would be equivalent of saying well we should allow polygraphs because monitoring blood pressure and heart rate and perspiration, well that is not new or novel. Well obviously the State of Maryland thought otherwise and said that the principles may have been around forever the application is not accepted.

I also think it is, you know and again on a final point Your Honor, I think it is important to recognize that Maryland has some different law from a lot of these other states. Some of these other states allow HGN, allow the officer to testify as to a specific level of blood alcohol content.

Some of these other states allow officers to come in and to testify as to the clues that were found on the

field sobriety test and what that means in terms of level of impairment.

Maryland does not allow a lot of the things that some of these other states do and I think that is what is really important in this case is that Your Honor is not deciding for the rest of the country, Your Honor is deciding for Maryland.

I think when you look at Maryland and Maryland law and the fact that we have, I mean by way of example one of the standards in one of the states essentially is if it has like any reasonable basis, and I will basically I can bring that case Your Honor, but the standard was so utterly low the Court criticized the program but still admitted it, actually that was in Wisconsin Your Honor, I could not remember off the top of my head.

But that is an example of where we cannot really compare ourselves to some of these other states because their law is different, what was presented was different and I think Your Honor at the end of this case will have a very good idea of what the limitations of this program are and what it should not be used for. Thank you.

THE COURT: All right, ready to proceed?

MR. WELLS: The State is Your Honor. Our first witness, Your Honor, we call Dr. Karl Citek to the stand. Whereupon,

DR. KARL CITEK

was called as a witness by the State, 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 your business address please.

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

THE CLERK: Thank you.

VOIR DIRE

BY MR. WELLS:

Q Good morning Dr. Citek.

A Good morning.

Q Dr. Citek, what is it that you do for a living?

A I am a professor of optometry at Pacific University College of Optometry.

Q How long have you been at Pacific University?

A I joined the faculty, I was hired in December of 1994 hired as an assistant professor. In 2000 I earned tenure and was promoted to associate professor and in 2006 I was promoted to full professor.

Q Okay. Are you a member of any adjunct faculty of any other institutions?

A Yes I am adjunct faculty with the University of

North Florida specifically with the Institute of Police Technology and Management. I teach a course for them on an as needed basis and as such I have adjunct status but no other benefits of that affiliation.

Q Did you prepare a CV for this court hearing today?

A I did.

MR. WELLS: Your Honor, if I may approach?

THE COURT: Yes.

MR. WELLS: I am going to have this marked as State's Exhibit No. 1.

THE CLERK: State's 1.

BY MR. WELLS:

Q For the record, what is this?

A This appears to be a copy of my curriculum vitae.

MR. WELLS: Your Honor at this time I will move to have this admitted.

MR. CRUICKSHANK: No objection.

MR. DeLEONARDO: No objection permission to voir dire.

THE COURT: State's Exhibit 1 is admitted.

(The document referred to was marked for identification as State's Exhibit 1 and was received in evidence.)

BY MR. WELLS:

Q Now you indicated something as an adjunct faculty at the Institute of Police Technology and Management, what is that?

A It is an affiliated school with the University of North Florida. They teach courses to law enforcement professionals and prosecutors about various aspects of law enforcement, how to conduct field sobriety testing for example, how to conduct internal investigations, things like that.

The course that I teach for them is entitled, Medical Foundations of Visual System Testing. In three days we cover much of the background information, much of the background medical basis and science behind the field sobriety tests and the DRE protocol showing officers some additional background information that they don't learn in DRE school.

Q Have you ever testified as an expert before?

A Yes I have.

Q Okay. Approximately how many times?

A I think it is 33 or 34 times.

Q Generally speaking, what different capacities as an expert have you testified as?

A I have testified in about half a dozen cases similar to this one, hearings similar to this one with regard to admissibility of the DRE program and about a dozen

hearings with regard to HGN and sometimes VGN in alcohol DUI cases and in about a dozen trials, DUI trials.

Q HGN is horizontal gaze nystagmus?

A Yes, I am sorry, horizontal gaze nystagmus and vertical gaze nystagmus.

Q Have you ever been published?

A Yes I have.

Q Approximately how many times?

A I have published about a dozen papers in Peer Review Journals on different topics.

Q Have you ever been called to testify for the defense?

A Yes I have.

Q Approximately how many times?

A Twice.

Q Have you ever been called upon by the defense to render an opinion outside of court testimony?

A Yes numerous times.

MR. WELLS: Court's indulgence. Your Honor if I may approach again?

THE COURT: Counsel you are free to move about the well.

MR. WELLS: Have marked as State's Exhibits 2 and 3.

THE CLERK: State's 2, State's 3.

BY MR. WELLS:

Q I am showing you what has been marked as State's Exhibit No. 2, what is this?

A This is a copy of a paper that we published in 2003 entitled, Nystagmus Testing in Intoxicated Individuals.

Q And State's No. 3?

A And State's 3 is a copy of a paper that we published in 2002 entitled, The Drug Evaluation Classification Program Using Ocular and Other Signs to Detect Drug Intoxication, I am sorry this is from 1998 not 2002.

(The documents referred to were marked for identification as State's Exhibits 2 and 3.)

BY MR. WELLS:

Q Now both of these you were involved in these studies, is that correct?

A Yes, the second one is a review of the DRE protocol I was a co-author in that and was reviewing it specifically for the purpose of introduction to optometrists who, our colleagues in optometry, to describe to them what is done within the DRE protocol so it wasn't a study, per se, it was a review paper again using the protocol that was in effect in 1998 at the time.

The second paper was a study in which we evaluated the HGN, VGN and positional alcohol nystagmus testing in

individuals who were standing, seated and laying down just to see if there was any difference of posture that might have effect on the results.

Q Now with both of these you indicated that these were published in peer reviewed magazines, what does it mean to be peer reviewed?

A Peer review simply means that you present a manuscript to a journal describing your study, describing your review as it may be and the journal editors and associate editors, whoever is involved in the journal, decide that it may be worthwhile, it may appropriate for their journal to include, maybe worthwhile to publish within the journal.

If they do so, the first step then is to present that manuscript to other experts, other content experts, in the field who may have some familiarity with that topic.

Usually on an anonymous basis those experts usually at least two, sometimes three, folks in addition to the editors will look at that, will critically go through the article to make sure that the methods are sound, that the background is appropriate, that the results are reasonable based on the methods that were described and that the conclusion is appropriate.

After that review by those independent anonymous reviewers then the associate editors will make a decision

either to accept the publication or ask the authors to re-write parts of it based on the criticisms and the critiques that they have received and sometimes that will go back and forth a couple of times before the paper finally is accepted for publication.

MR. WELLS: Move to admit these both State's 2 and 3.

MR. DeLEONARDO: No objection.

MR. CRUICKSHANK: No objection.

THE COURT: All right, those State's Exhibits 2 and 3 are admitted.

(The documents marked for identification as State's Exhibits 2 and 3 were received in evidence.)

BY MR. WELLS:

Q Now with regard to different studies, clearly if a study is peer reviewed it has gone through a procedure and a process to determine its background and the accuracy in its application and how it was done. With regards to other studies such as NHTSA studies, just because something is not peer reviewed what would that mean?

A Well first of all peer review is not perfect that is one thing I have to get out immediately. If peer review were perfect there would probably fewer than half the number

of publications out there.

Occasionally things get by reviewers, statements get by reviewers, methodology may not be recognized and it is accepted and it turns out to be incorrect.

So peer review isn't perfect but it is very good, it is one line of defense, if you will, against junk science or against publication of inappropriate material but sometimes it does happen nonetheless.

With regard to other studies, some journals will publish reports, publish reviews based on just review by the editor or by an associate editor without sending those to independent anonymous reviewers and that is certainly reasonable as well.

Q Are you familiar with --

A And with regard to --

Q I am sorry.

A With regard to NHTSA, I don't know the exact protocol I have never conducted any studies for NHTSA or published anything with the National Highway Traffic Safety Administration but I do know that reports that do come in before they are released to the public they are reviewed by their in-house experts.

It may not be exactly the same as peer review for a journal, not done in exactly the same way, but it is not an automatic TASIT's publication of a journal. There is some

review process.

Q Doctor, have you had any continuing education courses since you were admitted as an optometrist?

A Yes, to maintain my license I need to maintain at least 18 hours of continuing education courses each year.

Q Have you ever given any presentations on the DRE program and HGN in general?

A Yes I have numerous times.

Q Could you give a ballpark number?

A Well I have done a continuing education course for my colleagues for optometrists in reviewing the DRE protocol and some of the background behind it. I have also done presentations to law enforcement officers, prosecutors and Judges over the past dozen years maybe about 150 times or so all around the country.

Q Doctor, do you know what the International Association of the Chiefs of Police is?

A Yes.

Q What is that?

A It is an organization of police chiefs throughout the U.S. and Canada primarily.

Q Does that have any involvement with the DRE protocol?

A Yes they are the organization that oversees the DRE protocol and that sets the standard for the DRE schools and

for the certification of DRE's within each state.

Q Doctor, are you a member of the IACP?

A I am not.

Q Are you a member of law enforcement?

A I am not.

Q Do you have any other than the fact that you believe in it, do you have any attachments to the DRE program?

A I do not.

Q Doctor, when did you first become aware of the DRE program?

A It was probably right after I joined the faculty at Pacific University so it would have been about 1995 or so when one of my colleagues who is now retired introduced the program to me and introduced one of the officers in Oregon who had just become a DRE.

And 1995 is when the DRE program came to Oregon and by its own discussions with the first officers who were DRE's and reviewed some of the literature that was available up to that time, reviewed my own notes with regard to my own education and what I know about eye movements and intoxication eye movements and pupil responses and realized that from that standpoint and the purpose behind the DRE protocol it just makes sense. It is very similar to the --

MR. DeLEONARDO: Your Honor, I am just going to

object. I am not sure he has been offered up as an expert yet. That last part sounded like he was starting to endorse it, so I just wanted to make sure that at least before that happens that he is offered up as an expert.

MR. WELLS: I can move on that is fine. I was just asking how he first became involved or --

THE COURT: We could also offer Dr. Citek as an expert.

MR. WELLS: I am going to, I have a few more questions to ask and then I will.

THE COURT: All right.

BY MR. WELLS:

Q Dr. Citek, have you ever attended any of the DRE training procedures at any of the DRE schools?

A Yes since 2000 I regularly teach about HGN and eye movements at the Oregon DRE schools and since 2001 I do so at the Washington State DRE schools. I have also taught at the DRE schools on HGN and eye movements in Idaho and Montana.

Q Have you ever attended any of the schools as to follow through with them not just teaching?

A I have sat in on parts of them throughout the years but not entire two week course, no.

Q Have you ever been involved in any actual DRE evaluations themselves?

A I have observed numerous evaluations as they were

done during the certification training phase typically in Oregon after the DRE school. I have also observed the certification training on actual subjects in Florida and in Louisiana.

Q Can you give a ballpark of how many you have actually sat in on and observed?

A How many actual evaluations?

Q Yes.

A Just as a ballpark estimate because with the certification trainings they very often bring in multiple subjects and I have the opportunity to see multiple subjects examined by multiple numbers of the DRE students. It is certainly within the dozens and probably close to 100 if not more.

Q With your knowledge, training and experience as an optometrist are you familiar with horizontal gaze nystagmus, vertical gaze nystagmus and lack of convergence?

A Yes I am.

MR. WELLS: Your Honor at this time the State would move to admit the doctor as an expert in the fields of clinical research, optometry, DRE, HGN, vertical gaze nystagmus and nystagmus in general.

THE COURT: Voir dire.

VOIR DIRE

BY MR. CRUICKSHANK:

Q Good morning Doctor.

A Good morning.

Q Nystagmus Testing in Intoxicated Individuals, that is your paper correct?

A Yes I am a co-author on that paper.

Q That is a paper that involved alcohol, correct?

A Correct.

Q None of the subjects in that paper were dosed with any other CNS depressant but alcohol, correct?

A Correct.

Q They are not dosed with a narcotic analgesic, correct?

A Correct.

Q Disassociated anesthetic, correct?

A Correct.

Q Now you believe that alcohol has the same effects as all CNS depressants?

A Well it has very similar effects.

Q Is it fair to say that you have not conducted any clinical research with a CNS depressant other than alcohol?

A That would be correct.

Q When we define clinical research, would we define it as NIH would define it which would be to define it as research involving live human beings?

A Yes I would understand it that way.

Q It would be patient oriented research, would that be correct?

A Well either patient oriented or using controlled subjects, volunteers.

Q So Nystagmus Testing in Intoxicated Individuals was peer reviewed, is that correct?

A Yes.

Q The other article, The Drug Evaluation Classification Program is on the face of it, it is a journal of optometry I believe, the American Optometric Association, is that correct?

A Optometric Association, yes.

Q Thank you very much.

A I know Mr. Wells had a problem with that also.

Q Right. The Drug Evaluation Classification Program Using Ocular and Other Signs to Detect Drug Intoxication, that is the title of it right?

A Yes.

Q There were no patients involved in this, correct?

A As I said before that was a review of the program that was not a clinical study.

Q So not only was there no dosage of a CNS depressant other than alcohol, there was no dosage of alcohol?

A Correct.

Q Just to touch on your background, you have a Ph.D.

in Visual Science?

A Yes.

Q And you have an O.D., is that correct?

A Yes.

Q What is the meaning of an O.D.?

A It is a doctor of optometry degree.

Q On your resume, you consider yourself a primary care physician is that correct?

A Primary eye care physician, yes.

Q So you are not a medical doctor?

A No.

Q You did not go to one year of residency school, the hospital to become an optometrist?

A No.

Q You did not go to two years --

MR. WELLS: Objection. This point asked and answered, he already said he is not an M.D., I do not think we need to go through the steps.

THE COURT: Overruled.

BY MR. CRUICKSHANK:

Q You did not go to a second year of residency to receive your degree in optometry, is that correct?

A Correct.

Q Nor a third degree is that accurate?

A Correct.

Q In your degree of Visual Science, you took courses in pharmacology, is that correct?

A Well that would have been for the optometry degree.

Q In the optometry degree, how many courses in pharmacology did you take?

A We had one on systemic pharmacology, one on ocular pharmacology, at least one. Now at the State University of New York we were on the quarter system so that may have been broken up into multiple quarters, I would have to look back at my transcript to tell exactly how much but yes there were courses in both systemic pharmacology and ocular pharmacology.

Q From your background as a Visual Science Ph.D. and an optometrist you are familiar with the two categories of pharmacology, that is to say pharmacokinetics and pharmacodynamics, is that correct?

A Yes.

Q In any of the research that you have done, have you applied pharmacokinetics to a drug other than alcohol?

A No.

Q In any of the research that you have done have you ever, yes I get tongue tied, have you ever used pharmacodynamics on any other CNS depressant other than alcohol?

A No.

Q Have you applied pharmacokinetics or pharmacodynamics on any of the drug classes in the DRE matrix other than alcohol, excluding alcohol?

A No.

Q It is fair to say that the DRE protocol rules out alcohol before the DRE begins his examination?

A Well it includes it within it. The first clinical test, if you will first clinical step, of the DRE protocol is to take a breath test at least to get a breath test result and at that point a decision is made if that result at or above the per se limit then usually there is no need for a DRE evaluation because that standard has already been met.

If the breath test shows a zero result or a positive result but less than a per se limit so with some alcohol present then the DRE evaluation continues.

Q Have you ever done clinical research where an individual had a zero result on a breath alcohol test?

A Yes.

Q What was that?

A Well those would be included as the placebo conditions and also the baseline conditions to determine the controls on the studies that we have done.

Q Have you ever done research, clinical research, where somebody's breath alcohol was zero and other than the placebo there was another CNS depressant involved?

A No.

Q Have you ever done research, clinical research, for the National Institute of Health?

A No.

Q It is fair to say that you have never been a principle investigator for the National Institute of Health?

A That would be correct.

Q Co-investigator?

A No.

Q Have you ever received a National Institute of Health grant to do clinical research?

A I have not.

MR. CRUICKSHANK: Court's indulgence.

BY MR. CRUICKSHANK:

Q When you say you are a primary care doctor, do you make a medical diagnosis?

A Well we can, optometry is a primary eye care profession. It is related to ophthalmology, it is similar to ophthalmology but it is not the same thing. Yes, we in the course of examining a patient we will make a medical diagnosis.

Q You would make a differential diagnosis of a patient with a degree in optometry?

A Certainly.

Q Once you made that diagnosis what would you do with

that information?

A It depends on what the diagnosis is. As an optometrist I am licensed to treat some conditions such as conjunctivitis or if someone has a foreign body that needs to be removed or other, you can just think about any other very simple conditions of the front of the eyes or the eyelids. I can do very simple procedures like that.

If it involves something much more involved that may include medications, conditions such as glaucoma or where surgery needs to be involved then my licensing may, depending on the state, may or may not allow me to treat that unless I can, in the case of glaucoma, unless I consult with an M.D. with an ophthalmologist.

If it involves surgery or injections in the eyes other than treating very simple conditions or basic conditions I would make a referral to an ophthalmologist, to a surgeon or to a specialist who could do that.

Q Even though you are an optometrist who has taken pharmacology classes to get your degree and even though you are an optometrist who is a primary care physician you are not licensed to give CNS depressants are you?

A In some states we are.

Q Do you know if you are in the State of Maryland?

A I do not know that. I do not have a Maryland license.

MR. CRUICKSHANK: Thank you Doctor.

VOIR DIRE

BY MR. DeLEONARDO:

Q May I ask you, you talked about teaching you said that one of the things that you do is you teach at Pacific University a professor of optometry, correct? What do you teach there?

A That is my full-time occupation.

Q What do you teach there?

A I teach courses to first, second and third year optometry students in physiological optics, ophthalmic optics and environmental vision and I also supervise in the clinic with third and fourth year interns in the primary care vision clinic and the low vision clinic.

Q So all of those you are basically teaching optometrists, is that correct?

A Yes.

Q You are not teaching physicians, is that correct?

A Correct.

Q Or running the pharmacy school?

A Correct.

Q And as far as you said you also have lectured, you lectured it sounds like primarily for law enforcement and prosecutors' offices is that correct?

A Yes.

Q Have you ever been asked to lecture for the American Medical Association?

A I have not.

Q I guess the American College of Clinical Pharmacy?

A No.

Q American College of Physicians?

A No.

Q Any of those type of medical institutions, have you ever been asked to lecture on any topic?

A No.

Q Then obviously not this topic at all, correct?

A Correct.

Q You talked about peer review and you said you had, you described the process of peer review and you said it was not perfect but I guess you would also agree that it is an attempt to try to make sure that you expose any invalid results, correct?

A I think I did say that before yes.

Q Do you know the difference between a technical report and a peer reviewed publication?

A A technical report, it will depend on where it is published, a technical report can be published in a peer review journal and undergo a peer review just as well as a clinical research or other report.

Q But you are aware that there is a distinction in

terms of technical reports are not peer reviewed and published they are actually then published, correct?

A Correct.

Q Technical reports, you do understand that distinction?

A Yes I do.

Q And do you know the value that is placed in each one?

A Well it will depend on who is publishing it and who is reading it for the purpose of the information that they are trying to get.

Q Well let me ask you this, have you ever been asked to peer review another person's work?

A Yes I have.

Q When you peer reviewed that, have you ever been asked to peer review a technical report?

A Some of the, I am just trying to think back on the manuscripts that I have reviewed over the course of the years, I was trying to think if any would qualify as a technical report had they not been submitted to the journal for peer review they probably would have.

Q But only if they were ultimately submitted for publication you are saying?

A Correct.

Q So in your, what you have been asked to do peer

reviewed work let me just make sure I am clear, you have never actually done any peer reviewed work on drugs and impairing the ability to drive, correct?

A Correct.

Q And you have never been asked by anyone to do any peer review of that kind of work, is that correct?

A I am just trying to think, I am trying to recall the papers I have been asked to peer review whether any of them did involve, I honestly don't recall if any of those did involve studies that involved individuals who were dosed with drugs other than alcohol, it is possible I just don't recall.

Q Well certainly you have testified a number of times in this area, correct?

A Yes.

Q You think you would probably recall if you had done something like that on a subject like that that was that close to what you have testified so many times on?

A Well with peer review when I review article, first of all peer review is anonymous, usually anonymous, and confidential and I have served as a reviewer for several different journals. It certainly does not happen on a regular basis.

Q How many times?

A Again, that is not something that I keep track of.

Q One? Ten?

A Well every few months I may receive a request to review an article so maybe a few times a year on average, two, three, four times a year maybe. But there is usually a quick turnaround of a couple of weeks for peer review.

I usually do it in between my other activities because again it is something outside of my regular activities and once it is done I have no further involvement with that.

Q But again none on this area of drugs and driving, correct?

A To the best of my memory no.

Q Thank you. Now you said that you were asked by Mr. Wells whether or not you had any attachment to the DRE program and we said you did not, is that correct?

A Correct, no direct attachment.

Q Well, do you in your presentations, you said you have done about 150 of them?

A Yes.

Q Are they free?

A No.

Q You get paid for all 150 of going and providing those lectures, is that correct?

A Not every single time sometimes it is just for travel expenses and sometime you usually do get a speaker fee.

Q And you also said you teach at the DRE school in Oregon and Washington and even occasionally in Idaho and Montana, is that correct?

A Yes.

Q Is that for free?

A No.

Q You are familiar with IAACP, correct?

A Yes.

Q And that is a fraternal police organization, is it not?

A I don't know the specifics of their structure but could be.

Q You don't know? Have you ever been given any recognition by them?

A Yes I have.

Q So when you say that you have no connection, what did they recognize you for?

A In 2004, I received an award for the training that I have provided and in 2006 I was named a DRE Ambassador.

Q What is a DRE Ambassador?

A It is a recognition of someone who has involvement in the DRE program, who has made contributions to the DRE program but someone who is not law enforcement and therefore cannot be a DRE.

Q So, in addition to being a DRE Ambassador you teach

about 150 times so far on this subject and also teach at several schools, correct?

A Yes.

Q Would you consider that an attachment to the program?

A Well I have involvement in the program but if for by some chance of major drug impaired driving went away tomorrow and I never had to do this again I wouldn't mind.

Q It wouldn't hurt your feelings?

A It would not hurt my feelings at all.

Q Now you said you can make a medical diagnosis, is that what you said? You refer to the fact that you could make it at least as to simple eye conditions, correct?

A As an optometrist, yes.

Q So that means someone has pink eye, right, you could diagnose someone with pink eye?

A Correct and treat it.

Q You could diagnose that somebody has a piece of debris in their eye, right?

A Correct.

Q And you can give them contacts and you can give them glasses, prescriptions correct?

A Correct.

Q Other than that, you cannot diagnose any medical condition even as to the eye, isn't that right?

A No.

Q You could actually make a medical diagnosis as to glaucoma?

A I could.

Q And you could treat that?

A Again depending on the state, what the state licensing allows for optometrists, some will allow optometrists to treat glaucoma for example up to a certain stage and then they must involve an ophthalmologist and almost specifically a retina specialist.

Q What about in the state you reside in, they allow you to do that?

A I would need to be working with an ophthalmologist but it is in a co-referral basis.

Q So essentially though when you say you treat it you cannot treat it by yourself, you have to have a medical doctor overseeing your work, correct?

A Well I would be working with him, yes.

Q And that is so they can ensure that when you are talking about medical conditions that you are not properly trained for that according to state licensing, correct?

A It depends on the condition.

Q Again, other than the simple conditions that I have discussed you have to involve an ophthalmologist, correct?

A Actually again I have to disagree with you, I do

not. There are other conditions, other retinal conditions, for example such as macular degeneration or congenital conditions which may or may not involve any treatment whatsoever yet I am qualified to diagnose those.

Q Okay, so if they don't need to receive treatment you can say that but if they actually need treatment you have to go to a medical doctor?

A Yes.

Q As far as the clinical research, I just want to ask a follow-up question, the one paper that you did the drug evaluation classification and using ocular signs that was basically just a summary of the program, correct?

A Correct.

Q So it did not actually involve you conducting a study, correct?

A Correct.

Q Now the nystagmus and intoxicated individuals, did you actually set up the methodology and the protocol?

A Yes I did.

Q And that was the only occasion you have ever done that, is that correct?

A Of what you have there, there is another study that has now been accepted for a publication which the journal has informed me will be published in December of 2011.

Q That is not on any of these topics though, right?

A Yes it is.

Q What is that?

A That paper investigated the effect of sleep deprivation on field sobriety testing so HGN, VGN and the other field sobriety tests.

Q But not drugs?

A But not drugs, correct.

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

MR. WELLS: Very briefly Your Honor.

BY MR. WELLS:

Q Doctor, they talked about well actually Mr. DeLeonardo was asking, was making it sound like you can only basically only diagnose pink eye, is that true?

A No.

Q Can you let the Court know a little bit more as to what you can diagnose?

A Oh certainly. For example, if a patient has the inflammation of the iris, the colored part of the eye, which typically is a very painful situation we can treat that directly without involving a medical doctor because that very often very commonly is treated with drops as well.

Certainly all of the visual conditions such as if someone needs glasses or contact lenses or someone's eyes don't align properly or someone has visual perception problems, color vision problems, difficulty with using both

eyes together, difficulty with being able to use their vision properly using their eyes properly. We can certainly diagnose and treat that. Those are also recognized as medical conditions.

Q With regards not just to treating but to diagnosing, you can do a little bit more than just check for stigmatism, is that correct?

A Yes.

Q With regards to payment, you indicated that sometimes in the past you had been paid to testify, are you being paid to be here today?

A Actually I have never accepted monies for testifying.

Q Was any money offered or paid for or given to you to testify here today?

A Only my travel expenses.

Q There was some discussion as to the difference between a technical report versus peer reviewed report. Can a technical report even though not peer reviewed still be accurate?

A Yes.

Q Just because a report is not necessarily peer reviewed, does that necessarily mean anything negative about that report?

A Not immediately no.

Q What is the difference between a technical report versus a peer reviewed report?

A Well I have already described essentially the peer review process where the technical report the agency or the organization that is seeking the work, seeking the study to be done.

They typically will commission that, have the authors, the researchers prepare a report at the end of that and that is then submitted to them.

Whether that is peer reviewed or not and then if that agency, if that organization then decides to publish that to make that available to the public in any way they want that is their call.

MR. WELLS: Your Honor, again, the State would move to admit the doctor in the following fields, optometry, clinical research, DRE in general, horizontal gaze nystagmus, vertical gaze nystagmus and nystagmus in general.

MR. CRUICKSHANK: Just a quick follow-up.

BY MR. CRUICKSHANK:

Q You have no clinical research experience in anything, any drug but alcohol?

A Correct.

Q That would mean that you have no clinical research experience in any of the DRE drug categories other than alcohol?

A Correct.

Q You have had two opportunities to do research in alcohol, one is published and one is going to be published in 2011?

A Correct, yes.

Q Thank you.

MR. CRUICKSHANK : As to the field of optometry, Your Honor, I believe that the doctor is well qualified in the field of optometry.

But when we are talking about clinical research I don't think you can be an expert in clinical research when the only clinical research you have is one paper published in alcohol because we are talking about specific kinds of clinical research.

We have, just expertise generally, we have one paper published, we have one on the way and I am not sure that is going to provide the Court with the level of expertise that this case needs in that this case is dealing with drug categories that this expert has never been published in, research, clinical research.

MR. DeLEONARDO: Your Honor I will take a separate point and I guess my point on this is that what we found out is that he is not a medical doctor.

He is not qualified to diagnose but as he described simple eye conditions and even assuming that some conditions

like glaucoma again it is one it is all limited to the eye specifically, number one.

Number two, he even admitted that beyond that he would have to consult with physicians which means that even in the medical community he is not seen as having the level of expertise to diagnose general medical conditions.

The DRE protocol as was pointed out involves an exclusion of medical impairment and involves different medical protocols none of which this witness has testified that he is able to do.

So I would object to him being able to essentially testify as to any issues regarding the DRE protocol other than the eyes of HGN and VGN or lack of convergence I think those are all fair topics.

But beyond that, it requires a medical assessment of how signs and symptoms are interpreted and how you can make a diagnosis which he is not qualified to do.

He couldn’t diagnose someone, for example, with diabetes so my question would be then how is he now an expert to testify as to the issues assuming even he can he certainly cannot treat it and he cannot prescribe medication and he has not done any medication monitoring in that sense other than in conjunction with an ophthalmologist or a medical doctor of some sort.

So I am at a bit of a loss that of all the people

in this country and such this wonderfully wide accepted program the best that we get is an optometrist who is not a medical doctor, cannot diagnose medical issues, cannot prescribe medication, never done any research or methodology in the field of drugs or the effect of drugs on the body much less as to driving as to anything. There is nothing.

So I would strongly object to him being qualified as an expert in anything but the eye issues of HGN and VGN and lack of convergence as to the protocol.

MR. WELLS: Your Honor with regards to that, it is not what he said, he did not say that he cannot diagnose anything except for very simple things. He can diagnose glaucoma, the main differentiation that Mr. DeLeonardo is neglecting to mention is he cannot treat. He can diagnose.

He does not have to worry about it, he does not deal with --

THE COURT: Well the test for glaucoma essentially is testing eye pressure. I know because I have it. But Mr. Wells I want to hear you on the issue of why Dr. Citek should be accepted as an expert in any other area except the eye as it pertains to HGN, et cetera.

MR. WELLS: Well Your Honor with regards to DRE in general, he teaches in the DRE school he is very familiar with that. He has participated in I believe he said close to 100 evaluations of intoxicated individuals.

He is intimately familiar with the DRE protocols in general as well. So he knows that, he knows that back to front. He not only has taken parts of the courses he teaches parts of the courses, he speaks as to the issues with regards to the eye itself as well.

Additionally, he is familiar with the field sobriety test because of and through the DRE protocol. This is not something where he is not exposed to, it is not something where he is not intimately involved in.

He has been through the evaluations themselves and knows how these things go on. Additionally with regards to the schooling that he took, actually if you would permit I can ask him a little bit more information as to any teaching with regards to say field sobriety tests.

But he is familiar with that, he does have experience with it and through his knowledge, training and experience not just as an optometrist but also in his schooling they talk about certain issues with regards to the field sobriety tests, not named FST's but generally speaking that kind of thing.

THE COURT: How important is it for him to have experience in clinical research involving other CNS depressants other than alcohol?

MR. WELLS: Your Honor, what I am offering him as an expert it is an expert in the process of clinical research

in general. It does not have to be specific to drugs, it can be specific to how to do the process in general.

I do not see a need to differentiate and that is not what I am asking is that he is an expert in only drunk driving clinical research, he is an expert because he has published so many different times, so many different things not just those two that were presented.

He is intimately familiar with the process that it takes to do clinical research.

THE COURT: So just so I am clear, is there a proffer about what opinion you are going to ask him to render regarding clinical research?

MR. WELLS: I am going to ask him his opinions on some of the, generally some of the underlying studies that are the basis and the support for the DRE program generally.

I am not going to go into a whole lot of detail with him but he is familiar with them and he is familiar with the process that they took to become published and he is also familiar with those individual studies that I will be addressing.

THE COURT: Familiar with those studies in terms of having read the studies?

MR. WELLS: Yes, having read the studies, having looked at what they say and specifically the strengths and weaknesses of those studies.

THE COURT: You have tendered Dr. Citek as an expert in optometry, clinical research and was there a third area?

MR. WELLS: Vertical gaze nystagmus, horizontal gaze nystagmus which would be under optometry, nystagmus in general which would be under optometry and the DRE protocol in general.

THE COURT: Well, the definition of an expert is one who has specialized knowledge or training which may be of assistance to the Court and may have probative value.

I am going to accept Dr. Citek as tendered by the State. I think the issues raised by Mr. Cruickshank and Mr. DeLeonardo are primarily issues which go more to weight than to the admissibility or the qualification of the witness as an expert.

MR. CRUICKSHANK: I appreciate that and just to clarify the objection that I had as to the DRE protocol was I do not believe he is qualified to testify as to the symptomatology that is created by the administration of drugs on the human body.

THE COURT: Well I am not hearing that that is what he is going to be.

MR. CRUICKSHANK: Okay, well if that is not what he is saying then that was the objection I had as to the protocol. If he is not testifying as to symptomatology then

fine.

MR. WELLS: No and actually as a matter of fact I am going to have him testifying as to the symptomatology matrix and how it has been taught to him as an optometrist, he has been taught these things.

I can go through in more detail if you would prefer but he will be able to indicate how a CNS depressant affects the eye or marijuana or any of the other things. He definitely can testify to that based upon his knowledge, training and experience.

MR. CRUICKSHANK: Certainly he can testify to what he has been taught as a DRE. The baseline issue is that he is being offered as an expert on what those underlying drugs mean pharmacologically and the effect that they have on the human body and that is something that he is not qualified for by education nor through clinical research. So that is the distinction, Your Honor.

MR. WELLS: Your Honor, then I would like to ask more questions of the expert to make sure that it is clear that he can do that.

THE COURT: All right.

BY MR. WELLS:

Q Doctor, clearly you were present with regards to the argument with regards to your ability to testify with expertise.

With regards to the symptomatology of certain drugs on the eyes, have you had any training or any knowledge or any experience with regards to how say CNS depressant affects the eyes or marijuana or any of those things?

With regards to the symptomatology matrix itself of the DRE protocol, what gives you the expertise, the ability to testify as to the accuracy of the symptomatology matrix with regards to the eye issues?

A Much of the underlying basis of that, much of the background information of that actually was presented to me when I was in optometry school when we went through, I forget if it was one of the pharmacology courses or one of the systemic disease courses, but one of the textbooks we used a large volume about three or four inches thick called, Cecils Textbook of Medicine one of the chapters that we reviewed was on drug abuse and the effects of different drugs on the body and on the eye.

So certainly that was presented as part of my education. Since then of course in becoming familiar with the DRE protocol, like I said I have reviewed that as I was going to say earlier, I had reviewed that along with the papers that were the basis of the DRE protocol and with the other information that I had.

Just as a side piece, clinically in addition to doing pressure checks for glaucoma, for example, optometrists

will routinely measure blood pressure and pulse.

Now not every optometrist does it on every single patient but certainly on a first time visit and as a screening we would do that simply because we know that increased blood pressure that is around for too long may be a condition known as hypertension, that could lead to changes in the eye, that could lead to changes in how someone sees.

Diabetes likewise could lead to changes in the eye that are easily recognizable that we can differentiate.

So our eye exams will look for things like that and I will be able to diagnose the condition but to make a referral to get treatment for hypertension or treatment for diabetes or treatment of any other medical condition that is when I would properly need to make the referral.

I believe I do have that education and that background and that experience. Again, I think what the Court needs to realize is what defense counsel is primarily looking at is whether or not I can treat those conditions.

Certainly I could not and I would not want to have that responsibility as an optometrist but I can certainly recognize them, diagnose them and then make the appropriate referrals.

Q Now with regards to field sobrieties as they are listed in the DRE protocol, was there any corroborative education or training that you received in optometry school

and in your practice with regards to the basic field sobrieties. The law can turn the neurological psychophysical tests is what I am asking about.

A Well all the field sobriety tests are based on neurological examinations, simple neurological tests that a doctor who either an ear, nose and throat doctor who specializes in the vestibular system or a neurologist might perform.

They will do a walking test or a balancing test very similar to the walk and turn test and the one leg stand test and the Rhomberg balance test. They won't do it in exactly the same way but it will be very similar to it.

So the basis is the same, the underlying basis, is exactly the same and yes I did receive that as part of my education learning about neurological conditions and their effects and how they are tested.

Since then I have even helped teach some of those. Several years back at the Tennessee Police Academy, for example, when I was doing a presentation on HGN the afternoon involved teaching the field sobriety tests to the cadets and a couple of the instructors were absent that day so I was asked to step in and assist in that education.

So yes I am familiar with them and I even know how to teach them.

MR. WELLS: Your Honor, again I would tender him as

an expert and the ability to refer to and the diagnosis and the application of the different drugs and how they affect the eye movements and with regards to symptomatology of those drugs and with regards to DRE.

Clearly he knows all of this, he has testified, he has been taught this, he utilizes this in his diagnosis and his diagnosis despite the defense is trying to characterize him as so limited that he basically can only prescribe contacts, clearly it is a lot more than that.

He is very familiar with the symptomatology through his training in how the different drugs affect the eyes and with regards to the symptomatology in the DRE matrix.

BY MR. CRUICKSHANK:

Q You wrote a master's thesis Ph.D.?

A Yes sir.

Q Your dissertation wasn't in the general effective drugs on the human eye was it?

A No it was not.

Q To get your master's degree or your O.D., you do not recall how many classes you had in pharmacology?

A Not specifically no.

Q As someone who wants to talk about the effects of drugs on the human body, correct, because that is what happens in the matrix it deals with the effects of drugs on the human body?

A Yes.

Q You do not have a master's thesis that addressed that, correct?

A Correct.

Q You do not remember how many classes in pharmacokinetics you took do you?

A As I testified before, no.

Q Just going over ground again, okay. So when we talk about what you learned in optometry school, it goes back to a medical textbook, Cecils?

A That was one of the text that we used, yes.

Q One of the textbooks, okay. So the basis of your knowledge about the effects of drugs on a human body isn't that you have ever given someone a CNS depressant who is your patient, is it?

A Correct.

Q You have never dosed somebody with a therapeutic dose of CNS depressant?

A I have not, no.

Q Have you ever given a patient -- excuse me, strike that. So you never evaluated a patient for a doctor and provided a written opinion on the dosage of medication, is that accurate?

A Correct I have not.

Q When you were in optometry school it is fair to say

that you did not study toxicology?

A Correct.

Q You did not study forensic toxicology?

A Correct.

Q As someone who is an optometrist you have never made a drug dosage adjustment opinion based on pharmacokinetics calculations?

A Not for oral medications, no.

Q As someone who wants to be qualified in clinical research as to the effects of drugs on the human body, you have never dosed somebody with a therapeutic drug of any of the drug categories in the matrix, correct?

A Correct.

MR. CRUICKSHANK: Thank you.

MR. DeLEONARDO: Just a couple quick questions.

BY MR. DeLEONARDO:

Q As far as the medical side now, step 2 in the DRE protocol is determining that someone is impaired but not from a medical condition, correct?

A Yes.

Q So you are excluding all medical conditions to explain the symptomatology that is being seen, correct?

A Yes.

Q In medical school they actually specifically go into all the different components of the human anatomy and

human body, correct?

A Correct.

Q Cardiovascular, neurology, right?

A Skeletal system, all of that yes.

Q Skeletal systems all that, correct? That is part of the medical training that goes into understanding what effects a drug will have on the body and what it will have on the body when someone has certain medical conditions, for example hypertension, right?

A Correct.

Q None of that training you have had, correct?

A No, I had a class in gross anatomy, we had classes in systemic disease where we looked at these conditions so yes that was part of my education.

Q You took a class in optometry for just basically an introductory class to that is it not?

A Well we actually worked with cadavers.

Q But again, you did not do two years in medical school on this did you?

A No I did not.

Q You did not do subsequent to that an internship --

MR. WELLS: Objection, asked and answered, we have been through this.

THE COURT: Sustained.

BY MR. DeLEONARDO:

Q Have you ever been asked in your professional career, are you capable of distinguishing between someone who has a drug impairment versus an underlying medical condition?

A It has come up and on average in our clinics, the clinics that we oversee not that I have seen personally each time, but the clinics that Pacific University oversees on average once each semester one of our interns or one of our doctors conducts an examination on a patient who comes in under the influence, so it is something that we teach about.

Q But you do not do it?

A Not on a regular basis, no.

Q But you just said you never know that.

A I am trying to think if any of my patients ever came in under the influence of anything that we had to differentiate, I don't think that has happened but I know it has happened to my colleagues and my students.

Q So someone else may have done it but not you.

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

THE COURT: Doctor, with regard to the classes that you teach in your role as an adjunct professor and courses that you teach to law enforcement, do you ever have subjects that are given various controlled substances in order to observe the effects for teaching purposes?

THE WITNESS: For teaching purposes, the only controlled substance we use, the only safe substance we use

is alcohol.

THE COURT: Okay. My other question is, when you have been qualified in other courts to testify have you been accepted as an expert with regard to the symptoms of various substances?

THE WITNESS: Yes I have.

THE COURT: I am going to accept the doctor as tendered. I do believe that the issues raised by Mr. Cruickshank and Mr. DeLeonardo go primarily to weight.

Now that we have gotten through the voir dire process, do we have an estimate as to how long, Mr. Cruickshank, how long you will need to do direct of Dr. Citek?

MR. WELLS: Mr. Wells.

THE COURT: I am sorry.

MR. WELLS: That is okay. With regards to direct, Your Honor, I expect probably about two hours I think give or take.

THE COURT: Okay. All right, very brief cross I am sure (laughing)?

MR. CRUICKSHANK: Yes, Your Honor, absolutely I am sure by lunch.

THE COURT: Let’s take a 15 minute recess. I am sure Dr. Citek does not want to stay on the stand for another two hours and for planning purposes we will recess for lunch

around 12:30 and then this room will be secured so counsel you can leave your materials on the trial table if you so choose.

THE CLERK: All rise.

(Whereupon, a brief recess was taken.)

THE CLERK: All rise.

THE COURT: Be seated please.

MR. DAGGETT: We are recalling all the cases involving the DRE motions hearing.

THE COURT: All right.

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 my clients.

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

MR. WELLS: For the record, Adam Wells spelled W-e-l-l-s on behalf of the State continue with direct examination of Dr. Citek.

THE COURT: All right, Doctor you are still under oath.

THE WITNESS: Thank you Your Honor.

DIRECT EXAMINATION

BY MR. WELLS:

Q Dr. Citek, generally speaking can you just go over the general portions of the eye and explain generally how the

eye works to the Judge?

A I will try to keep this relatively short and relatively simple. There are a lot of different components to the eye that we need to consider and I will just start with some basic anatomy.

The first is just describing what you can see very easily when looking at someone. The clear window at the front of the eye is known as the cornea, that is the most powerful optical surface within the eye that does most of the focusing of the light for it to eventually get to the back of the eye to be focused there.

The cornea is where a contact lense would be placed if someone were to wear contact lenses as a refractive correction. The cornea is also the part of the eye that would be zapped by a laser if they have laser eye surgery done, that is a clear window.

So that needs to be relatively clear, it needs to be working properly just to focus light properly, to start focusing light properly onto the back of the eye.

The remainder of the structure of the eyeball itself is what you see is the white of the eye is the sclera, and that is spelled s-c-l-e-r-a, that is a hard structure it actually has multiple layers to it but just again keeping it very simple that is what allows the eyeball to maintain its shape that is the structural component.

On the top of the sclera is a thin membrane called the conjunctiva, that is spelled c-o-n-j-u-n-c-t-i-v-a. The conjunctiva has firm attachment at the junction between the sclera and the cornea so where the white of the eye ends and the clear cornea begins there is a firm attachment there.

The conjunctiva also is continuous, it is a thin membrane that overlies the sclera and it continues onto the inside of the two lids. It basically behaves to prevent material debris, any foreign substances, from getting to the back of the eye.

By way of analogy, if you are familiar with kayakers and especially sea kayakers they typically wear a special rubber suit not only to protect them in the water environment but the rubber suit has a little skirt around the waist that they will tack onto the boat and that prevents any water from getting into the boat. The conjunctiva behaves in the same way, it prevents anything from getting to the back of the eye.

Both the sclera and the conjunctiva have blood vessels within them and when those blood vessels dilate they will give a bloodshot appearance of possibly a pinkish or reddish glow.

So for example, when someone has conjunctivitis which is simply defined as an infection of the conjunctiva then the blood vessels there usually will dilate and that is

what gives the common appearance referred to pink eye.

If the blood vessels in the sclera, in the white part of the eye, dilate those will be more prominent they will be larger vessels and you actually will be able to see those and you will see them as typical blood vessels.

So when the eyes are dilated, when they are bloodshot very often will have dilation of the blood vessels not only of the conjunctiva but also of the sclera, the underlying white component of the eye.

Behind the cornea is the colored part of the eye, the iris. That has two muscles within it that control the opening in the iris known as the pupil. Those two muscles work as antagonistic muscles, they work against each other.

One is the dilator muscle, the other is the sphincter muscle and as their name suggests they have those functions. The dilator muscle causes the pupil to dilate, to become larger. The sphincter muscle causes the pupil to constrict or to become smaller.

As I mentioned they are antagonistic muscles, they will work against each other. So if one muscle contracts to achieve a particular function, the other muscle should relax to allow that function to occur.

Pupil dilation and constriction will happen under different conditions, physiological and environmental conditions. For example, when light level changes we expect

a change in pupil size.

Under normal circumstances if light level increases, if you go from a dark room into bright sunlight you would expect the pupils to constrict to limit the amount of light getting into the eye.

In that case, the sphincter muscle will do most of its work, the dilator releases some of its innervation, reduces its innervation to allow the sphincter to constrict.

When you go from a bright environment back into a dark environment, so I imagine going from a bright street into a movie theater that isn't very well lit, you would expect the pupils to dilate under that condition.

So there the effect of the two muscles is just the opposite. The dilator will now do most of its work and the sphincter will have reduced innervation to allow dilation to occur.

Dilation and constriction can also occur in response to physiological functions. For example, when we look up close and we change convergence, and I will describe the specifics of convergence later on, but just when we look up close to maintain single vision and we converge our eyes one of the things that occurs is that the pupils will constrict slightly.

This will allow a little bit more tolerance in the focusing mechanism than would otherwise occur and that is

something noticeable that can occur, so we get that pupil constriction with convergence.

Also if we are emotional aroused or stimulated the pupils will dilate. So under various states of excitement or arousal or stimulation very often you will have pupil dilation as well and that is a physiological response completely independent of light level and independent of anything else.

Those two muscles in the iris are controlled by different parts of the central nervous system, different components of the central nervous system. The dilator will be innervated by the sympathetic portion of the nervous system whereas the sphincter is innervated by the parasympathetic portion of the nervous system.

When the sympathetic nervous system kicks in that has been commonly been termed the fighter flight reflex, if you are ready for action you are ready to do something and one part of that response is to dilate the pupils, again regardless of light level, to dilate the pupils to try to get as much light information into the eye as possible.

Clarity at that point is not an issue, it is just a matter of getting light into the eye, that is the physiological response when we are threatened and this fighter flight reflex is initiated.

On the reverse side, the parasympathetic side has

been called the rest and digest system. When we are relaxed, when we are resting for instance after a meal the body basically shuts down so that it can digest the food that it has taken in and that it can distribute that through the rest of the body. At that point, your muscles become less tense you are more relaxed you may even fall asleep.

What happens to the pupil specifically is at that point the pupil will slightly constrict with respect to its baseline level, again regardless of what the light level is.

That becomes significant when we deal with medications either eye drops, for example, that can be distilled directly in the eye or systemic medications taken into the body that might mimic how one of these two systems work.

So probably the classic example is a central nervous system stimulant drug will mimic how the sympathetic nervous system acts in the body, muscles become tense, you are ready for action, you are ready to do something, in the eyes the response is that the pupils will dilate because it is mimicking that particular effect, the physiological effect.

Conversely, if the parasympathetic nervous system is innervated either directly with drops or systemically with medication, then the pupils will constrict. So that is the pharmacological effect.

Behind the iris is the lense of the eye. The lense changes focus as we look at objects at different distances. With age the lense loses its ability to change shape and that is when we need reading glasses, we need some optical correction to be able to see up close, to help us see up close.

There is not much more that goes on there except to say that the function of the lense is controlled by a single muscle, a ciliary muscle, that is spelled c-i-l-i-a-r-y, that when it contracts the lense changes shape to change focus for up close.

When the ciliary muscle relaxes, the lense goes back to a more flattened shape so that we can see clearly in the distance.

Again, pharmacologically some of the drugs that we might instill topically as eye drops will have an effect not only on the muscles of the iris but also on the ciliary muscle.

So as an example, where I think I testified earlier, with a condition known as iritis, iritis which is an inflammation of the iris. One of the drops that we typically use to relieve some of the pain that the patient may be feeling it actually prevents the ciliary muscle from working. It will basically knock that out and that reduces some of the pain response.

Systemically there is not going to be much that happens there, I just provide that information with systemic medications I should say there is typically not much that will affect the ciliary muscle I only provide it for completeness.

Between the cornea and the lense there is a fluid known as aqueous humor and that is spelled a-q-u-e-o-u-s. It is just a liquid that bathes the lense and is present in between the lense and the cornea.

Behind the lense is a more viscus fluid known as vitreous, that is spelled v-i-t-r-e-o-u-s. It is formed by the ciliary body, by the ciliary muscle, but it is somewhat more viscus. It is a fluid, it does replenish over time and it is really just there to allow the eye to maintain its shape.

With respect to certain conditions such as glaucoma where there might be an increased pressure in the eye, that is glaucoma is actually about a dozen or so different conditions that fall under that category.

The most common of which is that it occurs because of increased pressure within the eye and that increased pressure can come from any number of sources, either there is too much fluid produced inside the eye and it doesn’t drain quickly enough or the drainage of the fluid of the eye is blocked so the fluid production is correct but it doesn’t

drain out quickly enough to increase that pressure.

The difficulty with glaucoma and any of the variance of what may cause it occur at the retina. The retina is the back of the eye, the inside of the sclera, it has photo receptors that convert light energy ultimately into electrical energy which gets sent along the optic nerve through to the brain stem and to the brain for processing of the visual information.

The reason that glaucoma is such a terrible condition that we need to be aware of and treat if possible is that if pressure is increased within the eye and that pressure is maintained and does not decrease then it will lead to the death of those photo receptors and eventually the patient goes blind so we like to prevent that as much as possible.

Again, the most common treatments there are with medications, with eye drops that will affect how the ciliary muscle functions either in producing the fluids or in draining of the fluids.

There can be some surgical interventions also in end stage glaucoma, again that is completely aside from a pharmacological intervention.

Q All right Doctor, I am going to ask about specifically with regards to how the brain interacts with the eyes, specifically how it controls interacting eye perception

versus eye control.

A I was just building up to that. So, those are the basic structures of the globe of the eyeball itself and how the visual process starts.

Now around each eye are six muscles that control the movement of the eye with respect to the head. Those allow the eye to move side to side and up and down and even allow the eye to rotate slightly with respect to the head.

Those muscles are controlled by nerve centers that are located in the brain stem. The central nervous system has three basic components to it. The first is the cortex or the cerebrum what we typically classify as the brain or the gray matter, that is within our skulls.

The second component is the cerebellum which is a structure at the base of the head at the back located underneath the cortex and the third component is just the top of the spinal cord which has multiple subcomponents to it but I will just refer to it very simply as the brain stem.

Those three components make up the central nervous system. The remainder of the spinal cord makes up the peripheral nervous system.

When visual information comes in through the eyes that information is relayed via the optic nerve first to the brain stem and then relayed onto the cortex for processing of that visual information.

From the cortex after the visual information is processed and after other sensory information such as possibly hearing or balance information or even touch information is processed, those signals are coordinated by the cerebellum located at the base of the skull and then a signal or multiple signals are sent back to the brain stem to nerve centers that then tell the eye muscles, the ones that allow for eye movement, tell them what to do.

Now the eye muscles themselves are also arranged as antagonistic pairs or antagonistic groups so very much like the antagonistic muscles we had in the iris that controlled the pupil, the antagonistic pairs or groups that control eye movements will have similar effects, similar functions.

If an individual intends to move an eye in one direction then the muscle on that appropriate side needs to contract, it needs to pull.

The muscle on the opposite side needs to relax a bit to allow that action to occur and if the eye is to move in the opposite direction then the functions, the actions, need to reverse.

This is true for horizontal movements and for vertical movements and as I mentioned also for torsional or rotational movements.

All those eye movements are controlled by the nerve centers and brain stem that is where the signal comes from

and there are multiple nerve centers, there are one dozen pairs of nerve centers in the brain stem that control different aspects of basic life function.

Some of those nerve centers control the muscles of the face, the jaw and the tongue. Those allow us to take food into the body properly. Some of the nerve centers control basic life functions such as regulating or assisting in heart rate and breathing.

Three of the 12 pairs of nerve centers control the muscles in and around the eyes and that is their entire function, that is all they do. So this is a very basic system from the point of what we need to survive.

Human beings are very visual animals. Under normal circumstance, 85 percent of the information that we take in, the sensory information that we take in, comes in through the eyes, that is a pretty well accepted number.

That means vision should be reasonably good and we should have reasonably good control over our eyes to allow the visual process to occur properly.

Now in getting to the visual process itself, if we go back to the fovea and the different photo receptors there are two types of photo receptors, rods and cones.

Rods allow us to see under low light level conditions. They are primarily concentrated away from the center of the fovea. They don’t allow us to see color vision

and as a consequence they don't allow us very good ability to discriminate small details.

If you go out on a moonlit night, for example, and there is not other lighting available you might be able to see just fine but you will see everything in shades of gray.

You also will not be able to see details and if you actually wanted to look at something under a low light level condition like that you might do better by looking off to the side just a little bit rather than looking directly at the object.

When the light level increases, when there is enough light for the cones to function that is when they kick in. The cones come essentially in three different varieties so that allows us color vision. Not only are we able to discriminate small details but we can also see color.

The greatest concentration of the cones is in a small area that is about two to three degrees in diameter right at the center of the fovea.

When we say somebody has a particular visual acuity and you might be familiar with the number 20 over 20 as touted as being normal visual acuity whatever that number is usually we are talking about the ability to see small details with the center of the retina, with the fovea.

Away from the fovea the concentration of the cones decreases so that even as little as 10 degrees away the

acuity is only about one fifth as good as it is with the fovea.

That means with your peripheral vision, using your cones, you might be able to distinguish color but you cannot see details very well. That is why you need to use the fovea and align the fovea with the object that you are looking at in order to see the small details.

Yes you can detect things with your peripheral vision but if you want to see the details of it you need to move your eyes to that location so the fovea lines up with the object that you are looking at.

Now there is one more component of visual function, of visual perception and that is the fact that vision is in and of itself a divided attention task.

Central vision aside from the function of the fovea that essential two degrees, central vision is generally understood to encompass the central 20 degrees of someone's visual field. Everything beyond that is peripheral vision.

What will happen with individuals either if they have a disease, medical condition or intoxication where divided attention tasks are effected.

They will have difficulty performing the divided attention task of being able to pay attention to their central vision and their peripheral vision simultaneously and like with disability and other divided attention functions

they may only be able to pay attention to one.

When we go back to the function of the brain stem and the nerve centers that control the muscles around each eye, because there are pair of nerve centers that innervate the muscles of the eyes on both sides, both the right eye and the left eye, those nerve centers of the brain stem need to coordinate if we are going to be moving our eyes in a coordinated fashion.

There are two basic types of movements. The first is a vergence movement where the eyes move in opposite directions. When we are looking straight ahead out into the distance, the lines of sight of the eyes are essentially parallel.

When we look up close, both eyes need to move in toward the nose disregarding any vertical change both eyes need to move in toward the nose to be able to maintain single vision, that is known as convergence. When we look back out into the distance that is known as divergence, again the eyes are moving in opposite directions.

The other type of movements are version movements and that is spelled v-e-r-s-i-o-n. Here they eyes move together, move in a coordinate fashion.

Both eyes will move to the right, both will move to the left, both eyes will move up or down as the case may be. They are moving together but they are not changing position

relative to each other. All of that is coordinated within the brain stem.

As far as version movements are concerned, there are two basic types saccade, spelled s-a-c-c-a-d-e, and smooth pursuits. Saccades are fast movements to reposition the foveas to an object of interest.

By a fast movement, a generally accepted speed of movement is about 300 degrees per second. There is some research that indicates that that speed may be as fast as 1,000 degrees per second.

What it means in a real world situation, the numbers sound quick they sound like they are something fast they are describing something fast but without context doesn't make much sense, so I will try to explain that.

If we hold our head still and move our eyes all the way to one side in one direction, the eye rotates through an angle of about 60 degrees.

If we were to rotate the eye all the way to the opposite direction that would be a rotation also of about 60 degrees but in the opposite direction so a full angle of about 120 degrees.

If we voluntarily choose to look from one side and without moving ahead look all the way to the other side as fast as possible and the eyes moved at a speed of about 300 degrees per second it would take about four tenths of a

second, less than half a second, to make that complete eye movement so that is a fast eye movement. That is how we describe that.

The major concern though with saccades is that during the movement itself active suppression of visual processing occurs. The brain stops processing visual information while the movement occurs and then only starts up again once the movement has stopped.

That is very different than what happens with the smooth pursuit eye movements. With the smooth pursuit eye movements we have a target that we follow and we keep the eyes on that target and there is constant feedback and we can see the target continuously and if there are any changes to the speed or the direction of the target that change can be done immediately.

Smooth pursuits are limited in their speed. Fastest smooth pursuits anywhere from about 90 to 100 degrees per second. There is some research that indicates that some individuals can make smooth pursuit movements faster than that, slightly faster than that but generally not beyond 100 degrees per second for most individuals.

What that would mean is that something moving across your visual field coming back to the 120 degree visual field visual movement, moving across your visual field in a time of a little bit more than one second that would

represent about 100 degrees per second.

Most normal individuals, most normal sober individuals and by most I mean about 90 percent can make smooth pursuit eye movements when they have a target to follow and they are following a target that moves in a regular fashion, a predictable fashion, and moves across most of their visual field.

They can move at speeds up to 30 degrees per second and of course most can actually go faster than that but most can go at that speed.

That number is relevant because that ties into how one component of the horizontal gaze nystagmus test is conducted because it calls for the officer to move the stimulus from the center of the suspect's gaze to the side in a time of about two seconds.

Well if that angle, if we go back to that angle of movement that was about 60 degrees, if the officer moves in a time of about two seconds then the movement is about 30 degrees per second.

For the next piece, the officer will move the stimulus from the suspect's left to the suspect's right to the maximum extent there in a time of about four seconds.

Again, that is going to be a speed of about 30 degrees per second because now that stimulus has moved through an angle of about 120 degrees in a time of about four

seconds dividing that through gets us to 30 degrees per second so it is why that is relevant.

As for now I think that is --

Q All right, describe for the Court what nystagmus is. What is nystagmus in general?

A Nystagmus in general is an involuntary repetitive movement of the eyes where the eyes will move back and forth quickly, typically quickly, usually over a small angle, a small amplitude sometimes over a slightly larger angle but it is usually an involuntary movement.

Now, nystagmus has been classified in a number of different ways. We can define it in terms of the type of movement that we observe which tells us nothing at all about what is causing it. We can define it based on a medical condition that might be producing it or we can define it based on an environmental condition that might be producing it.

With regard to type of movement, when the eye movement is actually recorded using some very fancy, very expensive recording instruments such as electrodes placed on either side of the head and the tracing of the eye is imprinted on a piece of paper.

If it is done with a video system, any type of recording system, different types of movement can be distinguished, the wave form, the type of movement, the most

common probably is classified as a beat or jerk nystagmus where the eyes drift slowly in one direction and jerk back quickly in the opposite direction.

There is also a pendulum nystagmus where the eyes move back and forth at pretty much equal speed in both directions. There are also wave forms described as saw tooth or triangle waves where the speed in one direction is just different from what might have been noted with either of the other two or the speed in both directions might be different.

In general, if someone is doing a casual observation a clinical screening test, for example, that we might do on our patients or when an officer observes a suspect before starting the eye test and is just looking in the eyes, looking for something that in the law enforcement literature is termed resting nystagmus.

You can really only distinguish two types of movement that would be a jerk nystagmus, a slow drift and a fast jerk and a fast jerk in the opposite direction or pendulum nystagmus. It would be much too difficult to try to distinguish any other types of movements. Again, that would be done for diagnostic purposes in a very different setting.

With regard to the medical conditions probably the most common is referred to as congenital nystagmus. The term congenital simply means that a condition is present from birth or develops shortly after birth. It doesn’t tell us

what the root cause is, it doesn't tell us why it is there but we just recognize that it has been there essentially for the person's entire life.

Congenital nystagmus can take virtually any form. The best estimate that I know of is that about half percent of the population, so about 1 in 200 individuals, who are sober and otherwise normal have some level, some form of congenital nystagmus.

That doesn't mean that 1 out of every 200 people that you might see their eyes are balancing all the time. It can be present all the time in which case it is termed a constant nystagmus or it may be present some of the time in which case it is termed an intermittent nystagmus.

I have seen individuals, I have seen patients in whom the nystagmus was only present when they were converging their eyes by a certain amount and absent otherwise or when they were only looking in one direction but not in any other direction.

We just saw a young patient a couple of weeks ago where the nystagmus would initiate when one eye was covered, when he was viewing with both eyes there was no nystagmus. So those are all different forms of congenital nystagmus.

There are some well known medical conditions, commonly accepted medical conditions with which nystagmus is associated. One of those is albinism which runs the spectrum

of lacking all of the pigmentation of the skin and hair to only lacking the pigmentation at the back of the eye. At that extreme it is referred to as ocular albinism.

Again, nystagmus will be present with that condition but usually that will be a constant nystagmus. So an officer observing someone who has albinism doing an evaluation on that person should recognize resting nystagmus and then would be prevented from doing the eye test, should not be doing the eye test simply because there would be no way for the officer or me or anybody else to distinguish nystagmus that is caused by intoxication versus the nystagmus that is there because of the medical condition.

There are certainly other medical conditions that have nystagmus associated with them. Probably a very common one also to consider is multiple sclerosis. Multiple sclerosis is a neurological condition in which lesions or plaques develop in various parts of the central nervous system.

Different parts of the central nervous system will be affected for different individuals so not everyone will present with exactly the same signs and symptoms but when somebody with MS has eye signs they may show one eye movement that looks essentially like someone who is intoxicated but they will be lacking the other eye movements that are consistent with intoxication.

When I teach officers about the HGN test, for example which I am sure we will get into detail in just a little bit, two of the words I use commonly in training are consistency and symmetry. One of the pieces to look for is consistency not only of conducting of the test, performing it, making sure the protocol is right but also consistency in the observation.

If an officer makes an observation of an abnormal eye movement in some cases there are going to be many situations where he would expect to see other abnormal eye movements and if he does not do so and he knows that he did the testing correctly then he would label that a medical condition even though that one abnormal eye movement looked to be consistent with intoxication. If the others are not there then the officer would call it a medical condition or term it a medical rule out.

The other piece is symmetry. Very often what happens with neurological conditions, with medical conditions especially trauma is that the two parts of the body are affected in different ways.

The right eye might respond differently than the left eye, the right eye might function differently from the left eye as a result of that particular medical condition.

With alcohol and drugs assuming someone is physiologically normal to begin with, we would expect that

both parts of the body, both eyes, are affected in essentially the same manner so that an officer would not expect to see a very asymmetric response, very asymmetric performance of an individual.

Q Such as what? What do you mean by asymmetric?

A Well, as one example in the DRE protocol the officer will have the suspect do the one leg stand twice, once when standing on the right foot, once when standing on the left foot.

One of the reasons to do that is to rule out a medical condition because if let's say the suspect cannot balance when he is standing on his left leg but balances perfectly showing no clues of impairment when balancing on his right leg that would be inconsistent with intoxication because intoxication should affect both pretty much equally.

The same thing will happen in the eyes. If an officer observes, let's say all of the clues on a horizontal gaze nystagmus test on the left eye but none on the right eye that is not consistent with what drugs and alcohol do and how they affect the function of the eyes.

Q Now with regards to that and the medical rule outs, I don't want to get into too much detail with regards to that at this point but the indications that you have spoken of or the signs, are these easily determinable by someone who is trained to do HGN?

A Yes, to the point where the officers have come up with a saying, which I like very much, especially with regards to the HGN test and that is if you have to look hard and imagine that you are seeing the sign, the sign is not there. The signs are typically easily recognizable, obviously there is no question about them.

Q Okay.

A Now with regards to other nystagmus, a third major category of nystagmus that induced by environmental conditions there are any number of things that we can do to even a normal sober individual who does not have nystagmus under any other circumstance to initiate nystagmus.

The vestibular system, for example, which controls our sense of balance and knowing where we are in the world that has input to eye movements as well.

One of the most common reflexes to consider is the vestibulo ocular reflex which occurs when we move our heads from one side to the other the vestibular system will send a signal to the brain stem via the cerebellum to the brain stem to move the eyes in a direction opposite the head movement.

That allows us to maintain fixation straight ahead as we move through the environment with our heads moving side to side by just a little bit. So in that case the vestibular system will contribute to smooth pursuit eye movements and actually makes smooth pursuit eye movements better.

If we take away the visual stimulus, if we put someone in the dark and record either with an infrared camera or electrodes and look at the eye movements, when the head is moving side to side at that point we might see a slow drift in eye movement which would be consistent with the vestibulo ocular reflex but if we move the head fast enough we might also initiate nystagmus which comes about from rotating the head, from turning the head side to side.

That particular nystagmus is actually suppressed when you have a visual stimulus, when you can actually see something. So in the dark if you shake your head side to side the eyes might demonstrate nystagmus but that won't happen if you are actually looking at something.

There are other environmental conditions as well. A diagnostic test that ear, nose and throat doctors who specialize in the vestibular system or neurologists who are looking to determine any brain function on someone who may be unconscious or in a coma.

They will install warm water in one ear or warm air in one ear and cold water or cold air into the other ear to initiate something we will refer to as caloric nystagmus. That nystagmus will happen when the individual is looking straight ahead, it is going to be a jerk nystagmus and when it is there it is going to be very obvious and very prominent.

That usually will not happen in most individuals under normal circumstances and typically it is a good thing that it doesn't happen under the regular circumstances, it won't happen if you just step out of the shower or swimming pool and have water in one ear. Your sense of balance may be a little bit off if there is some water trapped there but it typically will not induce caloric nystagmus because the temperature difference isn't there.

One of the things that the doctors who do this diagnostic testing are intimately aware of is that if the temperature difference is maintained for more than about 20 or 30 seconds than even a normal sober subject will vomit. We don't see that on a normal basis under normal circumstances.

There are other, certainly other conditions as well. One of those types of nystagmus that is also encountered very frequently is referred to optokinetic nystagmus.

You can experience this if you are sitting at a railroad crossing watching a freight train go by. Your eyes will follow the train as it is moving and if you don't move your head your eyes will just follow and then jerk back, follow and jerk back.

If someone were to look at your eyes they would observe nystagmus. What optokinetic nystagmus requires is

that you pay attention to the moving stimulus.

Where it has become an issue in law enforcement and specifically in conducting the eye movement test at roadside is that the argument has been made that some movement behind the officer whether it was traffic or maybe a freight train going by or back when police cars had rotating lights, the lights were shining on a wall behind the officer or the lights were shining directly into the suspect's eyes that that movement induced the nystagmus that the officer observed and mistook for something being caused by intoxication.

In fact, during the test the suspect should have his fixation on the stimulus that the officer is presenting. That stimulus can be the officer's finger, a pen, a pen light depending on lighting conditions, it could be any relatively large object like that.

Regardless of what is going on behind the officer, the suspect is focused on that particular stimulus. The optokinetic response is mediated by central vision so if the suspect is using his central vision to pay attention to the stimulus that the officer is moving then any movement of any object behind the officer is irrelevant.

If optokinetic nystagmus were present if an officer is doing this test at roadside then right off the bat even before the start of the test when the suspect is facing the traffic the officer should observe resting nystagmus.

The fact that he does not mean that in fact optokinetic is not an issue, it will not come in. Again, as long as the suspect is not paying attention to that moving stimulus but paying attention to the officer's stimulus.

Q Okay, so it is readily discernable from the horizontal gaze nystagmus?

A Yes, right from the outset it would be present when the suspect is looking straight ahead.

Q Okay.

A Rather than only when looking off to the side is what the officer expects.

Now one other issue with medical conditions, there are two competing discussions that go on repeatedly in some of the literature that discusses nystagmus and those are whether nystagmus affects visual acuity, affects visual function or that it does not. Both of true, both of those statements are true to some extent.

Q I am sorry, can you say that again? Explain that a little bit more.

A The question is, does nystagmus affect visual acuity? Does it reduce visual acuity? Does it degrade vision or does it have no affect on vision?

Q Okay.

A And the answer to that is that each statement may be true depending on the type of nystagmus that the

individual has.

If the nystagmus is long standing, so if someone has congenital nystagmus that is present all the time or that is present because of another medical condition such as albinism or anything else for that matter.

In general, the brain will have learned how to adapt to the constantly moving eyes and in fact if we took a careful recording of the eye movements we would see that the eyes generally stop for sometimes as little as a tenth of a second but that is enough time to pick up visual information. That is enough time for that person to process visual information and see almost like any other normal person would.

So unless there are other problems with the person's eyes or the person's vision, we don't expect vision to be affected all that much under normal circumstances.

However, if the nystagmus only started recently and we typically refer to that as an acquired nystagmus of recent onset, that will affect vision because the individual has not yet learned, his brain has not yet adapted to the eyes moving, and we can characterize that nystagmus.

Very often it is a jerk nystagmus, we can characterize the fast movement of the nystagmus as a saccade. We know during a saccade visual processing is suppressed, it stops.

Q Now with regards to that is the introduction of something which would cause, obviously like a CNS depressant, would that cause what you were just talking about?

A The acquired nystagmus of recent onset.

Q So a drug, somebody under the influence and showing nystagmus that would impair their ability to see correctly?

A I believe so yes and there is actually, there are actually some clinical reports which I am familiar that do report that.

Q Okay. Just generally I don't want to spend a whole lot of time on all the other types of nystagmus, what other types of nystagmus are there, like post-rotational I believe that is one as well?

A Right, rotational, post-rotational, there is also end point nystagmus which is a normal response about half to two-thirds of normal individuals when they move their eyes to an extreme lateral gaze position there will be a little bit of nystagmus.

It may be somewhat related to the second component of the HGN test when an officer checks for a distinct and sustained nystagmus of maximum deviation but it does differ usually in two very specific ways.

First, normal end point nystagmus usually is of small amplitude so that means it is not distinct. It means it might not be readily noticeable to someone just looking at

the individual looking at the person's eyes.

Second is that end point nystagmus usually is not sustained. When an officer conducts that component of the HGN test he holds the stimulus out at maximum deviation for a minimum of four seconds.

Usually end point nystagmus if it is present at all and noticeable at all it will go away within one to two seconds. So even though maybe as many as two-thirds of normal individuals have end point nystagmus it will never, it should never be confused for anything caused by intoxication if the officer does the testing correctly.

Q And post-rotational nystagmus, what is that?

A That is a vestibular system function. Imagine being on a carnival ride or the teacup ride at Disney that spins you around, initially when you start spinning in a constant direction at a constant speed you will exhibit rotational nystagmus.

Once you stop spinning, after a few minutes your will adapt certainly after a few seconds physiologically you will adapt after a few minutes psychologically, cognitively you might adapt to the movement.

But as soon as you stop spinning, as soon as you stop rotating you might have an after effect where you feel now you are spinning in the opposite direction when in fact you are standing still or sitting still.

If we were to look at the eyes immediately after you stop moving there would be a post-rotational after effect where now the nystagmus that is present occurs in the opposite direction to the rotational nystagmus that had been present when you started spinning that usually goes away within about 20 seconds.

Q How does that apply to with regards to real life and HGN tests?

A In some cases, the argument has been made that because the suspect who was tested was either in a spin out or a roll over crash immediately before the officer did the testing the argument was made that what the officer observed was post-rotational nystagmus.

And knowing the ideology of that condition that it generally does not last for more than about 15 to 20 seconds unless the officer were in the vehicle with the suspect immediately after he stopped spinning he would never observe post-rotational nystagmus.

On top of that, it will be present in the resting position, it will be present when the individual is looking straight ahead and that is definitely a position of nystagmus that an officer is not looking for except for, with regard to drug intoxication, except for one very special situation.

Q So again, is that easily discernible from regular horizontal gaze nystagmus?

A Yes it is.

Q Okay.

THE COURT: All right, we are going to recess for lunch. We will resume at 1:30 and this room will be secure over the lunch recess.

THE CLERK: All rise.

(Luncheon recess was taken.)

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

THE COURT: Be seated please.

MR. WELLS: Good afternoon, Your Honor, for the record Adam Wells spelled W-e-l-l-s on behalf of the State and we are recalling the seven cases for the Frye-Reed hearing.

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

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

THE COURT: All right, we are resuming with direct examination of the witness, Doctor you are still under oath.

THE WITNESS: Thank you, Your Honor.

BY MR. WELLS:

Q Dr. Citek, we basically covered, and correct me if I am wrong, we basically covered nystagmus generally is that correct?

A Yes.

Q What I would like to do is direct your attention to specifically the horizontal gaze nystagmus test. How is it performed and what does it indicate?

A There are three subtests, three components, to horizontal gaze nystagmus or HGN test. Prior to performing the test itself there are a couple of pretests that an

officer will do.

One is to check for equal tracking, that is just to see that the eyes can move together and have full range of motion. The second is to check for equal pupils because if the pupils are not of equal size and it is not a condition that has previously been documented for that individual it might indicate they have recent head injury and third is to checking for resting nystagmus, it is a nystagmus when the individual and the suspect is just looking straight ahead.

If equal tracking is not present then there might be difficulty doing one or more of the components of the actual test itself.

If pupils are not of equal size and on further questioning the officer determines that the suspect has recently suffered head injury then he would not be doing the test either for fear that the head injury might be causing the impairment rather than any presumed intoxication.

Likewise if resting nystagmus is present the testing could not be done because as I have testified earlier it would be difficult to distinguish nystagmus caused by intoxication versus whatever might be there because of a medical or congenital condition with one exception.

The major exception to that is the use of a disassociated anesthetic such as phencyclidine or PCP. That in some individuals at high enough doses may cause what an

officer views as resting nystagmus.

Although invariably by the time the officer would start the HGN test and start that portion of the test either at roadside or as part of a DRE evaluation, the officer will have witnessed, will have observed other behavioral factors, other behavioral conditions and physical conditions that would be consistent with PCP intoxication and not a medical condition, so an officer would be able to tell the difference at that point.

I know the SFST manual states that the presence of resting nystagmus may indicate PCP intoxication but again most officers should be able to tell the difference at that point that there is something else not right with this individual under that circumstance.

Q And that would be readily apparent?

A That should be readily apparent, yes, even for non-DRE.

Q Okay.

A The testing itself then, the three components of the HGN test are done in order, in the order in which a test is prescribed because that is the order in which the test components would be expected to appear with increasing levels of intoxication.

We know that to be consistent with alcohol intoxication and simply because the studies are either too

difficult to do or just have not been done with drugs other than alcohol we presume it to occur with central nervous system depressants, inhalants and disassociated anesthetics other than alcohol.

But certainly for alcohol we can say that the clues for the individual tests appear in the order of the conduct of the test with increasing levels of intoxication. The first component of the HGN test is to check for lack of smooth pursuit.

The second component is to check for distinct and sustained nystagmus at maximum deviation and the third component is to check for the onset of nystagmus prior to 45 degrees.

I have already described the protocol a little bit earlier on two of those so I will just review it very quickly at this point.

After the pretest, once the officer has set the suspect in the proper position be that standing or seated as necessary as long as the head is upright it doesn't make a difference -- actually there is one other component to the pretest.

The officer will ask questions about the suspect's vision, questions about his medical condition, any eye problems he might have and questions about contact lenses or glasses.

If the suspect is wearing glasses the officer will have the suspect remove the glasses also that the officer can see the eyes, the suspect's eyes, more easily.

Q Does a stigmatism or problems with visual acuity cause any problems with the horizontal gaze nystagmus?

A No it does not because the officer is using a fairly large stimulus, it is not close to threshold. When we measure somebody's visual acuity that is their threshold ability of just being able to see small details.

The officer at the working distance of 12 to 15 inches will use a stimulus such as his finger, pen, pen cap or a pen light or holding his finger over a pen light, all of which are large stimuli, all of which do not need the ability to see fine details.

So removing the glasses if it were somebody who has a severe correction and would need that to see clearly at a distance that is not going to be of consequence here.

Q How about with contacts, does that in any way affect the reliability or accuracy of the horizontal gaze nystagmus test?

A Actually, clinically we often use contact lenses for patients who have nystagmus because of a medical or congenital reason because it turns out that, I am not sure exactly of the mechanism the precise mechanism how it works, but the mechanism of having a contact lense on the eye

whether it is a soft lense or rigid lense doesn't make a difference.

But for some individuals there is a mechanical bio-feedback response that actually helps to reduce nystagmus in someone who has the condition for a medical reason.

That generally will not improve the vision beyond the optical correction itself but it does reduce the nystagmus so that it is less apparent to someone looking at the patient.

Personally in our clinic, our success rate with the patients I have worked with is about 50 percent of the patients to whom we prescribe contact lenses as opposed to spectacles find that they have a reduction in the nystagmus so they are cosmetically more acceptable.

It doesn't improve their vision beyond what the contact lenses would do or glasses would do themselves but it does look better.

By extension, now there have not been any studies done on this it may again somewhat difficult to do but by extension somebody who has an acquired nystagmus possibly because of intoxication and is wearing contact lenses, it is possible that wearing contact lenses may slow down or slightly reduce the nystagmus.

It certainly will not get rid of it completely but it may slow it down and reduce it.

If a suspect is wearing contact lenses that would only be a benefit to the suspect. Contact lenses do not induce nystagmus and they would not exacerbate or enhance nystagmus that someone might have for other reasons.

So if anything they would help to reduce the nystagmus, not eliminate it entirely, but reduce it or have no effect. So that still goes into the pretesting with regard to the questions.

With the test itself, the officer places the suspect in the proper posture with the head still again the suspect could be standing or seated as needed. He will hold a stimulus 12 to 15 inches from the eyes and about two inches above eye level. Again, that is for the benefit of opening the eyelids so that the officer can see the eyes more easily.

It is of no consequence that the stimulus is slightly above eye level as opposed to at a perfectly horizontal eye level we are still testing essentially horizontal movements and all six eye muscles for each eye are still working regardless of where the suspect is looking and how he is looking.

Q How about the 12 to 15 inch range out from the eye?

A The 12 to 15 inch distance holding the stimulus from the eye at that distance is set primarily for standardization and for officer's safety.

Holding the stimulus that far away requires the

officer to stand about arms length away from the suspect. That becomes very safe for the officer in two regards. First, it allows the officer to maintain control of the suspect because the suspect is still within arms length but also because the officer can use his peripheral vision to observe what the suspect might be doing with his hands, if he is clenching his fists or grabbing onto the side of his pants or something, the officer will notice that with his peripheral vision.

If the suspect tries to make a move toward the officer maybe to go for his weapon or something else, the officer will be able to see that well before any of that action occurs.

From a scientific standpoint, from a medical standpoint there is absolutely nothing that requires the stimulus to be at that distance.

If the stimulus were at a further distance it simply would mean that the officer would have to move faster to maintain the same angular speed for the lack of smooth pursuit component of the test and it would mean that the officer would need to move further away to do the other parts of the test.

That is unsafe for the officer because now he is no longer in direct control of the suspect. If the officer were to hold the stimulus closer than 12 inches invariably the

officer will also step closer to the suspect and again that becomes an unsafe situation for the officer.

So there is nothing special about 12 to 15 other than it is very safe for the officer and allows the officer to maintain control of the suspect.

Q All right, continue.

A So with doing the lack of smooth pursuit component of the test, actually at that point the officer will start from the midline, start from the center, move the stimulus to his right or to the suspect's left out to maximum deviation in a time of about two seconds and then immediately move the stimulus back in the opposite direction now going to the suspect's right to maximum deviation for that eye in a time of about four seconds, do another complete pass, one more complete pass and then once back toward the center.

So that the officer looks at both eyes separately in two separate passes, at least two separate passes. The officer will do those two passes and do two assessments of each of the components simply to confirm that if he saw a sign the first time around that it is present the second time around or if he missed a sign the first time around that it is absent the second time around.

If the officer is not sure whether a sign was present or absent on the first pass or the second pass, there is absolutely nothing that precludes the officer from doing a

third pass or even a fourth pass. Certainly, the testing does not take all that long, it is not that difficult to perform and to make an additional pass does not have any effect on the suspect's eyes or in the process itself.

But in most cases officers will either observe the clue the first time on one eye or on both eyes, confirm that it is there by observing it the second time and that is all they will need to do or confirming that it is absent on the second time. Again, that is all the officer will need to do.

After that, the officer will conduct the second component and check for distinct and sustained nystagmus at maximum deviation. Here the officer will simply move the stimulus to that maximum lateral extent first for the left eye of the suspect and hold the stimulus there for a minimum of four seconds.

As I described earlier, that will allow the officer to distinguish, if he were to observe nystagmus, would allow him to distinguish that from end point nystagmus that somebody might have naturally.

Again the distinguishing factors being that end point nystagmus usually is of small amplitude meaning it is not distinct and might be difficult to discern and that end point nystagmus does not sustain for that four second time period typically, so the officer checks the suspect's left eye, goes to check the right eye and then checks the left eye

and the right eye again.

Again, doing two checks just to confirm that the clue was either present or absent in both and if the officer is not sure or the suspect could not properly move his eyes to do that part of the test, again there is nothing to preclude the officer from doing that a third or a fourth time.

The only concern here and sometimes the one argument with doing multiple testing like this that is raised is that this could induce fatigue nystagmus in the suspect.

Fatigue nystagmus has absolutely nothing to do with sleep deprivation. Fatigue nystagmus occurs when you maintain your eyes at maximum deviation for an extended amount of time.

That time, as much as the research indicates for most individuals is well beyond 30 seconds and for some even beyond 60 seconds before that fatigue nystagmus kicks in and it has to be a continuous time period of 30 seconds or 60 seconds.

That does not enter into this testing at all. At most the officer is holding the stimulus out there for five, maybe six seconds at a time and then always coming back to center or looking in the other direction, looking off to the other side.

The last component then of the HGN test is to check

for the onset of nystagmus prior to 45 degrees. Here the officer will move the stimulus slowly at about half the speed at which he would conduct the lack of smooth pursuit component of the test moving from the center to the suspect's left until he gets to an angle of 45 degrees.

Forty-five degrees is an easy angle to estimate with practice because if you imagine a box that has equal lengths on all four sides the diagonal line between any two corners in any two opposite corners of the box defines an angle of 45 degrees.

So during their initial introduction to the HGN test and initial training, officers either will be provided with a piece of paper that has a box like that printed on it or they can draw their own on a piece of paper and practice estimating that 45 degree angle just in free space and all that takes is practice.

With practice, DRE's especially are requested to be able to estimate the angle at which nystagmus is observed if the angle is less than 45 degrees, so they don't automatically just go to that 45 degree angle they will stop as soon as they observe any nystagmus whatsoever when the eye is moving slowly out to the side and then hold the stimulus there for about one second just to confirm the nystagmus is there.

Again, DRE's especially who practice this can

estimate that angle not only to the nearest five degrees but even to the nearest one degree and they can do so without the use of a template, without the use of a protractor or any other equipment and that simply comes about because of practice, officers can do that.

Q Okay, so that part of the test is not hard to do?

A No, none of it is hard to do. So, for this part of the test again the officer will check the suspect's left eye first then the right eye then the left eye again and then the right eye again and again hopefully looking for consistent responses on both components of the subtest for both eyes.

Q Now what is vertical gaze nystagmus?

A Vertical gaze nystagmus is a stand alone test that originally was developed as part of the DRE protocol. In about 2002 it was also added to the standardized field sobriety test protocol to be done immediately after the HGN test.

As part of the DRE protocol it already would be done immediately after the HGN test but even for non-DRE officers they are now trained on how to do that as well.

The protocol there is the officer will bring the stimulus back to the midline, back to the center to a straight ahead gaze and then usually turn the stimulus sideways so he is holding horizontally either his finger or pen or pen light, hold it horizontally, and then move it up

to a maximum elevated position of the eyes for the suspect.

Again, the suspect is requested to keep his head still, keep his chin down and only move his eyes up and a positive finding on that would be to observe vertical nystagmus in that maximum up position upgaze position.

The officer again will hold the stimulus for a minimum of four seconds. So this is conducted in a manner similar to the check for nystagmus at maximum deviation in the horizontal plane but now it is just in the vertical plane.

Interestingly, alcohol and other drugs of intoxication that may cause vertical nystagmus will do so only for the individual looking up not when looking down. So there is no commensurate, there is no correlated nystagmus when looking down, it will only happen in upgaze.

Q Okay, with regards to horizontal gaze and vertical gaze nystagmus do you believe that if an officer is trained that they are able to perform those tests correctly?

A Yes.

Q Is there anything difficult about performing those tests?

A No.

Q Are DRE's able to accurately able to present the HGN test and the VGN test?

A I believe they are.

Q Now with regards to alcohol and drugs, with regards to horizontal gaze nystagmus what is the correlation, how does it affect?

A Well the typical criteria that an officer would consider is if he or she were to observe four or more clues out of the six possible on the HGN test then that would be for a roadside evaluation that would be enough probable cause for arrest and a request for a chemical sample, breath, blood, urine, saliva, whatever it would happen to be.

We need to keep in mind that the purpose of the HGN test and the other field sobriety tests in general are as screening tests, simple, efficient tests that someone can do without the use of any fancy or expensive equipment or complicated procedures but that can be used for screening purposes.

In the case of the HGN test and the other field sobriety tests done at roadside, they allow the officer to establish probable cause for arrest.

The purpose is not to demonstrate intoxication although the results may correlate with intoxication but they are there to demonstrate impairment that indicators of impairment are present.

That is how I view all of the field sobriety tests and even the testing done within the DRE protocol they indicate impairment, they don’t necessarily prove

intoxication.

They don't necessarily each test by itself prove intoxication by any particular substance or category of drugs or anything else but it demonstrates impairment.

It is only when you take everything together and observe impairment that is evident on one test and consistent with impairment evident on other tests that is where the opinion that the DRE comes up with that is where that derives from.

Q With regards to horizontal gaze nystagmus in relation to driving impairment, how does HGN correlate to any kind of potential driving impairment talking about angles and everything divided attention?

A Well in general the field sobriety tests are not tests, including HGN and VGN of course, they are not tests of driving ability and they are not tests of driving impairment. There is no way to correlate performance on any of those tests or poor performance specifically on any of those tests with a particular driving behavior.

There are at least about two dozen clues that an officer might look for when he is observing on the road and deciding whether or not he or she would need to pull that vehicle over and maybe do an investigation.

It could be anything from running a traffic signal to not stopping at a stop light to making a turn improperly

to braking improperly to not maintaining a lane, to having a turn signal on inappropriately or not at all, to equipment failure, to having a headlight out.

Some things of course are mutually exclusive and some things under certain situations would never occur. For instance, one of the clues that an officer would look for as a possible indicator that the driver might be impaired is if the headlights are out.

Well that would really only be an issue of driving at night, so we cannot say if you are intoxicated at a certain level or with a certain drug that you will always forget to turn your headlights on, that would be an impossible statement to make.

We cannot say that if you are intoxicated at a certain blood alcohol level or with a certain drug that you will always run a red light because if you happen to be traveling along a route that has no traffic signals you will never approach an intersection with a red light, so you cannot say that will happen that is why we cannot make that correlation.

But the field sobriety tests including the HGN and VGN tests do assess factors and do assess abilities that you need in order to be able to drive a vehicle safely. They testify to the attention tests.

Q How? How does the HGN and VGN test divide at

attention?

A Well divided attention tests and for those tests specifically they test skills of eye movements that are similar to what we need when driving. So let me present a couple of scenarios.

When you are driving down the road you are not just staring at that imaginary spot in the lane directly in front of you, you are looking across the road, you are looking at lane markings, you are looking for signs or anything that might indicate that you may need to turn or change your speed or stop.

You are looking at other vehicles on the road either traveling in the same direction as you or traveling in the opposite direction or maybe traveling on a cross street to see what they are doing and how they are performing.

You may need to initiate an avoidance maneuver, you may need to either brake or speed up or drive around them. If you cannot move your eyes properly, if you cannot follow them and pay attention to them properly you may have difficulty recognizing those things, you may have difficulty reading signs, you may have difficulty seeing subtle changes in how a vehicle is not maintaining its lane or a vehicle may be slowing down without its brake lights being on.

That all comes about from smooth pursuit eye movements. If you don’t have good smooth pursuit eye

movements you may miss some of that information.

Now as I testified earlier, there are going to be some individuals perfectly normal folks who don't have good smooth pursuit eye movements.

They can compensate by making accurate and efficient head movements and very often as we find intoxicated drivers do not have the compensatory mechanism or someone has a medical condition of lack of smooth pursuit, they can compensate with head movements. An intoxicated driver cannot do that.

When looking into mirrors, into your rearview mirrors or side view mirrors you need to move your eyes off to the side. If you have an acquired nystagmus of recent onset that will almost certainly make it difficult to see the images in the mirror.

So it may be even to the point where it is just not comfortable to look in the mirror but certainly your visual acuity will be reduced and you may not even recognize that it is.

That leads directly to either the second component of the HGN test depending on the angle looking for distinct and sustained nystagmus at maximum deviation or the third component if the angle of the mirror or the sign off to the side of the road that you are looking at is at less than 45 degrees or to the vertical gaze nystagmus if the sign is

located above you such as at an overpass on a highway and you are trying to read it as you drive underneath it.

There is that correlation that is how those two tests will correlate more to driving performance and driving ability than the other field sobriety tests but we need to keep in mind that the individual is not initiating exactly the same types of eye movements and exactly the same procedure as would be done under those tests.

For instance, for nystagmus at maximum deviation the driver is not looking into his rearview mirror or looking out his side window with the eyes at maximum deviation for more than four seconds, that would be very unsafe to take his eyes off the road straight ahead for that long of a period.

For lack of smooth pursuit, the officer when doing the test tests at a speed of about 30 degrees per second. In a real life scenario, smooth pursuit might need to be at a faster speed than that or it could be at a slower speed than that, so it doesn't match the testing protocol precisely, it is not exact but it does correlate very well with it I believe.

So if a driver has impaired eye movements or has an acquired nystagmus --

Q And by acquired nystagmus what is that again?

A Again because of intoxication, as induced by intoxication either horizontally or vertically that driver's

ability to perceive the visual image, to process visual information properly will be affected.

Q With regards to your previous testimony, you talked about a number of different types of nystagmus. Does HGN basically rule out the majority or if not the majority all of the other types of nystagmus?

A Pretty much. In general, most medical conditions if nystagmus is present because of the medical condition the nystagmus either will be present in the resting position when the individual is looking straight ahead or it may present in a fashion that is not consistent with the appearance that an officer expects to see, it will just look different than how an officer would do the testing.

Q How so?

A Well for example, in the case of congenital nystagmus the horizontal congenital nystagmus that is present only in upgaze. When doing the vertical gaze nystagmus test to demonstrate a positive indicator on that test the officer would expect to see the eyes move up and down, that is the nystagmus that is expected.

If the officer were to observe an upgaze the eyes, the suspect's eyes to move side to side, it is nystagmus but it is a horizontal nystagmus it is not the type of nystagmus the officer is looking for.

Q Similarly, are there correlations between that and

horizontal gaze nystagmus?

A Yes.

Q Specifically with regards to HGN not VGN, is there a correlation between the level of intoxication and the level of clues that are expected to be seen with regards to HGN?

A The laboratory research that has been done going back to about the 1970's at least indicates that there is about a 70 percent correlation between BAC and the angle of onset, the third component of the HGN test.

So in general, the general statement is that the higher the BAC level the closer the angle of onset will be to straight ahead so the small of the angle in other words.

The correlation is not perfect and there is no problem with that but it is about 70 percent, but pretty much consistently for most folks as the BAC level goes up that angle decreases.

With regard to the entire test itself, with regard to looking at all the six possible clues the correlation between four or more clues and a BAC of .08 or higher, again if we are only talking about alcohol intoxication, that correlation also is around 75 percent.

The accuracy as determined by laboratory tests that have been done numbers of times in many different places around the world, not just around the country but around the world, indicate that on laboratory testing the HGN has an

overall accuracy of anywhere from 70 to 78 percent.

In the field testing, of course the conditions are different. The test protocol is the same but the hypothesis, the scientific hypothesis is different and the purpose of doing the test is different than in the laboratory.

The laboratory we are typically asking the question what is the effect of this particular drug or of alcohol on the eyes and we are looking to see what that effect is and that correlation is.

All of the field studies that use the HGN test and the other field sobriety tests now are using these established tests to determine whether or not the test can be used by an officer to correctly identify someone who is impaired and possibly impaired because of intoxication.

It is a different scientific question and as such the accuracy of being able to do that, to use this test for that purpose increases to 90 percent or even greater.

So in the laboratory we see around 75 percent or so accuracy of the HGN test. When we ask what is the effect of alcohol or drugs on the eyes in the field when we are asking, can this test be used to correctly identify an impaired driver that accuracy improves to 90 percent or even more.

Q With regards to the DRE protocol, clearly HGN and VGN are tests which are used, are there other eye tests that are involved in the DRE protocol?

A Yes.

Q What is the next one with regards to the protocol?

A Immediately after the VGN test, the DRE will check for lack of convergence because we know that some drugs will reduce someone's ability to converge the eyes properly or to maintain convergence.

That becomes necessary, that becomes critical in the driving scenario when we do a maneuver like looking from straight ahead, from out the window straight ahead, down the road to our dashboard. We need to be able to converge our eyes and then of course when we look back out into the distance we need to diverge our eyes.

If we cannot do that quickly, efficiently, accurately we may see double under one situation or the other.

After that then, after the lack of convergence test --

Q How do they do the lack of convergence test? What is that?

A The lack of convergence test will start with where the officer first holds the stimulus at the typical 12 to 15 working distance then move the stimulus typically in a circle around the suspect's face just to make sure that he is following with his eyes and then come back to the center all without stopping the stimulus, all without stopping the

motion, come back to the center and move it along the midline toward the bridge of the nose.

The officer will stop about two inches from the bridge of the nose and that is the point where he assesses whether the suspect can converge his eyes or not.

One of the recent updates, actually there have been a couple of changes to that protocol, originally when the procedure was first formulated back in the 1980's it required that the officer bring the stimulus to the bridge of the suspect’s nose.

That would lead to a number of false positives because not everybody can cross his eyes to the bridge of the nose, so even normal sober folks might not be able to do that.

Q What is it now?

A Now the protocol is to bring the stimulus to within two inches of the eyes.

Q Okay, when you say lack of convergence what does the eye do or what happens?

A What we expect to happen is that the officer will observe both eyes moving toward the nose to maintain single vision on that target.

If the suspect has lack of convergence either of two things can happen the eyes converge as they would normally but when the officer brings the stimulus to a stop

one eye deviates outward or as the officer brings the stimulus in along the midline well before he gets to two inches one eye maintains fixation and moves in toward the nose but the other eye loses convergence.

So either of those two things can happen and both would qualify as lack of convergence.

Q Is this something that is difficult to observe as an officer or is anyone watching?

A No not at all.

Q Is this a difficult test to perform?

A Not at all.

Q Something easily that is done and observable by a trained DRE?

A Yes. There is one more component to that, one more update and I believe it was with the most recent revision of the DRE manual which I believe was issued last year.

That is if the officer on questioning the suspect determines that the suspect has a correction, wears spectacles for up close viewing, wears reading glasses, then the officer should conduct the test first with the glasses off and then with those near reading glasses on.

Because very often as optometrists we will provide for some patients who have convergence problems, we will provide spectacles that will help them with that.

The prescription is a little bit different than

regular glasses but it will give our patients that assistance that they need to help them converge their eyes.

So in that situation if a suspect has glasses for that purpose, the DRE today's protocol is that the DRE will do the testing twice, once with the glasses off, once with the glasses on and if the lack of convergence is observed with the glasses off but then convergence is normal with the glasses on then that would be a negative indicator, there would be no indicator for that finding. So again, it rules out a false positive.

Q Is there anything else about the lack of convergence test with regards to the DRE program?

A No.

Q What is the next eye test that is done with regards to the DRE program?

A This would be looking at the pupils in room light. There are other components, other vital signs that are taken afterwards such as blood pressure, temperature, pulse, one of those is to observe the pupils in room light.

The officer, the DRE, will hold a card either a square or rectangular or circular card that has some circles of calibrated size with a calibrated diameter on them, hold them up the suspect's face to the side of the face in about the same plane as the eye and it also does a comparison as to which of the circles on the card is most similar to the

actual pupil of the eye.

MR. WELLS: If I can have this marked as State's Exhibit 4.

BY MR. WELLS:

Q Do you recognize this?

A Yes I do.

Q What is this?

A It is one version of what is referred to as a pupilometer.

Q Is this an example of one that is used in the DRE process, the DRE evaluation?

A Yes it is.

MR. WELLS: Move to admit.

MR. CRUICKSHANK: No objection.

MR. DeLEONARDO: No objection.

THE COURT: It will be received.

(The document referred to was marked for identification as State's Exhibit 4 and was received in evidence.)

BY MR. WELLS:

Q Now with regards to the pupil sizes, you can continue as to what is done with regards to the DRE evaluation and pupil sizes.

A Well the pupils will be tested under three separate

conditions. The first will be in room light, normal lighting whatever happens to be in the room.

The second will be done as part of the dark room evaluation where the officer takes the suspect to a small enclosed room hopefully light tight that can get completely dark, will sit there for about 90 seconds just so the both the suspect and the officer can acclimate themselves to the dark.

Then the officer will check the pupils under a condition known as near total darkness so it is not done in true darkness but just enough light is introduced by the DRE usually by holding his finger over a pen light to just barely allow him to see the suspect's pupil but not shine the light directly into the suspect's eyes.

So it is a way of checking the pupil under dilated conditions without light going directly into the eyes. The third component then is to check the pupils under direct light where the officer now removes his finger from the pen light and holding that pen light just a few inches from the suspect's eye illuminates the entire eye, illuminates the entire orbit and observes the reaction to light, observes the constriction that should occur with the introduction of that light and then maintains that for 15 seconds to see if there is any change in pupil size over that 15 second time period.

Q Why is any of that important?

A Well there are some drugs and some conditions that will effect a phenomenon known as rebound dilation. Rebound dilation as defined as an increase in pupil size over time, over this 15 second time period, with no change in light stimulus.

Under normal circumstances, when the DRE shines the pen light into the suspect's eye and the DRE holds the light steady and the suspect does not change his gaze, doesn't look anywhere else, doesn't move his eyes in any way, the pupil should remain fairly constant in size.

With rebound dilation what will happen is the pupil initially constricts to the initial introduction of the light and then over that 15 second time period the pupil dilates and gets larger and does not constrict back down to the original size it was when the light was first introduced.

As with other testing, the officer will test the suspect's left eye first and then the right eye and again checking both eyes twice under each condition.

Q Is there anything else with regards to the pupil size test or rebound dilation?

A No.

MR. WELLS: Can I have this marked as State's 5?

THE CLERK: State's No. 5.

BY MR. WELLS:

Q I am showing you what has been marked as State's

Exhibit No. 5 do you recognize what this is?

A Yes I do.

Q What is this?

A It is entitled Drug Influence Evaluation Symptomatology Matrix.

(The document referred to was marked for identification as State's Exhibit 5.)

BY MR. WELLS:

Q Are you familiar with this in your knowledge, training and experience a) as an optometrist and also in your expertise in the DRE program?

A Yes.

Q Specifically with regards to your expertise in optometry, were you introduced to any of this prior to be introduced to the DRE program?

A Well certainly the effects of some of the drugs, specifically such as stimulant drugs, some of the eye drops that we would use to dilate our patient's eyes could be classified as stimulant drugs, they would affect that part of the central nervous system and when they are introduced directly to the eye as an eye drop they would have the effects as listed there for example pupil dilation.

Q Now with regards to the individual tests and I don't want to go into a whole lot of detail, I am not

expecting you to go through each and every category, but with regards to HGN what does the matrix indicate?

A The matrix indicates that there are three direct categories with which HGN and VGN would be present. Those three drug categories are central nervous system depressants, inhalants and dissociative anesthetics.

Q Now with regards to vertical gaze nystagmus?

A Again, those same three drug categories central nervous system depressants, inhalants and dissociative anesthetics.

Q Lack of convergence?

A That would be four categories now, central nervous system depressants, inhalants, dissociative anesthetics and cannabis.

Q Now with regards to the pupil sizes and rebound dilation?

A And rebound dilation, okay, we would expect some drugs to be of the categories stimulants, hallucinogens and cannabis to cause dilated pupils. We would expect opiates or narcotic analgesics to cause constricted pupils.

We would expect cannabis and possibly, I don't think it is indicated on this particular one, but certainly cannabis to cause rebound dilation. It is possible that the down side of stimulant use also could cause rebound dilation.

With regard to the other category, the lighting

things of reaction to light how quickly the pupil will constrict when the light is first introduced in the direct light component of the testing. Some of the drug categories will slow down that reaction.

If a drug were to speed up the reaction there is no way for an officer to be able to identify that because we expect that normal reaction to occur within about one second but if it takes any longer than that from the initial introduction of the pen light or the direct light portion, if it takes longer than one second that is going to be readily observable by an officer.

We would expect that as the matrix indicates that central nervous system depressants, stimulants, narcotic analgesics or opiates and inhalants would slow down the reaction to light and the other drug categories typically would have no effect.

Q Being familiar with that matrix, is that consistent with the information that has been taught to you in your profession and generally accepted as far as you are aware?

A Yes.

Q Is there anything new or novel within the symptomatology matrix?

A No.

Q With regards to lack of convergence or HGN or VGN, is there anything new or novel about the application of that

test?

A No.

Q Is the use of that test, those tests HGN, VGN, lack of convergence is that generally accepted as an indicator of certain issues with the eyes?

A Yes.

Q How about rebound dilation as well?

A Yes.

Q Now is there ever any concern about something called eyelid tremors?

A Yes.

Q Can you explain to the Court what that is.

A During the Rhomberg balance test where the officer will ask the suspect to tip his head back, close his eyes and then estimate the passage of 30 seconds.

The officer is doing the testing for a couple of different purposes. One is to see whether the suspect can estimate the passage of 30 seconds accurately within plus or minus five seconds but also to see if the suspect can maintain his balance with his eyes closed and how well he maintains his balance and also if there is any muscle tremoring.

If the suspect has difficulty with his balance, the officer will observe sway. If there is muscle tremoring based on the drug that might be used then the officer might

notice that either the large muscles of the body such as of the legs or the trunk might be twitching and contracting or relaxing inappropriately.

With cannabis use specifically, the smooth muscles that make up the eyelids will undergo tremoring when the eyelids are closed lightly, that will be observed as eyelid tremors.

So there are a number of clues that are observed that are looked for during that test, one of those being eyelid tremors.

Q Now to the other parts of the DRE protocol specifically the pulse, blood pressure, vital signs, do you have any, well through your expertise as an optometrist are you familiar with those?

A Yes.

Q You have trained at the DRE school, you are familiar with how they, the DRE's are trained to utilize them, is that correct?

A Yes.

Q Are they trained accurately and correctly on how to do say the vital signs?

A Yes.

Q Taking the pulse?

A Yes.

Q Taking blood pressure?

A Yes.

Q Is there anything new or novel about the application of those specific portions of the DRE program?

A No.

Q Is the application and use of them as they are taught in the DRE protocol consistent with how it was taught to you as an optometrist?

A Yes.

Q Do you believe that the 12 steps are an accurate and effective means of determining whether a person is under the influence and explain how?

A Yes I do.

Q Okay. Generally.

A In general, the officer is not just looking at individual clues, the officer is looking at all the clues and with the help of the matrix, the symptomatology matrix, as it is described here and the officer's previous experience maybe with individuals who may have been, he may have observed under the influence of drugs prior to that particular evaluation.

The officer will put all of that together, look to see which of the signs and symptoms that he or she is observing, what drug category or categories they might be consistent with and that goes to assist the DRE to form his or her opinion.

Q Is it accurate in determining what category of drug and not just impairment as well?

A Yes.

Q Are you aware of the use of the DRE protocol outside of just simply the field of law enforcement and the use of the DRE specifically for impaired driving?

A I am aware that there are work place screening programs and also school screening programs that use major elements of the DRE protocol as a non-evasive screening test prior to subjecting someone to a urine test or something else and those are done in work place environments and in schools.

Q Are you aware of any endorsements that have been made by any optometric associations?

A Very good optometric, yes. Yes just this year, just a couple of months ago, the American Optometric Association at its annual meeting of the representatives from all of the state associations unanimously passed a resolution endorsing the DRE protocol.

Q Are you familiar with the American Optometric Association in general?

A Yes.

Q What is your involvement with them?

A I am a member of that organization. I have been a member since I was an optometry student which started in 1989 and I am now involved in the volunteer structure of that. I

am the Chairs of one of the committees and serve on a couple of other committees within that organization.

Q I am not looking for exact numbers but ballpark, what is the number of people that are in the American Optometric Association?

A I believe the current membership is about 37,000 optometrists around the country.

MR. WELLS: May I have this marked as State's Exhibit 6?

THE CLERK: State's No. 6.

BY MR. WELLS:

Q Do you recognize this?

A Yes I do.

Q What is this?

A This is a copy of the resolution that was passed that I just described that was passed by the House of Delegates on June 18th, 2010.

MR. WELLS: Your Honor, at this time the State would move to admit State's Exhibit No. 6 and if I have not already done so State's Exhibit No. 5.

MR. CRUICKSHANK: No objection.

MR. DeLEONARDO: No objection.

THE COURT: All right, State's 5 and 6 are admitted.

(The document referred to was

marked for identification as State's Exhibit 6 and State's Exhibit 5 were received in evidence.)

BY MR. WELLS:

Q I am going to show you what is going to be marked as State's Exhibit No. 7, do you recognize this?

A Yes I do.

Q What is this?

A This is a copy of our 2002 paper of which I am a co-author entitled Drug Recognition Expert Evaluations Made Using Limited Data.

MR. WELLS: Move to admit.

MR. CRUICKSHANK: No objection.

MR. DeLEONARDO: No objection.

THE COURT: All right, Exhibit 7.

(The document referred to was marked for identification as State's Exhibit 7 and was received in evidence.)

BY MR. WELLS:

Q Briefly, can you let the Court know what the findings were, actually let the Court know what the paper was about.

A In that paper, we took the drug influence reports

commonly presented on forms, on templates that are referred to as face sheets, DRE face sheets.

We took a number of those from actual cases, actual traffic stops and actual evaluations that had occurred several years prior and for which we had accurate toxicological reports from the State Crime Lab.

On blank reports then we recreated the data all in one handwriting so there would be no way of telling, for somebody to tell what the report was or whose it was or when it was done.

We presented all of the objective information, the results of the different eye tests, the blood pressures, all of the other information, all of the things that would be conducted in steps 3 through 10 just about of the 12 step DRE protocol.

We left out the information on the interview of the arresting officer. We left out any statements that the suspect may have made during the evaluation and we also left out the toxicological report and the original officer's opinion as to what drug category was causing the impairment that was being observed.

We created 70 of these reports from different drug categories that were all single drug or single category cases as determined by the analysis of the crime lab including five medical rule outs where the crime lab determined that there

were no drugs on board.

We presented those 70 different cases to DRE's in Oregon State about 18, I think it was 18 of whom evaluated those, and just based on that information alone offered an opinion as to first whether or not impairment was present based on the information as presented.

Then if impairment was present what the impairing drug or drug categories were that could have caused that impairment that would suggest those findings as presented.

Q So in a nutshell, you basically took the DRE face sheets and used DRE's only using the information on the face sheet to generate an opinion, is that correct?

A Correct.

Q Not doing the full evaluation personally?

A Right. That is where the limited data piece comes in. The officers were not doing these evaluations on live individuals, they were only looking at the face sheet data and they also received no other information about each case other than what was on the face sheet data.

So there were no admissions, there was no interview of the arresting officers and no suggestion as to why the individual was stopped in the first place, what the driving infraction was, if there was any, or any other information like that.

Q So they had less information than they would

receive had it just been a straight DRE evaluation?

A Correct.

Q What was the findings and results of your paper?

A The basic findings without going into the number specifically because, I would have to look at the paper to see the exact numbers, but the basic findings for all of the drug categories that we presented including the medical rule outs the officers were able to determine whether or not impairment was present.

I think it was about 95 percent of the time, and could correctly form an opinion as to the drug that was causing the impairment and also at high percentages operating well beyond chance or well beyond just guessing.

Again, for different drug categories the percentage correct would be different but I think it would range from about 50 something or 60 something percent up to over 80 percent for different categories.

Q Are you familiar with the, for lack of a better term, the two Heishman studies?

A Yes.

Q How are you familiar with those?

A I have read those papers a number of times.

Q Just very briefly, what does the first Heishman paper indicate?

A Well for those studies, these were controlled

studies that were done with live subjects, they were dosed either with a placebo, a low amount or a moderate amount of different drugs and just single drugs in each case and then subject it to a DRE evaluation.

There were a couple of goals of that study and the follow-up study that was done in 1998. The main goal was to see whether the DRE protocol works and if so if it can be improved in any way.

Q Generally speaking what were the findings? Did they endorse the protocol or not with those papers?

A I believe that the authors did indicate that the findings, the objective findings, based on the evaluations done by the DRE's were consistent with the changes in performance, the changes in the findings that the DRE's were looking at were consistent with the use of the particular drugs that were present.

Where the protocol failed is allowing the officers to correctly determine an opinion as to whether or not the individuals were impaired and if so what the impairing substance or substances were.

The studies, both studies were conducted in a double blind fashion meaning that at the very least the officers who were doing the evaluations did not know what the impairing substance was that was being used by the subject.

The other component of the double blind aspect was

the subjects themselves did not know what they were taking. They were provided pills or marijuana cigarettes either with or without active ingredients and they received the same type of medication each time, the only question was, was there any active medication in it but they did not know that and of course the DRE's did not know that.

What the authors were able to do was to take the objective data that the DRE's collected during, I believe they allowed them 20 or 25 minutes to do the evaluation, which is certainly less than a normal DRE evaluation takes which is usually about 45 minutes to an hour.

Q Were they allowed to do the full protocol?

A No they were not.

Q Okay, continue.

A So they were not allowed to interview the suspect, subject in this case, likewise there was no, obviously no, interview of an arresting officer.

But they were only allowed to do the objective tests and collect that data and then form an opinion based on those objective findings. So to some extent similar to what we later did with our face sheet data study but they were doing it on live individuals.

What the authors then did was they took that objective data, put everything into a computer database, crunched some numbers, boiled it down and said we have got

now a mathematical model that would allow someone to more efficiently, more quickly with using fewer variables determine whether somebody is under the influence of a particular drug.

That was one of their goals to see if the DRE protocol can be made any more efficient by looking at fewer variables rather than doing all of the testing that normally takes 45 minutes to an hour whether that can be done with fewer tests and fewer steps and therefore hopefully take less time and in the process be more accurate.

The authors themselves realized, and they make this statement in both the 1996 and 1998 papers, that this requires a lot of mathematical calculation and processing which a computer can do very easily, it can be programmed to do so ever easily but humans can't be expected to do that type of processing.

So that is one of the differences they found when they applied their database findings, their number crunching to what the DRE's determined and the opinions they came up with.

Q Okay.

A The other piece of course was to see whether the DRE's could be accurate and I believe in the first study overall taking out the alcohol only intoxication cases the DRE's were accurate in 44 percent of the evaluations.

In the second study, the DRE's were correct in their opinion of the intoxicating drug that was used in I believe overall in 32 percent of the cases.

Q Now 44 percent and 32 percent are not good numbers. Can you indicate as to why the numbers were so bad in those two specific studies, what were the issues?

A Well the main issues I identified that I thought in that situation is the dosages of the drugs that were used. I can address the alcohol specifically because I have done studies with that.

With regard to the dosages for the drugs other than alcohol you will have to ask a toxicologist or a pharmacologist about those but I will only extrapolate to what I know occurred in the alcohol situation and that is in the low dosage alcohol intoxication situation, the average BAC was only about .028.

Q Point 028?

A Point 028.

Q So it was ane exceptionally low dose?

A Yes.

Q Okay.

A In what they call the high dose or moderate dose situation, the average BAC for all the subjects was only .052 so well below the per se limit in both cases and at a .02, .03 approximately certainly at a level that most folks who

have some experience drinking alcohol would not be viewed as being impaired by individuals.

The analysis that Heishman and his colleagues did in that study, was to determine if the DRE could identify the impairment and they made the assumption that a BAC of .028, for example, would cause impairment.

So I think that is where that study fails because they assumed that any presence of any of these drugs even at these low dosages would cause impairment and could cause impairment that would be recognized by a DRE.

Again, I can certainly speak to the alcohol component of it, the alcohol part of that study and would guess that a similar analysis would be possible for the other drugs even though I am not qualified to address the drug levels, the concentrations on those to assess impairment.

But certainly for most folks at a BAC of .02 or .03 they would not be considered to be impaired and that would be considered a miss on the DRE as far as the DRE is considered.

Q Okay, so you would consider those specific issues flawed within the studies?

A Well the study itself was a very good study, it was an excellent design but the application of the finding suggesting that any non-zero amount of the substance would cause impairment, that was a flaw.

Q So they were asking the DRE’s to find somebody

impaired when they were not generally impaired?

A When under most circumstances they would not be considered impaired, correct.

Q Doctor, is there anything else that I have left out with regards to the DRE protocol that we have not gone over?

A I don't think so.

MR. WELLS: Court's indulgence, Your Honor. Your Honor, I have no further questions.

THE COURT: All right, we will take a 15 minute recess and then we will begin cross.

THE CLERK: All rise.

(Whereupon, a brief recess was taken.)

THE CLERK: All rise.

THE COURT: Be seated please.

MR. WELLS: I guess we are calling the case. For the record, Adam Wells spelled W-e-l-l-s on behalf of the State and this is another cross examination for the Frye-Reed hearing.

THE COURT: I am going to relieve everybody of the duty of spelling your name over and over and over again.

MR. WELLS: Thank you.

THE COURT: When we are in the same hearing. I could see if we were calling different cases that might be something we would need to do and ironically given the subject matter I have left my specs in my office so if you

could just call in there and ask them to bring them in for me.

All right, we are ready for cross. Mr. DeLeonardo is standing so I assume this is your --

MR. DeLEONARDO: I will be doing this first, Your Honor.

THE COURT: All right.

CROSS EXAMINATION

BY MR. DeLEONARDO:

Q Dr. Citek you indicated, well first of all you have been qualified as an expert in DRE do you believe you understand and know the protocol and what they are trying to accomplish?

A Yes I do.

Q Essentially, they are making a three step process, are they not, they are saying first of all they are trying to determine whether a person is impaired at all, correct?

A Correct.

Q And then they are making a diagnosis of whether that person is impaired by a drug or a medical condition, correct?

A Correct.

Q Then based on that, they are determining whether or not the person is impaired by a particular drug category so as to be unable to operate a vehicle safely, correct?

THE COURT: Give me one second please, I am sorry. All right, go right ahead.

MR. DeLEONARDO: Okay, thank you.

BY MR. DeLEONARDO:

Q So they are attempting to accomplish all three of those and render an opinion, is that right?

A Well the third component they would only do if during the second component they determined that the impairment was not caused by a medical condition.

Q Correct. So in the second stage they are determining that -- well let me just start again. Number one, there is an impairment, how is impairment defined?

A Well impairment in the DRE protocol would be anything that would affect your ability to operate a motor vehicle safely.

Q Is that defined in the protocol?

A The definition of drug within the protocol is defined as a substance which when taken into the body affects someone's ability to operate a motor vehicle safely.

Q So for example, if I were to take an aspirin is that a drug?

A It is a drug.

Q Is that something that is going to affect my ability to operate it safely?

A It should not.

Q So you are telling me that in the DRE protocol they actually exclude whole categories drugs, what are considered drugs in the medical community?

A Correct.

Q So they narrow down to what only drugs that they think can establish an impairment?

A Well they have been shown within other areas taking information from the medical community, taking information from scientific research with regard to what would cause impairment.

Q But you agree with me will you not that not all of these drugs actually will result in impairment?

A It will depend on the dosage and on the individual taking the drug certainly.

Q Right, there is a concept called therapeutic dose, correct?

A Yes.

Q And that would be a situation where someone is being prescribed the medication or taking the medication and essentially it doesn't mean they are going to be impaired if they are taking it as prescribed, correct?

A Depends on the medication.

Q What they are taking, correct, but that could mean it could be present in someone's system without it causing an impairment?

A Correct.

Q So when I asked you what is the definition of impairment you said, well it is defined by drug so again how does the DRE protocol define what it is to be impaired?

A Initially I did say that impairment would be the inability to operate a motor vehicle safely. So if you are impaired regardless of what the impairment is, let's say if you are having a heart attack or if you are a diabetic and you are having a hypoglycemic attack you are impaired, you are not able to operate a motor vehicle safely.

Q So the indicator, just to make sure I understand then, even though a drug may cause certain things in the body you agree that doesn't mean that you are impaired to drive a vehicle, correct?

A Depends on what it causes.

Q Right. So for example, you briefly touched on pulse that someone had an elevated pulse, an elevated pulse would not mean they cannot operate a vehicle, correct?

A Correct.

Q So the symptomatology in this matrix even if present does not mean that someone cannot operate safely, correct?

A Correct.

Q In fact, some of the categories in this matrix for example CNS stimulant does not even require a lack of

coordination as one of the symptoms, right?

A Actually what will happen with low doses of CNS stimulants as we see in people who drink coffee on a regular basis or might be prescribed a low dose of amphetamines for whatever reason or something like ADD drug like Ritilin or Cylert that is a low dose of the stimulant that might even improve their coordination and improve their functioning but that is a low dose.

Q So again, the fact that you have the drug in your system does not necessarily mean you cannot drive safely, correct?

A Correct.

Q Now let's talk a little bit of the studies and I will hint on the first one that you just discussed which was the Heishman study, correct, that was the one you just before we ended for the break you were discussing?

A Yes.

Q And that is entitled, Laboratory Validation Study of Drug Evaluation and Classification Program the first one dealt with ethanol, cocaine and marijuana, correct?

A Correct.

Q And that was actually conducted by representatives from the Addiction Research Center, National Institute of Drug Abuse and the Department of Psychiatry and Behavioral Science at Johns Hopkins, is that correct?

A Yes sounds correct.

Q One of the things that you mentioned earlier is the protocol is what are the first steps when someone is arrested is they actually do a breath test, correct?

A As far as the DRE protocol goes, after the interview of the arresting officer to determine why the suspect was stopped in the first place and arrested in the first place then the first objective test that is done would be a breath test.

Q Well the first step would it not be is actually getting the toxicological results, the breath test results?

A Yes that is what I said the first thing.

Q Then they would interview the officer as you indicated whether or not the reading from the breath test result was inconsistent with this perceived impairment, correct?

A Yes.

Q If I recall you this morning, you said that if it was over what the legal limit, lack of a better term is, you would not call him because you already have a case, correct?

A I believe that is what I testified to this morning, yes.

Q So what a DRE is called in to do is those situations where there is a low dose of alcohol, right?

A Or no alcohol.

Q Or no alcohol, fair enough. But in some of those cases you could have a .02 or a .03 and there would still be a drug recognition protocol done in those cases according to what you said this morning, right?

A If the impairment that either the arresting officer observed and reported to the DRE was not consistent with that breath alcohol result, with that breath test result, that is when the DRE test would be initiated.

Q Right. So the Heishman study that was actually published and peer reviewed, was it not?

A Yes.

Q A Journal of Analytical Toxicology, correct?

A Yes.

Q In fact, one of the things it said and you have read this study, right?

A Yes.

Q It says do you agree that, "Although why they use the validity of the drug evaluation or the drug recognition program has not been rigorously tested."

A That was in 1996 --

Q I was saying, do you agree when they wrote that --

A Yes, when they wrote that.

Q Right and that was actually after, as you referenced earlier we will get to it, but the earlier Hopkins study Bigelow, correct?

A Yes.

Q And that was after and we will explain the L.A. Field Study, correct?

A Yes.

Q And it was after the Arizona study, correct?

A Yes.

Q But this peer reviewed study said it actually had never been tested, do you agree with that?

A Well it had been tested just not in the same fashion that they were conducting their study.

Q Well they are conducting it in accordance with clinical research protocols, correct?

A Yes.

Q The prior ones were not double blind in the same fashion were they?

A No.

Q So in addition, in this particular study in fact one of the things they did as you indicated is they gave them what you considered or termed a low dose of alcohol, true?

A Well there were two doses that they supplied and both I would consider low doses.

Q Which is consistent with what a DRE would typically see, correct, a person with perhaps a low dose of alcohol, true?

A Except that a low dose of alcohol would not be

expected to cause a significant amount of impairment.

Q Which is exactly why you bring in a drug recognition expert because those situations where someone is claiming that there is this impairment and the alcohol does not mesh that is exactly the kind of situation that a drug recognition expert is called into, right?

A Again the exception is, the typical scenario that I am familiar with is that an officer on the road, a patrol officer, initiates a traffic stop, has contact with the driver, conducts the field sobriety tests, determines that he has enough probable cause to arrest and asks for a chemical sample, he gets the breath test done, finds that the breath test result is inconsistent with the impairment that he observed on the road.

So I think you are mixing two concepts in your question, forgive me if I am not understanding it correctly but the impairment that I was referring to is the impairment that the arresting officer observed.

So when the arresting officer says well this guy, this suspect, did not perform properly so six clues on HGN plus VGN and had clues on walk and turn and one leg stand, he had slurred speech, he was fumbling for his license, he couldn’t answer questions appropriately I think he is very impaired.

Q That would be a high level of impairment and the

breath test comes back and it is significantly below .08 whatever the per se limit happens to be or even zero that is the point.

Q But we already established that one of the things the drug recognition expert is supposed to do is determine whether that impairment is from drugs or medical condition, correct?

A Right.

Q And someone could do badly on the field sobriety test on the roadside either because of lack of coordination, right?

A Yes that could happen.

Q They could be overweight, correct?

A That could happen.

Q They could have various conditions like arthritis, right, and therefore could appear to be very impaired, true?

A Yes.

Q And so that officer on the roadside could determine that they believe this person was significantly impaired and it would be inconsistent with the breath test result, correct?

A Correct.

Q And that person would be then given to the drug recognition expert to tell us, is this person impaired by a drug as opposed to a medical condition and if they are what

are they impaired by, right?

A Correct.

Q So this study tests exactly what the drug recognition expert typically will see, did it not?

A Well no there I disagree with you. For the reason you are presuming that something occurred prior to the officers who are evaluators, the problem with this study is there are two subjects, one of the subjects who were dosed, the other are the officers who are the subjects who are being observed so I will use evaluators for that point if I may.

That the DRE's, the evaluators, are presented with these subjects who were dosed and they are not told anything about them, they are not provided any information about them.

They are to assume and the only valid assumption could be, would be in my mind they are to assume that the individual standing in front of them who is about to be evaluated by them had been stopped, had been subjected to roadside testing, enough probable cause was found to arrest and the breath test was not consistent with the impairment that was observed prior to the start of the DRE evaluation.

You have to make that assumption because that prior to the start of the DRE evaluation the arresting officer observed that level of impairment that triggered the arrest. If you cannot make that assumption then there was no reason for the arrest.

Q So you are saying because they were not told why the person was arrested and what they did wrong, that explains why they did so poorly in this study?

A That could be one of the reasons why.

Q So you have heard the term confirmation bias and science, have you not?

A Yes.

Q What is that?

A That is if you are told the result beforehand and then looking to fit your data, fit your findings to that result, to that conclusion basically.

Q Would you agree that it is a form of tunnel vision where essentially, and this is a concept in the scientific community, correct?

A Yes.

Q That people seek out evidence to confirm their hypothesis and they search their memories in bias ways preferring information that tends to confirm a preferred hypothesis or belief, correct?

A That seems correct.

Q So one of the things and in fact you even raised it in your summary of the validation studies that a lot of these other studies that had been previously done were situations where the person admitted they had ingested a particular drug, correct?

A Right.

Q And you would agree with me that if they have that information then it is also likely that they will reach that result in terms of what they are actually impaired by, correct?

A Correct and that is one of the reasons why we initiated the limited data study.

Q But the limited data study again that was not a double blind situation was it?

A No, it was not a clinical study from that standpoint, we did not actually dose individuals.

Q But this was.

A But also if I may, it was blinded with regard to the officers who were assessing the face sheets. They had not other information other than what was presented on the face sheet.

Q Other than they already knew a DRE had done a face sheet, they already knew this person had been subjected to the protocol, correct?

A That was the only thing they knew but we did have placebo conditions in there --

Q You had five.

A We had five medical rule outs precisely and for 70 that is not even significant.

Q You would agree however that this particular

program it actually took away that possibility of confirmation bias, right?

A That was one of the attempted goals, yes.

Q I mean it was not perfect because they still said that, the study actually said did it not that DRE's although they were not permitted to interrogate the subjects except for two questions about physical defects and vision problems they were also instructed not to converse with other DRE's in forming their opinions about behavioral impairment, that was the restrictions put on them so they could not do ultimately what they did, correct?

A Correct.

Q So that meant that this was specifically testing the matrix, right?

A Yes.

Q It was testing the matrix, right?

A Again, that was one of the stated purposes of the study.

Q And even after the level of alcohol, one thing that the DRE's were told is that they were told specifically what the alcohol was, correct?

A Well they knew it from the breath test because that was -- yes so they did have that information.

Q So going into this, they even knew exactly what the alcohol content was, correct?

A But they were also told that the subjects could be under the influence of one or more than one of drugs from different categories.

Q Right. That is their job to figure if that is true or not, right, that is a proper methodology. Now what it didn't do, you would agree with me, is the study concedes that it never determined whether they could determine behavioral impairment, correct?

A Correct.

Q That was never an issue in this study. They only tried to figure out whether the DRE's could even determine the presence of a drug in someone's system, right?

A And to that extent even the DRE protocol its purpose is not to determine behavioral impairment or especially not driving impairment to that extent.

Q So the matrix doesn't tell you about driving impairment?

A Correct.

Q It is the individual officer?

A Right.

Q Okay, we will get to that then. Let me ask you this, did this study even this study or any study that you know of ever test the ability of a drug recognition expert to distinguish between medical conditions and drug impairment that mimic each other?

A I know that study did not because they did not bring in medically impaired individuals. I am not aware of any other studies that have.

Q I mean you have obviously been very active, you are ambassador to the DRE program, you are pretty involved in this and you don't know of any study that has ever even tested that concept?

A Well, the information comes from medical literature and medical science.

Q But that is not the issue then the issue is whether the DRE can make that distinction not a doctor.

MR. WELLS: Your Honor, objection, if the witness could be allowed to answer the questions. He is cutting him off before he gets to answer them.

THE COURT: Give him the opportunity to answer Mr. DeLeonardo.

MR. DeLEONARDO: Very well Your Honor.

THE WITNESS: The information with regard to medical conditions will come from medical case reports and information that has been provided by doctors and for medical science.

So if we write a report or there is a report somewhere in the medical literature indicating that a particular condition will cause certain changes in eye movements or other changes in physiological responses.

We know this to be the case and these are things that we as doctors test on our patients or we ask other doctors to do where we make referrals in that regard yes it might be interesting for an officer to observe an individual like this versus someone who is impaired under the influence of drugs. But it would be somewhat impractical to do that in some cases, impossible.

BY MR. DeLEONARDO:

Q It would be impossible to conduct a study with people that have different medical conditions put into the mix to see whether or not they confuse them with drug impaired people?

A I don't think you could get past an institutional review board, a study where you might suggest that you let a diabetic go into insulin shock and have him evaluated by --

Q There --- other medical conditions without putting someone in that extreme, is there not?

A Well you would be asking about all sorts of different conditions and many of those would be life threatening conditions.

Q But none of those studies have ever done that, correct?

A None have done that.

Q Now as far as the results of this, it was 158 they said valid examinations, correct?

A I believe that was the number, yes.

Q And that the DRE's concluded impairment in 81 of those cases, is that right?

A Again, I believe that is correct.

Q Of course I will certainly have the study if you would like to see it, but let me ask you if you agree with this they found that under the DRE protocol that DRE predictions were consistent with toxicological in 41 cases or 50 percent.

These 41 consistent cases included 9 in which the DRE concluded the subject was impaired by ethanol alone, these were the low dose alcohols that you had, right, they were saying 9 of those the DRE actually concluded they were impaired by your low dose that would have no effect, right?

A Right.

Q Because the DRE's breath test was provided, a priority confirmation of ethanol an ethanol only prediction was guaranteed to be consistent so when they said, hey this person is impaired by alcohol they knew the person had alcohol in their system, they just excluded that because it really wasn't a valid result, right?

A Right.

Q Excluding those nine it resulted in 72 predictions that named some non-ethanol drug class and they determined that the DRE's predictions were consistent with toxicology in

32 cases or 44 percent, correct?

A I believe that is the number that I testified to earlier.

Q Now let me just be clear though, they weren't even actually holding them to the standard of predicting the actual drug category as the DRE is supposed to do, correct?

A I would have to review the study, I don't recall what their determination was I thought they had used the DRE standard.

Q If you would like to review it --

A I would like to. They were in fact using the IACP standards which if one drug category is present, and this is here on page 475 where we get to the 41 cases and then excluding the nine cases to get to the 32 cases or 44.4 percent, they were using the IACP standard --

Q Which is if you predict multiples one is good.

A If you predict one it must be that one, if you predict two you must get at least one, if you predict three it must be at least two.

Q So in this particular standard, if they picked alcohol which they knew was in fact there and they picked one of the other two possibilities --

A Anything else.

Q Right, well we only know there were three things, right?

A Well no, the diagnostic did not know that.

Q What I just said, but CNS stimulant and CNS depressant have different effects, correct?

A Yes.

Q So if they predicted alcohol in one of the other categories they would have been deemed correct if they had predicted alcohol, correct?

A Under the IACP standard, yes.

Q So essentially, they could be completely wrong on the type of drug that actually they predicted and only be right based on the breath test result and it would still be considered right under the study, correct?

A Correct.

Q And they still got 42 percent as the best they did?

A And again that is what I testified to earlier where I said I know certainly for the alcohol and I can surmise it for the other drugs that because they were administered at such low doses at such low levels which I am pretty certain are inconsistent with the street level dosages that officers typically would see.

That is very possible that for some of those drugs for instance as we discussed earlier the low dose of cocaine --

Q So what does that mean for a person out on the street with a low dose?

A That he would have not been picked up, that he would not have been identified as being impaired.

Q Oh, that never would happen is what you are saying?

A Well --

Q Let me ask you, what was the false --

MR. WELLS: Your Honor, objection, if he would be allowed to finish with his answer. He is cutting off my witness again.

THE COURT: Do not cut off the witness. Which study are we referring to?

MR. DeLEONARDO: We are referring to Heishman study, Your Honor, it is the Laboratory Validation Study of Drug Evaluation and Classification Program Ethanol, Cocaine and Marijuana.

I don't think the State has submitted it yet as evidence, I certainly will at an appropriate time.

BY MR. DeLEONARDO:

Q Well let me ask you this, the other thing that was determined what is a false positive rate?

A Well false positive means that you make your determination you presume that something is present when in fact it is not.

Q How do they define false positive in the study?

A Well the false positive rate or defining false positive in the study would be if a DRE were to make a call

that impairment was present because of particular drug category and that category was not the impairing category or is not one of the drugs that was present.

Q What was the rate in this case, in this study do you know?

A I think it varied for the different drugs when you look at the individual --

Q But overall?

A I don't recall the specific numbers.

Q Does 40 percent sound correct?

A Overall for everything yes, that sounds about correct.

Q So that means 40 percent of the time they said something was there it wasn't there?

A Right.

Q Confirmed by toxicological results, correct?

A Yes.

Q Now the other thing I am interested in is you are aware in the scientific research community the concept of inner-rater reliability are you not?

A Yes.

Q What is that?

A Well that is when you have multiple individuals, multiple evaluators doing testing to see if they get a result that is consistent when they do their testing independently.

Q That would mean if we are using this matrix we want to make sure that one person can get the same result as the next person, correct?

A Correct.

Q Are you aware of any double blind study where that had been tested?

A With regard to?

Q The DRE protocol, where one DRE using the matrix can come up with the same thing in a laboratory situation or in the field.

A I am not sure if it was done in a later study not the Heishman studies but rather Scheiner and Schekman reported studies --

Q You sure they tested inner-rater reliability?

A I said I don't recall that they did, I know that they addressed the issue but I don't believe that they did and other than that no I am not aware that it has been done.

If I may, part of the problem with that is as I testified earlier to do an entire evaluation, full evaluation or even a protracted evaluation as was done in this case 20 to 25 minutes full evaluation taking maybe 45 minutes for some drugs their effect is rather rapid and the individual's responses can change even within the course of an hour, even within the course of doing two evaluations immediately back to back.

Q So it is not testable?

A For some drugs it may not even be testable in the ideal sense of as you suggest.

Q Now you are aware of the report that came out being in the field that you are in forensic science so the Academy of Sciences came out strengthening forensic science in the United States, is that correct? Are you familiar with that?

A Can you remind me of that?

Q Well it was a study that came out from the National Academy of Science basically that was talking about the shortfalls and the problems that have been discovered in forensic science, are you aware of that?

A I know there have been issues discussed, I am not familiar with that report no.

Q So you are not familiar with what they have said as to research or how it should be done or the importance of actually testing these concepts, you are not familiar with that?

A No.

Q Let me talk now, you cite in your paper the Bigelow study, correct? The Johns Hopkins study?

A In which paper are you referring to?

Q I apologize, this was your article Drug Evaluation Classification Program Using Ocular and Other Signs to Detect Drug Intoxication.

A Yes, I believe the Bigelow study was one that was used as a reference.

Q You actually summarized the study in your case, is that right?

A I would have to review the article, yes --

Q I guess you didn't really testify to as to the validity of those studies, is that correct?

A Correct I did not.

Q You haven't reviewed those in detail?

A Not recently.

Q Let me ask you this then, with the paper that you did on these validation studies I just want to clarify for the Court you are not attempting to say that you believe the Johns Hopkins study or otherwise known as the Bigelow study the Arizona study or the L.A. field validations that were done, the 173 studies, you are not attempting to indicate that those were valid protocols or valid studies are you?

A No, that paper the one you are referencing that we published that was simply a review of the program and the review of the literature up to that point.

Q The only one that you were testifying that had importance was the Heishman study?

A Yes.

Q All right, fair enough. Now there are studies in the DRE protocol, correct?

A I am sorry?

Q There are several of these studies that are actually noted in the student manual and the instructor manual for the DRE protocol, is that right, the Arizona, the L.A. field study?

A Yes I believe they are included as reference materials.

Q Is the Heishman study included?

A I don't recall.

Q Would you like to review the portion to see if it is included? You don't recall it being in there, do you?

A I don't recall it being in there, no, I don't think that it was indicated as a reference within the DRE student manual if that is what you are referring to.

Q Now eye examination, you said you actually teach that portion of the DRE class, correct?

A Yes.

Q That is not a requirement for the DRE program is it not that it has to be an optometrist teaching that?

A No.

Q In fact, it is more commonly taught by other police officers, correct?

A Yes.

Q And they are required because the program is systemized and standardized, they are required to follow the

manual through?

A Yes indeed.

Q So how long is devoted to eye examinations when you are in these programs?

A When I am teaching it or in the regular school?

Q Well do you know what generally is required for that section?

A Well first of all, in general when I do my presentation on HGN, VGN eye movements in general it usually is about a four hour block and it is usually done during the second day of the first two days of the DRE school which is technically the DRE preschool component of it.

In the DRE school, the formal school itself, the students get the, the DRE students, get the prescribed protocol, the standardized protocol, the standardized presentation, excuse me, on HGN and the field sobriety tests. So on the exact administration and what to observe.

Q Is that the standardized time allotted for that?

A I believe for that section, I would have to review the manual on that, that would be Session 8 I think in the --

Q Of the 2010 manual?

A 2010 manual and it should indicate right at the beginning how much time is allotted to that. In this version at least or this 2010 update it would be Session 5 and Session 5 is allotted one hour on day one and a second hour

on day two just to review that.

Q A total of an hour and 50 minutes, correct, for that block?

A A total of an hour and 50 minutes for Session 5 and then later on there is about an hour and 45, oh I am sorry, Session 8 which is demonstration of the valuation sequence which goes for over two hours including a break.

Q But that includes the whole evaluation not your portion, correct?

A I believe that would include the whole evaluation.

Q The time on the eyes, the HGN, VGN, lack of convergence, pupil signs, all those concepts that you spent this morning discussing you have an hour and 50 minutes in that program to do that, is that correct?

A That is what the schedule seems to indicate.

Q Have you reviewed that section, I will leave it for, obviously you have taught this an awful lot in Session 5, have you reviewed that session in depth?

A Let me clear that up, I don’t teach Session 5. What I present is a different presentation which goes to some extent beyond Session 5 and to some extent does not cover some of the things that are covered within here.

Now there is also another session here that I note, Session 11 on eye examinations so that is practice time for the eye examinations.

Q They do it on each other, right?

A Right. To be fair, again, DRE students when they come into the program they should already be proficient in most states that is one of the requirements, they should already be proficient at the field sobriety tests including HGN and VGN.

So much of what is presented here with regard to HGN and VGN specifically should only be a refresher for them. The new information of course would be lack of convergence and the pupil testing and that really is not difficult and I went through it this morning in an hour.

Q Certainly you discuss a lot of, well I will step through it in a second, you said they should be efficient at doing field sobriety tests, HGN, before they ever come in, is that correct?

A Again, in many states to be able to go to DRE school a law enforcement officer is required to demonstrate proficiency.

Q Are you aware that IACP and the DRE program is now offering a combined DWI detection and standardized field sobriety school, preschool and seven day school all in one shot?

A I was not aware of that one.

Q If you can take a look at the instructor manual in the 2010 drug recognition expert program tell me if that is

accurate.

MR. WELLS: Your Honor, objection. He is asking him about the accuracy of a manual he has not seen.

THE COURT: Well I think that is what he is doing, he is looking at it. I will overrule it.

THE WITNESS: Again, I have not reviewed this manual so --

BY MR. DeLEONARDO:

Q It does have a schedule in there does it not?

A It does have a schedule here and that is what I was just looking for in Section 1. Prior to that and there is no review of the course, department prerequisites, legal and political prerequisites and I am not reading each of these things individually but -- now what I don't see is, I am sorry, but what I don't see is your suggestion that, okay here we go the alternate schedules.

So combined preschool and seven day school and in alternate schedule number 2 combined DWI detection and standardized field sobriety test preschool and seven day school.

So it does look like they do offer that. This is the first I am aware of that, as I testified to earlier I am not a member of IACP nor the technical advisory panel so I was not involved in putting the schedule together or anything like that.

Q But you are an ambassador?

A All that means is they gave me a recognition, an honor for the work I had done up to that point. It is not something that I sought and it is not something I have any responsibilities for to maintain.

Q And you would disagree with that or you are fine with that, combining them all at once like that, taking an officer off the street with no prior field sobriety training and basically giving him all of it all at one time?

A Well again that goes to some training and at this point I cannot -- it is different than the training that had been offered in the past but my initial instinct would be that it may work for some officers, if may not work for others.

THE COURT: For my clarification, who offers this?

MR. DeLEONARDO: The International Association of Chiefs of Police and I tried to ask that earlier, Your Honor.

BY MR. DeLEONARDO:

Q That is who actually runs the program, correct?

A Yes.

Q It is a police fraternity, correct? I mean basically you have to be law enforcement to be a member, is that true?

A Again, I don’t know the structure of it so I don’t know if it is a fraternal organization or that I do not know.

Q But there is a thing that oversees this called a technical advisory panel for the International Association of Chiefs of Police, correct?

A Yes.

Q And on that technical panel, how many spots on that panel are actually relegated to a medical person, do you know?

A I know there is at least one and probably I think two.

Q It is not even a doctor, is it?

A Yes.

Q Who is it?

A I know that one of the, actually I do think it is two, Dr. Drack Richmond who is an optometrist out of the New England area.

Q Okay, not a medical doctor?

A Not a medical doctor and there had been, I know some of the members personally of the TAP but not all, but I know there had been a medical doctor who was part of that panel and I know there was a change in who that doctor was in recent years, during the last year or two but I do not know that person's name.

Q Let me go to your discussion on the eye exams and you talk about the concept, first I will go to a lack of convergence is that correct?

A Yes.

Q And essentially what lack of convergence is, is the ability to cross the eyes as the stimulus is getting closer to you, correct, to maintain crossing the eyes?

A Well lack would be the inability to.

Q Right, right it would be your inability to do that would be an indicator of symptom in the matrix, correct?

A Yes.

Q Now it used to be it actually went to the bridge of the nose, is that right?

A Yes.

Q So for years they went to the bridge of the nose and what did they find about that?

A Well, they found that more folks than expected could not do that so there were some false positives.

Q How many people naturally have lack of convergence in the population?

A To the bridge of the nose, that number might be 15, 20 percent.

Q How many have it at two inches without there being any drug impairment?

A That false positive goes to less than 10 percent.

Q It does?

A Yes.

Q What does the manual say about that?

A I don't recall without reading the manual.

Q Let me ask if you agree with this, "You should be aware that many people have difficulty crossing their eyes even when they are totally drug free and it is not uncommon to find unimpaired individuals who exhibit lack of convergence." Is that what the manual says or do you need to check?

A Well I will trust you reading of that.

Q So it says it is not uncommon. The numbers you gave me it sounds like it would be uncommon?

A Well it depends on your definition of common, or uncommon, 10 percent is one in 10 but it is not a lot of people but it is not unusual to observe that.

THE COURT: We are saying 10 percent --

THE WITNESS: Of normal sober individuals.

THE COURT: Cannot cross their eyes?

THE WITNESS: Cannot cross their eyes to within two inches.

THE COURT: I might be one of the 10 percent.

BY MR. DeLEONARDO:

Q Fair to say that there is other people out in the field think that that figure is much higher, isn't that true?

A Is much higher than that?

Q Yes.

A No I don't think so.

Q So when they use the term in the manual saying it is not uncommon they are referring to 10 percent?

A Ten percent is not a low number in my mind. We have 10 people in here and very likely one of them would not be able to do that.

Q And that would be a symptom on the matrix against them, correct, for being drug impaired?

A That is one symptom.

Q I cannot speak for co-counsel but I certainly know I am not, so. Let me ask you this, the new manual also says that you should have them wear their glasses when they are doing the evaluation, correct?

A For lack of convergence, yes I testified to that earlier.

Q And that is because if they cannot focus on the stimulus then you cannot get an accurate assessment of lack of convergence, correct?

A And I believe I testified to that earlier, yes.

Q You did. You also have testified under oath inconsistent with that, have you not? Have you? Have you previously testified that you should have them remove their glasses to do a lack of convergence test?

A And actually I believe I testified that way here today as well that the standard, prior to this last revision of the manual which I am aware of, this revision I am aware

of, all of the eye tests were done with eyeglasses removed.

Q And that is the way you testified it should be done when you went to court, correct?

A That was the protocol prior to this year.

Q I am not asking about protocol, I am asking in your field of optometry you testified that that was the appropriate way to do lack of convergence testing, did you not?

A For the DRE protocol, yes.

Q So are you telling me that you only have changed your opinion on the appropriate way to do a lack of convergence test when the DRE tells you it is not the right way to do it?

A It would not be the way we would do it for clinical purposes but for the DRE purposes to maintain the standardization within the protocol I believe what I testified and I would have to review whatever transcript you seem to have there of my previous testimony but I believe what I testified to was how the DRE protocol assessed lack of convergence and how that was to be done. I don't believe I was testifying to clinical protocol what I would do with my patients or have my interns do.

Q Well let me ask, do you recall testifying in Nebraska back in March 30th of 2006, correct?

A Yes, I believe yes.

Q Let me ask if you recall this exchange, "What about glasses not contacts but actual glasses? Spectacles? Spectacles. As far as would that affect the ability of an officer to conduct these tests, HGN, VGN," and you were talking about lack of convergence and you said, "No, as I mentioned previously the officer would typically, should typically request the subject to remove his glasses so that the officer can see the eyes more easily, see them more readily whether the suspect can see the stimulus clearly or not would not cause nystagmus or any other eye problems." Isn't that what you said?

A The clarity of being able to see the stimulus clearly.

Q Right, and you said that would not cause any eye problems by them not wearing glasses, isn't that what you said in Nebraska in 2006?

A If that is what the transcript says, yes.

Q Well, you are saying something very different today are you not? You are saying by not putting on the glasses it could affect lack of convergence?

A In this particular condition you can go to the situation of what we might expect for most circumstances for most individuals versus what we might see in some cases.

Now this is not inconsistent with what I said earlier with regard to the uncommon situation. The fact that

lack of convergence is not uncommon doesn't mean that a lot of people have it and 10 percent certainly is not a lot of people but it is also not a rare situation.

In most circumstances and as I am thinking about it, I will stand by that statement that for most individuals, so we leave out the 10 percent who might have lack of convergence naturally, who might need glasses to help them with that.

For the other 90 percent, the great majority of folks out there, removing the glasses for distance viewing would not have any effect.

Q So when the protocol in 2006 said you don't have to remove glasses, you thought that was a perfectly appropriate way to do it and now that the protocol says you have to make them wear glasses you believe, no that really is the way you should do it, is that what you are telling me?

A Well what it will do, what the new protocol will do, is lower the false positive on one of the tests, one of the points.

Q Well you were involved in 2006, why didn't you suggest that to reduce the number of false positives?

A I think the discussion had come up, I was involved in the earlier discussion of changing, the discussion happened in about 1998 or 1999, of changing lack of convergence from the bridge of the nose out to two inches.

Q And you were certainly familiar then in the field of ophthalmology, leading people in that field would say that two inches is still way too close?

A No actually our guidelines when we do our initial entrance skills testing, screening testing of patients and we test for convergence, two inches is normal. Again, we would expect 90 percent or more of normal individuals to be able to cross their eyes to that level.

Q So if someone could only do it at three inches you would say that is an abnormal finding?

A Yes.

Q And you said that is indicative of a driving impairment, is that correct?

A No what I said was if it is not compensated for it could affect driving. It doesn't mean that --

Q How many times do you have to look at something two inches from the bridge of your nose while you are driving?

A And that is where I mentioned earlier that all of the eye tests that are done as part of the DRE protocol they are based on the same principles that clinical tests are based on and also the way we use our eyes when driving are based on. They are not perfectly correlated, they are not matched perfectly to that.

So under normal circumstances when you are behind the wheel, no you would not be converging by that much but

you do need to be able to converge when you are looking at something on your dashboard and then to divert again when you are looking at a distance.

Q That is a whole lot farther than two inches, is it not?

A Certainly.

Q So lack of convergence says nothing about your ability to operate a vehicle, isn't that true?

A Fine and I don't --

Q Thank you. Now you also, it says with these drug categories this matrix that you were presenting, there is lack of convergence and as you go across it says it is present with a CNS depressant, a dissociative anesthetic and an inhalant and cannabis, correct?

A Correct.

Q Now how often is it present when you take that drug?

A Which drug?

Q Any of them, let's start with CNS depressant, how often when you have a CNS depressant in your body do you get lack of convergence?

A It will depend, I cannot give you an exact answer because it will depend on the physiology of the person taking the drug. It will depend on the dosage. It will depend on that person's tolerance to that drug.

Q Right. Can someone therefore have that produced in their body without being impaired? In other words, could that sign appear on someone who is taking a therapeutic dose?

A Or a dose that does not cause impairment.

Q Fair enough for a dose that does not cause impairment.

A For that particular finding, yes that could happen.

Q Okay. And how often do you take a CNS depressant and that not occur? You don't know that either, do you?

A I cannot give you an answer on that, no.

Q So when DRE's are being taught by you that you look for this if it is not there they are taught well that could be expected, correct?

A Correct.

Q And if it is there they say, well that could be expected correct?

A Correct, it is not as consistent to finding as some of the other results.

Q You don't think this is a reliable indicator of anything do you?

A By itself, no it would not be.

Q And that would also be the same for all the other categories that I referenced is that correct?

A Right, by itself lack of convergence would not be an indicator of drug intoxication or impairment.

Q Now let's talk about the issue of pupil size, yeah let me go to pupil size. You talked about there is ranges that people fall into. You are aware on this sheet, the matrix, the symptomatology chart, it actually gives you ranges for pupil size and room light, near total darkness and direct light, correct?

A Yes.

Q Where are those ranges? Where were they obtained from?

A There were a couple of studies, a couple of population studies done in the 1990's and early 2000.

Q Do you know that?

A I am not sure if they are referenced in the manual they might be but I know that I believe it was either 2004 or 2005 was the most recent one.

Q So when you are dealing with this, there are people that are certainly outside of these ranges without any drug being in their system, correct?

A Yes.

Q And you certainly know of people who just naturally would fall outside this range without any systemic medical problem or without any drug, correct?

A Yes.

Q And then when you add medical conditions that could also be a reason for a lot of this, true?

A It could be, yes.

Q So you would agree with me that again the fact that someone has a pupil size that may be a half a millimeter outside of this range doesn't indicate that they even have a drug acting on their body, does it?

A Not for one of the indicators but generally, again the DRE is looking not only for one possible clue but looking for consistency across different clues.

Q But if none of the clues tell you anything and you add them all together they are still not telling you anything, true?

A Well if you have someone who has let's say a slightly dilated pupil and it does not react to light, the pupil will certainly be dilated under the direct light portion of the test, it very well might be dilated above the top of the range for the room light portion of the test.

It may be within the normal range for the near total darkness portion of the test but that is two conditions now under which dilation is present. That is what the DRE would conclude and that is just one condition.

Q Well but when it comes to pupil size you have three measurings, you have room light, near total darkness and direct light, right?

A Right.

Q And if you are outside a half millimeter in any one

of those that is considered to be a present finding when it comes to reaction to light, correct, I am sorry pupil size, true?

A Right and then it is considered with the findings on the other tests.

Q So when I am filling this chart out, if I find lack of convergence and I see present I would put present, right?

A Right.

Q And if I thought your pupil size was dilated even if it was a half millimeter only under one lighting condition I would also check that, correct?

A Yes.

Q Now you are aware are you not that some people, some people in the field have actually objected to these ranges saying they are too restrictive, they are too small?

A Yes.

Q And in fact they have called for expanding those ranges because you are capturing too many people that have it naturally, correct?

A Actually I believe the analysis that was done was that for those three different lighting conditions it is now better at capturing the individuals who need to be correctly identified prior to the introduction of the three different ranges, three different size ranges for three different lighting conditions, there was a single range for all

conditions.

Q Right but even in the way it is currently situated under near total darkness experts in the field have said it needs to be re-evaluated or needs to be expanded, correct?

A Well what the research, and I believe that paper again I am going to have to recall what, I would have to look up what it is it was published I believe in 2004 or 2005, upon which the different pupil size ranges are based.

It came up with the ranges not for the purpose of capturing everybody under that particular lighting condition but rather most individuals, the great majority of individuals, I believe they used for the subjects that they tested for the several hundred subjects that they tested they used the mean value plus and minus one and a half times the standard deviation and that captures essentially 88 percent of that population.

So yeah even from that study there might have been some folks, some of their subjects, who are outside of whatever range was defined and that is recognized. That does not mean that the range needs to be expanded.

Q Okay. As far as lack of convergence, there are medical conditions that cause that as well, are you aware of any?

A Usually it is going to be a problem with the eyes, where there is a problem with how the eyes work together. I

am not aware of any systemic conditions that would cause lack of convergence.

Q What about pupil size?

A Again that is usually going to be a problem with the eyes. I am not aware of any systemic conditions other than maybe a brain injury or a head injury.

Q Neurological conditions, true?

A Or neurological conditions, true, that is brain injury, head injury.

Q Right.

A That would hold true for lack of convergence as well but typically if the eye movement system were affected that convergence would be affected then other eye movements would probably be faulty as well.

Q Like reaction to light?

A Well the pupil reaction to light, again would be a neurological condition.

Q Now you talk about reaction to light, what medical causes can cause, and I hate to use this term, you said one second is what you looked at, right?

A Right, well what the DRE's consider when they introduce the direct light is to see that the pupil constricts to the light and that it does so fairly rapidly within one second or less. That is a fairly rapid constriction from a dilating condition.

If it takes faster than that, if it takes less time than that, then obviously they cannot observe that that is going to happen too quickly.

If it takes longer than that that will be readily noticeable so if the pupil only constricts slowly, takes two maybe three seconds to constrict to its final constricted state that is something that is readily noticeable. That is going to be what is evaluated as the reaction to light.

Q So first of all in your practice are you telling me that generally everyone you see it is one second or do you make adjustments for that based on the individual?

A We don't make adjustments, no.

Q So if it is one second you would write slow reaction to light?

A When we do pupil testing, when we test our patient's pupils and we introduce light and do something not exactly following the DRE protocol in testing pupil responses but doing something very similar we would look for that as well to see that the pupils react to light and that they do so with relative speed and relative briskness.

Q Well you say relative, what is it relative to?

A Well, one second. So a one second response would be considered normal.

Q So in your field, if the person is beyond one second you would term that a slow reaction?

A Yes.

Q As far as the drugs, again what are the medical conditions -- I am sorry let me strike that. You would agree with me that a slow reaction as you termed one second again can be caused by other things, true?

A Yes.

Q And it also again doesn't say anything about whether a person is impaired by a drug even if it is there, true?

A Yes.

Q I mean there is absolutely nothing to link that, right?

A Could have, yes.

Q How often will you take one of the drugs, you indicated here CNS depressant the reaction is slow, CNS stimulant slow, the rest of them appeared they are going to be pretty much normal, inhalant slow and narcotic analgesic little or none visible, right?

A Right.

Q How often, and you can walk through those categories, how often when you take a drug will it give you a slow reaction?

A Well again it will be the same answer, I will just give you a general answer for all the categories that it is going to depend on the person's physiological makeup, how

that person, that person's body responds to the drug and certainly the dosage of the drug and possibly that person's tolerance to that drug whether he or she has used it before and that is going to be true for all of the categories.

Q Absolutely and in your background in alcohol, alcohol and drugs are different in that respect, are they not?

A In some respects yes.

Q I mean not exact but you would agree with me you can pretty much, there is more accuracy to tell when someone has a certain amount of alcohol in their system that there could be impairment, correct?

A Correct.

Q But as to drugs, you would agree with me, that not only the fact it is present but even concentration levels in the person's system you cannot tell whether a person is impaired, correct?

A Correct.

Q So when you say that drugs can produce these symptoms, you cannot even tell the drug recognition expert how often that will happen can you?

A No I cannot.

Q So you are sending -- now these drug recognition experts have no prior medical training going in, is that right?

A Mostly not.

Q And save your class typically these classes are taught by other law enforcement officers, correct?

A Correct.

Q So you have law enforcement officers teaching law enforcement officers about eye issues and drug issues and acting on the body, true?

A Correct.

Q So in this Session 5, how much is dedicated to talking about medical conditions that can cause these issues?

A Like I said since I haven't seen that manual, that version of that manual, I don't know how that might have changed.

Q Okay, you certainly can scan this a total of 10 pages.

A If I may just scan it, okay. Within this particular section I don't see any reference to any medical conditions.

Q Okay. Is there any discussion in there about therapeutic levels and how a therapeutic level could produce this sign or symptom but it doesn't mean impairment?

A Not within this section.

Q Okay. Now there is another section in there called Physiology, An Overview of Physiology, is that right?

A I believe there should be if that has not changed

and I will look to find it.

Q There should be, I think it is 6.

A Six?

Q I think it should be 6.

A Yes Section 6, Physiology and Drugs.

Q Okay, and if you could turn to the back of that section and tell me how much of that section is devoted to medical condition that mimic impairment by drugs?

A This entire section is about 14 topics or study as well, 15 pages of that. There is little over one page on medical conditions that describes very briefly bi-polar disorder, conjunctivitis, diabetes, head trauma, multiple sclerosis, shock and stroke.

Q Does it say in any of those what the effect would be on the eyes?

A On some of them it does. With conjunctivitis for example, it will talk about blood shot appearance to the eye. Again just going through this quickly --

Q How about HGN, VGN, lack of convergence, reaction to light, pupil size?

A In head trauma it actually goes into the reasons why the pretesting is done and checking the pupils, checking lid position that they are about equal, so yes it does do that.

On stroke there is also a discussion of pupils,

their size, their relative sizes and their reaction to light so yes there is some discussion to that.

Q On that one page?

A On that page and a little bit more than a page.

Q And that is essentially where the medical issues are discussed in that entire manual, is it not?

A Right. I believe so, again without reviewing the rest of it but I trust you on that.

Q Well let me ask you this now and again we established in that Section 6 when it talks about your eye examination, just to be clear that it doesn't tell the DRE how to evaluate a person to determine whether it is drug or medical, is that right, only whether it is there?

A Well to some extent yes but the basis and here is the point of the DRE protocol and this entire training is not to turn a police officer into a doctor, that is not the purpose and I do not agree with the characterization that either at roadside or during a DRE evaluation the police officer is making a medical diagnosis.

Now depending on how you define that you might say he is but for the most part he is only looking for signs and symptoms that are consistent with what he knows and what he has been taught occur with intoxication be it alcohol, drugs or any combination thereof.

If he observes impairment but that impairment is

not consistent with what he has been taught by the rest of this two inch manual occurs with intoxication then the proper call is a medial rule out and appropriate medical attention whether it be an immediate trip to the emergency room to initiate some life saving procedures such as someone who might be having a heart attack or stroke or insulin shock or a recommendation that the individual go see a doctor at some point in the near future.

The purpose of the DRE once he establishes that once he is convinced that the impairment does not stem from intoxication at that point he would call it a medical rule out and then take the appropriate action be it a life saving procedure or something else to suggest medical intervention but at that point he does not need to and would not make any call or diagnosis or such.

Q Well we established earlier that step 2 of this protocol is determining that the impairment is from drugs and not medically, correct?

A Based on questioning of the suspect.

Q Well you would agree with me that sometimes people might not realize what they have medically going on with them, right?

A And certainly somebody who might be suffering from a stroke that just a heart attack might not realize it and part of the process and the interview of the arresting

officer and the interview of the suspect at the outset of the protocol is to determine that is to see if something other than intoxication may be occurring where the DRE now rather than doing the evaluation and proceeding with an arrest needs to proceed with some sort of life saving procedure.

Q Well let me ask, when someone comes into your office and you tell them that they have no medical problems, is that a diagnosis? Is that a medical diagnosis?

A It would be a diagnosis of exclusion.

Q Right, so it is a diagnosis though?

A It is a diagnosis, right. Again, we can bandy about that all day with specifically what we mean by diagnosis and is what under some definitions, okay yes a DRE is making a diagnosis. Under other definitions, no he is not.

For the purpose of establishing a medical condition I believe it is more than adequate that the DRE recognize that if impairment is present but it is not obvious that it is impairment caused by intoxication, the DRE simply can label it as something caused by a medical condition and then take the appropriate reaction.

Q But that is not what the protocol says, is it?

A I am not sure how it differs.

Q Well let me ask you this, in the manual when they make an opinion there are two categories here, right, major

indicators and general indicators?

A Yes.

Q How many major indicators would need to be present in a particular drug category for them to be able to reasonably conclude in your opinion that a person was impaired?

A I believe it would need to vary. It would vary based on the category based on the observations that the DRE is making. So certainly --

Q I was going to give you the State's previous exhibit, I don't know which one it was well actually the Judge will need that, you can use that. If you can take a look at that, is that reasonable and ---?

A Yes, certainly.

Q So you are saying that there is no set number of major indicators that they are taught and need to be present?

A I am not aware of anything within the DRE protocol and again it has changed in the 2010 version but I doubt that it has that states that an officer must have at least three of the indicators or four or only two.

I can say with certainty that if there was only a single indicator present then and almost depending on what that indicator is but let's just keep it basic at this point, a single indicator to indicate that impairment was present then that would not be enough to make a call.

Q It wouldn't. But nothing in the DRE manual says that, does it?

A No I don't believe so.

Q So the opinion of this non-medically trained person who is given this matrix to go out who may or may not see a symptom in a person even if they are on the drug is being asked to do this with no guidance as to how many need to be there to find a person impaired?

A Well they do have guidance from first of all what is presented within the formal school itself and then during the certification training.

During the certification training they are observed for at least 12 evaluations and then every two years a DRE must be observed by an instructor doing an evaluation.

So there is review and it goes beyond just sitting in the classroom and learning that stuff.

Q But again, let's take cannabis for an example if you don't mind. There are nine major indicators, is that correct?

A Yes.

Q Now if someone had a lack of HGN that would be a symptom or an indicator in this box, correct?

A Yes.

Q If someone didn't have vertical nystagmus, that would be an indicator, correct?

A Correct.

Q So the fact that they have nothing wrong in their eyes with HGN and VGN is actually under the DRE program considered an indicator, right? A normal person that would be an indicator, true?

A I am sorry, can you rephrase the question please?

Q Well HGN, if you are looking at the category of cannabis the fact that they don't have HGN is deemed to be an indicator for cannabis, right?

A It will be the lack of an indicator of anything else.

Q Right, the lack of HGN is actually an indicator?

A If you want to call it that, yeah if you want to term it that way yes.

Q I mean that is accurate though is it not because if you have HGN they will put you in another box, right?

A Or the cannabis could be present with something else that would cause the HGN.

Q Okay, so either you have cannabis or you are mixed with something else, right?

A Right.

Q But they don't have a box for not impaired, right?

A Right.

Q Now vertical nystagmus, if you don't have that you are also considered an indicator for cannabis, right?

A By your reasoning, yes.

Q Lack of convergence, now you have told me that it is not uncommon for people to have lack of convergence, correct?

A Correct.

Q So if you have that and you are one of those people who cannot cross your eyes two inches from the bridge of your nose then you actually would be an indicator here as well, correct?

A Correct.

Q Now pupil size, if the DRE were to consider that you were a half millimeter off one of those three ranges that would in fact be dilated, right?

A Correct.

Q Reaction to light, if you have a normal reaction to light that one second you discussed, that would be an indicator, correct?

A Correct.

Q Now if you have let’s say high blood pressure, that would be an indicator, right?

A Correct.

Q Body temperature, your body temperature was normal that would be an indicator?

A Yes.

Q And muscle tone that would be an indicator, right?

A Yes.

Q You can have eight of nine of those indicators, that is pretty good for DRE isn't it?

A Did you include pulse rate I don't recall?

Q No I didn't include pulse rate, let's say it is up let's say it is 91, it is one degree over the range of 60 to 90, all right? Then this person has all categories.

A It would have all of the indicators consistent with what is on the matrix for cannabis, yes.

Q None of those things say anything about their ability to drive a vehicle, correct?

A Correct.

Q So when this Heishman study does this double blind study and takes away their ability to talk to officers, to find out what was found in the car, to take statements from the person, they just had to use this correct?

A I believe that is all that they were allowed to do.

Q And they were only 40 percent successful, correct?

A Well that and the psychophysical tests, I believe they were like the walk and turn and one leg stand.

Q Okay. Some of these categories don't have lack of coordination as an indicator, correct?

A Correct.

Q In fact, on cannabis lack of coordination is not one of them, isn't that right?

A It is not listed as one of the general indicators, no.

Q So you don't even have to be uncoordinated under cannabis, right?

A Right, but there are other indicators as well.

Q Like odor of marijuana?

A Like odor of marijuana.

Q So if you had been around marijuana smoke then that would be an indicator that you are impaired by it?

A Well that would be one possible indicator, yes.

Q What about increased appetite, how do they figure that out? Do you eat there in the DRE protocol?

A No but if you indicate that if somebody who is under the influence of cannabis indicates that they might be hungry.

Q So if they, look I am really hungry how long is this going to take, that would be an indicator?

A Yes for a bag of cheetos that is an automatic giveaway.

Q Got you, okay. So you would agree with me however on all of these that is a pretty overwhelming number of indicators for cannabis is it not?

A Certainly.

Q Let me do you one better here, now under blood pressure it says it has to be up, right, and some of them in

the other categories says it has to be down, right?

A Right.

Q What is the range for blood pressure that is used by the DRE protocol?

A For systolic it is the upper number of the fraction, 120 to 140 millimeters of mercury. For diastolic, the lower number of the fraction, 70 to 90 millimeters of mercury.

Q What is generally accepted in the field as a normal blood pressure?

A Just like visual acuity where you think 20/20 is normal, an accepted value is 120 over 80.

Q Which means if you are less than 120 over 80 that is actually considered to be, as best as we can term it, a normal range, correct?

A Correct.

Q In fact, if your range is 120 to 139 over 80 to 89 you would be considered pre-hypertensive if that was a consistent condition, correct?

A If it were consistent, yes.

Q Right. So when they take your blood pressure, if you are below 120 that would be considered down under the protocol, right?

A Yes.

Q So if you are considered normal blood pressure

according to the medical field and according to the American Heart Association, Merck Manual, you are familiar with that?

A I have heard of it, yes.

Q If you are normal according to all of those, you actually will be down under the matrix, isn't that right?

A By those numbers, yes.

Q Well do you see something wrong with that? The fact that you could actually be normal blood pressure according to the entire medical world but according to the DRE world you would actually be considered down and that would be an indicator that you were on a CNS depressant.

A That is one of the issues that actually I have addressed with members of the technical advisory panel.

Q How long have you been in this? How long have you been dealing with this DRE program?

A Well since my first introduction to it about 1996, '95, '96.

Q So since 1996, so we are talking what 14 years and you have not gotten this changed? I mean, certainly in the medical community 120 over 80 has always been the standard as far as you can recall, is it not?

A Yes.

Q It didn't all of a sudden happen last year, did it?

A No.

Q So for the last 14 years that you have been

involved you have noticed the fact that that is a bad sign, right?

A Well I wouldn't say it is a bad sign but yes it may need to be adjusted, it may need to be changed.

Q But you could be perfectly normal and you are being marked that you are down that you have a depressed blood pressure and that is just not true is it?

A That wouldn't be true in that circumstance, no.

Q Well let's talk about pulse, you say 60 to 90 is the range that they use, correct?

A Correct.

Q What does the medical community say is the range?

THE COURT: Seventy to 90, right?

MR. DeLEONARDO: He said it is 60 to 90 on here.

THE COURT: Sixty?

MR. DeLEONARDO: Yes, it is 60 to 90 on --

BY MR. DeLEONARDO:

Q You use 60 to 90, the DRE program does correct?

A The DRE protocol uses 60 to 90 beats per minute.

THE COURT: Oh I am sorry, pulse, okay.

THE WITNESS: Seventy to 90 was the diastolic blood pressure.

THE COURT: Right, got you.

BY MR. DeLEONARDO:

Q What is the range when it comes to pulse in the

medical community?

A If I am not mistaken I believe it is similar.

Q Is it not if you are under 100?

A It will depend on age.

Q Well it certainly would, would it not, but certainly it describes 60 to 90 and this is the normal range. Let me ask you if you agree with this, "The normal pulse for healthy adults range from 60 to 100 beats per minute. The pulse rate may fluctuate and increase with exercise, illness and injury and emotions.

Females ages 12 and older in general tend to have faster heart rates than in the males. Athletes such as runners who do a lot of cardiovascular conditioning may have heart rates near 40 beats per minute and experience no problems." Is that a fair statement?

A Yes.

Q So in the medical community, they would consider 60 to 100 to actually be a normal range, some people may be above, some people may be below, but pretty much that is the consistent range you will find, correct?

A Yes and where the major difference is that there, I believe as you read yourself for that population considering young adults, adolescents as part of the population those are the ones who would be expected to have the higher pulse rates.

For the DRE protocol, if you really want to consider it, you are really only considering adults who would be driving and for this specifically.

Q So you are telling me that the medical community distinguishes between someone who is under 18 into this general 60 to 100 normal range?

A I believe you just read that yourself.

Q It indicated that some may have higher heart rates than males in that age group.

A Females under 18.

Q Females, correct?

A Yes.

Q But it says the normal pulse for healthy adults range from 60 to 100 beats per minute, correct?

A Fine, yes.

Q So I am going to ask you again, in the medical community is 60 to 100 isn’t that the correct range?

A That would be a modification of the range.

Q Who is modifying the range?

A That would be a modification of the DRE protocol in that case.

Q Well the DRE says 60 to 90 so that means if someone is 91 they would be normal according to the entire medical world but according to this they would have an elevated pulse rate, right?

A For that one sign, yes.

Q Okay, so let's go through cannabis again. We have no HGN, no VGN, lack of convergence which is not uncommon, we have pupil size let's give you that a half millimeter we will come to that later, reaction to light is normal, pulse rate up, we already know that is not accurate, blood pressure would be up that would be if they are pre-hypertensive, body temperature normal, muscle tone normal, right?

A Okay.

Q They have nearly all of the major indicators, would you support a DRE opinion that the person was impaired and not able to operate safely?

A Without the other evidence, without the other physical evidence the behavior evidence --

Q The physical evidence, are you talking about drugs that were obtained from the car?

A Possibly or the appearance of the individual and also odor would go into that and the odor that the DRE would notice as well as the behavioral component of it.

There are a number of behavioral characteristics listed within the general indicators and other indicators and that would fit in as well.

Q So how many of the general indicators would you need to have?

A Again it would vary from one category to another

for one drug to another. I cannot give you an exact number.

Q So and that is exactly my point that when you do an evaluation of a person you are using your medical training, is that correct?

A Right.

Q You are bringing that to bear to decide how much weight to put into one symptom, how much weight to put in another symptom, correct?

A Correct.

Q You will even discard abnormal readings based on other evidence you may see, correct?

A Correct.

Q While we established you are not a medical doctor you certainly have gone through optometry and can assess those issues in the field of eyes, right?

A Correct.

Q The DRE's don't have that do they?

A No.

Q This is basically portrayed as, would you agree, as a diagnostic test, right?

A It would be classified as a diagnostic test, yes.

Q Tell us what a diagnostic test is.

A Well a diagnostic test allows you to differentiate one condition from another or one condition from a series of other conditions.

Q So it would allow you to distinguish between impaired and unimpaired, correct?

A Correct.

Q Impaired by medical and impaired by drugs, correct?

A Correct.

Q Those are the diagnostic things that this proports to do, true?

A Correct.

Q And that was exactly what Heishman was testing whether this diagnostic test actually did what it said, right?

A To some extent because again in the protracted protocol that Heishman employed the officers were not allowed to ask the subject questions.

Q Is that what triggered confirmation bias, correct?

A Well because it could, yes.

Q You would agree with me if someone is told there was cocaine or prescription drugs found in the car they would be more likely they would find that to be present in a case, true?

A Well that would be one of the things, one of the pieces of evidence that they would consider.

Q Now in addition as to pulse rate, you take pulse correct?

A Yes.

Q You are taught to take it how? Let me rephrase I don't need you to break it all down. Essentially what I am asking is when you were taught to take it, you were taught to take it over a minute period of time, correct?

A There are two way to do it either over a full minute or 30 seconds and multiply it by two.

Q In the medical community you take it over the full minute?

A Over the full minute, yes.

Q In the DRE program you take it by 30 and times it by two?

A Yes.

Q Now why is that significant in a difference? Why would the medical community say take a full minute but DRE takes it 30 seconds, can you explain that to me?

A Part of the reason I cannot explain why it was done, but part of the reason may be to limit the time that it takes to do the full evaluation.

Q What error is produced by doing it that way or certainly could be produced by doing it that way as opposed to the full minute like the rest of the medical world says you ought to do it?

A In the 30 second measurement you might be off by one or two beats so when you multiply it by two you would be off by two or four beats.

Q So you could potentially be off by four beats in that period of time?

A Potentially.

Q So not only is the range wrong but you even have this error rate built in because they are not doing it like the rest of the world, right?

A Potentially.

Q Now when they are taught -- what are the medical reasons that you can have an elevated or a depressed pulse?

A When the DRE's are taught that?

Q Yes, what are they taught? What are they taught about medical reasons that you could have a depressed or an elevated pulse?

A Well what I would discuss with them, I am not sure if it is in the manual and I don't care to review it but I am sure the topic of hypertension has come up, high blood pressure, anxiety, if someone is nervous.

Q Heredity?

A Certainly, it could be a congenital condition.

Q Illness?

A There could be some illnesses so if someone for instance might be suffering from the flu pulse could be up.

Q Fitness or lack thereof?

A Or fitness or lack thereof.

Q Actually, those are noted in the manual in the 2010

edition, are you familiar with that?

A Yes.

Q Now are you familiar with whether or not however the DRE's are told how to evaluate that? For example, if you have someone in your office, let's say they are 101 on the pulse for example but they are obese, they are an obese patient, okay, would you take that into account in deciding whether it is an abnormal pulse?

A Certainly.

Q So you have actually taught from your training that some of these signs and symptoms can be explained away very easily by conditions the person has, right?

A Yes.

Q In anywhere in the protocol that you are testifying as an expert in this, is there anywhere in this protocol that explains how much weight or how that evaluation should be done by the DRE when they are faced with those situations?

A How much weight that should be given?

Q Yes, in other words, hey if this person is overweight then you should not consider pulse unless it is in this range. Is there anything like that?

A I don't recall.

Q That would also go for blood pressure too would it not?

A Certainly if there is the discussion of medical

conditions then being overweight or obese would be one of the considerations and for those two variables specifically certainly there should be discussion of that.

Q But you would be surprised if there is not a discussion as to the effects, really a detailed discussion as to the effects that it could have? I mean you can certainly take a look if you like.

A That is all right.

Q You would rather not? Okay. Blood pressure, there is a number of medical conditions that effect that, correct?

A Yes.

Q Cardiovascular disorders?

A Yes.

Q Neurological conditions?

A Possibly.

Q Kidney, urological disorders?

A Yes.

Q Psychological factors like stress, anger, fear, right?

A Yes.

Q And you also know of a concept called white coat hypertension, right, very recognized in the field is it not?

A Yes.

Q Can you tell us what that is?

A That is a little bit of anxiety it is related to

anxiety that you might experience when going to visit a doctor because of the fear of receiving some bad news about your medical condition or anything else.

Q And I think you probably would agree with me that someone who has already been arrested and is being examined with the stethoscope and taking their pulse all this by an officer, would probably experience the same level of white coat hypertension, correct, or certainly could?

A It could have.

Q Yes, it could have. So all of those issues are they discussed in the manual and explained as well to the DRE who is applying this matrix?

A I am not aware that they are, I don't know.

Q Would you like to look?

A Would you like me to review this?

Q Sure.

THE COURT: How much longer do you need Mr. DeLeonardo?

MR. DeLEONARDO: I think I am getting to the ---.

THE COURT: I am trying to let you finish your cross before we adjourn for the day.

MR. DeLEONARDO: I appreciate that. I think probably another 20 to 30 minutes Your Honor.

THE COURT: I think we are going to adjourn for the day.

MR. DeLEONARDO: Okay.

THE COURT: All right now, I told you we are going to be in Courtroom 1 tomorrow. The other thing is I have an appointment out of town actually and I anticipate starting tomorrow at 10:30 and I think I will be, I have to go to Frederick, but I think I will be back here a very brief appointment.

So you want to take your things with you because we are not going to be here tomorrow and Madam Clerk?

THE CLERK: Yes sir.

THE COURT: I am going to take this one file, I do not know that there is any need to bring all the other files tomorrow unless you want to lug them up the steps over there.

THE CLERK: If you don't think you need them I will leave them on my desk.

THE COURT: Yes, I do not think there is anything that is case specific here.

THE CLERK: Okay.

THE COURT: Now let me just for my own information, are you going to do any cross of this witness Mr. Cruickshank?

MR. CRUICKSHANK: I do have some questions but my questions are not specifically on the protocol and it will be a half an hour at the most, at the most.

THE COURT: I am sure you are glad to hear that

Mr. Citek or Doctor. For the practical matter, there is nothing more fun than being cross examined I am sure, never having had that pleasure I cannot say for sure but the end is in sight I believe.

THE WITNESS: Well Your Honor, I am still smiling.

THE COURT: And you have been subjected to it before I am sure.

THE WITNESS: Yes I have.

THE COURT: Everyone have a good evening.

THE CLERK: All rise.

(Whereupon, the hearing was recessed to reconvene at 10:30 o'clock a.m., September 21, 2010.)

C E R T I F I C A T E

CompuScribe, hereby certifies that the attached pages represent an accurate transcript of the duplicated 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 DATE TEETER

By:

_____ _____
Michelle L. Smiroldo, Transcriber Date