NORTH CAROLINA	**IN THE GENERAL COURT OF JUSTICE** **SUPERIOR COURT DIVISION**
WILKES COUNTY	**FILE NOS. 07 CRS 1555,** **07 CRS 52638**

STATE OF NORTH CAROLINA,]
]
]
vs.]
]
RICKY DEAN NORMAN,]
]
Defendant]

TRANSCRIPT OF THE TRIAL

DR. PAUL GLOVER TESTIMONY ONLY

The above-captioned case coming on for trial at the July 27, 2009, Criminal Session of the Superior Court of Wilkes County, Wilkesboro, North Carolina, before the Honorable Carl R. Fox, Judge Presiding, the following proceedings were had, to wit:

APPEARANCES

Appearing for the State:
Thomas E. Horner
District Attorney
23rd Prosecutorial District
Wilkes County Courthouse
500 Courthouse Drive
Wilkesboro, NC 28697
336.667.6461

Appearing for the Defendant:
Jay Vannoy
Vannoy Colvard Triplett & Vannoy, PLLC
P.O. Box 1388
North Wilkesboro, NC 28659
336.667.7201

TABLE OF CONTENTS

[END OF PAGE]

SWORN WITNESS: PAUL GLOVER

DIRECT EXAMINATION BY MR. HORNER

Q. If you would, state your name, please.

A. My name is Paul L. Glover.

Q. And how are you employed, Mr. Glover?

A. I'm the research scientist and branch head for the Forensic Test for Alcohol which is branch of the Department of Health and Human Services.

Q. And in that capacity what, what do you do?

A. Well, our branch has twenty-eight individuals in it. We oversee a number of different programs. I oversee all of the different programs and obviously all of my staff. We train law enforcement officers on how to operate breath test instruments that are used in DWI cases. We also perform maintenance on all those instruments. All of them that are used throughout the state are owned by us. We also do training on, for drug recognition experts; those are the officers who are going to get specialized training in observing effects of drugs in individuals. We have the Batmobile program which involves DWI checkpoints in vehicles that are used there. So I, I oversee that. I do in-service training for my staff on issues related to breath testing for alcohol, blood testing for alcohol, blood testing for drugs and urine testing for drugs. I evaluate permits that are submitted to me from individuals who want to become analysts

for analyzing blood. And we have some analysts at the Charlotte-Mecklenburg crime lab. All the rest of them are with the State Bureau of Investigation. So I review their applications, their methods and their abilities to perform the analysis and then determine whether or not that we issue the permit.

Q. Okay. And, if you would, just describe briefly the subject matter of your specialty.

A. I deal with scientific issues related to breath testing and blood testing for drugs and alcohol.

Q. And, do you have any particular specializations within that particular field?

A. Basically, just issues related to those, any scientific issues related to the, the testing or the effects of drugs and alcohol.

Q. Okay. And what is your educational background?

A. I have a BS in biology that I got at Florida State University in 1974 and a master's in biology that I got at Florida State University in 1978.

Q. Okay. And, in addition to that education, do you have any other specialized degrees or training?

A. I'm certified as a chemical analyst on the breath test instruments in this state, certified to do preventive maintenance on them, factory-trained on maintenance on alco-sensors. I attended a course of instruction for highway

safety supervisors at Indiana University. That course dealt with humans and alcohol, various methods for determining alcohol concentration in individuals, how alcohol gets in them, where it goes in them, the effects it has on them, the way the body eliminates the alcohol and, and, like I said, the various methods for determining alcohol concentrations. I also attended a course of instruction at Indiana University that deals with the effects of drugs on human psychomotor performance.

Q. Okay. Do you have any, have you held any positions since the completion of your formal education in reference to law enforcement or to the position that you now currently occupy?

A. Yes. I was a research scientist at Oakridge National Laboratory, Oakridge, Tennessee for seven years, a research scientist at the National Institutes of Environmental Health Sciences in Research Triangle Park for five years and research scientist at Burroughs-Welcome Pharmaceutical in Research Triangle Park for seven years. I've been a reserve officer in Durham since 1986. I'm currently deputy chief in the reserve program. And I've been a reserve officer at the University of North Carolina at Chapel Hill since 1992 where I'm a lieutenant.

Q. Okay. How long have you been at your current place of employment? I'm sorry, you might have already answered

that, but----.

A. It will be twelve years on August 31st.

Q. Now, if you would, in the course of your occupation, do you actually, I believe you, you briefly touched on this, but you actually teach classes with regard to this particular occupation, is that correct?

A. I do teach some classes. We teach a, an alcohol toxicology class to new prosecutors, to new district court judges whenever we're asked to do one of those sessions. My agency teaches classes. I'm involved in some of the classes but, certainly, not all of them.

Q. Okay. And have you published any, any works with regard to your occupation?

A. Yes. I did a study on the effects of interfering substances on breath alcohol testing which was presented for presentation at a conference in Stockholm, Sweden. It was published as part of their proceedings. And, had another presentation on the effects of heat on blood samples containing alcohol which was for presentation in Montreal and it was published as part of their proceedings.

Q. Okay. Now, if you would, just describe for the ladies and gentlemen of the jury, or if you could explain, what does forensic, what is a forensic blood alcohol physiologist?

A. It would be an individual who's going to be looking

at alcohol in humans from, when we're putting in the forensic component it's within the context of law enforcement or the legal aspects of it. And, it's an individual who's going to look at results, look at times, parameters, whatever might be involved in evaluating, say, a result, an alcohol result.

Q. Okay. And what about a forensic blood pharmacologist?

A. That's going to deal with the effects of the, how the body's going to be handling the drug, what the drug is going to be doing to the individual.

Q. And, you are actually both, is that correct?

A. I have been, yes.

Q. Okay. And you've been tendered as an expert in those particular areas before, is that correct?

A. That's correct.

Q. And, also, as an expert in breath and blood alcohol testing?

A. That's correct.

Q. And an expert in the effects of drugs on human performance and behavior, is that correct?

A. Yes, I have.

Q. How many times have you testified on those matters before?

A. In total, between two hundred and thirty, two hundred and forty times in the state of North Carolina.

Q. Okay. Have you testified in, in different courts?

A. Yes. I've, I've testified in about seventy different counties and district court, superior court and, also, in federal court.

Q. Okay. Your Honor, at this time the State would tender Mr. Glover as an expert in the field of forensic blood alcohol physiology and pharmacology, breath and blood alcohol testing and the effects of drugs on human performance and behavior.

MR. VANNOY; Can I ask some questions?

THE COURT: Yes.

VOIR DIRE EXAMINATION BY MR. VANNOY

Q. Mr. Glover, you said you had a degree, a bachelor of science degree in biology and a master of science degree in biology. Is that right?

A. That's correct.

Q. Do you hold any other degrees any other than that?\

A. No, I do not.

Q. You're not a doctor?

A. No, I am not.

Q. You said that, Mr. Horner asked you if you were a physiologist or a pharmacologist and you said you have been. What'd that mean?

A. It means that I've been tendered and accepted in those fields before.

Q. You've been tendered and accepted but you, you've not received any specialized training to become a physiologist in your practice, have you?

A. I don't have a certification as one or a specific degree in that, no.

Q. And you don't have any specific degree or any certification as a pharmacologist either, do you?

A. No, I do not.

Q. The, so your current position is a research scientist and you're the head of the forensics, Forensic Test for Alcohol branch?

A. Yes.

Q. And the classes you said you went to, you went to a course at Indiana University, you said?

A. Yes, I did.

Q. When was that?

A. The alcohol class would have been probably 1998, if I remember correctly.

Q. Have you gone to any other courses since then?

A. The effect of drugs on human psychomotor performance would have been a couple of years after that.

Q. So, about 2000?

A. I'm guessing 2000. I don't remember the exact date.

Q. How about since 2000?

A. Courses?

Q. Yes, sir.

A. No courses. Attended conferences with sessions in those conferences that deal with related topics, but no specific courses.

Q. How many hours were each one of those courses?

A. The alcohol course is a four and a half days, as I recall, so that would make it right at thirty-six hours. The drug course, as I recall, was three and half days.

Q. About how many hours was that?

A. That would make it about twenty-eight.

Q. All right, sir. No more questions.

MR. VANNOY: Based on that I, I would object to his tender as offered, Your Honor.

THE COURT: All right. All right. Witness may testify and give opinion testimony in those fields and testify as an expert in those fields as allowed by law. The exception is noted for the record.

MR. HORNER: Thank you, Your Honor.

DIRECT EXAMINATION CONTINUED BY MR. HORNER

Q. Mr. Glover, at some point in time after March the 26th 2007 were you contacted by my office with regard to looking over certain information involving the defendant, Ricky Dean Norman?

A. Yes, I was.

Q. Okay. And what was the purpose, or what were you

asked to do in reference to Mr. Norman?

A. I was asked to look at various results, those being different blood tests, those results and I looked at them with respect to the time of the test, time of the crash and give an opinion as to the significance of the results of those different tests with respect to alcohol and anything else that was found that night.

Q. Okay. And did you do that?

A. Yes, I did.

Q. Okay. And, okay, I'm going to hand you what's been marked as State's Exhibit Number 49. Do you recognize that, sir? I'm sorry. It should be 50, State's Exhibit Number 50. Do you recognize that, sir?

A. Yes. It's a report that I sent to your office.

Q. Okay. And that you prepared in this case?

A. Yes, it is.

Q. If you would just maintain that. Now, you were able to, to, or some information with regard to the defendant's record was provided to you, is that correct?

A. That's correct.

Q. That being his records, his medical records from Baptist Hospital?

A. Yes.

Q. His, the SBI laboratory results, being the blood alcohol results, is that correct?

A. That's correct.

Q. The results from the North Carolina State Bureau of Investigation laboratory with regard to the controlled substances found in his blood system.

A. That's correct.

Q. Is that correct? And, the, the medical, the record from the North Carolina Highway Patrol, at least of the record, with regard to the accident, is that correct?

A. That's correct.

Q. And, also, the medical records from Hugh Chatham Memorial Hospital, is that correct?

A. Some of them, yes.

Q. Some of them. Okay. Now, you were able to determine from the, at what time were you able to determine with regard to the North Carolina Highway Patrol investigation report as to what time the accident had occurred?

A. The crash time that was reported at 17:49 or 5:49 p.m.

Q. Okay. And that was on March the 26th 2007, is that correct?

A. Yes.

Q. Okay. And were you able, when you took a look at the SBI laboratory results, you were able to determine that it showed positive for alcohol, is that correct?

A. That's correct.

Q. And, you were able to determine, were you not, that the blood for that report was drawn at what time?

A. At 20:03 which would have been 8:03 p.m.

Q. Okay. And that was at Hugh Chatham?

A. Yes.

Q. And what was the result of that blood draw?

A. Result of that blood draw is reported by the SBI was .03 grams of alcohol per one hundred milliliters of whole blood.

Q. Okay. And, you were also able to examine that medical records from Baptist Hospital with regard to the blood draw, is that correct?

A. That's correct.

Q. Were you able to determine that----? Well, strike that. Also, you were able to determine from the SBI blood draw that he had controlled substances in his system at the time, is that correct?

A. That's correct.

Q. Okay. Now, when you examine the Baptist Hospital records, what time was the blood drawn or what time, what time was the blood drawn there at Baptist Hospital or was the urine specimen taken at Baptist Hospital?

A. I'm not seeing the hospital collection time right now. Oh, 20:49 or 8:49.

Q. Okay. And that was, again, on March the 26th, is

that correct?

A. That's correct.

Q. Same day as the accident and the same day that, that it was taken for the blood draw for Hugh Chatham?

A. That's correct.

Q. And what was the result of the blood draw from Baptist Hospital?

A. That result was thirteen milligrams per deciliter of plasma, as opposed to whole blood.

Q. Okay. And there's a conversion from plasma to whole blood, is that correct?

A. That's correct.

Q. Did you do the conversion?

A. I did convert it to a whole blood value.

Q. And what was the conversion?

A. When I did the conversion the result after truncation, that is to we drop any third digit and just report it as two digits, would have been a .01.

Q. Okay. And is that one hundred milliliters of, grams per one hundred milliliters of whole blood?

A. That's correct.

Q. Okay. Did you actually do that conversion and make that a part of your report?

A. Yes, I did.

Q. Okay. And attached it to it?

A. Yes.

Q. Okay. And, based on the fact that you were able to take a look at those, both the SBI blood result and the blood result from Baptist Hospital, what were you able to do with, with those two results?

A. What I was able to do is to calculate the rate that the defendant's body was eliminating alcohol from his system by having two different blood draws with time between them. We looked at the difference in the two results and the elapsed time and I was able to calculate his rate of elimination.

Q. Now that's the actual rate of elimination, is that correct?

A. That's correct.

Q. Okay. And, were you able to calculate that?

A. Yes, I was.

Q. And what was his actual rate of elimination?

A. .0247 which means an individual's alcohol concentration would be expected to go down .0247 for each hour that passes.

Q. Okay. And based on his rate of elimination, were you able to do some calculations with regard to the defendant's alcohol concentration what it would have been at the time of the accident?

A. Yes, I was.

Q. Okay. And do you have an opinion as to what that

would be within a degree of scientific certainty?

A. Yes, I do.

Q. And what is that?

A. The calculated value at the time of the crash would have been a .08.

Q. Okay. .08?

A. Yes.

Q. And, is that process called retrograde extrapolation?

A. It is.

Q. Is that process commonly accepted and within the law?

A. Yes, it is.

MR. VANNOY: Objection, form of question.

THE COURT: Well, as to form, sustained. Disregard the answer.

Q. Have you testified about retrograde extrapolation before?

A. Yes, I have.

Q. Now, you indicated that his blood alcohol content at the time of the accident was .08 grams per one hundred milliliters of blood, is that correct?

A. That's correct.

Q. And what is the legal level of impairment in North Carolina?

A. The per se limit is .08.

Q. Okay. Now, you've indicated that based on your observations of the records that, that there were other impairing substances detected in his blood, is that correct?

A. That's correct.

Q. There were cocaine metabolites detected in his blood at Baptist, within Baptist Hospital's records, is that correct?

MR. VANNOY: Objection to the leading.

THE COURT: Sustained.

Q. What, if any, impairing substances were you able to observe or were recorded in the Baptist Hospital records?

A. I believe there's an indication of cocaine and possibly benzodiazapenes or opiates. I, I don't recall right off the top of my head on that one.

Q. Okay. What about with regard to the SBI lab results?

A. The SBI lab report had presence of cocaine, presence of cocaethylene, benzoecalnene, lidocaine and I believe opiates.

Q. Okay. Now, at least to some degree with regard to the lidocaine you were able to rule that out, were you not, that that was a part of his medical treatment?

A. It is very likely the result of medical treatment.

Q. Okay. What about the other substances, the other

metabolites of cocaine?

A. Those would not have been a part of the treatment.

Q. Okay. And, if you would, describe what a metabolite of cocaine, those particular metabolites of cocaine are.

A. Well, cocaine gets broken down by the body in the liver. It would normally be broken down, the first metabolite that would be generated would be bezoecalnene. In this case, that was present but also present was a metabolite that's formed when there's alcohol present, with alcohol with cocaine and that compound is cocaethylene.

Q. Okay. And, if you would, describe what, what is a parent compound?

A. A parent compound would be the original starting compound. We frequently refer to compounds. In this case, cocaine would be the parent compound. It's the compound that you're starting out with initially.

Q. Okay. And, with regard to the particular metabolites of cocaine, do you have an opinion based on your training and experience as to what the half lives of those particular metabolites would have been?

A. Yes.

Q. And what are they?

A. The half-life of cocaine is in the range of forty-five minutes to maybe an hour and a half. We typically see it at about forty-five minutes. So, the half-life of

cocaethylene is longer. It's in the range, depending on the studies that you look at, a hundred and forty-three minutes, maybe three to five times as long as cocaine's half-life. So there's variation in that.

Q. And what's the significance of the issue of half lives of these particular compounds with regard to finding them in, when they're laboratory tested?

A. Well, the significance comes in when you look at something with a short half-life. A half-life means how much time does it take for a substance for say the body to break down or reduce the concentration of a given drug by half. So how much time does it take to reduce that concentration by half? The half-life is significant when we're looking at short half lives when they're measured in minutes or say less than an hour. That means if a compound had a half-life of a half an hour then half of it would be eliminated from the body in the first half hour, half of the remaining compound would be gone by the second half hour. If we're looking at a drug that say has a six-hour half-life it would take six hours before we would see it reduced.

Q. Okay. And when you find a metabolite are you always going to find a parent compound?

A. No.

Q. Okay. And what's the significance in finding the cocaine, the parent compound, in the SBI laboratory results?

A. In my opinion the significance of a parent compound being present, because it does have a relatively short half-life, it indicates recent use of the drug.

Q. Okay. And, when you compare that to the time that the accident occurred, according to the information that you've been provided, what is the significance of, of finding the parent compound in the SBI laboratory testing at that point?

MR. VANNOY: Objection.

THE COURT: Grounds?

MR. VANNOY: I don't think he's qualified to make that opinion with regard to the accident.

THE COURT: Overruled. Do you have an opinion?

A. Yes, sir.

THE COURT: All right. Overruled.

A. The concentration would have been higher at the time of the crash.

Q. Now, you're familiar with, with the effects of certain controlled substances on an individual's system, is that correct?

A. That's correct.

Q. With regard to one's ability to drive, what would the effects be with regard to ingestion of alcohol?

MR. VANNOY: Objection, speculation.

THE COURT: Repeat that question.

Q. What are the general effects of alcohol on an individual's ability to drive?

THE COURT: Overruled.

MR. VANNOY: Your Honor, may I be heard?

THE COURT: All right. Let me ask the jury to step back to your room for just a few minutes, please. Yes?

MR. VANNOY: Your Honor, may it please the Court, the basis of my objection is that there's no, this is speculation because there's no foundation for it. We have no foundation as to the quantity of the substance. That's not been proven by the state at all. The time that it was ingested, the amount that was ingested of alcohol or of cocaine, there's absolutely no way to base an opinion on the way it affects driving without knowing the way it was ingested. Just like the prior experts testified to this morning. The toxicologist from the SBI lab said you've got to know when it was ingested. You've got to know what was ingested. You've got to know the quantity of it being ingested. And here, he's just asking him to make a general determination of how cocaine might affect somebody's driving. Well, it might affect my driving a whole lot different than it affects anybody else's driving. So to make that determination to some type of reasonable degree of scientific certainty

without any foundation or evidence to support it is speculation and I would contend, based even on the prior evidence the State's presented, that this opinion goes too far. It's outside the scope of Rule 702 and, Your Honor, should restrict it under Rule 403.

THE COURT: Well, how is that different than the----. I mean when, when you have, you asked that question about alcohol there are generally things that you can testify to about what, how alcohol affects the body. The question is, is how exaggerated those tings hare depending the amount that one has ingested. I mean, it's, it's not that alcohol doesn't. It's just that there are general things associated with alcohol, as I'm sure there are with almost every drug, and the, and the way that it impacts the body. The question is how much does it take to have a certain affect on the body. It's not that they don't have that, the effect. It's just, the question is whether or not he had consumed enough to have that effect or, and I doubt he can give an opinion as to what, what in fact this would have had on Mr., on the defendant if he had this in his system because he wouldn't know how much of the cocaine he had in his system. He may have some idea as to how much alcohol, but I'm, he's not being asked to tell how much, what impact it had on him. It's just generally what effects those things have on the body.

MR. VANNOY: My point exactly, Your Honor. To

even make a generalization of how it affects on driving one would need to know how much is consumed, the quantity of it, when it was consumed in relation to the driving. There has to be more factors produced to lay a foundation for how you can make that determination, otherwise, it's just a generalization without any basis.

THE COURT: Well, I would agree with you with regard to if he were saying this about, specifically about the defendant, but that's not what the question is. The question is generally what effect do these drugs have on, on, on the body.

MR. VANNOY: I think if they had more foundation for it then they might be able to make a generalization. My point is there is no foundation for making that generalization without knowing more specifics about what generalizations you make in somebody who----. Another point scientifically, is it makes a difference whether you snort it, whether you shoot it, or whether you cook it. There's all kinds of different ways to ingest cocaine. It, it, it affects the half-life. It affects a lot of different things. It affects the, the affect on the person. We have no evidence of that. And so just saying, how does cocaine affect somebody's driving in general without any basis at all as to the way it was taken, the amount taken, any of those factors, I think goes outside of Rule 702 being able to form a based opinion on it and it's

more prejudicial and it's misleading to the jury and should be excluded under 403.

THE COURT: Let me ask you, are you saying then that you don't think that there are studies that have been done with regard to cocaine and, and the body to be able to determine to list the, the impacts that, that that drug could have on, not, not on him specifically, but on a person in generally, depending on the amount ingested?

MR. VANNOY: I'm sure there are studies, but that wasn't the question. The question was his opinion, to generalize. I, I have no doubt that there are studies in the scientific community that, that give you ranges of behavior based on the way the study was created based on the intake of the drug that was controlled.

THE COURT: So you----

MR. VANNOY: It might have been done in a social setting but that wasn't the question. The question was his opinion to generalize without any foundation for anything else. So, yes, I agree with you that there are studies.

THE COURT: Do you have an opinion as to the impact, the effect of cocaine on driving?

A. Based on the studies that I've read, yes, sir.

THE COURT: And what is, what, what is your, what is that opinion?

A. Well, cocaine is a central nervous system stimulant

and what has been gathered in literature is an indication that, well, first of all, it gives individuals a sense of well-being, it being a stimulant, that lasts during the euphoric phase. There are reports based on crashes and then studies when they've looked at what's in an individual and there's a correlation between high-risk driving; some of it being high speed, some of it being fleeing, a number of different things, specifically with driving where individuals had cocaine in their systems and behavior was that of high-risk driving.

THE COURT: You want to ask him any questions about what he just said, Mr. Vannoy?

CROSS-EXAMINATION BY MR. VANNOY

Q. Yes, sir. The, these studies, can you tell me the names of these studies, Mr. Glover?

A. There's a list, there's a paper done by Dr. Isenschmid and he lists--and it's not his study--but a listing within that review he did of crashes. I believe these were from the Detroit or Fort Wayne, Indiana area where they looked at crashes and behaviors and found association or correlation between the presence of cocaine and high-risk driving.

Q. And, and Dr. who?

A. Isenschmid.

Q. Can you spell that? Do you have that study with you?

A. I do. It's, well----. Would you like me to spell it?

Q. Please.

A. I-S-E-N-S-C-H-M-I-D.

Q. In that study he did was the, the, the manner of ingestion of cocaine documented in the study?

A. I don't think that it was. I don't know that they, that they knew in those cases how it was ingested.

Q. Well, what, what did they, what basis did they document their study on [inaudible] to the cocaine that was found in the system of the subjects of the study?

A. They looked at resulting crashes or behaviors and saw correlation between those behaviors in the presence of cocaine.

Q. Did they, did they measure in that study any of the amounts detected of cocaine in those subjects?

A. They did measured amount of cocaine, the amount of benzoecalene, the amount of cocaethylene and the amount of alcohol, if alcohol was present in those.

Q. So they did have some measurement of the quantity that was involved?

A. In some of them, yes. They didn't have, some of them they didn't find a parent compound. It looks like about half didn't have any parent compound in there.

Q. All right. And you, you do not have any information

as to the quantity or amount of cocaine that was found in the testing you reviewed in this case, do you?

A. That's correct, I do not.

Q. Were there any other studies you relied on?

A. Basically it, it's, this is where it has been reported for the correlation as been seen between high-risk driving and cocaine.

Q. All right. So you don't have any other studies?

A. Other studies on cocaine generally, but as far as the high-risk driving I believe this is the one that Dr. Isenschmid had----.

Q. And, in this study, was the conclusion based at all on the amount of cocaine that was in the subjects?

A. No. In fact, they say that predicting a particular behavior you, you can't really predict a particular behavior based on the amount of it, you have to look at the behavior of the individual.

Q. Look at the behavior of the individual.

A. Yes.

Q. I don't have any further questions.

THE COURT: Any questions you'd like to ask him, Mr. Horner?

MR. HORNER: No, sir.

THE COURT: All right. All right. The objection is overruled and the exception's noted for the

record. Okay.

MR. VANNOY: Thank you, Your Honor.

THE COURT: All right. Before I bring them back in, man in the blue shirt out there, yes, you. This is a courtroom. If you stretch in this courtroom one more time the sheriff will just ask you to step outside. Understand? Understand?

UNKNOWN MALE: Yes, sir.

THE COURT: All right. All right. You can bring the jury back. All right. The objection is overruled. Do you recall the question, sir? And the exception noted for the record. Do you recall the question, sir?

CROSS-EXAMINATION CONTINUED BY MR. HORNER

Q. Would you like for me to repeat it?

A. Go ahead if you would.

Q. Mr. Glover, first of all with regard to alcohol, what would the general effect of alcohol be on a person's ability to drive?

A Alcohol is a certain nervous system depressant. It tends to impact on divided-attention tasks. Driving is a divided-attention task where you have to do a lot of things at once. You have to maintain lane position. You have to maintain speed. You have to maintain awareness of people behind you, upcoming traffic, upcoming traffic controls. And, as you drive you tend to juggle, if you would, all of these

different divided-attention tasks. And what we see with alcohol in individuals is that their ability to juggle these divided-attention tasks suffers when alcohol is present. We see impairing affects with respect to the ability to deal with things visually starting at .02, .03 as far as concentrations go. As the concentration goes higher then we see an increase in the effect on all of our, on our abilities to handle divided-attention tasks.

Q. And what about the general effects of cocaine on a person's ability to drive?

A. We see a correlation between what's considered high-risk driving, speeding, sometimes fleeing, things like that when cocaine is present in individuals. Cocaine being a central nervous system stimulant it provides euphoria in the individual. The first, probably, forty-five minutes there's a euphoric phase but then we go into the disphoric phase where they're coming down off the cocaine and then it's more like a central nervous system depressant at that point.

Q. Okay. And, you indicated that, or you were able to determine that the first test involving the, the, the blood alcohol and the drugs conducted by the SBI was at 8:03, is that right?

A. The collection was done then, yes.

Q. Okay.

Q. And, that the second test at Baptist was at 8:49, is

that correct?

A. That's correct.

Q. What is the significance, if any, of the fact that the parent, that cocaine would be found in both tests?

A. It's significant to show that there's cocaine in the body and still in the body that much time after the crash.

Q. Okay. Now, based on the fact that after you did the retrograde extrapolation of the defendant's blood alcohol and based on your calculations it was at .08 at the time of the wreck. You, in the course of your job, do you do certain testing of individuals with regard to what's called dosing?

A. Yes. We do controlled drinking exercises. Whenever we conduct a week-long class for officers, and we do about seventy of these classes a year when they are there for a week to learn how to do breath testing. On Wednesday and Thursday afternoons we divide the class in half and we dose the volunteers with alcohol. And so we will look at their weight and their gender and we dose them with the amount of alcohol targeted to get them to a .08.

Q. Okay. And, how long have you done that?

A. Well, it's always been part of the program, so for the past twelve years while I've been there.

Q. Okay. And then based on, on these programs, what do you do with that information?

A. Well, we, we use it a couple of ways. We use it as

an educational tool for the officers. Most of them have never had an opportunity to see, to experience impairment and see the numbers that they blow at that time. And so it's, it's a tool for them to become educated, a tool for them to be able to see that in fact you can measure an alcohol concentrations on the breath and you can measure it accurately. We have looked at some of our schools where we've looked at the elimination of alcohol. And we see, calculate the rate of elimination. And we've been able to see that the rates that we see when we actually dose people are consistent with the rates that have been published in the literature for probably seventy years.

Q. Okay. And would be consistent with the defendant's rate of elimination?

MR. VANNOY: Objection, relevance and speculation.

THE COURT: Ask the question again.

Q. I asked if, if what he found in his dosing programs if those rates of elimination are consistent, if the defendant's rate of elimination is consistent with what he found in those dosing programs?

THE COURT: Well, at this point, sustained.

Q. Okay. Mr. Glover, based on all your experience and training, do you have an opinion based on the fact that once you did the calculations for his blood alcohol at the time of the accident, do you have an opinion as to how much alcohol he

would have had to consume to get to that .08 at 5:49 p.m. on March the 26th 2007?

A. I can't tell you how much he had to consume because I would need a point in time and if, if at a given point in time we could calculate how much was in him at that time but the amount that was consumed would depend on a really more of a window of time. We can always calculate what's in them at a particular time but, because drinking takes, takes place over a window of time we need that. It's kind of like filling a bathtub with the drain open. As soon as you start the water running some is going down the drain. The more, the faster the water's on at some point you'll start to accumulate. Well, as soon as you start drinking alcohol you start eliminating it right then. And if you drink more than, than you're eliminating then your concentration's going to go up. Well, a person could get it to a level and maintain that level for hours and hours and hours depending on their consumption.

Q. Okay. Are you aware of the fact that the defendant told Trooper Anderson that he consumed between four or five beers between one thirty and three o'clock on that day?

A. Yes, I am.

Q. Is that consistent with having an .08 at 5:49?

A. Absolutely not.

Q. Okay. No other questions.

THE COURT: Cross-examine.

CROSS-EXAMINATION BY MR. VANNOY

Q. Mr. Glover, let's go back. First, I believe----. You, you've been with the state, working with the state in the Forensic Test for Alcohol branch since 1997, is that right.

A. That's correct.

Q. And, prior to that you worked, you said you did some work at Burroughs-Welcome for seven and a half years?

A. That's correct.

Q. You didn't have, you didn't work with alcohol at all at Burroughs-Welcome though, did you?

A. No, I did not.

Q. Didn't have anything to do with alcohol testing or anything like that?

A. No.

Q. You also worked I think prior to that at Oak Ridge Lab?

A. Actually, prior to that I was at NIEHS in the park.

Q. I'm sorry.

A. National Institutes of Environmental Health Sciences. I was there before I went to Burroughs-Welcome.

Q. All right. And when you were there you didn't do any work with the studies of alcohol there either, did you?

A. No, I did not.

Q. When did you work at the Oak Ridge Lab?

A. That would have been from like a year before I got

my masters and for seven years so that was before NIEHS.

Q. All right. And you, you worked there, during your work there you didn't do any studying of alcohol there either, did you?

A. No, I did not.

Q. So all of your work related to alcohol has been while you've been employed by the state of North Carolina, is that right?

A. That's correct.

Q. You said you are currently a, a police officer?

A. Yes, I am.

Q. How long have you been a police officer?

A. This makes twenty-three years.

Q. In fact, your last job before going to the forensic test for alcohol branch, you were working full-time as a police officer, were you not?

A. I was. I, when I left Welcome I ended up going full-time with Durham Police Department and then this position with the state came up. It was straight hours instead of rotating shifts and a number of other things made it interesting so I went to that job but I maintained my certification with Durham PD.

Q. All right. Now, as part of your job at the Forensic Test for Alcohol branch you said you train law enforcement officers across the state?

A. That's correct.

Q. And you train them how to use the breath testing machines that are used in DWI cases, isn't that right?

A. That's correct.

Q. You also said you train the judges.

A. We get invited to a judges' training session that happens once every year when we have new district court judges who've either been elected or appointed, the School of Government at UNC puts on a, a training session and we go there to a presentation, do a controlled drinking exercise with them, basically answer their questions, and do demonstrations with the instruments.

Q. Well according to your curriculum vitae you've done that 2000, 2001, 2003, 2004, 2005, 2006, 2007 and 2008. Is that right?

A. And I believe I did one this year. I don't know.

Q. So, 2009, also.

A. Yeah. That plus we do the same kind of training for new prosecutors. Sometimes that's been twice a year. Usually it's once a year.

Q. All right. So, so not only do you train the judges you train the prosecutors?

A. That's correct.

Q. And in, in fact you primarily work for and are called to testify by prosecutors, are you not?

A. Primarily. I've been subpoenaed by the defense over a hundred times and been called by the defense as a witness for them six or eight times.

Q. So out of two hundred and thirty times you've been to court you've testified for the defense six or seven?

A. Yeah.

Q. All right. And, Mr. Horner said he, in fact, contacted you himself about this case, did he not?

A. I,I can't recall who I heard from first. I probably heard from him but it would have been a phone call and, and I, I don't remember exactly.

Q. Well I thought he asked you just a minute ago in direct examination if he didn't contact you and ask you to look at some results.

A. I believe he did contact me at one point but I, I've been in touch with different people in his office and his----. I don't keep track of the exact person I speak with every single time, so----.

Q. Well, let me ask you this. Your report dated April 30th 2009 was addressed to Mr. Tom Horner the district attorney. It states Mr. Horner, does it now?

A. Yes, it does.

Q. All right. So, sometime prior to April 30th you talked to Mr. Horner about this case?

A. Yes.

Q. Now, your report states that, your report's dated April 30th 2009, correct?

A. Yes, it is.

Q. And it states you reviewed the information, states: "Dear Mr. Horner, I've reviewed the information provided to me by your office in the above-captioned case. That information consists of hospital reports showing hospital [inaudible] to determine serum alcohol concentration. . ." and it also says "a reporting", excuse me, ". . . a blood sample collected at 20:49 on 3.27.07 in a reported vehicle crash time was 17:49 on 3.26.07. . ." Is that right?

A. That's correct.

Q. Well, what did you have that reported to you the vehicle crash time?

A. I believe it was a copy of the crash report that was initially generated by the trooper.

Q. A, a standard accident report?

A. Yes.

Q. All right. So at the time is, is, am I right being based on what you wrote in your April 30th report you had the accident report, you had the SBI blood results and you had the testing done at Baptist Hospital. Is that correct?

A. That's correct.

Q. And did you have any other information at that time?

A. I don't believe I did.

Q. All right. And based on that information you came up with, you did the calculations that you testified to on the conversation from plasma to whole blood, correct?

A. That's correct.

Q. And, based on the information that you had at that time you did the extrapolation from .03 to your testimony's .08, is that right?

A. That's correct.

Q. So you testified a minute ago that you, you also reviewed some records from Hugh Chatham Memorial Hospital?

A. I, I reviewed records that were in the facts. I don't know exactly which hospital was in all of them. It may have just been the Moses Cone, but I, it just looks like Wake Forest is the one that I had.

Q. All right. So, in fact you didn't, you have not reviewed any of the Hugh Chatham Memorial Hospital records have you?

A. Well, I, I saw some of them, but I couldn't say specifically which pages or what I saw in them when I was here last week.

Q. So, some of them you saw last week and that's the first time you'd seen any of whatever it was you saw, correct?

A. Yeah.

Q. All right. So, certainly, you, your report that was dated April 30th 2009, you didn't use any of the information

in the Hugh Chatham Memorial Hospital's record to make your determinations, did you, sir?

A. No.

Q. The first thing Mr. Horner asked you about is you, you made a conversion of the plasma or serum alcohol that was done at Wake Forest?

A. That's correct.

Q. You converted that to whole blood?

A. That's correct.

Q. Why did you make that conversion from plasma to whole blood?

A. Because plasma samples contain more water. Alcohol goes into water containing tissues. Plasma has a higher water content than whole blood so we know that whenever we're looking at a plasma sample the reported alcohol concentration is going to be higher in a plasma sample than in a whole blood sample so we effectively reduce it by a fixed percentage.

Q. And what percentage did you use?

A. Well, it's right at eighteen percent. We actually do it by dividing the value by 1.18 and then move the decimal three places.

Q. And what's that based on?

A. It's based on a number of different things: one, it has been used in North Carolina and is in case law in North Carolina. Its origins come from peer review publications

where individuals have looked at alcohol concentrations. They compared a sample of blood, split it into one two with whole blood, one with plasma to determine the alcohol concentration and then compare the two. The average value that they came up with, or the average ratio, is 1.15 and if you add a standard deviation to that you get 1.18. The higher the value then the, the more it reduces the alcohol concentration. So we use one standard deviation above the actual average value that's reported.

Q. Now, that, that average conversion rate doesn't have anything to do with the Ricky Dean Norman, does it?

A. Only in that the rate was determined in humans, in human blood.

Q. All right. But it's an average conversion rate. You, you're not testifying that that conversion rate is Ricky Dean Norman's conversion rate, are you?

A. No, I'm not.

Q. You, you don't know what his conversion rate is, do you?

A. No, I don't.

Q. So, you're using an average?

A. I am.

Q. His conversion rate could be different.

A. It could be different.

Q. And this average is based on the literature that you

review in the field, is that correct?

A. That's correct.

Q. All right. And you, you said you actually go up from 1.15 to 1.18 basically to give the person that you're testing the benefit?

A. Yes.

Q. So it would reduce it even more, is that right?

A. That's correct.

Q. And your results from making that conversion got you to a value of .01----

A. That's correct.

Q. ----grams per one hundred milliliters of whole blood?

A. That's correct.

Q. And the, the legal limit of .08 is also grams per one hundred milliliters of whole blood, isn't that correct?

A. That's correct.

Q. So we're talking about the same points with .08 or .01, right?

A. The same units, that's correct.

Q. All right. Now you use this .01 in determining Mr. Norman's elimination rate and then in doing the extrapolation that you testified about, isn't that correct?

A. That is correct.

Q. Now in reaching your opinion that his blood alcohol

level was .08 at the time of the crash, you had to do some math to do that, did you not?

A. I did.

Q. And it's just a mathematical, arithmetic formula, is it not?

A. It is.

Q. And you used, you took the .03 grams per hundred milliliters of whole blood that was in the SBI report, correct?

A. That's correct.

Q. And you used the time of the crash and the time the blood was drawn to determine how much time that was, isn't that right?

A. That's right.

Q. And that time was the difference between 5:49, the time of the crash, and, 8:03 when the blood was drawn.

A. That's correct.

Q. That, that in your math calculated 2.23 hours, right?

A. Um-hmm.

Q. So, the blood was drawn 2.23 hours after the crash.

A. Based on the reported time of the crash, yes.

Q. All right. Now, you're aware, aren't you, Mr. Glover, that 2.23 hours is considered a relevant time after driving for DWI purposes, is it not?

A. Yes, it is.

Q. And then you took the 2.23 hours and you multiplied it by what you considered to be his elimination rate.

A. That's correct.

Q. Let's talk about his elimination rate a little bit. You came up with an elimination rate of, you testified 2.0247.

A. Yes.

Q. And you testified that was his actual elimination rate based on the difference in .03 and .01.

A. Yes.

Q. And you did it just on those two points, is that correct?

A. Yes, I did.

Q. Now, when somebody drinks alcohol first they, they have to absorb the alcohol first, do they not?

A. They start absorption and distribution as soon as they start drinking.

Q. Well, really they're, when, when you talk about this, the physiology of alcohol you're talking about the absorption, the distribution, and the elimination of it, isn't that correct, sir?

A. That's correct.

Q. All right. So when somebody starts drinking it they're body starts absorbing?

A. It does.

Q. And then it starts distributing it and then it eliminates it over a period of time.

A. Well, it, it has all, once you start drinking you have within minutes all three processes going on. You're absorbing it, you're distributing it throughout the body and you're starting to eliminate it. As soon as the first blood hits your liver with alcohol some of it's broken down right then so all three processes start within minutes of starting consumption.

Q. And when, when I'm talking about and you're talking about this elimination rate, this is a rate you use to determine what Mr. Norman's actual rate of elimination was over a period of time?

A. That's correct.

Q. And you had to use that rate of elimination in your mathematical formula to get to .08?

A. That's correct, I did.

Q. And, just like in the conversion, the average conversion rate, the elimination rate differs, does it not?

A. The rate can differ. It's influenced by gender if we're comparing similar populations but, gender's not an issue and wasn't factored into this. It's effective probably by more than anything experience with alcohol. And we find chronic abusers with highly, highly elevated rates of elimination. We find a population of individuals who've been

charged with DWI looking at them as a population we see a rate of elimination higher than the average rate that we typically use. And the average rate that we typically use is consistent with what we see in individuals with very limited experience with alcohol. So, there's a range.

Q. This range goes from----. I mean in the literature there's a range from .009 all the way up to .03, is there not?

A. Point, no, .009 is not been considered to be a credible rate. I don't know that there are any rates credible below .01. In fact some rates in ultra-fast eliminators go up to .054.

Q. Well, you would agree with me at least then that in the literature that there's a, a rate of elimination?

A. There's a range of rates.

Q. A range of rates. All right. And, while I'm talking about the literature, in your job you, you review literature and look at studies of alcohol that other people have done, do you not?

A. I do.

Q. And that's accepted within, in alcohol science to look at this literature and to rely on it, right?

A. Well, we have to. We just, due to lots of limitations, funding, staff and time, we can't all do the all the experiments we might like to do so we do review on studies that other people have done and have published.

Q. All right. Now, in order to get, to do this, this retrograde extrapolation, that's, that's what you call the mathematical formula you did, isn't that correct?

A. The process, yes.

Q. The, this retrograde extrapolation process, the body has to have fully absorbed the alcohol before you can consider the elimination is that right?

A. Before I can consider----?

Q. Well, the body has to----. Before you can do the retrograde extrapolation the body has to have fully absorbed the alcohol, does it not, sir?

A. To, to calculate an accurate one you would want somebody to be fully absorbed, yes.

Q. And it somebody was not fully absorbed, if they had not fully absorbed the alcohol, you couldn't calculate an accurate number using retrograde extrapolation, could you?

A. That's correct.

Q. All right. Now, you testified that you use two different points to determine his elimination rate. You've previously testified in courts in this state that a conservative elimination rate for somebody is .0165, have you not?

A. That's correct, that is. That's the average value that we use based on case law from 1985. If we don't have any way of calculating an individual's rate then we use that

average value.

Q. All right. So you, you, in most of the cases you've testified in you've used that average value of .0165.

A. Most of them. I've had, I don't know, eight, ten, twelve, maybe, where I've been able to calculate their actual rate of elimination.

Q. Well, if you use----. Let me ask you this, Mr. Glover, if you used a different elimination rate, an elimination rate below .0247 for Mr. Norman you would get a blood alcohol content below .08, would you not?

A. That's correct. And if I used a larger one I'd get a larger number.

Q. That's right. And, his, the number you used is on the higher end of the ranges that are recognized in the literature, are they not, is it not?

A. I would say it's right in there. It's, it's, it may be on the shoulder. If they pump things up in the histogram you can get a bell curve. It may not be dead center, maybe slightly to the right of dead center, but it's not out here on the edges where we find the ultra-fast eliminator say at .054 per hour.

Q. Well, did you, did you happen to do your mathematical formula on a .0165 value that you've testified in court before is a fair average value?

A. No, I did not.

Q. You didn't?

A. No.

Q. So you don't----. If, if you use .0165 that you've used in court before you don't know what Mr. Norman's blood alcohol content would have been, do you?

A. I did not do that math based on, again, North Carolina case law. If the person's actual rate is available then that's what's preferred.

Q. Well, let me ask you this. If you use .0165 you would agree with me that it would be below .08, would it not?

A. Yes, it would be.

Q. Now, when you talk about a person's actual elimination rate, there's really no scientific way to pinpoint somebody's actual elimination rate, is there?

A. There is a way of, for that moment, for that time and that's why having a points, different time points, different alcohol measurements and so we get their rate for that moment for that particular set of conditions. If we were to dose them a day later, a week, a month, a year later we might see something different. It's not going to be, assuming they've not changed their behavior with respect to alcohol, we wouldn't expect to see some drastic off the wall value. We would expect to see a rate comparable to what we measured before.

Q. Well, you, you're aware, aren't you, Mr. Glover,

that the literature that you rely on says that it's not proper to use just two points to determine or try to determine an actual elimination rate, are you not?

A. I know that some people have written that. I also know that I've calculated rates on individuals when I've had three and four points--that would be three and four points of measurement over a period of time--and the ones I've looked at I have seen consistent rates if I look at all four points, set a straight line and the value. For that rate of elimination has been the same whether I look at, at the value generated between the first two points, second and third point, third and fourth point or the whole line. My experience has been that it is consistent for that time.

Q. Well, why did you use more than two points in those?

A. One case was an assault case where the victim had about a .32 and they did multiple alcohol draws on her over about ten hour period. One in particular was one where an infant, thirty-seven day old infant, had been poisoned with alcohol and they did multiple time points monitoring the baby and that one, again, about eight or ten hours. And so, we have other cases where we've gotten an implied consent blood draw. That's one requested by an officer. Then there's been a hospital draw and then there's been a subsequent blood draw pursuant to search warrants. So we have a number of different situations when we'll see more than two alcohol concentrations

determined.

Q. Okay. That, that's my point. You, you said in your experience you have looked at various cases where you've looked at three or four different ones.

A. That's correct.

Q. You looked at three or four different ones because it's hard to make a determination just based on two points. Isn't that why you did that?

A. No. I looked the number of points because as to the number of points that were presented to me, those, those were in the facts. In this case I have two alcohol concentrations at two different, collected at two different time points, that's what I have to use. If I have a case with three or a case with four then I use all three or four.

Q. And you're saying that when you have two it's just as accurate as having three or four points.

A. In my experience it has been.

Q. That's not what the literature says, though, is it?

A. That's correct.

Q. So your experience is different from the literature?

A. No, what I'm-----. What's put in the literature is, I'm not saying you can't do it, but, you, it would, we'd love to have more points. We'd love to have a dozen points but we don't get that. Some individuals have tried to look at points where they're just minutes apart and looking at, at results

that are just five or ten minutes apart. It gives a lot of variation sometimes so, depending on the testing methods.

Q. Well, let me ask you this. I know you've testified before and you've testified under oath at times that you've relied on Allen W. Jones as an authoritative figure in alcohol studies, have you not?

A. I have.

Q. And you've stated under oath before in court that Allen W. Jones studies, you've used them and you believe them to be authoritative, isn't that correct?

A. That's correct.

Q. Well, let me ask you this. Here's a quote from Mr. Jones, "however, a double-blood sample is not even a reliable way to estimate data" which that what [inaudible] called the elimination rate. Isn't that correct?

A. That's correct.

Q. "A double-blood sample is not even a reliable way to estimate the elimination rate because details about previous drinking and the position of the blood alcohol curve, such as phase of absorption, are unknown. Dispute some attempts to justify blood samples, there is no scientific foundation for the continued use of this strategy." That was written by A. W. Jones and R. Eifland in journal. Do you recognize that?

A. I do.

Q. And do you disagree with that?

A. He said because you don't know the history and that and I, I, I happen to know from visiting Dr. Jones at his lab in Sweden and also talking to him at different conferences that he, in fact, will do a retrograde from a single time point. And so, he may have that in his paper, and he, also, conditions it with saying, not knowing the exposure time. He didn't say he can't do it. And I know, in fact, that he does do it even from a single point.

Q. Well, here's another quote.

THE COURT: Let me ask you to slow down when you're reading these quotes, if you will [inaudible].

Q. I'm sorry. I'll try to. "The practice of calculating a person's elimination rate of ethanol from just two blood samples taken at two time points about an hour apart is not recommended." That was Allen W. Jones and that was quoted in Dariat's Medicolegal Aspects of Alcohol. Are you familiar with that Mr. Glover?

A. Yes, I am. I also have copies of two papers that Dr. Jones did where he and another researcher looked at about thirty-five hundred paired samples and they, they, they published rates of elimination from these, like I said, thirty-five hundred paired samples.

Q. Here's a third quote by Dr. Jones. "The calculation of elimination rates based on just two measurements of BAC . . ."--that's blood alcohol content, is it not?

A. Yes.

Q. ". . . and the time lapse between taking the samples can yield highly valuable results." Isn't that true?

A. Highly valuable?

Q. Maybe I said valuable, highly variable results. Isn't that true, Mr. Glover?

A. It could, depending on a number of different things, if a person still has access to alcohol, when they were last consuming alcohol, certainly.

Q. All right. So despite what you considered to be an authoritative figure who you've actually flown across the country, across the continent to meet with, you disagree with these quotes that you shouldn't use two points to determine an eliminate rate. Isn't that what you're saying?

A. No. I'm saying that he qualified it by saying if you don't know certain things then you don't know what the results are going to be.

Q. All right. But you, you can't testify to a scientific certainty that you know that Ricky Norman's elimination rate is exactly .0257, can you?

A. I can say that I calculated it based on the information for that particular time and that was the rate that I was able to determine with the information I was provided.

Q. All right. Well, let me ask you this question then.

If his rate were lower than that, his blood alcohol content would not reach the legal limit of .08 on the date of the crash, would it?

A. At, on the day of the crash or at the time of the crash?

Q. Time of the crash.

A. At the time of the crash if we used a slower rate he would not have been .08.

Q. All right. So the only way you get .08 is to use the exact rate you used.

A. That rate----

Q. Isn't that correct?

A. That rate gives, that rate gives a value that once truncated is a .08.

Q. Now, the, there's also in the literature statements about this whole retrograde mathematical extrapolation that you're doing that it's not a certain science. Isn't, isn't that true?

A. You're asking if the literature says it's not a certain science?

Q. Yeah. Well, let me ask you this. You're aware that Jones, Allen W. Jones, that you met with personally, has said that extro-, retrograde extrapolation is a dubious science, aren't you?

A. I believe he did say that. But, I also know that he

actually does retrogrades in practice.

Q. And he's dubious----. What's that mean?

MR. HORNER: Objection.

THE COURT: If he knows.

Q. Do you know what dubious means?

A. Dubious, questionable, probably.

Q. Uncertain?

A. Uncertain depending upon your information that you have.

Q. All right. In fact, Jones has said this technique called backtracking, BEC, or retrograde extrapolation is a dubious practice. "Expert testimony on both of these issues requires careful consideration of the absorption kinetics of alcohol and the factors influencing this process." Isn't that right?

A. That's what he said.

Q. And, in Mr. Norman's case, you didn't consider any factors influencing the process, did you?

A. I considered a number of different things. I don't believe he was given any alcohol after the crash. I'm not aware of him being administered any alcohol. So he had no access and was given no alcohol from the point of the crash forward. I considered the fact that when we've looked at individuals, drivers who've been killed in crashes, and we look at their alcohol concentration and we looked at whether

their alcohol concentration would have been going up or going down, we can determine that over ninety-five percent of the people are actually going down. They do that by comparing their, in the fatal driver, they'll look at the blood alcohol concentration and a urine alcohol concentration and they compare the two and, based on those ratios they can determine whether a person's going up or down. Ninety-five percent of the individuals, drivers killed in crashes where they looked at this, were in the elimination phase, so, that would be----.

Q. Well, my point, what I asked you was, I read you this quote from Jones and, and his quote was this is a dubious practice and it went on to say that you should consider all the factors surrounding it. The only factors you considered is what the district attorney provided to you. That's what you told me a minute ago. Isn't that correct? That was the SBI results and the results from WFU, Wake Forest?

A. I, I used information they provided to me. I didn't have to look at that whole collection of information to see if it makes sense to me, if it works, what are the other things to be concerned about. And that's where I said, the fact that ninety-five percent of the drivers killed are post-peak. That means they're in the elimination phase. It gives me confidence and my number gives me confidence that he is in the elimination phase at the time that these blood samples were taken. The claim with respect to alcohol consumption ended

five hours before, not five, four hours--three to six--three hours, I guess, before the crash. Looking at that claim he would certainly have been in an elimination phase if, in fact, the last consumption was at three o'clock. So I looked at all of those. When I'm generating a report I consider all of that.

Q. Let me rephrase the question. You don't know what kind of alcohol was ingested, do you?

A. It would have been ethylalcohol.

Q. You don't know what kind of beer it was or anything, do you?

A. No, I don't.

Q. You don't know how fast it was drank as far as whether it was one, two, three, right after the other, or whether it was drank over a period of time? You don't know that, do you?

A. That's correct.

Q. You don't know what Mr. Norman had eaten or when he had last ate. You didn't know that, did you?

A. That's correct.

Q. And, and all those are the factors that the literature talks about what an expert needs to know to make these calculations. Are they not?

A. Not, not absolutely. While there's some studies that have suggested that the concentration of alcohol--in

other words, whether you're doing shots of, of high concentration, if you're doing beer, or if it's carbonated or not--that that may influence some absorption. It doesn't influence the elimination and the studies have been done in very small numbers to the point that it, it's not a significant consideration. Eating food will speed up the rate of elimination, not terribly. It doesn't double it. It doesn't even increase it fifty percent. It's a small percentage increase if you're metabolizing food at the same time you're metabolizing alcohol. So those are things you may want to know, you may consider but it's real hard to factor any of those in.

Q. Well, my point is, you didn't factor any of them in because you didn't know it.

A. We don't know.

Q. Okay. So you didn't factor any of them in?

A. Well, I, I, I don't know what he ate, what he drank, when he drank. All of those things don't influence it significantly.

Q. So, it's your opinion then that none of that influences the opinion you gave and his blood alcohol would be .08 at the time of the wreck?

A. When he ate, what he ate, what he drank

Q. Yes.

A. No.

Q. None of that would influence it?

A. It, it, it's not known when that happened.

Q. Are, are you familiar with the literature that rely on that says you should give a range of results, to be scientifically accurate you should give a range of results that a person's blood alcohol may be at a given time?

A. You can give a range. There are times that people will give ranges. In this case we are using calculated individuals' rate and then I did not put a range in.

Q. So you're saying that, in your opinion, his exact blood alcohol content was .08.

A. I'm saying that his calculated alcohol concentration after the third digit was dropped was .08.

Q. Well that's what you have to do legally, is truncate it, don't you.

A. Correct.

Q. So, you're saying that's his exact rate?

A. I'm saying that was his calculated concentration. It wasn't measured at that time and so it is a calculated value.

Q. Are you prepared to give me any ranges of what his alcohol content could have been other than .08?

A. Well, if you want to go up to ultra-eliminators who are .054 then we would add about a .11 to it, put him to about a 14.

Q. Okay.

A. If you want to use .01 as absolute low end, that's going to add .02 which would put it to .05. However, since I've got his rate of elimination I don't use those ranges.

Q. Okay. So, even in the use of the conversation rate of 1.15 to 1.18 to give a person in Mr. Norman's position the benefit of the doubt, you wouldn't be able to give him the benefit of the doubt here, that it could have been .05 or .06? You're not giving him that benefit of the doubt, are you, sir?

A. No, I'm not. I'm using--and again, it goes back to case law. If you have a person's rate, use the person's rate.

Q. What about the literature that tells you the science behind it? You're not, you're ignoring that, aren't you? We just went over that.

A. If, if, if, if I have a bathroom scale that says someone weighs a certain amount and the literature says people in that age range weight can vary from here to here I'm going to use what's on the bathroom scale.

Q. All right. Well, the literature says that: "Dealing with the uncertainty of this mathematical formula that you're testifying to here in court that the expert witness must be prepared to acknowledge the uncertainty inherent in measurement results. All measurements possess uncertainty that arises from both systematic and random sources. Estimates of uncertainty become particularly important when

the results are near the critical prohibited levels." Have you ever read that quote in the literature?

A. I don't know that I have.

Q. Do you agree with that?

A. I will agree that there, any measuring device has, I would say, a degree of inaccuracy, but the measurements, every measurement----

Q. I'm sorry. I'm sorry. I didn't mean to interrupt you.

A. Every measuring device----. If we go to Lowe's and get ten tape measures and measure a two-by-four we're liable to get a range of measurements. So there is some error associated with any measuring device.

Q. All right. So there is some error associated with your retrograde extrapolation of Mr. Ricky Dean Norman, is there not?

A. There----

Q. Yes or not. Is there an error, sir? Are you able to recognize an error in the calculations?

A. I don't have a calculated error in it. I have a measured value for him. Error, as far as what the SBI value was, errors as far as what the hospital value was, I don't have a concern of either of those and don't have a way of calculating their potential error.

Q. Well, will you acknowledge, or can you acknowledge

that there is uncertainty in your extrapolation that you've testified to here today, sir?

A. Only in that you, if, if you, if either the numbers or the times were not correct or the numbers were not correct then your result would be different.

Q. Okay. So if his elimination rate was different the results would be different?

A. Yes.

Q. If the conversion rate, if the conversion average was different that could make that number different, isn't that correct?

A. It could.

Q. All right. So there could be uncertainty, isn't that correct?

A. Could be.

Q. And, of course, just as this quote said, "This uncertainty's critical because your opinion is right at the legal limit of .08." Isn't that correct?

A. I did the calculation. That's the number that came up. Point o eight happens to be our per se limit in North Carolina. It is not magic with respect to impairment. It's, it's Black Letter law per se .08, but that's not tied to impairment. That's a technical violation, .08. You can have impairment way below .08.

THE COURT: Well, I want to object and

sustain as to whether that's a technical violation as to law.

Q. Well, you testified in response to Mr. Horner's questions earlier that the per se rate in North Carolina is .08.

A. The per se level if .08, yes.

Q. Okay. So, if you're .07 or any number below .08, you're not demeaned to be intoxicated under the per se rule of DWI, are you?

A. Well, it's not intoxication, it's impairment and that would not qualify if it was less than .08. That would not qualify as violating the per se value.

Q. All right. Now, you also testified about the, the results of the cocaine. You, you, in looking at the cocaine you looked at the SBI report and, again, the Baptist Hospital results, isn't that correct?

A. Yes. I think with the, that the only result on the Baptist was, it was the alcohol. I don't have the, I don't have the sheet that had their drug screen if they did one.

Q. All right. You, you looked at the SBI results that showed the presence of those, of cocaine and cocaine metabolites.

A. That's correct.

Q. Now, you talked about the half lives of these substances, but you would agree with me, wouldn't you, Mr. Glover, the, there's a difference in the time period to which

cocaine or the metabolites of cocaine would affect somebody's behavior and the time periods that it could be detected in the body, isn't there?

A. Well, yes, only in, when you use the word detect, there are obviously thresholds of detection, but, yes.

Q. Well, I'll use your bathtub example. You talked, you talked about alcohol in the bathtub when, you know, when you put it in it starts going out. You know, when you, when you ingest substances, such as cocaine, you know, the effects, you start losing the effects after time, don't you?

A. You do.

Q. And then you could become unimpaired by cocaine after a period of time, could you not?

A. You would become unimpaired at some point.

Q. And then you, down the road on that same timeframe, you could still detect the cocaine in someone's system even though they weren't impaired from it, could you not?

A. The, the further down the road you are the less likely are in the shorter and the shorter the half-life the less likely you are to detect the parent compound.

Q. But, so, that it might be in someone's system and be detected but not be effecting them as far as the parent, isn't that correct?

A. That's correct. Could be.

Q. You don't know the quantity of cocaine that was in

Mr. Norman's system, do you?

A. No, I do not.

Q. There's no way, from what you looked at, to determine that, is there?

A. There's no way.

Q. And, you testified about the effects of cocaine and the effects, in your opinion, on cocaine affecting somebody's ability to drive, you testified about that.

A. Yes.

Q. But that's dependent on how cocaine affects somebody's behavior, is it not?

A. It does.

Q. And, since you didn't look at any of the Hugh Chatham Memorial Hospital records before you drew these opinions in your report in April, you don't know how he was acting at the hospital, do you?

A. I don't know how he was acting. I believe there were indications of heart rate and blood pressure. That's about all that I can recall.

Q. Just heart rate and blood pressure?

A. Yes.

Q. Well, you're aware, aren't you, that heart rate and blood pressure increase can be caused by a number of different things besides cocaine.

A. Yes.

Q. In fact, the trauma from a serious wreck could cause it, could it not?

A. I don't know that it would cause an elevated and persistent especially when medication has been given.

Q. All right. What were his vital signs by the EMS?

A. I don't recall those.

Q. You don't know what they were?

A. I don't.

Q. So you don't know if the EMS vital signs there at the scene of the wreck were even elevated at all, do you?

A. I, I don't recall, did not see those.

Q. And that might be something important to consider in determining whether his behavior was actually affected by cocaine at all, wouldn't it?

A. The elevation is, is a part of, elevation blood pressure and heart rate, is a part of what happens with cocaine and cocaethylene for that part. So, I don't know what their rates were when EMS checked him.

Q. And, since you said that the blood pressure and the heart rate's important factor, it would help you to know what that was there at the scene if the EMS took it there at the scene, wouldn't it?

A. It would be more information, yes.

Q. All right. And if it, well, strike that. No more questions.

THE COURT: Redirect?

MR. HORNER: Yes, sir.

REDIRECT EXAMINATION BY MR. HORNER

Q. First of all, Mr. Glover, you have before you State's Exhibit Number 50 which is your report, is that correct?

A. That's correct.

Q. Is that a true and accurate copy of your report as you prepared it?

A. Yes, it is.

Q. The State would offer that into evidence.

THE COURT: All right. Any objection?

MR. VANNOY: No, sir.

THE COURT: Received without objection.

Q. And, you indicated, I believe----. Mr. Vannoy asked you with regard to the blood draw at 8:03 that, that two hours and twenty-three minutes was a relevant time.

A. Yes.

Q. Did he not?

A. Yes.

Q. Okay. So is the time of the accident is a relevant time for him driving, is that correct?

A. Yes, it is.

Q. Okay. And while the----. What is per se? What does per se mean?

A. Per se is in the example of DWI our per se statute says if you're .08 or greater then something's triggered. That means without any other evidence of anything else violation of the per se limit is a violation of that particular statute.

Q. Okay. And is that the only way that someone in North Carolina could be founding guilty of driving while impaired?

MR. VANNOY: Objection.

THE COURT: No. The objection's sustained. This is a question about the law. All right. Next question.

Q. You could be impaired on things other than alcohol, is that correct?

A. That's correct, you can.

Q. And be subject to an impairing substance other than alcohol.

A. Yes, you can.

Q. And in addition to alcohol?

A. Yes, you can.

Q. Now, with regard to----. He asked you the question about being fully absorbed. What does that mean?

A. That means that if you were to plot out an alcohol concentration on an individual where we've given them a Bolis dose, for example--Bolis dose is a great big drink mixed up. Somebody drinks it right down in a couple of minutes and we

start monitoring their alcohol concentration. If we plotted it out on a gram we would get a ideally a nice little straight line that goes up to a peak and then a straight line that comes down. Full absorption would be at the point that you're now eliminating alcohol. So you've gone to the peak and you've just come off the top of that peak. That's when you would have full absorption.

Q. Okay. And, based on the information that the defendant provided to Trooper Anderson and the information that you were provided in preparation of this report did you, in your opinion based on those facts, did you think that he was fully absorbed?

A. If he stopped drinking at three o'clock then certainly by 5:49 he would have been fully absorbed.

Q. Okay. Now, with regard to the elimination rate, what----. Strike that. Before we get to the elimination rate, with regard to the blood test that was done by the SBI and the blood test that was done at Baptist Hospital, those are actually rounded down, is that correct?

A. That's correct.

Q. And what's the purpose of that?

A. The purpose is with respect to the SBI value our statute restricts us to two digits so we drop any third digit that's existing. No rounding up, something covering up dropping off a third digit.

Q. And that's actually to the defendant's benefit.

A. Yes.

Q. Is that correct?

A. That's correct.

Q. And built into your calculations were, did you also round down in, in, in certain portions of your calculations which were to his benefit?

A. Yes.

Q. Did anything that you did in your calculations round up or do anything that was actually to his detriment?

A. No.

Q. And, with regard to the average value, I believe you testified that, that you had used that in the past where you were not able to actually calculate the actual value of, of discharging the alcohol in your system. Is that correct?

A. That's correct.

Q. But, that, that you used actual elimination rates when you have that information available.

A. I do.

Q. Okay. And that that's been fully accepted, is that correct?

A. That's correct.

Q. Based on the information that you had, do you feel like that you had enough information to do the retrograde extrapolation?

A. Yes, I do.

Q. And, with regard to the cocaine ingestion, what significance was it that the cocaine was ingested at the same time as his alcohol use?

A. The----

MR. VANNOY: Objection, assumes a fact not in evidence.

THE COURT: Sustained.

Q. What was----? You indicated that in order to get that one metabolite that the alcohol consumption would have to have been approximately at the same time as him ingesting the cocaine.

MR. VANNOY: Objection, the form of question leading.

THE COURT: Sustained.

Q. Based on the fact that he had cocaethylene in his system, what significance is that?

A. It's significant in that cocaethylene is a psychoactive substance. It is formed by the body in the liver by what's called transisterification where cocaine in the presence of ethanol is converted into cocaethylene. The alcohol has to be in the person's system before the cocaine is ingested in order to generate this. The alcohol actually inhibits the normal pathway of breaking down cocaine, going from cocaine to benzelecanene instead it goes from cocaine to

cocaethylene which is again a psychoactive substance. It's formed with these two compounds. It has effects very similar to cocaine but the duration is more in the range of six hours.

Q. No other questions.

THE COURT: Any re-cross?

RECROSS-EXAMINATION BY MR. VANNOY

Q. To create cocaethylene alcohol and cocaine just have to be in the system at the same time. They don't have to be taken at the same time, do they?

A. Alcohol has to be taken first, has to be in the system. If they're taken at the same time you won't generate cocaethylene or if you drink alcohol after you've done your cocaine you won't generate it. According to the literature, alcohol has to be in the system before the cocaine is ingested in order to make cocaethylene.

Q. What, what literature is that?

A. The literature that I reviewed.

Q. Can you give me the name of that literature?

A. "The Effects of Concurrent Use of Alcohol and Cocaine" by E. G. Pennings. That's in the 2002 edition of *Addiction*, Volume 97.

Q. Are you saying then it, it's your opinion that there's no way cocaethylene would show up in your system if cocaine's in your system before alcohol?

A. That's what the literature is saying is that if you

do the cocaine first. It's, it's primarily because of this breakdown. Alcohol inhibits the formation of benzoecalene. So if the alcohol is there first then, then when cocaine is ingested it's immediately diverted into being turned into cocaethylene rather benzoecalene.

Q. Well, irrespective of the literature, do you know if that's true or not?

A. I have to base what I'm saying on the literature because I have not dosed individuals with cocaine and alcohol and measured it.

Q. All right.

A. There are three other papers if you wanted those.

Q. Okay. What are those?

A. "Pharmacology of Cocaethylene in Humans following Cocaine and Ethanol Administration" by Deborah Harris. It's in *Drug and Alcohol Dependence*, 2003.

Q. All right.

A. "Effects of Concurrent Use----" That wasn't [inaudible]. "Cocaethylene Toxicity" by Paul Andrews. That's *Journal of Addictive Diseases.* And "Cocaethylene Pharmacologic Activity and Clinical Significance" by Peter Jatlaw from *Therapeutic Drug Monitoring.* Those are the four primary sources I was using.

Q. Now, Mr. Horner asked you if the, using two points to determine someone's actual elimination rate was fully

accepted in the literature and you said it was. That's actually not true, is it?

A. I, the papers, some of the people, Jones and those would say, using two points and then he put conditions on that: when you don't know this, don't know this, don't know that, don't know certain things then it's an issue.

Q. So it's not fully accepted, is it?

A. Depending on the parameters that you have.

Q. Okay. The, Mr. Horner asked you about the rounding of numbers and did you round anything to the detriment of the defendant. But you, you did in your calculations come up with an elimination rate that gave you the conclusion that he had a blood alcohol content of .08, didn't you?

A. .08, plus a third digit which was dropped.

Q. Okay. So you did come up with the exact elimination rate that you needed to get the result of per se impairment, correct?

A. Well, I did, but an elimination rate is not a per se violation. An elimination rate is a tool that I'm using in calculating his alcohol concentration.

Q. But if you gave us a range of the numbers and that range included numbers lower than .08, you'd be giving Mr. Norman the benefit there, wouldn't you? Isn't that correct?

A. If there was a range to give. But when I have two time points, two concentrations, you do the math you get one

number.

Q. All right, sir. No more questions.

MR. HORNER: I would have two questions.

THE COURT: All right.

REDIRECT EXAMINATION BY MR. HORNER

Q. I believe, if I'm not mistaken, that I asked the question to you, Mr. Glover--perhaps I'm wrong. Is that process fully accepted by the courts?

A. Yes, you did.

Q. And, and what was your answer?

A. Yes, it is.

Q. Okay. And, with regard to the .08, you didn't start at a .08 trying to and work backwards. In other words, you didn't try to start the defendant at, at a .08 which is his legal limit and then work backwards to figure out what the actual elimination rate would need to be for him to get to .08, did you?

A. No, I did not.

Q. In other words, and, and what you actually did was you took the two points that you had, you did the math and it just turned out to be a .08.

A. That's correct.

Q. No other questions.

RECROSS-EXAMINATION BY MR. VANNOY

Q. Just a mathematical coincidence, is that what it

was?

A. I would not call it a mathematical coincidence. I would say it was the product of the numbers that were there.

Q. No more questions.

MR. HORNER: No other questions.

THE COURT: That's okay. I was just thinking. You may step down.

[END OF TRANSCRIPT]