Volume 9

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

Before The Honorable Vince Chhabria, Judge

EDWARD HARDEMAN,	)	
	)	
Plaintiff,	)	
	)	
VS.	)	**NO. C 16-00525 VC**
	)	
MONSANTO COMPANY,	)	
	)	
Defendant.	)	
	)	

San Francisco, California
Wednesday, March 6, 2019

TRANSCRIPT OF PROCEEDINGS

APPEARANCES:

For Plaintiff:

ANDRUS WAGSTAFF PC
7171 W. Alaska Drive
Lakewood, Colorado 80226
BY: AIMEE H. WAGSTAFF, ATTORNEY AT LAW
DAVID J. WOOL, ATTORNEY AT LAW

MOORE LAW GROUP
1473 South 4th Street
Louisville, Kentucky 40208
BY: JENNIFER MOORE, ATTORNEY AT LAW

(APPEARANCES CONTINUED ON FOLLOWING PAGE)

REPORTED BY: Marla F. Knox, RPR, CRR
Jo Ann Bryce, CSR No. 3321, RMR, CRR, FCRR
Official Reporters

APPEARANCES: (CONTINUED)

For Defendant:

WILKINSON WALSH ESKOVITZ LLP
2001 M Street, NW - 10th Floor
Washington, D.C. 20036
BY: BRIAN L. STEKLOFF, ATTORNEY AT LAW
RAKESH N. KILARU, ATTORNEY AT LAW
TAMARRA MATTHEWS JOHNSON, ATTORNEY AT LAW
JULIE RUBENSTEIN, ATTORNEY AT LAW
CALI COPE-KASTEN, ATTORNEY AT LAW

I N D E X

Wednesday, March 6, 2019 - Volume 9

Wednesday - March 6, 2019 **8:56 a.m.**

P R O C E E D I N G S

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(Proceedings were heard in the presence of the jury:)

THE COURT: Good morning, everyone. We are ready to resume with Dr. Weisenburger.

MS. MOORE: Thank you, Your Honor.

DENNIS WEISENBURGER,

called as a witness for the Plaintiff, having been previously duly sworn, testified further as follows:

DIRECT EXAMINATION (resumed)

BY MS. MOORE

Q. Good morning, Dr. Weisenburger.

A. Good morning.

Q. I'm going to pick up where we left off yesterday; and I think before we adjourned, we were about to go to the last article that you wanted to highlight to the jury. And if you could, turn to tab 1599 in your binder.

MS. MOORE: Permission to publish.

MR. STEKLOFF: No objection, Your Honor.

THE COURT: Go ahead.

MS. MOORE: Thank you.

Q. And if you can tell the ladies and gentlemen of the jury, Dr. Weisenburger, what this article is. It is titled "The Effect of Antiviral Therapy on T14;18 Translocation and

Immunoglobulin Gene Rearrangement in Patients with Chronic Hep C Virus Infection."

A. Yes. So this is a study of patients with chronic hepatitis C infection, some of whom were treated with antiviral therapies and some of them who weren't. So there is a treated group and a non-treated group or a control group, and some patients with chronic active hepatitis C viral infection have abnormal cells -- B cells in their blood. Some of them are clonal. They have this -- what we call immunoglobulin gene rearrangement.

Q. What is clonal?

A. Clonal means they all come from one cell, so they are -- they are descendants or they are -- I don't know -- children of one cell. So they all look the same, okay. And some of them have another abnormality called the T14;18 translocation. So we have known this for a long time. We see the abnormal clonal B cells in the blood of some patients with hepatitis C infection, okay.

And it has been postulated that these cells are the ones that are sort of like pre-lymphoma cells; that they are on their way to becoming lymphoma cells, but they are not yet true lymphoma cells. So they have some genetic abnormalities, but they don't have all the abnormalities they need to become malignant, sort of premalignant cells. So they are circulating in the blood of some patients with hepatitis C viral infection.

Q. And what about this study that you wanted to point out to the jury?

A. So, yes, in this study they had two groups of patients. They had one group of patients with chronic active hepatitis C where they found some of those cells in the blood, okay. And they wanted to see what happened to those cells when they treated the patient with antiviral therapies, did the cells stay there or did they go away. And then they had a control group that weren't treated, so they could see what happened to those cells in the control group. So there is one table which shows all of the data very nicely.

Q. I think we have that blown up.

MS. MOORE: Mr. Wolfe, it is table 3 which is on page 1557 of the study.

BY MS. MOORE

Q. Dr. Weisenburger, if you want to come down, we have got a blowup, if that's helpful.

A. Okay.

So this is a table that shows the treated groups. There were 15 people in the treated group, and there were 14 people in the non-treated group. And when they looked at the treated group, there were nine patients with this immunoglobulin gene rearrangement, which they call IGH positive. So it had this gene rearrangement. So 9 of the 15 patients had this abnormality, okay.

And after treatment, seven of the nine lost the abnormal cells, okay. And six of the seven were ones that had a complete virologic response. So what this says is a complete virologic response, not only does it get rid of the virus; but it gets rid of the abnormal cells that are there because of the virus because these cells need the virus to proliferate and exist. So once the virus is gone, the cells die off, okay.

Now, there was one patient who had a partial response to the treatment and the cells went away, okay. And then there were the two other patients who had -- who had partial responses to the treatment but the cells didn't go away. So the story here is that, you know, if you have a complete virologic response like Mr. Hardeman had, if he had these abnormal cells in his blood, they would have gone away, okay.

Here is the control group for the same patients. So they had eight patients with the same immunoglobulin gene rearrangement abnormality. And, of course, these patients weren't treated, so it was only lost in one of the patients, and that was probably just a spontaneous loss, okay. Sometimes the cells they -- sometimes they increase and sometimes they decrease, and sometimes you can detect them and sometimes you can't. But in the other seven patients they persisted, okay. So what this says is that if you treat, the cells go away. If you don't treat, the cells persist, okay.

And that's why these people are at increased risk for

non-Hodgkin's lymphoma and these people are not, okay. And the story is the same for the cells that had this 14;18 translocation. Again, if they weren't treated, there were six patients, six of the 14 patients who had these cells. If they weren't treated, they only went away on one patient, probably again spontaneously as they go up and down. They couldn't detect them. But the other five continued to have the abnormal cells.

But if you look at the group that was treated, seven of the 15 patients had these abnormal cells with this translocation. And actually, it went away in six of the cells, okay -- six of the patients. And here it says five, but actually if you look at the data on table 2, all six of the patients who had a complete virologic response, the cells went away, okay. And there was one patient who still had the cells, and that patient didn't have a complete virologic response.

So what the data says in this study -- and there is a second study too -- which I'm not going to show you the data, but it shows very similar results -- that if you are treated -- if you have chronic active hepatitis C and you are treated with antivirals and you get a complete virologic response, then the virus goes away and you are cured. And not only that, the abnormal cells that were there also go away because they depend on the virus to go and proliferate. So they won't live if the virus isn't there; and this, I think, study shows that very

nicely.

Q. Let me ask you how that applies to Mr. Hardeman then. Yesterday we had the flip chart. I guess I should write hep B and hep C up here. I didn't do that yesterday.

Okay. So you talked yesterday about the rapid response that Mr. Hardeman had within 12 weeks and then he was cured. Is he still considered cured today of hepatitis C?

A. As far as I know, yes. The last time he was tested the virus was negative in the blood.

Q. So once he was cured in 2006 of hep C, what happened to any abnormal cells he may have had, based on the data here?

A. Well --

MR. STEKLOFF: Objection, Your Honor.

THE COURT: Overruled.

THE WITNESS: So they would have disappeared just, like they did in the study, okay. They would be gone because the abnormal cells depend on the presence of the virus. When the virus is not there, the cells are not stimulated. They are not infected and they die off, okay.

BY MS. MOORE

Q. So when someone has active hepatitis C -- when it is active, what happens to the cells?

A. Well, what happens is the cells develop some genetic damage like these cells, and eventually they get enough genetic damage to where they become a lymphoma cell, a cancer cell.

And so -- and so that didn't happen in Mr. Hardeman, even though he had been exposed to -- he had had this chronic viral infection for almost 40 years. You know, so if he was going to get the lymphoma, he should have got it while he had that chronic infection, not nine years after he was cured of the infection.

Q. And so in your opinion, Dr. Weisenburger, based on your experience and your review of the literature, in Mr. Hardeman's case then once he was cured in 2006, if he had any damaged cells or abnormal cells as you called it, then what happened in 2006 to those cells?

A. Those cells would have died off during the antiviral treatment.

Q. I guess I want to go back because you said that he had the active virus, likely he had it for 40 years. Are you saying to the jury that even though he had this active virus for 40 years, that any damage to those cells would have just gone away once he had treatment?

A. Well, that's what the data shows; that the abnormal cells -- the genetically abnormal cells which depend on the presence of the virus, they go away. They die off once the virus is gone from the system.

Q. All right. Now, are we ready to go to the differential, back to that or is there anything else about --

A. No. I think we made our point.

Q. All right. Let me switch places with you.

Let me pull up what you were working on yesterday and go back to your process, Dr. Weisenburger. And when -- I think you were talking yesterday about you had ruled -- ruled in four different risk factors for Mr. Hardeman, right?

A. Right.

Q. And now based on -- yesterday you spent a lot of time on this data about hepatitis C and hepatitis B. Can you tell the jury then what conclusions that you drew from your review of the literature and review of Mr. Hardeman's medical records in your experience within the field for over 40 years?

A. So when you look at the potential risk factors for Mr. Hardeman, we had Roundup, you remember. He had lots of exposure to Roundup. He was overweight, which gives him a risk of maybe 30 percent. And then he had this history of infection with hepatitis C, and he probably had infection with hepatitis B in the past because he was immune to it. We don't know whether it was active infection or whether he just recovered from it without much damage, okay.

And based on what I have told you and the studies I showed you yesterday, it's my opinion that after he was cured from the hepatitis C, he was no longer at risk for non-Hodgkin's lymphoma, okay. You remember the curves all went back to the normal background level after treatment.

And the same is true for hepatitis B because he was -- he

has been immune to hepatitis B all along throughout his entire nine or ten years up to the time he developed lymphoma, and he never had active infection. He was immune to hepatitis B, so the hepatitis B would not cause his non-Hodgkin's lymphoma either.

So basically I eliminated those two because I don't believe that they could have caused his non-Hodgkin's lymphoma. So then it leaves it between Roundup and obesity, and we know that Roundup gives an -- people with high exposure to Roundup have a significantly increased risk for non-Hodgkin's lymphoma of at least twofold, okay.

MR. STEKLOFF: Objection, Your Honor.

THE COURT: Sustained.

THE WITNESS: I didn't write that, okay.

But they have an increased risk, a significant increased risk. The risk with people who are overweight is a very small risk, okay.

THE COURT: Why don't you take that chart down and provide the rest of your analysis from the stand just verbally, okay?

MR. STEKLOFF: Your Honor, may we approach?

THE COURT: Sure.

(The following proceedings were heard at the sidebar:)

[redacted]

[redacted]

(Sidebar ended.)

(The following proceedings were heard in open court:)

BY MS. MOORE

Q. Dr. Weisenburger, so I wanted to go back to your process. And you were explaining to the ladies and gentlemen of the jury about I think the next two risk factors that you were considering was the obesity or overweight and Roundup. Can you explain your process to the jury about what you considered with respect to overweight, obesity and Roundup?

A. Right. So obesity is what I would call -- increases the risk, but it doesn't increase the risk very much, probably at most 30 percent. Whereas Roundup -- he was in a -- because of his extensive exposure, he was at high risk for developing non-Hodgkin's lymphoma. So in the end I decided -- based on the whole story and all the things I have told you today and

all the information I have read and all of my experience that -- that the obesity or the overweight was a minor risk factor, and the substantial risk factor in the case of Mr. Hardeman was the extensive exposure to Roundup.

Q. And, Dr. Weisenburger, is there any kind of test that one can do to determine the cause of non-Hodgkin's lymphoma, or is this based on your experience and your review of the literature?

A. Well, there is no real medical test you can do. I mean, when I look at the slides, I can see the non-Hodgkin's lymphoma, but I can't really say from looking at the slides that it was caused by Roundup or even by any other cause.

Q. And as a pathologist, one of the things you do in your role as a pathologist is look at slides, the tissue that is taken from the patient; is that right?

A. Yes.

Q. And what -- when a pathologist is looking at tissue slides, what is the main purpose of the pathologist doing that?

A. Well, the main purpose is to make a diagnosis so that the clinical doctors know how to treat the patient, okay. So we tell them what the disease is. In this case non-Hodgkin's lymphoma. And then they know how to treat the patient, okay.

And sometimes we try to find a cause when there is a possibility. So I mean, one of the things that was done in Mr. Hardeman is that they did a stain for Epstein-Barr virus,

which is one of the viruses we know causes non-Hodgkin's lymphoma, and that stain was negative. So they were trying to see is Mr. Hardeman's non-Hodgkin's lymphoma was due to Epstein-Barr virus infection, and in this case the answer was no.

So sometimes we do -- we have the ability to look for causes, particularly infections, where we can do stains or other tests to determine whether there is a cause; but in most cases we can give the diagnosis but we can't give the cause.

Q. And can someone look at Mr. Hardeman's tissue slides and say whether Roundup caused non-Hodgkin's lymphoma?

A. No.

Q. And did you review the pathologist report in this case?

A. Yes, I did. I reviewed the pathologist report. I read it carefully. I looked at all the different tests and stains that he did. And it seemed to all fit together. And, you know, so I didn't have anything -- any reason to doubt the diagnosis of the pathologist -- Mr. Hardeman's pathologist.

Q. At the time you rendered your expert report in this case, had you had an opportunity to review all of the tissue slides for Mr. Hardeman?

A. Well, I did review some slides. So I did review the slides on the bone marrow, which did not show any evidence of lymphoma. And I did review the slides from the first needle aspiration, which just showed necrotic tissue, probably a

necrotic tumor; but you couldn't know what kind of tumor it was.

Q. And when you say "necrotic," what does that mean?

A. Well, the tissue was dead. So the tissue was dead. And sometimes when tumors grow fast, some of the tissue just dies because it doesn't have enough blood supply, okay. So that biopsy that I looked at was not diagnostic. It just showed dead tumor cells, probably, okay.

And so then they did a third biopsy, and we tried to get that biopsy before I wrote my report; but it was unavailable. And so, you know, I had a deadline for writing my report. So I wrote my report relying on the information from the original pathologists who looked at the case, and we continued to try to get the slides, and eventually we did a few weeks ago. And I reviewed the slides and all the stains. And I agree with the diagnosis of diffuse large B-cell lymphoma, which I don't think is -- is an issue in this case.

Q. And did reviewing the tissue slides in any way change your opinion in this case?

MR. STEKLOFF: Objection, Your Honor.

THE COURT: Overruled.

THE WITNESS: No.

BY MS. MOORE

Q. Now, going back to the differential, I noticed that you didn't list in that first column on the known risk factors for

non-Hodgkin's lymphoma something called "idiopathic." Can you tell the jury what idiopathic is and why you didn't have that on your list?

A. Well, idiopathic is a big word that means we don't know what caused the lymphoma, okay. So it means -- it is -- basically what it means, we don't know what caused the lymphoma. So -- and that is true in many cases of lymphoma, we don't know what the cause is. After we go through the complete list of risk factors and known causes, the patient doesn't have any of those. And so we ended up saying, Well, we don't know what caused the lymphoma.

But that is not the case here in Mr. Hardeman because he has one substantial risk factor that I think -- that in the end, when you go through the list, it makes more sense to say, Well, gee, if he has the lymphoma and he has a risk factor and it is a substantial risk factor, that must be the cause more likely than not.

I mean, it would be -- it wouldn't be logical to say, Well, we know he has the substantial risk factor, but we really don't know what caused his non-Hodgkin's lymphoma. That wouldn't really make sense, right. It wouldn't really make sense.

Q. Well -- and the jury has heard from Monsanto's attorney in opening that, you know, most cases of NHL, the cause is listed as unknown. Why didn't you just say you don't know the cause

like in these other cases of NHL here for Mr. Hardeman?

A. Because we identified a cause.

Q. And that cause?

A. The cause is Roundup. More likely than not it is Roundup.

Q. And, Dr. Weisenburger, based on your 40 years of investigating and researching the causes of non-Hodgkin's lymphoma, your extensive literature review, your review of all the data, your own publications -- I think there is over 40 about the causes of non-Hodgkin's lymphoma -- your review of the medical records and your interview of Mr. Hardeman, please tell the jury your opinion within a reasonable degree of medical certainty what is the substantial factor in causing Mr. Hardeman's non-Hodgkin's lymphoma.

A. I think it is Roundup.

Q. Do you have any doubt as to your opinion that Roundup was a substantial factor in causing Mr. Hardeman's non-Hodgkin's lymphoma?

A. No.

MS. MOORE: Thank you, Dr. Weisenburger. I pass the witness at this point.

THE COURT: Okay.

MR. STEKLOFF: I'm going to pass out some materials, Your Honor.

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CROSS-EXAMINATION

BY MR. STEKLOFF

Q. Good morning, Dr. Weisenburger.

A. Good morning.

Q. I want to read something that you told the jury yesterday about this differential that we just finished walking through, okay. You said, So the methodology for doing this is the same methodology we use when we are diagnosing and treating patients in the hospital or the clinic.

Do you remember telling the jury that?

A. Yes, it's the same methodology.

Q. Okay. And then right now, I tried to write this down, you said -- in talking about idiopathic, you said -- part of what you said was, It is only idiopathic after we go through the complete list of risk factors and known causes.

Do you remember just saying that two minutes ago?

A. Yes, if you go through all the known causes and you don't find a cause, then by definition you don't know what caused it; and you call it idiopathic.

Q. Okay. So you are suggesting to the jury that this differential process that you go through is the same thing that you do at the hospital, at City of Hope and at the University of Nebraska; right?

A. Yes.

Q. Okay. Well, isn't it true, Dr. Weisenburger, that in your

40 years of caring for patients for non-Hodgkin's lymphoma, you have never used this differential method to determine the cause of a patient's non-Hodgkin's lymphoma?

A. Well, it's true because pathologists don't -- the job of the pathologist is not to go through this list. The job of the pathologist is to look at the slides and to do stains or other tests that might help, but we don't interview the patients. We don't review all of their laboratory results. So that's the job of the clinician, okay. That's the job of the clinician, not the job of the pathologist.

Q. And you are not an oncologist, right?

A. I'm not.

Q. Okay. But you are the expert that is here to testify about the specific cause of Mr. Hardeman's non-Hodgkin's lymphoma; right?

A. Yes.

Q. And you have never used the method that you just used to do that for non-Hodgkin's lymphoma patients in your 40 years of treating patients, right?

A. I have not used that precise method. I have used the same method when I was taking care of patients back during my internship. This is the method we would use. A patient comes in with a diagnosis of lymphoma -- of pneumonia, and you go through all of the known causes of pneumonia and you do tests. You try to find out what the cause is. And if you find a

cause, then you treat for that cause. If you don't find a cause, then you do some empiric treatment. This is the methodology that physicians use when they make a diagnosis in patients. It is called differential diagnosis.

Q. Right. When they make diagnoses, correct?

A. Right.

Q. Yeah. And my question is not about pneumonia. It is about non-Hodgkin's lymphoma. I just want to be clear. Yes or no, you have never used this method to determine the cause of a non-Hodgkin's lymphoma patient's cancer, correct?

A. No, but I have done it in other cases where I have tried to rule out causes. So, you know, I have done it -- I have done it in other cases.

Q. But not to determine the cause of non-Hodgkin's lymphoma, correct?

A. No, because it is not part of my practice.

Q. Okay. So let's talk about your practice a little bit. You talked -- you spoke yesterday about the City of Hope Hospital where you currently practice; right?

A. Yes.

Q. And you said that that's a cancer hospital that is recognized by the National Cancer Institute; right?

A. Yes.

Q. And we can all agree it is an elite hospital in this country for taking care of cancer patients, correct?

A. Yes.

Q. Okay. And when you are there -- I think you said just a few months ago you stepped down as the chair of the pathology group, right?

A. Yes.

Q. When you were the chair for several years, you were overseeing 20 to 25 pathologists who work at this elite hospital, City of Hope, right?

A. Yes.

Q. You were also working on a daily basis with elite oncologists, correct?

A. Yes.

Q. And you were working with other doctors who were taking care of patients who had non-Hodgkin's lymphoma, right?

A. Yes.

Q. And we can also agree that every single day there are patients with non-Hodgkin's lymphoma at the City of Hope who were there for care and treatment, right?

A. Yes.

Q. And you -- and to be clear, you agree that oncologists -- oncologists are the ones who are responsible for the treatment of non-Hodgkin's lymphoma; right?

A. Yes.

Q. And you agree that oncologists would want to know that glyphosate or Roundup caused their patient's cancer if that

were true, right?

A. Well, I think they would want to know if, in fact, we knew that.

Q. If a -- if a patient came in with non-Hodgkin's lymphoma and it were true that Roundup or glyphosate caused his or her cancer, the oncologist would want to know that, right?

A. Yes.

Q. Okay. And you, in your -- how many years have you been at City of Hope, 12?

A. A little over six.

Q. Okay. A little over six.

In those six years you have never gone to a pathologist at City of Hope and told him or her that you think that Roundup or glyphosate causes cancer, correct?

A. To a pathologist, no, I have never told it to another pathologist.

Q. Okay. And you have never gone to an oncologist at City of Hope, who is taking care of patients with NHL every single day, and told him or her that you that think Roundup or glyphosate causes cancer, correct?

A. I haven't because it is not part of my practice. I have published on it. You know, I was a coauthor on the *De Roos* paper, the first *De Roos* paper, where we found glyphosate to increase risk. And I'm actively involved in the NAPP study where we looked at glyphosate and showed it was increased risk.

So the way academic physicians communicate is through the literature, by publishing so the rest of the world can know, okay.

But in my practice, I don't speak to patients with non-Hodgkin's lymphoma except in rare circumstances. So I wouldn't know which patients with non-Hodgkin's lymphoma might have been exposed to Roundup and which ones haven't, okay.

And frankly, the oncologists, they are more concerned with treating the patient than trying to understand what happened 5 or 10 or 15 years ago that might have caused it. So patients don't often even get asked about questions about pesticide use or Roundup use unless it is volunteered by the patient, okay.

Q. And I agree that you have never told a patient, but we will come to patients in a moment. I want to focus on the doctors that you work with every day, okay.

Do you understand that's what I want to focus on right now?

A. Yes, I have never told them because I don't interview patients. I don't know which patients I have diagnosed have exposure to Roundup. So how could I tell the doctor?

Q. You have never gone to a doctor and said, You should ask your patient if he or she uses Roundup because it might help you treat or care for them. You have never said that to an oncologist, right?

A. I haven't, but I published it in -- I published it.

Q. We will talk about *De Roos*. You published *De Roos*, right?

A. Yes.

Q. NAPP is not published. We will get to that in a moment, right?

A. It will be soon.

Q. We will talk about that in a moment.

You have never gone to a pathologist and said, We should really consider whether or not our patients are using Roundup or glyphosate because I think it causes cancer?

A. No, but it is not part of our practice. It is not what we do, okay. It is not part of my work. It is part of my research.

Q. Well, you agreed earlier that oncologists would want to know what caused their patient's cancer if they could figure it out, right?

A. Yes, it's true.

Q. Now, you also were on something at the City of Hope called the Committee of Chair; is that right?

A. Yes.

Q. That was all the chairs of different practice groups: Oncology, pathology, radiology, other practice groups, right?

A. Yes.

Q. And those meetings -- you would have regular meetings, correct?

A. Right.

Q. Including administrative meetings but also medical scientific meetings, right?

A. No. Those were all administrative meetings. There really wasn't any science presented at those meetings. Those are meetings to manage the medical practice.

Q. And you never told any of the other chairs at those meetings that you thought Roundup or glyphosate causes cancer, right?

A. No, because it wouldn't have been appropriate. It was -- they were administrative meetings. They weren't scientific meetings. They weren't meetings about what causes cancer.

Q. They were the meetings of the leaders of the practices at the City of Hope, right?

A. Yes, and chairs.

Q. Including Dr. Levine, correct?

A. Yes, they organized the meeting.

Q. She was the chief medical officer, correct?

A. Yes.

Q. We will talk more about her later.

Now, you also mentioned yesterday that you were part of these research groups, and I think you mentioned something called InterLymph. Do you recall that?

A. Yes.

Q. And you described InterLymph as a group of epidemiologists and other researchers who are trying to determine the cause of

lymphoma, correct?

A. Yes.

Q. You have never at a meeting of InterLymph told the other epidemiologists or scientists that you think Roundup or glyphosate causes cancer, correct?

A. I probably discussed it with some of them, but the InterLymph -- the people -- the scientists in the InterLymph who have done case control studies for the most part didn't ask questions about pesticides and didn't ask questions about Roundup. So we never, in the InterLymph, did a pooling project because all the -- all the pertinent North American studies were put into the NAPP, okay. And there weren't other studies from other countries that really focused on pesticides. So the InterLymph hasn't published a paper on pesticides, but there are lots of other papers out there.

Q. But InterLymph is trying to determine the causes of lymphoma, right?

A. Yes.

Q. And you have never told the other epidemiologists or scientists associated with InterLymph that you think that Roundup or glyphosate causes cancer?

A. Probably we have discussed it. I don't remember specifically, but we probably have discussed it because we have discussed multiple times about all the causes, including pesticides. But the InterLymph didn't have the right data from

the studies that were done to really do an analysis to look at Roundup. And the North American Canadian studies were already analyzed in *De Roos* and in *McDuffie* and now in NAPP. So other people were doing it, okay.

Q. Dr. Weisenburger, you have some binders behind you, so if you can look at the binder on the shelf that is labeled 3 of 3. Do you see that?

A. Yes.

Q. You have a transcript from November 26th, 2018. So it is tab 5, first tab.

MR. STEKLOFF: Your Honor, I would like to read page 20, lines 1 through 5.

THE COURT: Okay. One moment.

Any objection?

MS. MOORE: No objection, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF

Q. Dr. Weisenburger, you have previously testified before, right?

A. Yes.

Q. Under oath, correct?

A. Yes.

Q. And so you were asked on November 26th, 2018 at page 20, line 1 through 5 -- and just tell me if I have read this correctly -- Have you ever gone to the epidemiologists and

other doctors associated with InterLymph and told them that you believe that glyphosate is a cause of non-Hodgkin's lymphoma?

And your answer was No.

Correct?

A. I don't remember this case, John Adams versus Monsanto? I never -- I was never involved in that case.

Q. Dr. Weisenburger, I'm just asking you if you -- if I read that correctly. I mean, you can see on the first page of this --

A. This is a deposition on a John Adams versus Monsanto. I have never testified in that case, so I don't know whose -- whose testimony this is. If it's mine, I don't know what case it came from.

Q. Have you ever heard of Gordon?

A. Gordon case, yes.

Q. And that's this deposition, okay.

A. Okay.

Q. And did I read the answer correctly?

Have you ever gone to the epidemiologists and other doctors associated with InterLymph and told them that you believe glyphosate is a cause of non-Hodgkin's lymphoma?

And your answer was one word, No.

Correct?

A. And part of that is because these people are studying in the field. So they know about glyphosate. And if they are

studying -- particularly if they are studying pesticides, okay. If they are not studying pesticides, they might not know about it. The only reason for me to do something like that would be if somebody was designing a new study and they wanted to look at pesticide use, then, you know, I would be happy to give them advice and tell them the kinds of things that I would do if I was designing a study, but there wasn't anybody during this period of time that was designing a new study to look at pesticide use. And so, you know, we never really discussed glyphosate or other pesticides because the studies that they had done had already been published and so there wasn't anything more to do.

Q. Let's talk about another organization you are a part of. It's called LLMPP. It is the Leukemia and Lymphoma Group -- Research Group?

A. Yes. Leukemia Lymphoma Molecular Profiling Project, yes.

Q. And it also involves epidemiologists, other researchers, other clinicians trying to deal with the causes of lymphoma, correct?

A. No. That group is basically more of a basic science group, so there are no epidemiologists in that group. We are looking more at the biology of different types of lymphomas. So we would never talk about this in that group.

Q. That's my question. You have never gone to that group and told them that you think that Roundup or glyphosate is a cause

of non-Hodgkin's lymphoma, correct?

A. There would have been no reason to do so because they are not doing that kind of research.

Q. Now, you also attend meetings of doctors that get together, correct?

A. Yes.

Q. There are conferences basically?

A. Yes.

Q. So one of them, you are part of something called The American Society of Hematology, right?

A. Right.

Q. That brings hematologists, oncologists, pathologists around the country together to talk about medical and scientific issues, right?

A. Yes.

Q. And you have never presented at that conference your opinion that Roundup or glyphosate causes non-Hodgkin's lymphoma, correct?

A. No. We -- we presented and published -- we presented our research on glyphosate at other meetings. We didn't present it at this meeting.

Q. You, yourself, have never presented at that meeting your opinion that Roundup or glyphosate causes non-Hodgkin's lymphoma, correct?

A. I have not.

Q. You also have never told -- let's shift away from the research groups you are a part of or meetings. You have never told a patient that you think his or her Roundup was caused by -- sorry, non-Hodgkin's lymphoma was caused by Roundup or glyphosate, correct --

A. No, but that's not part of my practice. I don't see patients routinely. It would be a very unusual case where I would go see a patient.

Q. But it happens occasionally. It happened at the University of Nebraska, right?

A. Once in a while, but I was going to ask them other things, not ask them about pesticide use, okay.

Q. And then you do write, when you look at the slides that you talked about, you do write pathology reports, correct?

A. Yes.

Q. And in a pathology report you have never written that the cause of a patient's NHL was Roundup or glyphosate, correct?

A. That's because when you look at the slides, you can't know what the cause is. So why would I -- it would be nonsensical to try to do that.

Q. Well, you never made any effort to determine if a single patient that you were diagnosing with non-Hodgkin's lymphoma ever used Roundup in his or her life, right?

A. No, because it is not part of my practice, okay.

Q. So just to sum up, you have never told an oncologist that

you believe Roundup or glyphosate causes non-Hodgkin's lymphoma, correct?

A. That's correct.

Q. You have never told a pathologist, correct?

A. That's correct. There would be no reason to tell another pathologist.

Q. You have never told the other chairs at the City of Hope, correct?

A. There would be no reason to tell the other chairs, no.

Q. You have never told the other members of InterLymph, correct?

A. I'm sure we have discussed it at InterLymph. But as I told you, it wasn't a focus of InterLymph so we really didn't -- we really didn't spend much time talking about pesticides at InterLymph because we were looking at other causes.

Q. You have never told a patient, correct?

A. It is not part of my practice, no.

Q. And you have never written it down in a pathology report, correct?

A. No, because I wouldn't know to write it down. It is not part of my practice.

Q. Now, you mentioned the NAPP, the North American Pooled Project, right?

A. Yes.

Q. So I want to talk to you about the NAPP.

MR. STEKLOFF: Your Honor, may I just grab the easel?

THE COURT: Sure.

MR. STEKLOFF: Your Honor, is this okay?

THE COURT: Fine with me.

MR. STEKLOFF: Am I blocking anybody? Will everyone see if I write on this?

BY MR. STEKLOFF

Q. Dr. Weisenburger, let's just explain to the jury again what the North American Pooled Project is. That is -- that is this poster or this abstract that you described yesterday to the jury that combines the data from *De Roos* 2003 with *McDuffie*, correct?

A. Yes, that's correct.

Q. Okay. Now, that data that you showed yesterday, do you recall, was from June 2015?

A. I think that's correct, yes.

MR. STEKLOFF: Actually, can I -- do you mind if I just show -- remind the jury of the board that you displayed yesterday about the NAPP?

MS. MOORE: That's fine.

BY MR. STEKLOFF

Q. Dr. Weisenburger, this is what you showed to the jury yesterday about the NAPP, correct?

A. Yes.

Q. You showed one table about frequency, number of days per year of glyphosate handling and NHL risks, right?

A. Yes.

Q. And this is from June 2015, correct?

A. Yes.

Q. And this was part of your explanation for -- what you called dose response, right?

A. Yes.

Q. Your argument -- sorry, your opinion was that this data supports your view that the more Roundup you use, the higher your risk is, right?

A. Yes.

Q. I'm going to write down June 2015. And that is almost four years ago, right?

A. Yes.

Q. And to be clear, this data today is still not published in a peer-reviewed journal, correct?

A. It's -- it's not currently published, but hopefully it will be shortly. It has been sent to the journal. It has been reviewed. They have asked for revisions. The revisions are currently being made, and it will be resubmitted and hopefully accepted in the next month or two.

Q. Right. And the numbers are actually changing, right?

A. The numbers do change some because they do additional analyses. They -- you know, epidemiologists, when they are

doing these studies, try to do all of the adjustments so that the data that they are presenting is the truest representation of the data, and so numbers do change.

Often in abstracts you are giving preliminary numbers, and then you go back and reanalyze the data and the numbers change a little bit. This is very common practice in epidemiology.

Q. Okay. So these numbers were preliminary; is that right?

A. They were the earliest iteration.

Q. And we have heard -- the jury has heard some testimony about peer review, but the peer review process for an article in a journal is an important one, right?

A. Yes, it is important -- it is important, sure.

Q. You just told us that doctors go to peer-reviewed literature to understand medical and scientific issues, right?

A. Yes.

Q. And let's show the jury this June 2015 presentation beyond what you showed them yesterday, okay?

A. Okay.

MR. STEKLOFF: Ms. Melen, may I please have the ELMO?

I'm going to display Trial Exhibit 899.

May I publish, Your Honor?

THE COURT: Go ahead.

BY MR. STEKLOFF

Q. So this is that overall presentation. This is the -- this was -- this is the unpublished data, correct?

A. Yes.

Q. When you told the jury yesterday that there is some sort of peer-review process to be able to present this at a conference, that is different -- that is a different process than peer review for an article in a journal, correct?

A. Well, it is a similar process, but it is probably not as detailed and critical.

Q. Exactly.

And let's show the jury some of the data that you did not show them yesterday. So first of all, you did not show them from June of 2015 this page, correct?

A. That's correct.

Q. This is glyphosate use and NHL risks, right?

A. Yes, it's ever-never. So it's all -- it's all cases: Low exposure, high exposure.

Q. Right. This is ever-never. So if someone -- this is demonstrating the overall risk if compared to whether someone ever used Roundup versus never used Roundup, right?

A. Yes.

Q. And that odds ratio for NHL overall was 1.22, not statistically significant, correct?

A. That's correct.

Q. You didn't show that to the jury yesterday, right?

A. Well, I could have, but -- I was trying to show them -- I was trying to keep the time short and show them the things that

were really important, okay. There was the same finding in *McDuffie*, and I showed that yesterday.

Q. Well, you were -- you are a part of this NAPP group, right?

A. Yes.

Q. And you agree, you are obviously here to give truthful and accurate testimony to the jury, right?

A. Yes.

Q. Well, you agree that part of giving truthful and accurate testimony to the jury is giving them complete information, right?

A. Well, we discussed it. I discussed it with counsel whether we should -- whether we should show the whole NAPP study, which would have taken me about 15 additional minutes. I could have done that, but we didn't run through any of the other studies in great detail. We showed what the most important message was from the study. And so that's what I did in this case. But I would have been happy to go through all of the results with the jury if, you know -- I just didn't think it was necessary.

Q. We are going to go through the results with the jury now.

A. Good.

Q. Okay. But you were involved in the decisions of what to present to the jury yesterday, right?

A. I was.

Q. Okay. And you did not present this slide, correct?

A. We decided not to present it, exactly.

Q. Okay. You can also see on this slide it actually breaks out DLBCL. That is the type of non-Hodgkin's lymphoma that Mr. Hardeman had, correct?

A. Yes.

Q. And that is also -- the odds ratio was 1.32, but also because it is less than 1, not statistically significant, correct?

A. Yes.

Q. Now, you showed frequency, which was number of days per year, correct?

A. Right.

Q. Well, there are other ways that the NAPP group measured dose response, correct?

A. Yes.

Q. Okay. So here is another way that the NAPP group in June 2015 measured dose response, correct?

A. Right. This is another way.

Q. And I should point out -- and I should point out on the last slide, this data here you can see -- you described this yesterday -- is adjusted for other pesticides, use of 2,4-D, use of dicamba, use of malathion, right?

A. Yes.

Q. Same with this duration slide. It is adjusted for those

other pesticides, correct?

A. Yes.

Q. And now, what this shows is number of years. So your group broke down users between zero and 3.5 years, right?

A. Right.

Q. And then greater than 3.5 years, correct?

A. Yes.

Q. And -- so this is dose response, right?

A. It is one way to look at dose response.

Q. It is one way you and your fellow scientists chose to look at dose response in NAPP, correct?

A. Yes.

Q. And what it shows is that for users who -- this is overall non-Hodgkin's lymphoma. For users who used it for less than three and a half years, the risk ratio was 1.4 and not statistically significant, correct?

A. Yes.

Q. But for users who used it for more than three and a half years, the risk went all the way down to 1.02, still not statistically significant, correct?

A. Correct.

Q. So this does not show dose response, right?

A. It does not.

Q. And you did not show this to the jury yesterday, correct?

A. I didn't, no.

Q. And the same here for DLBCL, Mr. Hardeman's non-Hodgkin's lymphoma. You can see here if it was less than three and a half years, it was 1.77 and it actually was statistically significant, correct?

A. Yes.

Q. But then for more than three and a half years -- so the users in this pooled study who were using it for a longer period of time when measured by number of years, the risk ratio went all the way down to 1.03, not statistically significant, correct?

A. Correct.

Q. You did not show this to the jury yesterday, right?

A. No, but I would be happy to explain it if you would let me.

Q. Well, I would like you to just answer my questions. But this -- you did not show this to the jury yesterday, right?

A. I did not.

Q. Okay. Now, let's look at another slide in this presentation. Lifetime days.

So this is another way that your group chose to assess dose response, number of years times days per year, correct?

A. Yes.

Q. And if you look again at overall -- so just to break this down, this was less than seven. So if you took the number of years and multiplied it by the days of year, there was a group

that had less than seven and then a group that had more exposure greater than seven, correct?

A. Yes.

Q. And so here the overall risk was 1.00 for the less than seven but not statistically significant, correct?

A. Correct.

Q. And then it did go up to 1.19, but it was not statistically significant when greater than seven, correct?

A. That's correct.

Q. And then same, look at DLBCL. It was actually below 1 for less than seven by this formulation, right?

A. Right.

Q. Not statistically significant, correct?

A. Correct.

Q. And then 1.25 but not statistically significant here for greater than seven, correct?

A. That's correct.

Q. And you didn't show this table to the jury yesterday, correct?

A. No. The reason I didn't is because I don't think these measures are as -- as important in pesticide use as what I showed. And, you know, in some of my prior testimony deposition --

MR. STEKLOFF: Objection to prior testimony, Your Honor.

THE COURT: Sustained. You shouldn't be talking about any prior testimony you have given unless you are asked about it.

THE WITNESS: Okay. Thank you, Your Honor.

BY MR. STEKLOFF

Q. Dr. Weisenburger, you and your group chose to measure dose response in these different ways in this study, correct?

A. Yes, those are the standard ways that epidemiologists do it.

Q. Okay. And you showed the one page of the June 2015 deck that supported your dose response opinion, correct?

A. That's correct.

Q. And you did not show the other pages that did not support your opinion, correct?

A. That's correct.

Q. You also didn't tell the jury that there were subsequent presentations from NAPP, did you?

A. There were three presentations, yes.

Q. Okay. You didn't show either of the next two presentations, right?

A. I didn't, no, because that would have taken an hour.

Q. Okay. Well, you were -- you testified for over three -- at least three, maybe four, hours, right?

A. Yes.

Q. And have you read -- did you review Dr. Ritz's testimony?

A. I did not.

Q. You talked a little bit about what Dr. Ritz presented, right, because you referenced that yesterday?

A. We didn't talk very much about it. I mean, I don't really know for sure what she said.

Q. Okay. But you understand that Dr. Ritz presented some of the same things that you presented, right?

A. Yeah, she probably did.

Q. Okay. And she did not present this NAPP data, that you are aware of, correct?

A. I don't know.

Q. So this would have been new data for the jury yesterday if you had shown it, right?

A. It would have, but I didn't know that she didn't show it.

Q. You didn't ask about that when you were considering whether to show the NAPP data?

A. I didn't.

Q. So the next presentation was on August 31st, 2015, correct?

A. I'm not sure. I will trust that you are correct.

Q. Well, if you look at your binder Number 1, Trial Exhibit 1425.

Are you with me, Dr. Weisenburger?

A. Yes.

Q. You see that this is the next NAPP presentation,

August 31st, 2015?

A. Yes.

MR. STEKLOFF: Your Honor, permission to publish.

THE COURT: Any objection?

MS. MOORE: No objection, Your Honor.

THE COURT: Go ahead.

MR. STEKLOFF: Thank you.

Ms. Melen, may I continue to use the ELMO, please.

(Whereupon, a brief pause was had.)

MR. STEKLOFF: We might be able to do this by the other technology, if it won't work.

THE CLERK: This has been known to happen when it just stops working.

THE COURT: Should we do our morning break a little bit early to try to get it fixed, or?

MR. STEKLOFF: I think, Your Honor -- I'm happy to take a break or I'm happy to use the other technology.

THE COURT: Your preference. It is a little early to take a break. We can keep going for a little while. So if you want to use the other technology, that's fine.

MR. STEKLOFF: I'm happy to use the other technology, if we can switch over.

Q. Okay. So this the jury can now see on the screen, Exhibit 1425. Do you see that as well as, Dr. Weisenburger?

A. Yes.

Q. In fact, your name is listed here, the second-to-last name among the other scientists, correct?

A. Yes.

Q. And we can see that date below that August 31st, 2015, correct?

A. Correct.

Q. And this also presented some of the data that you and your colleagues were studying, correct?

A. Yes.

MR. STEKLOFF: And, Mr. Holtzen, if we can turn to the page that is titled "Glyphosate Use and NHL Risks."

Q. We can see at the bottom of this page this is adjusted for the three other pesticides, correct?

A. Correct.

Q. And you agree it is important to adjust for other pesticides when possible, right?

A. Yes.

Q. Excuse me. And it is actually -- so there are two columns here, and it is the column on the right with that little B above it that shows the adjusted numbers, correct?

A. Correct.

Q. The column on the left is unadjusted for other pesticides, right?

A. Correct.

Q. And so if we look again here at the overall risk, it is

1.13, not statistically significant, correct?

A. Yes, this is for ever-never.

Q. This is for ever-never. And, in fact, those numbers have actually changed since the June 2000 presentation that we just looked at, right?

A. Yes, that's what happens when you re-analyze data and you take other things into consideration. So it is not surprising the data changed.

Q. It went down. In June of 2015 it was 1.22, not statistically significant. Now, in August of 2015 it is 1.13, not statistically significant, correct?

A. Yes.

Q. And when you presented the June 2015 numbers in that one table yesterday to the jury, you didn't tell the jury the numbers have been going down and changing since June 2015, did you?

A. I did not.

Q. Now, this also shows DLBCL. And in that adjusted column, it shows 1.23, but it is not statistically significant, correct?

A. That's correct.

Q. And you did not show that to the jury yesterday, right?

A. I did not.

Q. That number --

A. Because I didn't show any data on ever-never yesterday.

Q. And that number has also been going down since the June -- one month later or two months later this number is going down as the numbers are re-analyzed, correct?

A. I don't remember what the odds ratio was for DLBCL in the first ever-never number in the first analysis.

Q. Well, if I told you it was 1.32, we can agree it has gone down here, correct?

A. Yes.

Q. Now, at the back of this presentation, there is a slide titled "Proxy Versus Self-Respondents."

You see that, Dr. Weisenburger?

A. Going backwards, uh-huh.

Q. It is the second -- third-to-last slide.

And this is where you and your colleagues showed adjusted -- adjusted dose response information, correct?

A. On this table?

Q. Yes.

A. I'm on the wrong table. Let's see.

Q. You can also look on the screen if it helps.

Are you with me?

A. Okay. Yeah, I see what it is.

Q. Okay. So let's just walk through for the jury what this is. Well, let's make one thing clear. If you skim through the rest of the presentation in Exhibit 1425, in this presentation when you and your colleagues presented duration, frequency,

lifetime days, on earlier slides, it was not adjusted for the other pesticides, right?

A. That's correct. That's one of the reasons I didn't show the data.

Q. Okay. But this data is adjusted for other pesticides, right?

A. It is, yes.

Q. So you could have shown the jury this data, right?

A. We could have. I don't know why we didn't. I don't remember why we didn't.

Q. But you were part of that decision?

A. I knew about the decision. I didn't make the decision. It was a group decision.

Q. Okay. So now you don't -- you are not taking responsibility for not presenting this data?

A. I'm not.

Q. Okay. So let's first explain to the jury what it means proxy versus self-respondents because I don't think we have talked too much about that, okay?

A. Well, so --

Q. I'm going to ask questions.

Proxy. In some of the studies that were part of *De Roos* or *McDuffie*, there were phone calls to family -- to people who were part of the study to try to determine what pesticides they had used, correct?

A. Yes.

Q. And in some instances, either because the person with non-Hodgkin's lymphoma was deceased or they just weren't available to pick up the phone, the questions were asked to what is called a proxy, right?

A. Yes.

Q. And that is a family member or other person in the household. So you are not getting the information directly from the person who was using Roundup or other pesticides. You are getting it from someone else in their household, right?

A. Yes. It is usually the spouse, but that's correct, someone who lives there and has knowledge of it.

Q. And you agree that is a limitation of these case control studies that you discussed, correct?

A. Well, it can be a limitation. It can be.

Q. Okay. And then self-respondents, that is obviously where you were able to directly reach the person who was using the other pesticides, right?

A. Correct.

Q. Okay. And so this table breaks down the combination of proxy and self-respondents and then self-respondents only, correct?

A. Right.

Q. That's the two --

A. It gives you the data -- the entire data and then it gives

you the data just for the self-respondents, yes.

Q. Okay. And all of these numbers in this table are adjusted for the other pesticides, right?

A. Yes.

Q. So let's look at -- we already walked through in this August 2015 presentation never-ever -- but let's look at the three dose response metrics: Duration, frequency and lifetime days. For duration it shows that either -- whether it is proxy and self-respondents or self-respondents only, the more years that people were using pesticides and using Roundup, the numbers actually went down, correct?

A. Yeah. So the data is consistent between the entire group and the self-respondents that -- the results are pretty much the same.

Q. And it shows they are at least, by that metric of duration, there was no dose response, correct?

A. Using that metric, that's true.

Q. And there is none of these numbers -- in duration, all four, none of them are statistically significant, correct?

A. They are not.

Q. Okay. Now, in frequency, the numbers do go up and number of days per year. If it was more than two days per year, the number on the left is 1.73, statistically significant, correct?

A. Yes.

Q. And the number on the right is 1.77, barely not

statistically significant, correct?

A. It is borderline, but it is the same -- it is the same number, okay. It is the same number.

Q. Right. Now, lifetime days, that was the other metric that you and your colleagues chose to use, correct?

A. Yes.

Q. And that shows that it went up, but from below 1 to above 1 on both sides -- slightly above 1, 1.08 and 1.06, correct?

A. Yes.

Q. Not statistically significant, correct?

A. Correct.

Q. And 1 -- if it is at 1, that means there is no risk, right?

A. Correct.

Q. And none of this data -- you didn't present any of this data to the jury yesterday, right?

A. I presented data on frequency by number of days. So, you know, I did present some of this data, but the numbers are slightly different. I presented the data for proxy and self-respondents.

Q. But not in the August 2015 presentation of these numbers, correct?

A. No, but the numbers are still statistically significant, okay.

Q. For the one metric?

A. For the one metric, yes. Probably the most important metric.

Q. Okay. Out of one, two, three, four, five, six -- out of 12 metrics, one metric was statistically significant?

A. And one was a borderline significant.

Q. Okay. And that's the one -- the one metric that was statistically significant is the metric that you showed the jury yesterday, right?

A. Yes, because I think it is the most important one. And I hope, if you don't ask me that, Ms. Moore will ask me in cross, okay, why I think it is the most important.

Q. Okay. Now, there was a third presentation that we have discussed -- that you have mentioned existed in June of 2016, correct?

A. Again, I don't remember the date. There was a third presentation, yes.

Q. Well, in your binder, Dr. Weisenburger, is Trial Exhibit 1424.

A. Okay.

Q. Do you see that this presentation -- again, not a published article in a journal, but this poster presentation or abstract presentation occurred in June 2016?

A. Yes.

Q. And you also didn't present this information to the jury yesterday, correct?

A. I didn't, because then it would have taken me an hour to show all three of these.

Q. Okay.

A. And it would have been frankly redundant.

Q. Okay. The jury will determine that.

MR. STEKLOFF: Your Honor, may I publish Exhibit 1424 please?

THE COURT: Any objection?

MS. MOORE: No objection, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF

Q. So we can see here on the front page, again, your name is listed here, Dr. Weisenburger. We can see that?

A. Yep.

Q. We can see the date, June 2016. So this is a year later, correct?

A. Yes.

MR. STEKLOFF: And if we can turn, Mr. Holtzen, to the page that is titled "Glyphosate Uses and Risks of NHL Overall."

Q. So -- in this table a year later the information is presented differently, correct, Dr. Weisenburger?

A. Yes, it is a different format.

Q. It doesn't give the specific numbers. It is just showing the p-trend; is that right?

A. Well, it does give the numbers on the left side, but it's

hard to know exactly what they are.

Q. Right. It is a little --

A. Whether it has increased or not increased or decreased.

Q. It is a little oddly presented, right?

A. It is what?

Q. A little oddly presented.

A. It is a different way of presenting things.

Q. You can't tell the exact numbers. I mean, you can see that there is a 1.0, but you can't tell the exact numbers, correct?

A. Correct.

Q. And you, on the chart yesterday, actually explained briefly p-trend to the jury. Do you remember that?

A. Yes.

Q. So if we look here, you were emphasizing that there were two p-trends that were statistically significant, correct?

A. Correct.

Q. And that is because they were at .02, right?

A. Yes.

Q. So when we are talking about p-trend, which is comparing the two numbers using a statistical method, if it is .05 or lower, it is statistically significant, correct?

A. Yes, if you use that as your parameter.

Q. .05 or .04, .03 or .02 or .01, right?

A. Yes.

Q. And you actually called out these two numbers here, .02, that these demonstrated a trend for these two columns that were statistically significant that supported your opinion that there is a dose response, right?

A. Yes.

Q. Let's look at what the p-trends are in the data that was presented in June of 2016 that you didn't show to the jury yesterday.

First of all, this has all the same metrics ever used. So that is ever-never, whether someone ever used it compared to never used it, correct?

A. Correct.

Q. And then it has duration, number of years. So we have now seen that, right?

A. Correct.

Q. Frequency, number of days per year, correct?

A. Yes.

Q. And lifetime days, number of years times number of days per year, correct?

A. Yes.

Q. And it is the orange data that is adjusted for other pesticides. You can see that on the bottom, right? It says ORB, adjusted for variables and ORA, and the use of 2,4-D, dicamba and malathion, right?

A. Correct.

Q. So let's look at the data that is adjusted for other pesticides, starting with duration per years. That p-trend, .87, is not statistically significant, correct?

A. That's correct.

Q. The next one, frequency of number of days per year, .23, not statistically significant, correct?

A. That's correct.

Q. Next one, .92, not statistically significant, correct?

A. That's correct.

Q. And then if we turn to the next page, frequency of glyphosate use in NHL risks, this is the one that you think is the most important, right? That's what you have told us?

A. It's been a long time since I have looked at this, so I'm trying to sort of understand it again.

Q. But that's not my question, Dr. Weisenburger. I'm asking of the three dose response ways to measure, you say that frequency is the most important, right?

It's frequency, duration and lifetime days are the three ways that dose response is measured, right?

A. Right. So frequency would be days per -- days per year, that's correct.

Q. Okay. And so in this, all five numbers that are adjusted for other pesticides -- .23, .89, .16, .24 and .38 -- for the different types of non-Hodgkin's lymphoma are not statistically significant, correct?

A. So where are you looking? I'm sorry.

Q. You can also look on the screen if it helps, Dr. Weisenburger. I'm looking at the frequency page, and I'm looking at the p-trend where the data is adjusted for other pesticides. All of those numbers are not statistically significant; correct?

A. That's correct, although diffuse large B-cell lymphoma again is borderline.

Q. Okay. But it's not statistically significant; correct?

A. That's true.

Q. And if we go to --

A. But you can see how the numbers change.

Q. That's not my question, Dr. Weisenburger. They're not statistically significant; correct?

A. Correct, but epidemiologists look at the numbers and look how the numbers change. So sometimes you see important information that isn't statistically significant, and here you see that it does change. The odds ratios do go up with greater number of days per year. In this analysis it's not statistically significant, but it's borderline.

Q. Okay. And yesterday when you were emphasizing the importance of that one slide, you emphasized the importance of statistical significance in the p-trend; right?

A. Yes.

Q. Okay. Now, if you look at duration on the next page,

again, all of the adjusted numbers are not statistically significant; correct?

A. That's correct, but they weren't in the previous analyses either.

Q. Okay. And then if you look at the next one, "Lifetime days of glyphosate use and NHL risks," none of the data adjusted for other pesticides is statistically significant; correct?

A. That's correct.

Q. Okay. So in this chart, we actually have 15 measures, depending on whether it's NHL overall, follicular lymphoma, diffuse large B-cell lymphoma, which is the type of lymphoma that Mr. Hardeman had, SLLL or other subtypes, and regardless, across the board, all 15 metrics are not statistically significant; correct?

A. Correct, but you can see on frequency of glyphosate use, that in each of the curves, the frequency goes up with a higher dose. Okay? So there's -- you can see -- you can see the trend. It's unmistakable when you look at it. It just doesn't -- it isn't statistically significant. Okay? So it's consistent with what I showed before.

Q. I mean, you didn't show this, though; right?

A. I didn't.

Q. And you told us yesterday if something's not statistically significant, it could be because of chance or other

confounders, other things that might complicate the data; right?

A. It's possible.

Q. And that's why yesterday you were emphasizing the data that was statistically significant that supported your opinions; right?

A. Yes.

Q. Now, Dr. Weisenburger, let's actually move away from NAPP.

THE COURT: Since we're moving away from NAPP, I think now is probably a good time to take a break.

Why don't we take a ten-minute break, and we'll resume at 25 after the hour. Thank you.

THE CLERK: All rise.

(Proceedings were heard out of the presence of the jury:)

THE COURT: You can step down, Dr. Weisenburger.

THE WITNESS: Thank you.

THE COURT: Anything anybody needs to discuss?

MS. WAGSTAFF: No, Your Honor.

THE COURT: No? Okay. Thank you.

THE CLERK: Court is in recess.

(Recess taken at 10:15 a.m.)

(Proceedings resumed at 10:26 a.m.)

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. Bring the jury back in.

(Proceedings were heard in the presence of the jury:)

THE COURT: Okay. You can resume.

MR. STEKLOFF: Thank you, Your Honor.

Q. So, Dr. Weisenburger, I want to talk about a few of the studies that you showed to the jury yesterday.

And may we publish, please, 1066.

MS. MOORE: No objection.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. Dr. Weisenburger, do you remember discussing this study by Dr. Bolognesi and others yesterday with the jury?

A. Yes, I do.

Q. And this is one of the studies that you discussed where there was aerial spraying to try to eliminate cocaine in Colombia; is that right?

A. Yes.

Q. Okay. And you discussed this in supporting your opinions on genotoxicity; is that right?

A. Yes.

Q. Okay. If we could turn, please, to page 995. This is one of the studies -- or this is a page that you did not show to the jury in this; is that correct?

A. I didn't show them this page, no.

Q. Okay. And if we can go in the left-hand column about less than halfway down, there's a sentence that starts "Evidence indicates." Do you see that? It will be on your screen as

well.

A. (Witness examines document.)

Q. Are you with me, Dr. Weisenburger?

A. Yes.

Q. And so in this study that you said supports your opinion on genotoxicity, the authors wrote (reading):

"Evidence indicates that the genotoxic risk potentially associated with exposure to glyphosate in the areas where the herbicide is applied for eradication of coca and poppy is of low biological relevance."

Right?

A. That's what they say.

Q. And then if we go to the right-hand column, there's a paragraph that starts "Given the situation." Do you see that?

A. Yes.

Q. And in the second sentence the authors wrote (reading):

"Based on the applicable *Bradford Hill* guidelines" --

That's something you discussed yesterday with the jury, the *Bradford Hill* guidelines; correct?

A. Yes.

Q. And one of the guidelines, one of the criteria is something called causality; right?

A. Yes. That's why you do the *Bradford Hill* analysis.

Q. And so what the authors wrote based on their review of the data from this study is (reading):

"Based on the applicable *Bradford Hill* guidelines" -- then they cite back to 1965 when we've heard about Sir Bradford Hill -- "it is not possible to assign causality to the increases in frequency of BNMN" -- those are the chromosomal changes that were happening -- "observed in our study."

Right?

A. Yes, but it doesn't really make any sense, that statement.

Q. Okay.

A. Because you wouldn't take one parameter and apply the *Bradford Hill* analysis. So it doesn't really make any sense.

Q. But that's what the authors wrote; right?

A. That's what they wrote.

Q. And you did not show that to the jury yesterday; correct?

A. No, because it doesn't make any sense.

Q. Okay. So I'd also like to turn to a new study. Do you remember also discussing the Paz-y-Miño study?

A. Yes.

Q. Okay. And you showed the jury a Paz-y-Miño study from 2007, which is Exhibit 1438.

MR. STEKLOFF: May I publish, Your Honor?

MS. MOORE: No objection, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. And so this is the study that you discussed in part called

"Evaluation of DNA Damage in an Ecuadorian Population Exposed to Glyphosate"; correct?

A. Yes.

Q. And this is where both of these studies are where you were talking about real human data that proves, in your opinion, genotoxicity; right?

A. Yes.

Q. Not that it was in a petri dish, but these were real people and you emphasized that yesterday; right?

A. Yes.

Q. Now, what I'd like to show you -- you're aware that Paz-y-Miño did a follow-up on this same group of people a few years later; right?

A. Yes.

Q. You did not show that to the jury; correct?

A. I didn't.

Q. Okay. So let's, please, pull up that exhibit.

MR. STEKLOFF: And I apologize, Your Honor. It may take me a moment to figure out what exhibit number that is.

(Pause in proceedings.)

MR. STEKLOFF: Yes, 1437. And may I publish 1437, Your Honor?

THE COURT: Any objection?

MS. MOORE: No objection.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. Okay. So, Dr. Weisenburger, this is 1437. We can see the title "Baseline determination in social, health, and genetic areas in communities affected by glyphosate aerial spraying on the northeastern Ecuadorian border"; correct?

A. Yes.

Q. You can see the first author is Dr. Paz-y-Miño. You agree the same group of scientists looking at the same group of people; correct?

A. Yes.

Q. And the last article we looked at was published in 2007; right?

A. Yes.

Q. And this article we can see at the top was published in 2011; correct?

A. Yes.

Q. And if we look in the abstract on the first -- on the front page of this article, the bottom of the abstract, what the authors explained was starting at the bottom "In conclusion" (reading):

"In conclusion, the study population did not present significant chromosomal and DNA alterations."

Do you see that?

A. Yes. That's -- that's -- that was the result I think four years later or four years or more later, yes.

Q. Right. Four years or more later they went back -- actually two years later, it just took them -- they published it four years later, but two years later they went back to see if the participants in this study had undergone chromosomal or DNA alterations; correct?

A. Yes.

Q. And this was their conclusion; right?

A. Yes, but it wouldn't be surprising for the abnormalities to go away because the body fixes the vast majority of genetic abnormalities. And so four years later, if they hadn't been exposed, the abnormalities might go away. So I didn't find it -- I didn't find it to be really relevant to the point I was trying to make.

Q. Okay. So when a person stops using Roundup, in your world where it causes abnormalities, you agree, even in your opinion, those abnormalities can go away when a person stops using Roundup?

MS. MOORE: Objection.

THE WITNESS: They often go away, yes.

THE COURT: Overruled.

BY MR. STEKLOFF:

Q. Now, let's turn to page 50, the last page of this article. At the bottom of the left-hand column there's a paragraph that starts "Several research studies." Do you see that, Dr. Weisenburger? And it says (reading):

"Several research studies related to glyphosate exposure have been conducted in Colombia by Bolognesi" -- That's what we just looked at; right?

A. Yes.

Q. (reading)

-- "Sanin, and Solomon."

So those are two other studies; correct?

A. Yes.

Q. And what the authors here say is (reading):

"Those other research studies state that the studied populations have low genotoxic risk associated with glyphosate."

Correct?

A. That's what he -- that's what these authors say, yes.

Q. And then it goes on to say (reading):

"Regarding our study -- our study -- "we obtained results showing no chromosomal alterations in the analyzed individuals."

Right?

A. Yes. More than two years later.

Q. Okay. You did not show this to the jury yesterday; correct?

A. No, because the point of what I was showing is that if you have exposure to the chemical in high doses, you get genotoxic damage.

Q. Now, Dr. Weisenburger, I want to turn to talk about some of the epidemiology that you discussed with the jury yesterday.

MR. STEKLOFF: And, Ms. Melen, may I briefly have the Elmo, please?

THE CLERK: Cross your fingers.

MR. STEKLOFF: It looks like it's working.

Your Honor, may I publish Trial Exhibit 1569, which was used with Dr. Weisenburger?

MS. MOORE: No objection.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. So, Dr. Weisenburger, this was one of the articles that you discussed yesterday, and it is titled "Lymphoid Malignancies in Nebraska: A Hypothesis"; correct?

A. Yes.

Q. This is something -- this is -- a hypothesis is sort of -- is like a theory, correct, that needs to be tested?

A. Right.

Q. And you published this in the *Nebraska Medical Journal* in August of 1985; right?

A. Yes.

Q. And you described for us yesterday how when you moved to Nebraska, you were very interested in the increased amount of non-Hodgkin's lymphoma that you were seeing; right?

A. Yes.

Q. Okay. And so I want to show you one of the pages -- one of the things you wrote in this paper. It might be -- hopefully my highlighting doesn't make it too hard to read, but this is one of the things you wrote. You said (reading):

"The markedly increased risk of leukemia, 80 percent, and lymphoma, 70 percent, in young farmers in Nebraska and Wisconsin respectfully suggests that exposure to one or more agricultural chemicals first introduced and used in significant quantities in the late 1940s and early 1950s may be important in the etiology" -- that's causation, determining causation -- "of lymphoid malignancies in farmers."

Correct?

A. Yes. Yes.

Q. And so when you started looking at this issue in 1985, you were focused on what you called "agricultural chemicals" but pesticides that were introduced in the 1940s and 1950s; right?

A. Yes, because I was thinking that there has to be a latency in order to really see effects.

Q. And you previewed my next question, which is that you also discussed yesterday that the average latency for pesticides is 20 years; right?

A. That's a guess.

Q. Well, it's not a guess. You showed us a blowup yesterday with two curves, and you walked through and you said the

average latency is 20 years; right?

A. I said it was an idealized curve, and I thought that chronic exposure to pesticides like Roundup would have a curve very similar to what we -- what we see for low-dose chronic exposure to solvents. Okay?

We don't really ask -- we don't really know what the median latency is for Roundup so, you know, we can only -- we can only surmise from what we do know what it might be.

Q. And what you surmised yesterday when you were offering opinions to the jury was 20 years; right?

A. 20 to 25 years, yes.

Q. 20 to 25 years.

And so -- I mean, earlier you said -- you used the phrase "more likely than not"; right? Do you remember using that phrase?

A. You'd have to tell me how I used it. I don't remember how I used it.

Q. All right. We'll come back to that "more likely than not" phrase later.

But 20 to 25 years average latency. That's what you think is -- that's your best opinion about the latency associated with Roundup or glyphosate; right?

A. Yes.

Q. So I want to walk through now the case-control studies that you are relying on to form your opinion. Okay?

A. Okay.

Q. All right. So let's start with McDuffie, which was published in 2001; correct? Well, we can look at the exhibits.

This is -- I'll try to use the version that was used yesterday. And it's in your binder. It's in your -- it should be in that first binder TX447. Okay?

MR. STEKLOFF: And permission to publish the McDuffie study, Your Honor.

THE WITNESS: What number is it?

MR. STEKLOFF: 447.

THE WITNESS: 447.

(Witness examines document.) Okay.

MS. MOORE: No objection.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. Okay. So this is McDuffie. And if we turn to McDuffie, and we'll pull this up on the screen for you, but they explain the years of diagnoses of non-Hodgkin's lymphoma for the patients that were studied in this study; correct?

A. Yes. You mean when the cases were accrued, when they were diagnosed?

Q. Correct. So that's true in all of the case-control studies, they went and they found people who had non-Hodgkin's lymphoma; right?

A. Yes.

Q. And then they tried to ask them questions to see whether they had used pesticides in the past or not; right?

A. Yes.

Q. And so the year that -- they also recorded the years that the patients were diagnosed with non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And so what I want to do now is in each of the studies, the four studies that you are relying on to support your opinion, tell the jury the years of the diagnoses. Okay?

A. Correct.

Q. Okay. And so in McDuffie, if we turn to page 1156, it shows us that the patients were diagnosed between September 1st, 1991, and December 31st, 1994; correct?

A. Yes.

Q. So if we went back 20 -- let's just say 20 years, not even 25 years, we would be talking 1971 to 1974; correct?

A. For what?

Q. For the average latency of these patients.

A. Well, that's not a proper way to look at things. I mean, we should -- I mean, you can't subtract the latency from when they were diagnosed. It's a median latency.

Q. Right. You said yesterday and today it's the average latency; right?

A. Right.

Q. So the average latency for these patients if it's 20 years would take you back to 1971 to 1974; correct?

A. Yes, but you can calculate actually how many years -- potential years they could have been exposed to glyphosate by subtracting 1975 from 1991. So there was a potential for 16 years and then it goes to 19 years. Okay?

So, as I explained yesterday, you don't have to necessarily -- in case-control studies you don't necessarily have to meet the median latency because you already have cases. So as I showed yesterday, that people in De Roos and all the other studies had adequate time to be exposed to Roundup and to develop non-Hodgkin's lymphoma. They were on the up slope of the curve; right?

Q. You're saying that just conveniently every person in all of these studies, their latency was less than 20 years; right? That's basically what you're telling the jury now; right?

A. Well, that's one way to explain it if, in fact, the latency -- the median latency is 20 years. It could be 15 years. I don't know what it is. It's long rather than short.

Q. Okay. And you, who wrote a paper about this that we saw yesterday in 1992, to the best of your opinion, as someone who has focused on this issue in your research, have told us that your best opinion about the average latency for Roundup use would be 20 to 25 years; right?

A. I didn't say that in my paper. Those were idealized

curves and we just talked about chronic low-dose exposure and high-dose exposure. The word "Roundup" never appears in that paper.

Q. I agree the word "Roundup" never agrees in that paper. I think my question is a little different so I'll try to rephrase it. Okay?

You have written about latency --

A. Right.

Q. -- and you published a paper about latency in 1992; correct?

A. Yes.

Q. And you developed those curves that you showed to the jury yesterday; right?

A. That is idealized curves to make a point. To make a point.

Q. Right. And when you were making the point yesterday, you said 20 to 25 years; right?

A. That's my best guess, 20 to 25 years, but I -- but we really don't know what the median latency is for round up.

Q. Okay. But if you're right about 20 to 25 years, if you went back 20 years, these patients would have been exposed to pesticides starting between 1971 and 1974; correct?

A. No. They could have been exposed anytime in there.

Q. Including starting between 1971 and 1974; right?

A. Well, they were probably exposed to some pesticides during

that time, but they weren't exposed to Roundup during that time.

Q. I agree because Roundup didn't even come on the market until 1974; right?

A. Right.

Q. And we've heard from both you and Dr. Ritz that the increase in Roundup use didn't happen until the mid-'90s; right?

A. Well, it started -- it was on the market in 1975 and the marked increase occurred in approximately 1995-'96 --

Q. Right.

A. -- right.

Q. Okay. Now, let's talk about the next study, which is the De Roos study. Okay? And that is Exhibit 451.

MR. STEKLOFF: Permission to publish, Your Honor.

MS. MOORE: No objection, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. So De Roos is the paper that you were a part of. We can see your name right there on the front; right?

A. Yes.

Q. And I'll write "De Roos 2003."

And De Roos is actually one of the authors that is part of the AHS as well; right?

A. Yes.

Q. The Agricultural Health Study; right?

A. Correct.

Q. And in the De Roos paper, you and your colleagues combined data from three separate studies in different states; right?

A. Yes.

Q. Okay. And so if we turn to page 1 to 2, we can actually see how that breaks down; right?

So it describes here (reading):

"The three case-control studies had slightly different methods of subject recruitment."

Do you see that?

A. Yes.

Q. And part of that actually goes back to that proxy question. Some of the studies relied more on proxy responses than others; right?

A. Yes. Some studies used proxies and some studies didn't.

Q. And then some of the studies out of these three studies also mailed out questionnaires; correct?

A. I think that's correct.

Q. And actually only received, say in some instances, less than 70 percent of the questionnaires returned; right?

A. I don't -- I don't remember -- recall that.

Q. Okay. We can find that.

But that is -- if so, if they were only getting part of the questionnaires in return, that's a limitation of these

studies; right?

A. Well, it could be because it could lead to some selection bias, but I'd like to look at the data I have. I don't remember the data and I haven't reviewed those old papers for a long time, the individual papers.

Q. Okay. Well, let's first talk about the dates here. The first study that we can see was done in Nebraska. That was the one that you were a part of directly; correct?

A. Nebraska was the last study actually.

Q. Right. But it's the first one referenced here; right?

A. Yeah.

Q. Okay. So Nebraska was between July 1983 and June 1986; right?

A. Right.

Q. And if you went back 20 years from that, you'd be in 1963 to 1966; correct?

A. I would never do such a calculation because it doesn't make any sense.

Q. But mathematically that's the correct calculation?

A. If you want to do it, fine, but it doesn't make any sense to me.

Q. Okay.

A. Because, as I explained yesterday, these people in this study also had sufficient time to be exposed on that up slope of the curve.

Q. Right. They were -- the people who were being studied about their Roundup use did use Roundup sometime after 1963 or 1966; right? They reported using Roundup; right? That's why they're part of the Roundup analysis --

A. Right.

Q. -- correct?

A. Right.

Q. So they did use Roundup, but they also -- if they were using pesticides back in the '60s, would have been using other pesticides; right?

A. Yes.

Q. And that's why it's so important to adjust for other pesticides in these studies; correct?

A. That's correct.

Q. Because if you don't adjust for the other pesticides, you might not be able to identify what the real data is about Roundup or glyphosate; correct?

A. Yes.

Q. So then after the -- not in order but part of the Nebraska group there was also a study that was done in Iowa and Minnesota; is that right?

A. Yes.

Q. And that was from 1981 to 1983?

A. Yes.

Q. And understanding that you don't like the value of this,

20 years before that is 1961 to 1963; correct?

A. I'll take your word for it.

Q. Okay. And then the third study that was combined in the De Roos study was in Kansas, and that was actually studying non-Hodgkin's lymphoma diagnoses between 1979 and 1981; right?

A. Yes.

Q. And these were largely farmers being studied; right?

A. Yes.

Q. So they were likely using pesticides for many years; correct?

A. Yes.

Q. And so these people in this study were clearly using pesticides before 1979; right?

A. Yes, probably they were.

Q. And the average latency is 20 years; right?

A. Yes.

Q. Okay. So 20 years before this is 1959 to 1961; right? Is that math correct?

A. I guess it's correct. I don't -- I don't understand what you're doing, but I guess it's correct.

Q. Okay. Let's look at the next study, which is the Hardell study, and that is Exhibit 499.

MR. STEKLOFF: Permission to publish, Your Honor.

THE COURT: Any objection?

MS. MOORE: No, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. And if you look at page -- well, first of all, let's just see. This is the Hardell study. This is the second Hardell study; right? Because I think we heard from Dr. Ritz there were two --

A. Yes.

Q. -- because they were both small so they needed to get more numbers; right?

A. Correct.

Q. And this was published in 2002; correct?

A. Yes.

Q. And if you look at page 1044 in the bottom left, it shows that the diagnoses of NHL occurred between 1987 and 1990; right?

A. Yes.

Q. And the math on that takes you from -- 20 years before that is 1967 to 1970; right?

A. Yes.

Q. And then the last study that you rely upon is the Eriksson study; correct?

A. Yes. That's the last -- I mean, there were a couple other studies too, but that's one of them.

Q. Right. The other studies were Cocco and Orsi. You were much less focused on those; right?

A. Yes, because they're small and they were not -- and the results were not significant.

Q. Right. And you're less -- I'll stop there.

Let's look at the Eriksson paper, which is Exhibit 452.

MR. STEKLOFF: And permission to publish, Your Honor.

THE COURT: Go ahead.

MS. MOORE: No objection.

BY MR. STEKLOFF:

Q. And the Eriksson paper, if we look at page 1657, shows us that the diagnoses there were between 1999 and 2002; correct?

A. Yes.

Q. And 20 years, just as a pure mathematical statement, 20 years before that is 1979 to 1982; right?

A. Yes.

(Pause in proceedings.)

MR. STEKLOFF: One moment, Your Honor.

(Pause in proceedings.)

BY MR. STEKLOFF:

Q. So let's look at -- can we go back, please, to Hardell, which is Exhibit 499?

Permission to publish.

And if we look at page 1044 in the Hardell study. Dr. Weisenburger, we talked about this issue of questionnaires, and do you see in the section there's a section called "Assessment of Exposure"?

A. Yes.

Q. And it talks about that a questionnaire was mailed out to the recipients?

A. (Witness examines document.) Yes.

Q. And can you look through the study and tell me the percentage -- oh, if you look on the next page, in this study it shows that 91 percent and 84 percent of the people who were sent the questionnaire returned the questionnaire; correct?

A. Yes. That's pretty good.

Q. That is pretty good. In some of the other studies do you recall that it's actually lower?

A. I don't recall.

Q. Okay.

A. I'm sure you're going to show me.

Q. If I can find it, I'm going to show you. I know it exists.

And in De Roos, that's one of the papers -- that's the paper that you were an author on, it also breaks down the proxy respondents; is that right? Do you recall that?

A. I'm sure it does. I don't have it handy.

Q. Okay. So look at Tab 451.

MR. STEKLOFF: And permission to publish, Your Honor.

THE COURT: Go ahead.

MS. MOORE: No objection.

\\\

BY MR. STEKLOFF:

Q. At Table 2 it breaks down among the cases and the controls how many proxy respondents there were. Cases, that's the people diagnosed with non-Hodgkin's lymphoma in Table 2 at the bottom. It shows that of the cases, 37 percent the questions had to be answered by proxies; correct?

A. (Witness examines document.) So proxies made up, it looks like, 7.5 percent of the cases and 3.2 percent of the controls.

Q. Well, if you look on your screen, maybe we're looking at different numbers, do you see it says "Respondent Status," "Self-Respondent," "Proxy Respondent."

A. Oh, I see. I see.

Q. So it was 37 percent, 37.4 percent in the cases, and 45 percent in the controls; right?

A. Yes, that's correct.

Q. Okay. And you told us before that's the potential limitation of this study; right?

A. It is a potential limitation. We looked at it in the NAPP, and it really didn't -- the numbers didn't change between proxy and self-respondent.

Q. Right.

A. So, you know, it's always a consideration, but that's why it was adjusted for in the NAPP.

Q. So I want to talk to you briefly, Dr. Weisenburger, about the Agricultural Health Study. Okay?

In the Agricultural -- ah, thank you.

Okay. So before we do that -- I knew there was another questionnaire -- let's look at the McDuffie study.

MR. STEKLOFF: Before we publish, permission to publish, Your Honor, Exhibit 447.

MS. MOORE: No objection.

THE COURT: Go ahead.

BY MR. STEKLOFF:

Q. And on that one, if we look at Table 2, it shows the percentage of questionnaires that were returned under -- sorry, not Table 2 -- under "Results," and what it told us in this study, McDuffie -- this is one of the ones that you used in the NAPP combining data; correct?

A. Right.

Q. And it says that data from -- so this study, McDuffie in Canada, used postal questionnaires; correct?

A. Correct.

Q. And of the 517 NHL cases, only 67 percent, still okay, but 67 percent returned the questionnaires; right?

A. Yes.

Q. And 48 percent of the control group returned the questionnaires?

A. Yes.

Q. And that also, you told us earlier, could result in bias; right?

A. It's possible.

Q. And do you know -- you haven't reviewed Dr. Ritz's testimony to know if she told the jury anything about these limitations?

A. I don't.

Q. Okay. So let's briefly talk about the Agricultural Health Study. I think we heard some of your criticisms of the Agricultural Health Study yesterday; right?

A. Yes.

Q. And the jury has seen the Agricultural Health Study in 2005. It reported that there was no association between glyphosate and non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And in 2018, after more years, it reported same thing, no association between glyphosate and non-Hodgkin's lymphoma; correct?

A. That's correct.

Q. And just to be clear, you respect the researchers and doctors who are associated with the National Cancer Institute; right?

A. Yes.

Q. And even more specifically, you respect the doctors and researchers that are part of that 2018 Agricultural Health Study publication; right?

A. Yes.

Q. Okay. So let's -- I'm going to shift gears away from the epidemiology and talk a little bit about some of the topics that you finished up with this morning on direct, which is specifically what you do as a pathologist. Okay?

THE COURT: Mr. Stekloff, let me ask you, about roughly how much longer do you have? I'm wondering if we should take another quick break this morning.

MR. STEKLOFF: Overall, Your Honor?

THE COURT: Yes.

MR. STEKLOFF: That's such a dangerous question. I have at least --

THE COURT: I won't hold you to it.

MR. STEKLOFF: I have at least 45 minutes to an hour I would say.

THE COURT: Okay. Why don't we go ahead and take another five-minute break. People can grab their coffee if they need to or anything like that, and we'll be back in five minutes.

THE CLERK: All rise.

(Recess taken at 11:03 a.m.)

(Proceedings resumed at 11:07 a.m.)

(Proceedings were heard out of the presence of the jury:)

THE COURT: We'll wait one more minute for plaintiff's counsel to come in.

(Pause in proceedings.)

THE COURT: Dr. Weisenburger, you can go ahead and have a seat.

Go ahead and bring in the jury.

(Proceedings were heard in the presence of the jury:)

THE CLERK: Please be seated.

THE COURT: Okay. You can resume.

MR. STEKLOFF: Thank you, Your Honor.

Q. So, Dr. Weisenburger, I want to talk to you a little bit about pathology. There was very little about it on your direct, and I just want to follow-up. Okay?

A. Okay.

Q. So as a pathologist, in your clinical care, both at the University of Nebraska and at City of Hope, your focus is on diagnosing different conditions; correct?

A. Yes.

Q. And so what happens, just so the jury understands, is that, for example, when a biopsy is taken, you are able to slice a piece of that biopsy and then review it under a microscope; correct?

A. Yes.

Q. There are different stains so you as a pathologist can -- and your colleagues -- can use different stains to look for different characteristics; right?

A. Yes.

Q. And then based on that, looking through a microscope, you

will be able to make -- or potentially be able to make a diagnosis of a condition; right?

A. Yes.

Q. And so when we're talking about non-Hodgkin's lymphoma, that's what happens? Let's just use Mr. Hardeman. That core biopsy was sent to a pathologist who stained it and looked under a slide and diagnosed Mr. Hardeman with non-Hodgkin's lymphoma; correct?

A. Yes.

Q. And I think you told us earlier that's why typically you're not involved in speaking to patients; right?

A. Correct. We work -- our work is mainly in the laboratory behind the scenes.

Q. Yes. And you're also, then, not responsible for treating patients. So once that diagnosis of non-Hodgkin's lymphoma happens, the patient is then treated by an oncologist; correct?

A. Yes.

Q. Maybe in consultation with other types of doctors depending on the specifics of the patient; right?

A. But often what we tell them determines how they treat the patient. So in many ways, they treat the patients based on what we tell them.

Q. Exactly. So you have an important role in the treatment of patients with non-Hodgkin's lymphoma; right?

A. Yes.

Q. Okay. And when you look through any tissue on a slide, you cannot tell whether someone used Roundup; correct?

A. You cannot, that's correct.

Q. There is no what's called a biomarker, there's no marker in a slide, in a cell, that says "This person used Roundup as compared to another person"; correct?

A. Yes.

Q. Yes, correct; right?

A. Yes, that's correct.

Q. Okay. And there's no test that you can use, there's no stain, there's no other test in any way that you can use to tell whether a patient used Roundup or not; correct?

A. Yes, that's correct.

Q. And that's all true with respect to Mr. Hardeman as well; correct?

A. Yes.

Q. There's nothing in any of his -- in his biopsy -- sorry -- from his biopsy, from that tissue that would tell a pathologist or anyone else looking at that tissue whether or not he used Roundup; correct?

A. Yes. And that's the reason why I don't try to tell oncologists those kind of things because I don't have that information.

Q. Right. But you also don't tell them to seek out that information; correct?

A. I don't because they -- it's not important to them. They're interested in treating the patient, not trying to figure out what happened 10 or 20 years ago.

Q. I mean, Dr. Weisenburger, I don't want to redo everything we did this morning, but you told us this morning oncologists would want to know the cause of their patient's NHL if they could; right?

A. If it's obvious.

Q. Only if it's obvious?

A. Yeah, because they wouldn't know otherwise.

Q. They would know if they ask; right?

A. They might not even know if they asked.

Q. Okay. Now, Dr. Weisenburger, you're not able to look at anything in Mr. Hardeman's slides -- all the questions that I'm asking about non-Hodgkin's lymphoma, they also apply to diffuse large B-cell lymphoma; correct?

A. Yes.

Q. It doesn't matter -- I mean, whether you have diffuse large B-cell lymphoma or any other type of non-Hodgkin's lymphoma, there's nothing a pathologist can do to see that a patient used or did not use Roundup; correct?

A. That's correct.

Q. And so if you had two different patients, two different tumors with diffuse large B-cell lymphoma and I told you one used Roundup, the other didn't use Roundup, when you're looking

through the slides, you couldn't tell which was which; right?

A. That's correct.

Q. You would have no idea which one used Roundup; right?

A. I wouldn't.

Q. Okay. And I think you talked a little bit about this this morning, but that's, in fact, why you didn't review Mr. Hardeman's -- the slides where you were able to make a diagnoses of non-Hodgkin's lymphoma, you didn't have those and you didn't review those before completing your opinions in this case; right?

A. Yes. I try to do that before I complete my opinion, but I wasn't able in this case.

Q. Okay. And you reviewed the pathology report from Mr. Hardeman's doctor back in 2015; correct?

A. Yes.

Q. You also know that Dr. Arber, an expert for Monsanto, reviewed those slides; correct?

A. Yes.

Q. And you respect Dr. Arber; right?

A. Yes, I do.

Q. You, I think, know him because I think you run in the same circles; right?

A. Yes.

Q. And you see him at conferences, for example; correct?

A. Yes.

Q. And he's a well-respected pathologist; right?

A. Yes, he is.

Q. Doctor -- oh, I also want to ask you while we're on this topic, Dr. Levine, she's a very well-respected oncologist; right?

A. Yes, she is.

Q. She, in fact, hired you at City of Hope; right?

A. Yes, she did.

Q. She also until recently was the chief medical officer; correct?

A. Yes.

Q. So she in some ways oversaw all of the oncologists, all of the pathologists, and all of the elite doctors who practice at City of Hope; right?

A. That's correct.

Q. And you respect her and her opinions; correct?

A. Yes, for the most part I do.

Q. You disagree with her on some opinions to be clear, but you respect her?

A. Yes.

Q. Okay. Now, let's talk about idiopathic. You used that word toward the end of your direct. Do you recall that?

A. Yes.

Q. And before we do that, let's talk about what a risk factor is as compared to a cause because I don't think that's been

made very clear. Okay?

A. Okay.

Q. So on your chart for your differential, you had known risk factors; right?

A. Yes.

Q. And a risk factor is something that statistically increases a person's likelihood of developing a disease; right?

A. It predicts it, yes.

Q. Okay. It doesn't mean that it automatically is the cause of the disease. It just statistically predicts a greater likelihood that the person might develop the disease; right?

A. Yes, that's correct.

Q. Okay. So if I write "increases likelihood of disease," is that a fair characterization?

A. Yes.

Q. Now, a cause is something different; right? The way you're using cause in this courtroom; correct?

A. Yes. I have -- I consider there are risk -- there are risk factors that are noncausative. We talked about that yesterday. And then there are risk factors that are actually causes of non-Hodgkin's lymphoma.

Q. Well, that's -- but that's a different question. Let's talk about that.

First of all, you can't point me to any peer-reviewed literature that differentiates between a causative risk factor

and a noncausative risk factor; right?

A. Probably not.

Q. Okay. But regardless of whether you view something as a causative risk factor -- so let's just use an example. Hepatitis B you agree is, in your words, a causative risk factor; right?

A. Yes.

Q. For non-Hodgkin's lymphoma --

A. Yes.

Q. -- correct?

A. Yes.

Q. If someone had a history of active hepatitis B, it increases their likelihood of developing non-Hodgkin's lymphoma; right?

A. No. If they have chronic active hepatitis at the time they're diagnosed with large B-cell lymphoma, then it's likely the cause.

Q. Okay.

A. But just having a history of it doesn't really increase risk.

Q. Okay. You don't think that there are studies that show that you're at an increased risk if you have a history of hepatitis B?

A. If you look carefully at the studies, it's the people who have chronic active hepatitis either B or C that get

non-Hodgkin's lymphoma. If people are immune to the hepatitis B or hepatitis C and they don't have active chronic infection, they're not at increased risk for non-Hodgkin's lymphoma.

Q. We're going to talk about hepatitis B and hepatitis C, so I'll rephrase my question.

If you have active hepatitis B, it increases your risk of developing non-Hodgkin's lymphoma; correct?

A. Yes.

Q. If you have active hepatitis B, you still could never develop non-Hodgkin's lymphoma; right?

A. Yeah. The chances are that you wouldn't.

Q. Exactly.

And if you have active hepatitis B, just because you have active hepatitis B, it doesn't mean automatically that that is the cause of your non-Hodgkin's lymphoma; correct?

A. Well, you'd have to look at all the other causes. You'd have to -- you'd have to do an analysis like I did.

Q. Okay. Just because you had exposure to a causative risk factor does not automatically mean that causative risk factor is, in fact, what caused your non-Hodgkin's lymphoma; right?

A. That's true.

Q. So that's why it's important to distinguish between a risk factor and a cause because you can be exposed to a causative risk factor and it still may not be the cause of your

non-Hodgkin's lymphoma; right?

A. That's possible.

Q. Okay. So a cause is something different, and I want to focus on a cause in an individual like Mr. Hardeman.

A cause is something you are saying was the thing that actually more likely than not led to the development of non-Hodgkin's lymphoma; right?

A. Yes.

Q. Without that, in your opinion, he probably wouldn't have developed non-Hodgkin's lymphoma; right?

A. It would certainly be less likely.

Q. Okay. So cause equals -- can I write the thing that led to non-Hodgkin's lymphoma?

A. Yes.

Q. But you agree with me, Dr. Weisenburger, that there is a difference between a risk factor and the actual cause of a person's non-Hodgkin's lymphoma; right?

A. Yeah. Well, risk factors I think that increase risk and then, you know, usually there's one thing or -- one thing that causes the non-Hodgkin's lymphoma but sometimes you don't have any risk factors, and in those cases you say, "Well, gee, I don't know what caused it. It's idiopathic."

Q. We're going to talk about that in a moment.

And just to be clear, when you're talking about cause using your differential method that you used in this courtroom,

you're saying to the jury, and you used these words, more likely than not it's Roundup that led to his NHL; right?

A. Yes.

Q. And more likely than not is 50.1 percent; correct?

A. Anything above that.

Q. Yeah. And in your clinical practice -- well, let's actually use peer-reviewed journals.

In peer-reviewed journals, the standard is not 50.1 percent; right?

A. No. That's a legal standard, 51 -- 50.1, that's a legal standard. It's not a medical standard.

Q. Okay. Also, if you have patients, if something is 50.1 percent, you don't go tell them, "This is the cause of your non-Hodgkin's lymphoma"; right?

A. I don't do this in my clinical practice, but if --

Q. Well, let me ask a different question about cause. You do make diagnoses; right?

MS. MOORE: Excuse me, Your Honor. He was in the middle of a word when he interrupted him.

THE COURT: Sustained.

You can finish your answer.

THE WITNESS: I lost my train of thought.

BY MR. STEKLOFF:

Q. You were saying that in your clinical practice, you don't -- I think you were saying you don't --

A. So I'll give you a hypothetical. So what if a patient has pneumonia or let's say what if the patient has lung cancer. Okay? And I look at the lung cancer and I say, "It's lung cancer." And the patient has a 40-year history of smoking three packs a day. You know, it's more likely than not that the smoking caused the lung cancer because we know smoking is a strong risk factor for lung cancer.

So it's the same kind of -- it's the same kind of logic. Okay? We can't be absolutely sure that smoking caused the cancer, but it's more likely than not that it did cause the cancer. In fact, it's very likely that it caused the cancer.

Q. Right. Higher than 50.1 percent; right?

A. Yeah, probably higher than 51 percent -- 50.1 percent.

Q. Okay. And what you do focus on in your clinical care is making diagnoses; right?

A. Yes.

Q. When you are making a diagnosis, if it is 50.1 percent, you don't go tell the other doctors this is the diagnosis. You run other tests, right?

A. For making diagnosis we have to be much more sure than that, absolutely.

Q. Let's now talk about idiopathic. Idiopathic means the cause is unknown, correct?

A. Yes.

Q. And you in your career have diagnosed and been involved in

the treatment of thousands of patients with non-Hodgkin's lymphoma; is that fair?

A. Yes.

Q. And is it fair to say that probably at least 70 percent of the cases of non-Hodgkin's lymphoma that you have diagnosed have been idiopathic?

A. Well, that's a guesstimate that I made when asked. You know, it's -- it is a guesstimate. I never sat down and tried to figure that out but, you know, if you look at all the causes, it's probably a good guesstimate.

Q. Right. But what I want to be clear about is that means that 70 percent, guesstimate, of the patients that you have been -- treated, the doctors were not able to tell the patient what the cause of his or her non-Hodgkin's lymphoma was, right?

A. Yes, that's true. But that is often because they don't do a very detailed history and analysis to try to figure out what it is. So, you know, it might be less if they did a very detailed history and, you know, asked about occupations and exposures and all those things. It might -- it might be less, but, you know, I think in today's practical world, it is probably about 70 percent.

Q. You agree, though, that the cause of a patient's non-Hodgkin's lymphoma is unknown in most cases,right?

A. Yes.

Q. And in the other approximately 30 percent, just to be

clear, it is things like Epstein-Barr or HIV or the other autoimmune diseases or viral infections or hepatitis, right?

A. Yeah, the things that are obvious when you examine the patient and take the history.

Q. It is not Roundup or glyphosate, correct?

A. What is not Roundup or glyphosate?

Q. In the other 30 percent when your patients -- where it hasn't been idiopathic, it has not been --

A. No. Because as we said, physicians don't ask about Roundup. They don't even often ask about pesticides. Unless it is a farmer and he volunteers it, they might ask about it. So often that's the reason physicians don't know what the causes are because they don't pursue it in detail.

Q. Of the 70 percent that are idiopathic, you agree that those patients still have some risk factors in many of those cases for developing non-Hodgkin's lymphoma, right?

A. Sure. We know their age and their sex and their race, so those are some risk factors that we do know. We know their weight; but after that, we sometimes don't know anything more than that.

Q. Well, they may have had a history -- let's not talk about hepatitis. But they may have had a history of some other autoimmune disease or viral problem or immunosuppression problem that may have increased their risk, but they are still considered idiopathic, correct?

A. No. If you know they have a factor that would have increased their risk and it is a real causative factor, obviously you would have to take a detailed history and look at the timeline and know the whole story; but, you know, if they had rheumatoid arthritis and they were being treated and then developed non-Hodgkin's lymphoma, you would probably attribute that non-Hodgkin's lymphoma to the rheumatoid arthritis or the treatment for rheumatoid arthritis. You wouldn't say that was idiopathic.

Q. Let's say someone had a history of chronic inflammation but that wasn't current. You wouldn't know whether it was the chronic -- you wouldn't say that that was the cause. It was a risk factor, but you wouldn't go tell that patient that was the cause, right?

A. I mean, you would have to investigate it more clearly.

Q. Okay. Now, in people who are idiopathic -- who have idiopathic cancers, where you can't identify the cause, they still have genetic mutations that occur that lead to the development of non-Hodgkin's lymphoma, right?

A. Yes.

Q. And it is just unexplained in some situations why those genetic mutations occurred, right?

A. Yes.

Q. And even people who use Roundup could have unexplained genetic mutations that occur, correct?

A. It's possible. I don't -- I don't know. We don't know the answer to that question.

Q. Okay. To the best of your knowledge the vast majority of patients with non-Hodgkin's lymphoma never were exposed to Roundup, correct?

A. I think -- yes, I think that's correct.

Q. To the best of your knowledge, the vast majority of patients with diffuse large B-cell lymphoma were never exposed to Roundup, correct?

A. I don't really know the answer to that. My guess is that most of them wouldn't have been exposed, at least at high doses like Mr. Hardeman.

Q. And 70 percent of those patients by your estimate you can't tell what the cause is. It was idiopathic, right?

A. Yes, more or less.

Q. And, in fact, using your differential, had Mr. Hardeman never been exposed to Roundup, you would say his NHL was idiopathic, right?

A. Well, I would probably say, Well, he's obese. Maybe that was the cause, but I wouldn't be very sure, okay, because everybody has some risk for developing non-Hodgkin's lymphoma, even people with no risk factors.

Q. Can you please turn to your binder 3, and there is a tab -- I will tell you what tab it is. This is your December 20th testimony.

A. Volume 3?

Q. Yes, Volume 3, Dr. Weisenburger. And this is tab Number 9. And I'm looking at page 96 lines 20 through 25.

A. Page 96?

Q. Yes, Dr. Weisenburger.

MR. STEKLOFF: Your Honor, I would ask for permission to read page 96, lines 20 through 25.

THE COURT: Any objection?

MS. MOORE: No, Your Honor.

THE COURT: Go ahead.

BY MR. STEKLOFF

Q. So you were asked, Dr. Weisenburger: So if you have a patient that has the same background as Mr. Hardeman but no Roundup exposure, I should say, what caused his non-Hodgkin's lymphoma?

And your answer was: We wouldn't know. It would be considered idiopathic.

Correct?

A. Yeah, I would still stand by that.

Q. Okay. So you agree that Mr. Hardeman could have been diagnosed with the exact same diffuse large B-cell lymphoma without exposure to Roundup, correct?

A. It's possible, not as likely but it is possible.

Q. Let's look at that same deposition, page 93, lines 1 through 5.

MR. STEKLOFF: Permission to read, Your Honor.

THE COURT: Any objection?

MS. MOORE: No, Your Honor.

BY MR. STEKLOFF

Q. And you were asked: And you would agree that Mr. Hardeman could have been diagnosed with the exact same diffuse large B-cell lymphoma without exposure to Roundup, true?

And your answer was: It's possible.

Right?

A. It is possible.

Q. So I want to talk about your -- going into the risk factors in your -- in the differential that you used here in the courtroom, okay?

A. All right.

Q. We agree that age is a risk factor, right?

A. Yes.

Q. You agree that diffuse large B-cell lymphoma -- developing diffuse large B-cell lymphoma is a function of age, correct?

A. Yes. The older you get, the higher your risk.

Q. Okay. And Mr. Hardeman was 66 when he was diagnosed with diffuse large B-cell lymphoma, right?

A. Yes.

Q. And being above 60 puts him at an increased risk of developing it, right?

A. Yes.

Q. Developing --

A. Yes.

Q. Okay. But you, under your differential, would never say that age is the cause of someone's non-Hodgkin's lymphoma, right?

A. I would not.

Q. You agree that weight can be a risk factor for developing non-Hodgkin's lymphoma, correct?

A. Yes.

Q. And you agree it was a risk factor for Mr. Hardeman, correct?

A. Yes.

Q. And you said that gave him a 30 percent chance of -- an increased risk of 30 percent of developing the diffuse large B-cell lymphoma that he developed, correct?

A. Yes.

Q. But you ruled that out based on the 30 percent, right?

A. No. I thought it was a minor risk factor.

Q. So it may have had a minor contribution to his development of diffuse large B-cell lymphoma?

A. It is possible.

Q. Okay. Now, gender is a risk factor, right?

A. Yes.

Q. But you would never say -- if you are male, you are more likely to develop non-Hodgkin's lymphoma, right?

A. True.

Q. But you would never say that that was the cause, correct?

A. I wouldn't.

Q. Clearly there are things about being a male as compared to a female that increase your chance of developing some genetic mutation, correct?

A. It must be, but we don't know what it is.

Q. Same with age, right? The longer you live, the more likely you are to develop a -- to have a genetic mutation that leads to non-Hodgkin's lymphoma, correct?

A. That is probably one of the reasons, yes.

Q. Okay. And same with race, that is another thing you mentioned yesterday, right?

A. Yes.

Q. But you would never consider age, gender or race the cause of someone's non-Hodgkin's lymphoma, correct?

A. I wouldn't tell them that that was the cause, no.

Q. Right. It would be idiopathic, correct?

A. Yes. It would be idiopathic, if there were no other risk factors.

Q. But in Mr. Hardeman's case, all of those things -- his age, his gender and his race -- statistically increased his chances of developing diffuse large B-cell lymphoma, right?

A. Yes, compared to people who don't have those characteristics.

Q. So let's talk for a moment about hepatitis B. Hepatitis B is a risk factor for the development of non-Hodgkin's lymphoma, right?

A. Yes, chronic active infection with hepatitis B is a risk factor.

Q. And you agree that hepatitis B infection is also a -- is also a causative risk factor, right?

A. Yes.

Q. So from -- well, let's talk about how hepatitis B works. People can be exposed to hepatitis B, correct?

A. Right.

Q. And then at some point it may be active in their bloodstream, right?

A. Right. So they get exposed to hepatitis B, and they can have a mild illness or no illness and become immune to it, okay. That's probably the most common scenario or they can get a chronic active infection in their liver, which leads to hepatitis and cirrhosis.

Q. Well, with hepatitis B, while it is active -- if it is active, it can cause genetic mutations, correct?

A. If you have a chronic active infection with hepatitis B, yes, that's true. If you just have an infection and recover from it and you become immune to it, it's highly unlikely.

Q. And you told us yesterday that Mr. Hardeman was exposed to hepatitis B in 19 -- I think you said 1966, right?

A. We don't really know, but that's the best guess, yes.

Q. Sometime in the mid 1960s is the best guess.

A. Probably. He didn't really find out until 2005 that he had hepatitis B or C. So it is just a guestimate going backwards, but that is probably the best guess.

Q. Right. And you don't know during that period from 1966 to 2005 if, at any point, it was an active infection impacting him -- his liver and the rest of his body, right?

A. With what.

Q. With hepatitis B?

A. We don't know.

Q. And if it was, it could have been causing genetic mutations during that time period, correct?

A. Yes, it could have.

Q. Okay. And now you told the jury that the fact that in 2005 it was not active meant that he was immune to it, correct?

A. All the -- we don't know what the actual test results were, but his physicians did testing for hepatitis B and hepatitis C, and they told him that he was immune to hepatitis B. So they focused on hepatitis C.

Q. But with both hepatitis B and hepatitis C, those conditions, even if they are not apparent on a test that is run, they can still be in low levels in your bloodstream but undetectable, right?

A. That's true.

Q. So even with hepatitis C after you go through that antiviral therapy and then you get a negative test on the tests that we -- that you showed yesterday, there still could be hepatitis C that is sort of on very low levels undetectable in the bloodstream, right?

A. Yes, or in the liver, yes.

Q. Okay. And that's exactly why in Mr. Hardeman's case the doctors in 2015 wanted to make sure it didn't come back, right?

A. Yes.

Q. That's why they treated him so his hepatitis B wouldn't come back after his diagnosis, correct?

A. Yes.

Q. And that's why they tested him for his hepatitis C, to make sure issue it didn't come back, right?

A. Yes.

Q. So, in fact, when you tell the jury that he is immune, that's not completely accurate, right, because it may have still been there and it may have returned, correct?

A. Well, by immune I don't mean that it went away. What you mean by immune is that the body keeps the virus in check and doesn't allow it to expand or cause disease. So that's the way it is with viruses. Sometimes they persist at low levels in a latent state kind of hiding in certain cells in the body, and the immune system keeps them there, and it doesn't allow them to cause disease. And that's true of hepatitis B and

hepatitis C.

Q. So that's what you mean by immune?

A. That's what I mean by immune.

Q. So -- that wasn't clarified either yesterday or today, right?

A. I'm happy we clarified it.

Q. Okay. I'm happy we clarified it as well.

So going back to hepatitis B, you agree that someone who has, at some point, an active hepatitis B infection, it can cause genetic mutations, correct?

A. Yes.

Q. You can't rule out that at some point between 1966 and 2005 Mr. Hardeman had an active hepatitis B infection, correct?

A. I can't. We don't know -- we don't know.

Q. And so you can't rule out that if he had an active hepatitis B infection at any point between 1966 and 2005 it may have caused genetic mutations, right?

A. It may have, yes.

Q. And people with a history of hepatitis B who have never been exposed to Roundup do, in fact, develop non-Hodgkin's lymphoma, right?

A. I'm sorry. Ask that question again.

Q. No problem. People with a history of hepatitis B who have never used Roundup do, in fact, develop diffuse large B-cell lymphoma, correct?

A. Yes, people who have an ongoing active chronic infection of hepatitis B, they can develop non-Hodgkin's lymphoma due to hepatitis B.

Q. Let's talk about hepatitis C. First of all, you agree that active chronic hepatitis C is a risk factor for the development of non-Hodgkin's lymphoma, correct?

A. Yes.

Q. And same thing with hepatitis B, your best estimate is that Mr. Hardeman was exposed to hepatitis C in 1966, correct?

A. Yes.

Q. And, in fact, at one point in the 1980s you saw a record that demonstrates that he had increased liver enzymes, correct?

A. Yes, in 1980.

Q. So that tells us that at least before 1980 he had active hepatitis C that was impacting his liver, correct?

A. Yes, yes.

Q. And we also know that in 2005 he was diagnosed with liver cirrhosis, correct?

A. Yes.

Q. And you agree that his liver cirrhosis was the result of his history of having hepatitis C, correct?

A. Most likely, yes.

Q. So he most likely had active hepatitis C, chronic hepatitis C, between the mid-1960s and 2005, so 39 years approximately, correct?

A. It's certainly possible.

Q. And that hepatitis C was in his bloodstream, and it led to the development of cirrhosis, correct?

A. Yes.

Q. And hepatitis C, just like hepatitis B, can cause genetic mutations, right?

A. Yes.

Q. It can cause genetic mutations that ultimately lead to the development of non-Hodgkin's lymphoma, right?

A. Yes.

Q. And so it is possible you can't rule out -- that in Mr. Hardeman specifically -- during that 39- or 40-year period he had genetic mutations that were caused by his active hepatitis C, correct?

A. Certainly possible.

Q. And so it is certainly possible that the hepatitis C caused genetic mutations in Mr. Hardeman in the 1960s, correct?

A. It is possible.

Q. 1970s?

A. Yes.

Q. 1980s?

A. Yes.

Q. '90s?

A. When was he treated?

Q. 2005.

A. 2005, yeah, the '90s.

Q. And then between 2000 and 2005?

A. Yes.

Q. He was treated between 2005 and 2006, correct?

A. Yes.

Q. So he had active hepatitis C that can lead to genetic mutations that can lead to cancer for 39 years, right?

A. Probably, yes, it probably was that long.

Q. Okay. So I want to show -- then you showed the jury yesterday and this morning the series of studies that you say demonstrate that if you are treated, your risk goes down -- of developing non-Hodgkin's lymphoma goes down to zero, right?

A. It goes down to the background rate of what his risk would be if he hadn't had hepatitis C. It doesn't necessarily go to zero.

Q. I wanted to ask you that. One of the studies -- if we can pull up Exhibit --

MR. STEKLOFF: Ms. Melen, if I can please use the ELMO. I can just use the ELMO.

MS. MOORE: Which number?

MR. STEKLOFF: 918.

MS. MOORE: No objection.

THE WITNESS: Which number? Which volume?

BY MR. STEKLOFF

Q. This would be in the volume that you used yesterday, if

you have the -- it might be the white binder behind you, Dr. Weisenburger. It is 918.

This is one of the studies that you discussed with the jury yesterday, right?

A. Yes.

Q. And it is titled "Early antiviral therapy reduces the risk of lymphoma in patients with chronic hepatitis C infection," correct?

A. Yes.

Q. And it is important to consider in these studies how soon someone is given antiviral therapy as compared to when they were exposed to hepatitis C, correct?

A. Well, what happens is like Mr. Hardeman, people have the disease for a while and they don't know it. They could have it for a long time, just like he did; and then there is a diagnosis made. And at that point, like in Mr. Hardeman, they gave him antiviral therapy.

So the principle is that you want to treat the disease as soon as you make the diagnosis. You don't want to wait another two, three, four, five or ten years to treat because during that whole time he would be at risk, right.

Q. Exactly.

A. So early treatment after the diagnosis is what should be done.

Q. Right. But early treatment after the exposure is also an

important consideration, right?

A. Well, with the exposure you don't know what is going to happen. As I said, he might just have the exposure and the body might fight the virus off and put the virus into a latent state, and he would be immune and he -- you would never have to treat it because he has already treated it himself, right?

Q. But that didn't happen with Mr. Hardeman and hepatitis C, correct?

A. In Mr. Hardeman's case it didn't happen, but what I'm trying to say is you wouldn't -- you wouldn't treat everybody who got exposed to hepatitis C. You would treat those who actually have disease due to hepatitis C.

Q. Right. But the longer -- in these studies, the timing of the treatment as compared to how long they had active hepatitis C that may have been impacting their body is relevant, correct?

A. Well, it is, but, you know, if you go for 40 years and you don't develop non-Hodgkin's lymphoma and then you get treated, then your risk basically goes down to the baseline of what the background rate would be for somebody who never had hepatitis C.

Q. Well, I want to show you in this study this column table 1. Are you with me?

A. Okay.

Q. And this left-hand column that says, Peg IFN/RBV, those

were the patients who were treated, correct?

A. Yes.

Q. If you go all the way to the bottom, even though those patients were treated and had sustained viral response, 28 of them still developed non-Hodgkin's lymphoma, correct?

A. That's correct, but you would expect some of them to get it because they would get non-Hodgkin's lymphoma -- they would be at risk for the background rate of non-Hodgkin's lymphoma that everybody else is at risk for, right. You are not going to completely prevent non-Hodgkin's lymphoma by treating hepatitis C because there are all kinds of other causes of non-Hodgkin's lymphoma, including cases which are idiopathic.

Q. But, Dr. Weisenburger, these studies that you showed the jury -- I think you said there were eight or nine studies -- they are comparing people with -- who were treated with -- treated for hepatitis C, with people who had hepatitis C who were not treated, right? That's the comparison?

A. Yes, and people who had hepatitis -- and people who had hepatitis C who were not treated and people who never had hepatitis C.

Q. Well, that's what I want to ask you because there are studies that show people who were treated for hepatitis C and compared to just the background rate of people who never had hepatitis C, and they show an increased risk, correct?

A. I don't know. You would have to show me the studies. I

don't think that's correct, but you will have to show me the studies.

Q. Okay. Well, the first study I want to show you --

THE COURT: Before we get to that, I think we are at lunchtime now. So why don't we resume -- take lunch and resume at 12:30. Remember all my admonitions about communicating and all that. Thank you.

(Proceedings were heard out of presence of the jury:)

THE COURT: You can step down, Dr. Weisenburger. And a reminder to everybody in the courtroom, you have to stay here for five minutes before you leave.

MR. STEKLOFF: And, Your Honor, can Dr. Weisenburger be instructed not to discuss the subject of his testimony with counsel?

THE COURT: Yes, you are instructed not to discuss the subject of your testimony --

THE WITNESS: Okay. Thank you.

THE COURT: -- with either counsel.

THE WITNESS: Thank you.

(Recess taken at 11:47 a.m.)

(Proceedings resumed at 12:35 p.m.)

THE COURT: Go ahead and bring in the jury.

(Proceedings were heard in the presence of the jury:)

THE COURT: Okay. You can resume.

MR. STEKLOFF: Thank you, Your Honor.

BY MR. STEKLOFF

Q. Good afternoon again, Dr. Weisenburger.

A. Good afternoon.

Q. So I would like to just walk through a few additional studies on hepatitis C with you, okay?

A. Yes.

Q. So the first is Exhibit 1348.

THE COURT: Which binder is that from?

MR. STEKLOFF: It is binder 1 of 3, Your Honor.

THE COURT: Okay. I assume all of these can be published?

MS. MOORE: Yes, Your Honor.

THE COURT: Okay.

MR. STEKLOFF: Thank you. If we can publish Exhibit 1348, please.

BY MR. STEKLOFF

Q. You can see -- you are familiar with this paper, correct, Dr. Weisenburger?

A. Yes, I am.

Q. By Dr. Mahale and others, correct?

A. Yes.

Q. It is entitled "The effect of sustained virological response on the risk of extrahepatic manifestations of hepatitis C virus infection," correct?

A. Yes.

Q. And if you look at the first page where they have a conclusions section, I would like to read that. And what they said in this study was that, the risk of several EHMs -- so let's just take a moment to explain to the jury what EHMs are. The EHMs were the diseases that were being studied here, correct?

If you need to, Dr. Weisenburger, you can look in the version you have in front of you under Introduction. It defines EHMs on the first page.

A. Right. These are medical effects outside of the liver.

Q. Right. Extrahepatic manifestations, correct?

A. Yes.

Q. And one of those in this study that they were assessing was non-Hodgkin's lymphoma, correct?

A. Yes.

Q. And what they say is: The risk of several extrahepatic manifestations of HCV -- that is hepatitis C viral infection, correct?

A. Yes.

Q. -- are reduced after antiviral therapy with sustained virological response, correct?

A. Yes.

Q. But then they go on to say, However, early initiation of antiviral therapy may be required to reduce the risk of three conditions including non-Hodgkin's lymphoma, correct?

A. Yes.

Q. Okay. And if we turn to page 555, in the right-hand column under Risk of EHMs by treatment status, they -- in the bottom paragraph of that section, they explained their conclusion about how soon the antiviral therapy needs to be initiated to reduce the risk of non-Hodgkin's lymphoma, correct?

A. Yes.

Q. And what they write in the sentence that starts, The aHRs. So the aHRs were significantly protective only when antiviral therapy was initiated.

And then if you skip ahead it says, And after the HCV index date and one year for non-Hodgkin's lymphoma, correct?

A. Correct.

Q. So what they are saying here is that to see a reduction in the risk of developing non-Hodgkin's lymphoma, the antiviral therapy needed to start within a year, correct?

A. Within a year of diagnosis, yes.

Q. Right. And -- but that makes sense, right? The earlier that you treat someone with antiviral therapy, the more likely it is to reduce the risk of developing non-Hodgkin's lymphoma, correct?

A. Yes.

Q. And in this study, to be clear, they were studying patients who at most -- and you can look at study design and

study population -- had hepatitis C, active RNA between October 1999 and August 2009, correct?

A. Yes.

Q. So these patients were being treated -- at most they were being treated -- they had active hepatitis C for ten years and then were being treated with antiviral therapy, correct?

A. I don't -- where is that? I'm sorry.

Q. Sure. Let's go on the page before, 554, the study design and study population. Let's blow that up.

And it says that they conducted a retrospective cohort study using data, and they included individuals who had a positive test for hepatitis C RNA -- that is the active virus -- in plasma between -- using different assays between October 1999 and August 2009, correct?

A. Yes.

Q. Then they had other criteria?

A. That just means that they had their diagnosis of hepatitis C virus and active virus infection during that ten-year period.

Q. Right. And also their treatment during that ten-year period, correct?

A. Yes.

Q. So many of them may have been treated within a year or two or -- of the diagnosis of hepatitis C, correct?

A. Well, some of them probably were, yes.

Q. And the results of the study showed that there was only a decreased risk of developing non-Hodgkin's lymphoma if you were treated within a year of diagnosis, correct?

A. No, I don't think that's what it shows. It's a bit of a confusing paper, but I don't think that's what it shows.

Q. You didn't show this paper to the jury yesterday, right?

A. I didn't.

Q. Okay. And you agree that Mr. Hardeman had active hepatitis C for approximately 39 years, correct?

A. Right, right.

Q. And he certainly wasn't treated during that 39-year period, right?

A. He wasn't, but -- can I explain what this paper shows or will we do that on cross?

Q. You understand that Ms. Moore will ask you questions when I sit down, correct?

A. Yes, because I think -- your interpretation of the paper is wrong so I will be happy to clarify that.

Q. What the paper says, Dr. Weisenburger, is that the aHRs were significantly protective, only when the antiviral therapy was initiated after one year for non-Hodgkin's lymphoma, correct?

A. Within the first year.

Q. That's what the paper says, right?

A. Yeah, but it's -- it's a bit misleading. I will be happy

to explain it.

Q. Okay. Now, let's look at the next paper, which is Exhibit 1146. You are familiar with this paper by Dr. de Sanjose as well, correct?

A. Yes.

Q. If we go to the methods -- so first of all, let's just read the title. "Hepatitis C and non-Hodgkin's lymphoma among 4,784 cases and 6,269 controls from the International Lymphoma Epidemiology Consortium."

Do you see that?

A. Yes, this is the InterLymph I was talking about.

Q. Exactly. This is the InterLymph that you are a part of, correct?

A. Yes.

Q. That group published this paper discussing the relationship between hepatitis C and the development of non-Hodgkin's lymphoma, correct?

A. Yes.

Q. So you would agree that would be a reliable paper, right?

A. Yes.

Q. Okay. So let's look at the next page, page 2, under Study Population, okay?

A. Which reference is this?

Q. Sorry. Thank you. This is Exhibit 1146 in your binder.

Okay. So in this paper they collected data from a group

of papers, correct?

A. Yeah. It was a pooling project, uh-huh.

Q. And if you look five lines down, it says, Studies were required to have used the third generation enzyme-linked immunosorbent assay test for HCV, correct?

A. Yes.

Q. So that means that the patients who were included in this -- or the studies that were included in this, the patients were not required to have active HCV, correct?

A. For this study they weren't. They were just supposed to -- they were just -- to get into the study, they had to have the antibody to hepatitis C. So some of them had active hepatitis C, and some of them were immune to hepatitis C.

Q. Exactly. So there were people in this study that did not have active hepatitis C, correct?

A. Yes.

Q. Okay. So let's look at the discussion on page 5 and look at their conclusions. And the first paragraph, it says, The pooled analysis to explore the association between HCV infection and risk of NHL subtypes included mostly countries with low background HCV prevalence, with the exception of Italy. Our results show increased risk of DLBCL, and then other types of non-Hodgkin's lymphoma associated with HCV infection.

Correct?

A. Yes.

Q. And then it says, These risk estimates were particularly robust for diffuse large B-cell lymphoma with a twofold increased risk overall and statistically significant increased risk observed in three of the seven studies.

Correct?

A. Yep.

Q. Okay. So let's look at the last study I want to show you, which is Exhibit --

A. We will need to clarify this, too, because, again, this is misleading. So we will need to talk about this in cross, okay.

Q. I'm sure you will cover it.

Let's look at Exhibit 1132. 1132 is a paper titled "Hepatitis C virus and risk of lymphoma and other lymphoid neoplasms: A meta-analysis of epidemiologic studies."

Correct?

A. Yes.

Q. And this is by Dr. Dal Maso, and another doctor, Franceschi, right?

A. Yes.

Q. You are familiar with this study as well, correct?

A. Yes.

Q. And if we look on the second page, page 2079 of the study, they also explain what was required to be included --what type of patients who had hepatitis C were included in the study,

right?

A. Okay.

Q. And do you see that in the second paragraph it says, The presence of HCV RNA is the best marker for hepatocellular carcinoma risk.

That is not the type of NHL that Mr. --

A. Can he highlight it so I can find it?

MR. STEKLOFF: Sure. Under Assessment, can we please call up the second paragraph, under assessment of study quality.

THE WITNESS: Okay.

BY MR. STEKLOFF

Q. Do you see that it says in the -- about six lines down, The presence of HCV RNA -- that is active virus, right?

HCV RNA refers to active virus?

A. Right.

Q. -- is the best marker for hepatocellular carcinoma risk, correct?

A. Correct.

Q. But that is not the type of non-Hodgkin's lymphoma that Mr. Hardeman had?

A. No, but the same is true for non-Hodgkin's lymphoma.

Q. Okay. Well, let's read the rest. It says, Whether detection of HCV RNA in addition to anti-HCV antibodies is a requirement in the association between HCV and NHL is still

unclear.

Right?

A. That's what they say.

Q. That's what these authors say, correct?

A. But that was back in, when, 2000 --

Q. This is from 2006.

A. 2006, yeah. So that was a long time ago.

Q. Okay. The -- it was more recent than the case control studies you are showing, right?

A. That's a whole different subject.

Q. Okay. Then it goes on to say, The availability of HCV RNA findings was not there for the prerequisite for inclusion in the present study.

Correct?

A. That's correct. This is a method to do an epidemiologic case control study. So I would be happy to explain this on cross and why this, again, is misleading.

Q. Okay. My question, Dr. Weisenburger, is that there were people included in this study who developed non-Hodgkin's lymphoma that did not have active hepatitis C, correct?

A. Probably true, yes.

MR. STEKLOFF: Okay. And so let's turn to page 2081, and look at the results.

If we can blow up the first -- the two paragraphs, so the section in the middle there, please. Thank you.

BY MR. STEKLOFF

Q. And if you look, it says, Similarly positive associations with HCV positivity was seen for all NHL histologies examined. In particular relative risk was 2.7, 95 percent confidence interval, 1.9 to 3.7.

So that is statistically significant, correct?

A. I'm a little behind you here.

Okay.

Q. You agree that -- bless you -- they had a relative risk of 2.7 with a statistically significant confidence interval for diffuse large B-cell lymphoma in this study?

A. Yes.

Q. Then it goes on to say -- and it talks about other subtypes of non-Hodgkin's lymphoma, right?

A. Yes.

Q. Then the next sentence on the other side says, Heterogeneity between studies was present only for diffuse large B-cell.

Correct?

A. Yes.

Q. Okay. Now, this was another study you are familiar with, right?

A. Yes, I referenced it. It is one of the studies that shows that hepatitis C virus causes non-Hodgkin's lymphoma.

Q. Okay. Now, I think -- I just want to be clear. This

morning you ruled out hepatitis C as a potential cause of Mr. Hardeman's non-Hodgkin's lymphoma, right?

A. I did.

Q. You said it was -- it had played absolutely no role whatsoever in his development of non-Hodgkin's lymphoma, correct?

A. That's correct.

Q. Okay. But isn't it true, Dr. Weisenburger, that it could have played a role?

A. It is highly unlikely.

Q. Isn't it true that while he may have had a markedly decreased risk, you can't be absolutely certain that the hepatitis C didn't contribute to his non-Hodgkin's lymphoma?

A. I can't be absolutely certain, but I can be certain to at least more likely than not.

Q. Okay. Isn't it true that hepatitis C very well could have played a role in Mr. Hardeman's development of non-Hodgkin's lymphoma?

A. It is highly unlikely.

MR. STEKLOFF: Your Honor, I would like to use -- read from his December 20th deposition, page 73, lines 11 through 25, which in volume 3 is tab 9.

THE WITNESS: You will have to say that over for me so I can find it.

MR. STEKLOFF: Yes, Dr. Weisenburger. It is tab 9.

And I'm looking at page 73, lines 11 through 25.

THE COURT: Any objection?

MS. MOORE: No, Your Honor.

THE WITNESS: What page? I'm sorry.

BY MR. STEKLOFF

Q. Page 73.

A. Okay.

Q. So at your deposition you were asked this question about Mr. Hardeman specifically and -- and this was your answer -- and you would agree that you cannot rule out the role that the 25 to 40 years of chronic hepatitis C infection played in his diffuse large B-cell lymphoma.

THE COURT: Can I just ask you to present that again, because it sounded like you were saying that that was his answer --

MR. STEKLOFF: Sorry.

THE COURT: -- and you were reading the question, so if you could present that again.

MR. STEKLOFF: Yes, Your Honor. Thank you.

BY MR. STEKLOFF

Q. Dr. Weisenburger, this is the question you were asked specifically about Mr. Hardeman. Tell me if I read this correctly: And you would agree that you cannot rule out the role that the 25 to 40 years of chronic hepatitis C infection played in his diffuse large B-cell lymphoma.

That's what you were asked, right?

A. Right.

Q. And this was your answer under oath: It could have played a role. It could have played a role. You know, it is my position that the fact that he was treated, he was in a sustained virologic remission for nine or ten years would have markedly decreased this risk, but I can't be absolutely certain the hepatitis C didn't contribute to his non-Hodgkin's lymphoma. It very well could have.

That was your answer, right?

A. That's my answer, yes.

Q. So I want to wrap up with just one more topic, which is when you were ruling out -- you said, I think yesterday, when you were ruling out the risk factors, you have to go through a very thorough analysis to determine whether the risk factors that were in Mr. Hardeman played a role or not. That was your testimony, right?

A. Correct.

Q. Okay. And that should be true with respect to Roundup as well, right?

A. Repeat the question again? I'm sorry.

Q. Which question --

A. The prior question.

Q. Yeah.

A. I missed the first question.

Q. Okay. You explained that Mr. Hardeman had four risk factors for non-Hodgkin's lymphoma hepatitis B, hepatitis C --

A. Right.

Q. -- his weight and Roundup, right?

A. Right.

Q. And you told the jury that you need to go through a very thorough analysis of each of those risk factors to see if they should be ruled out as the cause, correct?

A. Correct.

Q. And that should include Roundup, right?

A. Yes.

Q. Okay. But isn't it true, Dr. Weisenburger, that absent extreme examples of very minimal use of Roundup or that someone is wearing like a suit where they never have any skin exposure ever to Roundup, if you have a patient as part of your methodology who was exposed to Roundup and developed non-Hodgkin's lymphoma, in every one of those cases you are going to say more likely than not Roundup was a substantial contributing factor?

A. No. I would have to -- each -- I would have to weigh each case individually, just like I did Mr. Hardeman, and look at how much exposure there was and make a decision in each case. So that's the way I would approach it.

Q. Okay. So what I said is inaccurate?

A. I think it is inaccurate, yes.

Q. So I would like you to turn binder 3, the same binder that you have. And please look at your deposition from November 26th, 2018, tab 5, page 226, line 15 through 25.

A. What page? I'm sorry.

Q. Page 226.

A. Is it -- the document is Number 5?

Q. Yes, sir, tab 5.

THE COURT: Any objection to reading that?

MS. MOORE: No, Your Honor.

THE COURT: Okay.

BY MR. STEKLOFF

Q. Are you there, Dr. Weisenburger?

A. Page 226.

Q. Yes, 226, line 15 through 25 at the bottom of the page.

A. Okay.

Q. This was again under oath, correct?

A. Yes.

Q. I asked you this question: That's my question. In any case absent extreme examples of very minimal use or Tyvek suits where there was never any skin exposure ever, if you have a patient who was exposed to Roundup and developed NHL, in every one of those cases you are going to say that Roundup was more likely than not a substantial contributing factor to that patient's NHL, correct?

Did I read that question correctly?

A. Yes. I want to read through it again myself.

MR. STEKLOFF: Tell me when you are ready.

(Whereupon, a brief pause was had.)

THE WITNESS: Well, I think -- I agree, it is more likely than not, if there was a substantial exposure. But in each case, in each case I would look at the degree of exposure and weigh it. And if it was infrequent, if it was low exposure, I would have to really consider that.

So you are drawing very extremes here and getting me to commit to something -- and, you know, I don't want to -- I don't want to -- I agree with my statement, but I would like to qualify it that I would carefully look at every case and not just make a black-and-white, yes/no statement, which is what you are asking me to do.

BY MR. STEKLOFF

Q. Let me just read the question and the answer that you gave, okay?

A. Okay.

Q. You were asked: That's my question. In any case absent extreme examples of very minimal use or Tyvek suits where there was never any skin exposure ever, if you have a patient who was exposed to Roundup and developed non-Hodgkin's lymphoma, in every one of those cases you are going to say that Roundup was more likely than not a substantial contributing factor to that patient's NHL, correct?

And your answer was: More likely than not.

Right?

A. Yes, more likely than not if there was a substantial exposure, okay.

Q. So you are changing your testimony?

A. Well, I'm clarifying my testimony.

Q. Changing it, right?

A. Well, I'm changing it and I'm clarifying it, for you and for the jury.

MR. STEKLOFF: No further questions, Your Honor.

THE COURT: Okay. Any redirect?

MS. MOORE: Yes, Your Honor.

REDIRECT EXAMINATION

BY MS. MOORE

Q. Dr. Weisenburger, I'm going to pick up right where Mr. Stekloff left off. And I'm going to ask you to turn the page in that deposition.

A. Back or forward?

Q. To the next page, page 227.

And I believe what you were just telling this jury was that you would have to look at every case, right?

A. Yes.

Q. And do your own differential?

A. Yes.

Q. What did you tell the attorneys who were taking your

deposition in the Gordon case back in November after that question was asked of you?

A. I don't remember.

Q. What does it say on the next page?

A. What was the question?

THE COURT: Well, hold on. Hold on a second. You need to -- if you want to use prior testimony, as I have said a number of times in this trial, you need to request permission to read the prior testimony.

MS. MOORE: I'm sorry, Your Honor. May I have permission to read the prior testimony in order for him to clarify his -- in order to follow up on the testimony -- or the questions asked by Mr. Stekloff?

THE COURT: Any objection?

MR. STEKLOFF: Can we clarify which page and line?

MS. MOORE: Sure. Page 227, lines 5 through 14.

THE WITNESS: Right. So here --

THE COURT: Hold on a second.

THE WITNESS: Oh, I'm sorry.

THE COURT: Any objection?

MR. STEKLOFF: I have no objection.

THE COURT: Go ahead.

She has asked you to read it. So you need to wait. She will read it, and then she will ask you a question about it if she wishes. Okay?

THE WITNESS: Okay. I see, Your Honor.

BY MS. MOORE

Q. So the question that -- right after the one that defense counsel asked you, Dr. Weisenburger, reads: Sir, before you can make an opinion on -- an expert opinion about whether or not Roundup caused someone's cancer, do you have to evaluate that person's case?

And you answered: Yes.

A. Yes.

Q. Is that -- is that still your testimony?

A. Yes, I would look at each case individually.

Q. Okay. And then the next question that was not read to you a minute ago was: So he has asked you about every future case. That's in the context after you have done a full differential diagnosis, an etiological examination?

And your answer was: Yes.

A. Yes.

Q. Can you explain what you mean by that?

A. Well, it means that I would take each case individually and evaluate it. So just because someone was exposed to Roundup doesn't necessarily mean that they have a high risk for non-Hodgkin's lymphoma. So as you saw in some of the epidemiology studies, if the patient had low exposures -- few exposures, their risk was not much increased. But people who had very extensive exposures had increased risk. So that's

what I was trying to evaluate along with all the other risk factors in this case, and that's the way I would do it for each and every case.

Q. And is that what you, in fact, did in this case?

A. Yes.

Q. Okay. And there was a series of questions asked of you this morning about the NAPP. Do you recall all those questions?

A. Yes.

Q. Okay. So I want to go back to the NAPP. And I believe that counsel for Monsanto actually stated that when Dr. Ritz testified -- I think the quote was: She did not present NAPP data.

And I understand you were not here during Dr. Ritz's testimony; but I want to remind the jury -- I'm going to grab the blowup that was used and ask you a question. Just one second.

MR. STEKLOFF: I'm going to object. I don't think that that's what I said, Your Honor.

THE COURT: That question will be stricken.

MS. MOORE: Your Honor, can we have a sidebar about that, please?

THE COURT: Sure.

(The following proceedings were heard at the sidebar:)

[redacted]

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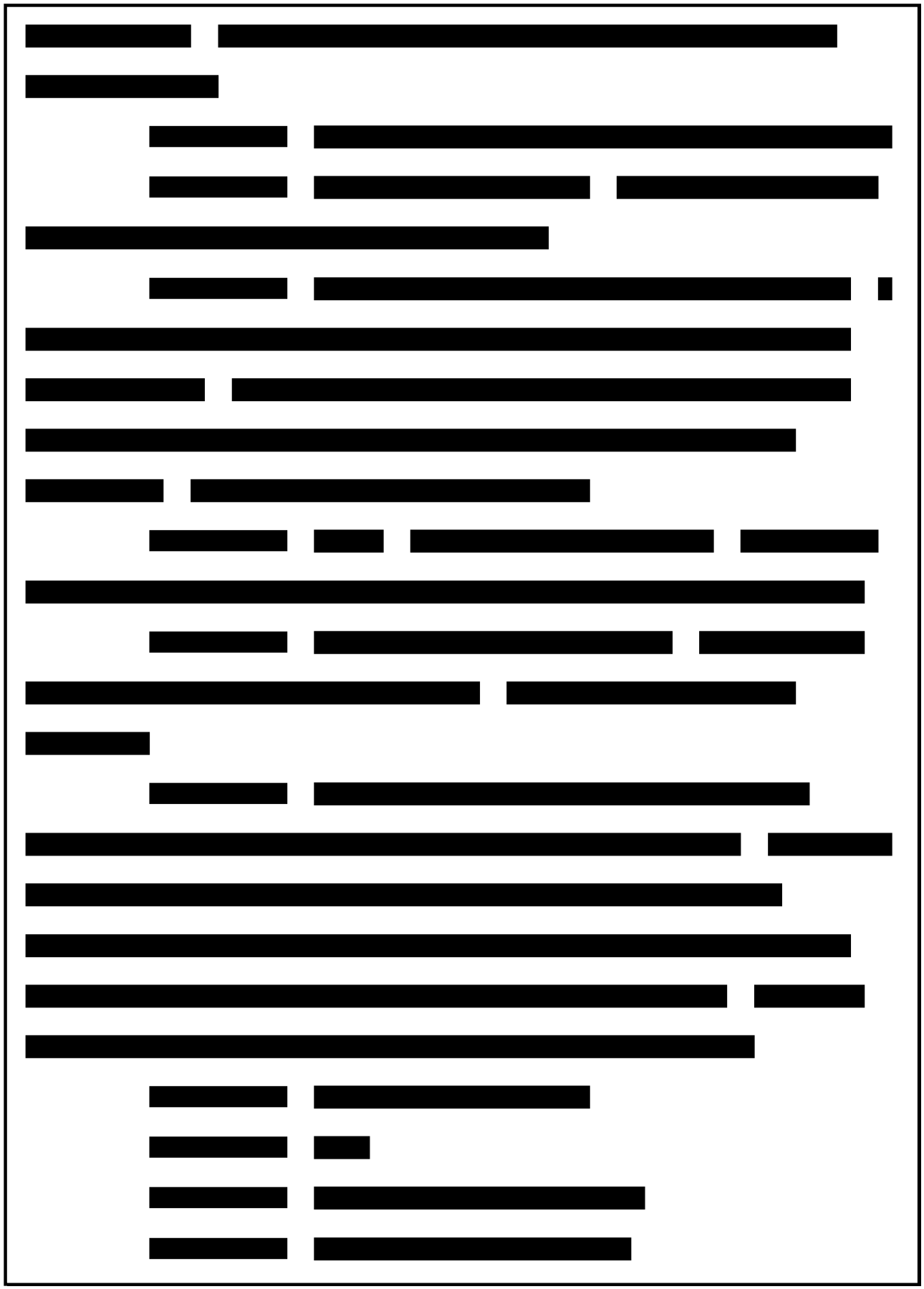

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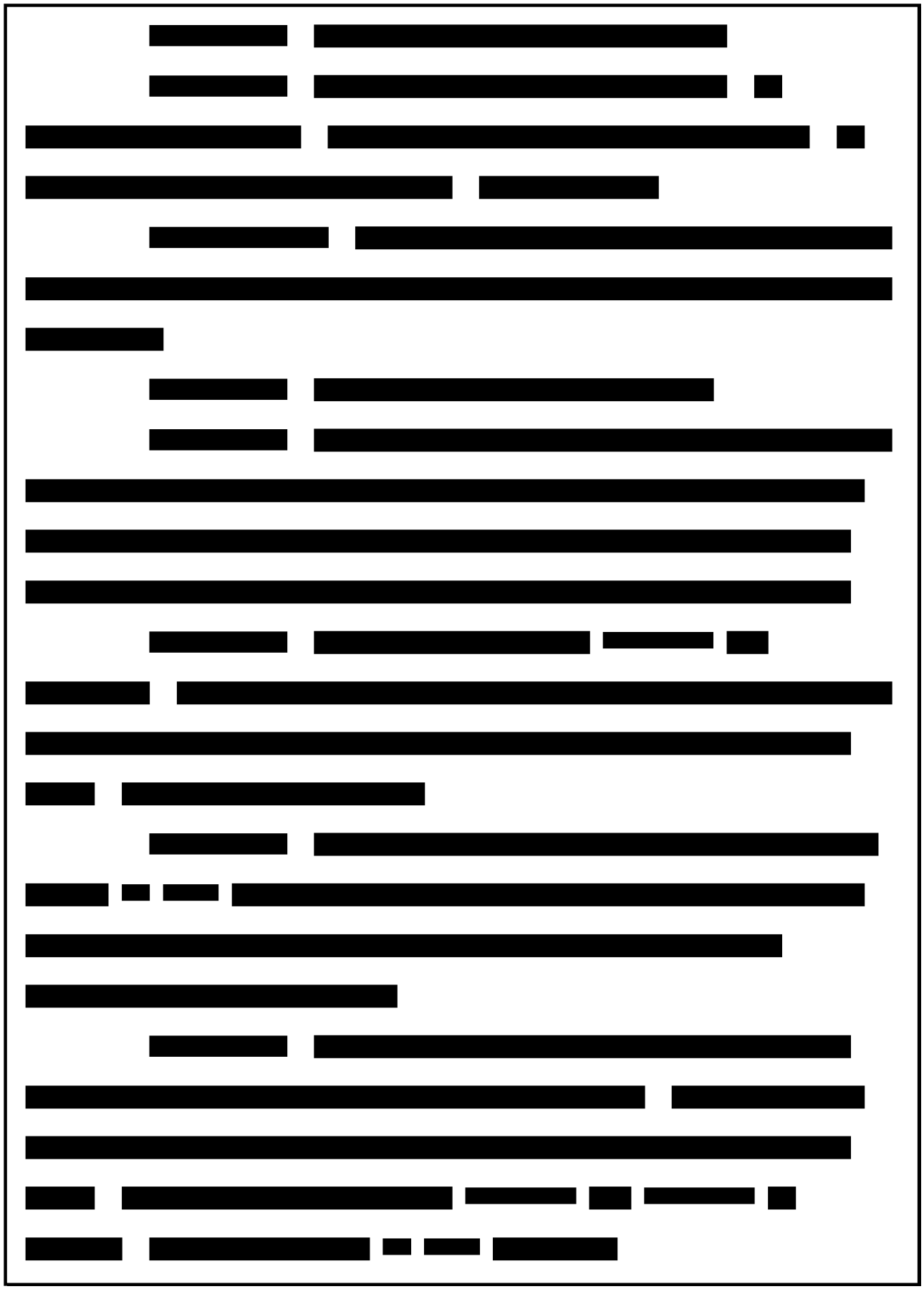

[redacted]

(Sidebar ended.)

(The following proceedings were heard in open court:)

THE COURT: Different chart.

MR. STEKLOFF: Sorry.

BY MS. MOORE

Q. Dr. Weisenburger, yesterday, if you will recall, when I first started asking you questions about the epidemiological case control studies, I referenced --

MS. MOORE: Your Honor, would it be okay if he came off the stand so he could --

THE COURT: Of course.

BY MS. MOORE

Q. I referenced -- I started by saying that the jury had heard from Dr. Ritz extensively about all these studies that is on Exhibit 904. And so we had asked you for -- to testify in a

summary fashion on that.

Do you recall that question yesterday?

A. Yes.

Q. Okay. And counsel made reference about the NAPP this morning, and he was asking you questions. And do you see the NAPP on this chart?

A. Yes, it's right here.

Q. Okay. If you will come over here, I will let you stand on this side.

And you were asked a series of questions about the different odds ratios from the NAPP, and there was some asked of you on cross about the 1.22 and then the 2.49; and that's all on this chart, correct, that the jury saw last week?

A. Right. So I didn't show you this odds ratio but Dr. Ritz did.

Q. Okay. And -- if you want to go back up to the stand, we will go through that real quick.

What you showed was the frequency chart. And, Dr. Weisenburger, can you tell the jury why you wanted to show the frequency chart to -- to them yesterday?

A. You mean the number of days per year?

Q. Yes.

A. The frequency chart?

Yes. So, well, I mean, I could have showed all the data, but I knew that -- I knew that Dr. Ritz had shown you some

things, and we didn't want to repeat everything that Dr. Ritz said. So I sort of truncated my presentation to really what was important. That's why I just showed you the one slide. But the importance of this slide, it shows you that people who have relatively low exposure to Roundup, don't have an increased risk, okay. And that's why the overall odds ratio is elevated but not statistically significant.

But if you look at the people who had the higher number of days per year, they had a more intense exposure. They had a significantly elevated risk. And so I felt like that was the most important data to show because, you know, when you are talking about pesticide exposures, I think intensity of the exposure, which is best reflected in number of days per year, is a much better reflection of overall exposure than number of years.

And, in fact, we had the same finding in our Nebraska study when we looked at 2,4-D. The number of years of exposure to 2,4-D didn't really predict for an increased risk; but the number of days per year that people were exposed, telling you that they had an intense exposure over a shorter period of time, did significantly elevate the risk. So I think the intensity of the exposure is a better surrogate marker of exposure.

Q. And would it be fair to say that repeated exposure at those levels over time is indicative of an increased risk more

so than someone just saying I used it once?

MR. STEKLOFF: Objection. Leading.

THE COURT: Sustained.

THE WITNESS: Yes.

THE COURT: That answer will be stricken; question will be stricken.

MS. MOORE: I will rephrase, Your Honor.

THE COURT: I will just remind you when you hear someone make an objection --

THE WITNESS: Pause.

THE COURT: I know it is hard. It is much different from normal people having normal conversations, but you have to pause when you hear an objection --

THE WITNESS: Yes.

THE COURT: -- and allow me to rule on it. And if I say "sustained," that means you should not answer the question.

THE WITNESS: Yes. Thank you. I should know that by now.

MS. MOORE: I will rephrase.

Q. Dr. Weisenburger, what is never-ever or ever-never?

A. So ever-never basically means if you used glyphosate once, then you used it. So you are in the ever rather than the never. So -- basically it includes anyone who is exposed to glyphosate one time or two times or 200 times.

Q. And what is the difference between an ever-never analysis

versus a frequency of the number of days year, like what you showed to the jury?

A. Well, usually an ever-never analysis is only positive if it's -- if it's a very potent carcinogen where maybe one or two exposures could cause cancer, but there aren't very many things like that. So it's much more important to look at dose response and especially look at the individuals who have -- who have higher exposures or have more intense exposures, and that's what is reflected on this table.

MS. MOORE: And, Your Honor, may he step down?

THE COURT: Sure.

MS. MOORE: Great.

Q. Dr. Weisenburger, I want you to come back down.

And you referenced dose-response, and can you point out to the jury, then, on this chart the day and the years drawn from the NAPP where the dose-response is?

A. Sure. So for NHL overall, these are the people who weren't exposed at all, so their risk is set at 1. Okay? These are the people who have relatively few exposures, less than two days per year, and you see that their odds ratio is about the same as 1. And so there's really no increased risk for two or fewer days per year.

It's only the people who have more exposure, more days per year, that have the increased risk of -- almost twofold increased risk, statistically significant; and there's a

statistical difference between these two numbers, and so the trend analysis is positive.

So this just shows you the dose-response. Looking at -- looking at large numbers of patients -- of people who have very low doses, probably you'd need thousands and thousands to really see an increased risk because there isn't much increased risk or even any increased risk here.

So you need to look at the people who have -- who have higher exposures just like in the mouse studies. The mice who get the highest number of tumors are the ones who got the highest dose, and it's the same in the epidemiology studies. You see a communicable dose-response here for overall NHL, for diffuse large B-cell lymphoma, and you see it actually in the other subtypes too.

Q. Now, you were asked some questions about -- this is a slide from the presentation of the NAPP results in June of 2015; right?

A. Right.

Q. Okay. Then you were asked some questions about a different presentation given a couple months later in August. Do you recall those questions?

A. Yes.

Q. And I want to put up on the screen -- if I may publish, Your Honor, just for comparison -- 1425. It's the August -- no, you can stay here for a second.

May I publish? Thank you. 1425.

And if you can keep -- Mr. Wolfe, if you can keep flipping.

Tell Mr. Wolfe -- Dr. Weisenburger, I want to compare apples to apples. So on the presentation in August, let's get to the same slide so we can look and see apples to apples here.

Keep on going. You can just tell him when to stop.

A. We're getting there.

Q. It's a long presentation.

A. This one.

Q. Okay. Now, I don't think Mr. Stekloff showed this slide a few minutes ago, and so I wanted to ask you about this. Is this the same type of slide in August that was shown in June?

A. It's the same type of slide, yes, but the difference is that this one is not adjusted for the use of other pesticides. So I thought this was more relevant because adjustment to mitigate confounding needs to be done. So I thought this was a more important one to show than that one.

Q. Okay. And, in fact, on the one in August that's nonadjusted for other pesticides, what is the odds ratio for DLBCL?

A. Well, it's even higher. It's even higher, and that's what you'd expect because it hasn't been adjusted for other pesticides that might have caused NHL.

Q. And so what's the significance to you, Dr. Weisenburger,

that the August presentation, the odds ratio is at 2.83 when it's not adjusted for other pesticides versus the odds ratio when it's adjusted for other pesticides at 2.49?

A. Well, this is the more important data because this is the one that's been adjusted. Okay? So showing you that one, you know, wouldn't be as valid as showing you this one because that one is unadjusted for other pesticides and this one is.

Q. And is that why you showed the jury this slide --

A. Yes.

Q. -- versus the one in August?

A. Yes.

Q. Thank you. You can have a seat.

Dr. Weisenburger, the jury has heard about the De Roos 2003 study -- and I'm not going to go through all that again -- and it was published, you know, 2003. That data was collected at what point?

A. Well, the cases were accrued starting in 1979 through, I think, 1986.

Q. Okay. It takes several years to get something published, doesn't it?

A. Yes. It can take a long time.

Q. Okay. And it's your understanding that the NAPP is going to be published?

A. Yeah. This year for sure.

MR. STEKLOFF: Objection. Leading. Speculation.

THE COURT: Sustained. That response will be stricken.

BY MS. MOORE:

Q. What is your understanding as far as the NAPP being published?

A. Later this year.

Q. Okay. You were asked a series of questions about who you've told and when you've told people about whether Roundup causes cancer or causes non-Hodgkin's lymphoma. Do you remember those questions?

A. Yes.

Q. Okay. Can you explain to the ladies and gentlemen of the jury, as a researcher, as a medical professional, what is the way that scientists communicate with one another as to their findings?

A. So we do it by publication -- by presenting our results at national meetings and international meetings to our peers, and also by publishing it in journals that are read by other doctors. And that's exactly what we did with the De Roos study of 2003 and that's exactly what we're doing with the NAPP study. So that's how professionals and researchers communicate their findings to the rest of the world.

Q. And then you were asked some questions about the two studies that I asked you about yesterday where there was aerial spraying in South America, the Bolognesi study and the

Paz-y-Mino. Do you remember those questions this morning?

A. Yes.

Q. Okay. And there was some questions asked about short-term exposure. Explain to the ladies and gentlemen of the jury, when you have short-term exposure to Roundup, does that lead -- what does that lead to as far as the DNA damage? How long would you expect the DNA damage to last?

A. So for the kind of damage that occurred in those two scenarios, if the exposure -- so they were exposed heavily to aerial spraying of Roundup but once the spraying stopped, by and large, a lot of those cells would just die off because the genetic abnormalities might be bad for them.

And then the other thing that happens is the body has a vigorous repair mechanism where it will repair the genetic damage. So either though cells will be repaired or die off. That's the usual situation.

So if you looked two years later and tried to find those abnormal cells, they would have -- they would probably be gone because either they died off and so those abnormalities weren't passed off to the cells that came from them, or the abnormalities were repaired by the normal repair mechanisms that we have to repair our genetic damage.

Q. And if we could, let's go to 1066 and we'll go -- and this is the Bolognesi.

MS. MOORE: Sorry. May I publish, Your Honor?

THE COURT: Sure.

MR. STEKLOFF: No objection, Your Honor.

MS. MOORE: Okay. And we'll flip over to page 991, Mr. Wolfe.

Q. And the jury will recall this graph that we showed them yesterday at the bottom. And, Dr. Weisenburger, does that graph represent what you were just explaining to the jury on short-term exposure?

A. Right. So if you just look at the last three to the right, those are the ones that were sprayed with the aerial glyphosate. And what she's marked is the measurement of DNA damage just before the glyphosate was sprayed. Okay?

And then within five days after the glyphosate was sprayed, they did the same test again, which is the next bar. And you can see that the DNA damage went up in each of those, and it was a statistically significant increase.

Q. And what does that tell us?

A. That tells you that the glyphosate that was sprayed was the reason why, in a very consistent way, the level of damage increased.

Q. And, Dr. Weisenburger, you said "glyphosate." I just want to make sure we're clear because --

A. Roundup.

Q. Okay. And so from this study, from the Paz-y-Mino study, the other aerial spraying study, what conclusions are you able

to draw?

A. Well, from the other study, the DNA damage actually stayed up longer because they measured the -- they did the test for DNA damage anywhere from two weeks to two months after the spraying, and there still was DNA damage.

So what that said is it doesn't go away right away. It may take weeks for it to be healed or for those cells to die off.

Q. And what happens when your body is exposed to Roundup repeatedly, so the frequency is more than this one aerial spraying? What happens to the body's DNA in those circumstances?

A. Well, in those kind of circumstances --

MR. STEKLOFF: Objection.

THE WITNESS: -- your --

MR. STEKLOFF: Objection, Your Honor.

THE COURT: Hold on.

THE WITNESS: Sorry.

THE COURT: Overruled.

BY MS. MOORE:

Q. You can go ahead.

A. So in those kind of situations, the exposure to the Roundup overcomes the ability to the body to fix those genetic abnormalities, and so they begin to accumulate in cells and some cells develop a second abnormality as well. And so you

get a cumulative increase in genetic damage if the body can't repair it or if the cells don't die off.

And so that's what we saw in the first study; that, you know, at least out by two months there was still people who had elevated genetic damage. But when they looked at two years later, those cells had either healed or died, and they didn't find any abnormalities.

Q. And was there continued or repeated exposure during that two years' time to Roundup?

A. No.

Q. You were asked a series of questions about latency --

A. Yes.

Q. -- with respect to the case-control studies, and at one point on the flip chart that Mr. Stekloff was using, he had put down a number of years and then he put some years in orange. I think he was subtracting 20. Do you remember that?

A. Yes.

Q. Okay. And you said that it didn't make any sense to you, and you were wanting to explain that. I wanted to give you an opportunity to explain to the jury why subtracting 20 from the collection dates didn't make sense to you.

A. Yeah. Well, because 20 is the median latency. So some people are --

Q. Did you want your bell curve?

A. I don't think -- well, you can put it up if you like,

sure.

But the 20 years is the median latency, but half of the people who get the cancer get it in the first half of the curve as you can see there. So for some of the studies, for some of the early studies, as I explained to you yesterday, there was 4 to -- in the De Roos, 4 to 11 years of potential exposure to Roundup in those studies.

And, of course, that is short but, as you can see, there are cases that occur relatively soon after exposure, and I think those are the cases that we're measuring.

And just to take the 20 and subtract it doesn't make any sense. It's -- it just doesn't make any sense.

Q. And, Dr. Weisenburger, I'll ask you to come down here for a second. If you could point out on your bell curve chart where you believe that the individuals from McDuffie and Eriksson and the three pooled cases from De Roos 2003 would fall on the bell curve and which bell curve are you referring to.

A. So I'm referring to this bell curve (indicating) that we talked about yesterday. And from the De Roos, it would be in the early part of the curve. McDuffie is later. I can't remember the chronology, but the only one that had a relatively short latency period was De Roos. The other ones had later and later ones, more proximating and surpassing the median. So all of the studies were performed on this part of the curve

(indicating). Okay?

Q. So all the studies that were on that flip chart that you were just asked questions about, do they all fall within the bell curve?

A. They do. They were all performed -- we have to talk about temporality again -- they were all performed after glyphosate came on the market. So people who used glyphosate used it after it came on the market and before they got their non-Hodgkin's lymphoma.

Q. And in your opinion, then, because those fall within the bell curve, are the conclusions you can draw from those studies valid?

MR. STEKLOFF: Objection. Leading.

THE COURT: Sustained.

THE WITNESS: I accepted them as valid.

THE COURT: Sustained. So that answer is stricken. The question is stricken.

MS. MOORE: I'll rephrase, Your Honor.

Q. In your opinion, Dr. Weisenburger, the conclusions, the results of those case-control studies regarding the Eriksson and De Roos, what is your opinion as to what you can draw from those conclusions given where they fall on the bell curve?

A. Well, I think they're valid studies. I think their conclusions are meaningful, and the IARC and the EPA and the European communities --

MR. STEKLOFF: Objection, Your Honor.

THE WITNESS: -- all observe those, evaluated them --

THE COURT: Hold on a second.

The objection is sustained. That question and answer will be stricken.

MS. MOORE: All right. I'll do it one more time, Your Honor.

Q. In your opinion, Dr. Weisenburger, what significance can you draw from the conclusions of McDuffie, Eriksson, and De Roos in relation to the bell curve?

A. Well, I accepted the studies as valid studies, and they show statistically significant increases in the risk of non-Hodgkin's lymphoma associated with Roundup. So that was my conclusion.

Q. Thank you. You can have a seat.

All right. Last topic. You were asked several questions about hepatitis and I wanted to go back to that. And there were about three articles or three studies that you were shown that you had asked if you could explain a little bit more about that, and so I want to give you an opportunity to do so now.

And why don't we turn to the -- I don't know if this is in the right order, but I'm going to hit all three, Dr. Weisenburger -- 1132.

MS. MOORE: And permission to publish.

MR. STEKLOFF: No objection to any of these studies

being published, Your Honor.

THE COURT: Okay. Go ahead.

BY MS. MOORE:

Q. And is this one of the ones that you were asked about by Monsanto's counsel?

A. Yes, it is.

Q. And are you familiar with this study, Dr. Weisenburger?

A. Yes. It's a meta-analysis of studies of people with a history of hepatitis C infection.

Q. All right. And you were asked some questions.

And if we could go to page 2, Mr. Wolfe, please.

And what conclusions can you draw from this study, Dr. Weisenburger?

A. Well, the conclusion that I drew is that hepatitis C is a risk factor for non-Hodgkin's lymphoma. Okay? And they used studies because most of the epidemiology studies used the antibody to hepatitis C, anti-C, to find people who had -- who had active hepatitis C infection or people who have had the infection and now were immune. Okay?

And if -- so the way it works is you've got a bunch of patients, all of these patients that either have active hepatitis C or are immune to hepatitis C. And if enough -- if enough of the patients have active hepatitis C, you're going to see a positive result. Okay? And so that's what happened in both these studies. Although they didn't measure it, that has

to be what happened.

And if we go and look at the Nietters study, I can show you real data -- okay -- which proves my point.

Q. Is this hypothetical?

A. No. This is just a methodology that epidemiologists use. They wanted to find all the cases they could of people who had current or past hepatitis C, and they wanted to see was there an increased risk of non-Hodgkin's lymphoma, and the answer is yes. Okay?

But it's -- but if you want to look at the actual viral DNA in the blood, it's much more expensive and much more tedious, and most of the studies didn't do it. Okay? These are what I would call sort of more quick-and-dirty and less expensive studies. And, in fact, even using those kind of methodologies, it was positive.

Q. And what does that mean?

A. Well, it means that -- what the study showed is that if you have or have had hepatitis C infection, you're at increased risk, but it's misleading because you've really got two different things in there. Right?

So if we go to the Nietters study, I'll show you the way it was done there and it illustrates my point.

Q. Okay. If you can turn to -- and this is -- it's in the binder that you had yesterday, Dr. Weisenburger, so I don't know if you have that in front of you. I can pull it up on the

screen.

It's 1413, Mr. Wolfe.

And this study, the Nietters study, Exhibit 1413, Dr. Weisenburger, the title is "Hepatitis C and Risk of Lymphoma: Results of the European Multicenter Case-Control Study EPILY" -- oh, I guess "EPILYMPH." Sorry. And what about this study did you think was important to discuss today?

A. Well, the nice thing about this study is they did the same thing as the other two studies. They looked at the antibody -- they looked for the antibody first to find all of the cases that had active chronic hepatitis or had become immune to hepatitis C, and then they went ahead in this study and actually looked for the viral RNA. And what they found was most of the people who had the hepatitis C antibody also had the viral RNA. So those were the chronic active hepatitis.

And when they then looked at the difference, it was only the ones who had the chronic active hepatitis that had the increased risk, and those that were immune didn't have the increased risk.

And I actually showed you a slide yesterday that made that same point. I don't know if you remember, but I showed you a slide yesterday that made that same point.

Q. Is that the Gianelli?

A. No.

Q. This one (indicating)?

A. No. It was one of the ones that we -- I think we showed on the screen.

Q. Oh. Okay. Let me grab this. I'll bring it back up here and make sure I understand.

Let me flip over. And it was one of the tables from yesterday, Dr. Weisenburger?

A. Yes. It was I think the second one when we were talking about hepatitis C.

Q. Okay. If you want to go to --

A. I mean, do you want to look on here and actually see where it says that on this one?

Q. That would be great. Okay.

A. So it's the bottom of page 1880.

Q. And is that under the results?

A. Yeah, at the very bottom of the page where it says "HCV infection" and going to the next page. No, not the table.

Yeah, there. There you go. Good.

Q. Great. Thanks.

A. So what their finding was that HCV infection defined -- was defined by a positive test for anti-HCV or HCV RNA. Okay?

Q. What does that mean?

A. Well, it means that they combined those two groups together, and it was associated with an increased risk for non-Hodgkin's lymphoma of 1.42. Okay? But it wasn't statistically significant but it was close.

But then the next paragraph is really important because it says (reading):

"A statistically significant association between HCV infection and lymphoma was seen only" -- that's a big word -- "only in those subjects with detectable HCV RNA were considered."

Okay? (reading)

"The presence of this marker of persistent and actively replicating HCV was associated with an odds ratio of 1.82, almost a twofold increased risk and is statistically significant."

Let's go to the rest of what comes after. Oh, no. I guess that's it.

So when they looked at the ones that didn't have the -- that were positive for the antibody but didn't have the circulating RNA, they didn't find an increased risk. Okay? And the other -- if the other studies had done the same thing, they would have found the same thing.

Q. And is that why when you were asked questions about the Mahale study, which is in the binder that's marked as 1348 and you had an exchange with Monsanto's counsel about the interpretation of that study, is that one of the reasons why?

A. No. It's a different reason for that one.

Q. Oh, okay.

A. It's 13 -- what is it? 13?

Q. 1348 is the Mahale study.

A. Yeah. It's in a different binder, I guess.

Q. It's in the black binder.

A. Okay.

Q. It's actually, I think, in your binder as well.

A. Okay. So why don't you pull up Figure 2 on page 559.

Q. Do you want the one that has non-Hodgkin's lymphoma?

A. Yeah. Number D.

So this, I think, illustrates it. And so what the paper is saying is that once you diagnose -- once you make a diagnosis of active hepatitis C viral infection, in order to get adequate protection and prevention of non-Hodgkin's lymphoma, you should treat it right away. Okay? We treat it. And what they found is if you treat it within the first year, the risk ratio is lower and you're protected. Okay?

And you see that here in the curve. If you can see the curve, the -- where it says "1," so the -- yeah. So 1 means that they were treated within the first year. Okay?

And the risk of non-Hodgkin's lymphoma is lower than 1 here -- okay? -- which means they're protected. One would be the people who have active chronic hepatitis. Okay? So they're comparing the ones that had a sustained virologic response, like Mr. Hardeman, to those that weren't treated.

And you can see that if they were treated within the first year, they're protected. Okay? But if you wait till the

second year, which is 2, you see less protection. If you wait till the third year, there's less protection. If you wait till the fourth year, there's almost no protection. And by the fifth year, they have the same rate of non-Hodgkin's lymphoma as people who are untreated.

Well, what you've done is you've left them untreated for five years, so it's not surprising that they would get non-Hodgkin's lymphoma during those five years because they're at increased risk.

Q. So I want to bring us back to Mr. Hardeman. Is that what happened with Mr. Hardeman?

A. Well, Mr. Hardeman would have been in the first group who was protected because as soon as his diagnosis was made, he was treated. Okay? So he would actually be in the first group here, and you can see that there is protection and the risk is markedly lower. And I showed you yesterday a number of curves that the risk goes down to what is the background general risk in the general population.

Q. So you were asked a series of questions this morning and this afternoon about hypotheticals about what happens when someone who had active hep C versus someone who's been treated, and I just want to ask you about what the evidence shows us in the facts of this case.

Can you explain to the jury in the facts of this case what happened with Mr. Hardeman with respect to the hepatitis C and

whether that has anything to do with his diagnosis of non-Hodgkin's lymphoma?

A. Well, I'll reiterate what we said yesterday. He was treated in 2005. He was cured. The virus was eradicated from his system, and he lived for nine years until he got the non-Hodgkin's lymphoma. So it couldn't have been the virus that caused it. Okay?

So defense raised the issue of: Well, could there have been some virus still there? Well, there was some virus still there. Could there have been abnormal cells still there from that early 40 years? Well, it's possible there could have been but, in fact, when you look at the actual data, there's no evidence that there's an increased risk even if there are a small amount of those infected cells still there.

So in the end, you have to believe the data and not focus on some hypothetical that may or may not be true, and that's what I tried to do. I tried to show you the data yesterday that made my point.

Q. Okay. And based on your opinions that he was cured and that the abnormal cells were killed off, did you come to a conclusion, an opinion, within a reasonable degree of medical certainty as to whether hepatitis C was a cause of Mr. Hardeman's non-Hodgkin's lymphoma?

A. I don't believe it was a cause, and I don't believe hepatitis B was a cause either for the same -- for similar

reasons.

Q. Okay. So can I mark through hepatitis B and C?

A. Yes.

Q. All right. Almost done, Dr. Weisenburger.

And on hepatitis, again, what percentage of people who have active hepatitis C -- not the people who have been cured, but the people who have active hepatitis C -- what percentage of those people are even going to develop non-Hodgkin's lymphoma? What's the evidence show us?

A. The evidence shows us it's really a small number. It's probably less than 1 percent. There was one study that found that it was a 10th of 1 percent at 10 years. Now, it would be more than that going out further, but I think the data shows that even people with chronic active hepatitis B -- hepatitis C have a risk of getting non-Hodgkin's lymphoma of less than 1 percent. They have a much higher risk, 10- to 25-fold increased risk of getting liver cancer than they do non-Hodgkin's lymphoma.

Q. And going back to a hypothetical, okay, we'll move from the facts for a second, but in a hypothetical situation, if what the defense is saying, that maybe there's some abnormal cells that stayed behind after he was cured, in your opinion if that was true, what would those abnormal cells be doing to Mr. Hardeman, if anything?

A. Well, they would be in a latent state hiding in a few

B cells and liver cells and held in check by the immune system. So they wouldn't be -- they wouldn't be causing any disease, and --

Q. And how do we know -- I'm sorry, Dr. Weisenburger.

How do we know they're being held in check by the immune system?

A. Well, because they don't -- they don't reactivate later and get real disease unless you immunosuppress the patients in some way that knocks out the normal immunity and then allows the virus to come out and cause disease.

Q. So let's go back to the evidence. We know Mr. Hardeman had to go through chemotherapy; right?

A. Yes.

Q. And what happened with respect to hepatitis C when he went through chemotherapy?

A. It didn't reactivate. It didn't reactivate. So that was a good test, that if it was there, it should reactivate and it didn't.

Q. And that's the evidence, not a hypothetical; right?

A. Yes.

MR. STEKLOFF: Objection.

THE COURT: Sustained. The answer is stricken.

BY MS. MOORE:

Q. The fact that he --

I'll rephrase, Your Honor.

The fact that we know Mr. Hardeman went through chemotherapy and the hepatitis C, he was checked for it and it never came back -- that was this chart we showed yesterday, Exhibit 940, this one, Dr. Weisenburger --

A. Yes.

Q. -- what does that tell us?

A. Well, that tells us that in clinical terms he was cured of his hepatitis C infection; that once he responded to the antivirals, the virus was largely eradicated from his system and there was no continuing liver damage; and even when he was immunosuppressed during his chemotherapy, it didn't reactivate.

So either it wasn't there or the immune system was strong enough to keep it in check even through the chemotherapy, but that was a real test.

Q. And is that one of the other reasons why you were able to eliminate hepatitis C as a cause of Mr. Hardeman's non-Hodgkin's lymphoma?

A. Yes.

Q. You were asked some questions about I think you had used the phrase "more likely than not," and I wanted to ask you, Dr. Weisenburger, before I sit down, your testimony and your opinions that you've given to this jury today and yesterday, are those given within a reasonable degree of medical certainty?

A. Yes, they are.

Q. Okay. And within a reasonable degree of medical certainty, can you tell the ladies and gentlemen of the jury, after all of the literature you've reviewed, all the publications you've shown them, in your 40 years of studying and investigating the causes of non-Hodgkin's lymphoma, in your opinion, what was the substantial factor in causing Mr. Hardeman's non-Hodgkin's lymphoma?

A. It was the Roundup exposure.

MS. MOORE: Okay. Thank you so much for your time.

THE COURT: Mr. Stekloff, how much time do you anticipate having? I'm trying to figure out if we should take a break.

MR. STEKLOFF: Two minutes.

THE COURT: Okay.

MR. STEKLOFF: Ms. Melen, may I please have the Elmo?

THE CLERK: Yes.

MR. STEKLOFF: Your Honor, I'm just going to publish Exhibit 1413, which is the study that was just shown to Dr. Weisenburger?

THE COURT: Okay.

MS. MOORE: No objection.

RECROSS-EXAMINATION

BY MR. STEKLOFF:

Q. And, Dr. Weisenburger, this is the Nietters study that you said was an expensive study that you wanted the jury to see;

right?

A. It was an expensive study.

Q. You said the other ones weren't that expensive. This one was expensive. You wanted the jury to see this; right?

A. Yes.

Q. Okay. So I want to show you here what the authors say on the third page of this study. They say (reading):

"Diffuse large B-cell lymphoma was the lymphoma subtype most clearly associated with indicators of HCV infection. The presence of anti-HCV" --

That means the virus was not active; correct?

A. Well, it detects both the ones that are immune and the ones that are active.

Q. It says (reading):

"The presence of" --

Well, no. It says (reading):

"The presence" --

I'm just asking you about anti-HCV. That means those people are not active; correct?

A. No. The anti-HCV identifies all the patients who have active infection and the patients who don't have it but are immune. So it includes all the patients.

Q. Okay. Fair enough. But it includes patients who aren't active; right?

A. Who are inactive?

Q. Who are not active. It includes those?

A. Yes, it does.

Q. And it says (reading):

"The presence of anti-HCV and HCV RNA were both associated with a statistically significant 2.2-fold and 3.3-fold increased DLBCL risk."

Correct?

A. That's what it says but, again, it's mainly being driven by the ones who have the chronic active infection. If you go up to the quote above, it said it was only the individuals who had the HCV RNA, the active infection, those are the ones who had the increased risk. The presence of the antibody alone without the RNA did not give any increased risk so the people who were immune did not have an increased risk. That's what this paper shows.

Q. Okay. I read correctly what the paper says; right?

A. Well, you read correctly, but -- but it needs to be clarified because otherwise it can be very misleading.

Q. Okay. And then on the back page it says (reading):

"The most important finding of this study" -- "of this large study is the significant association of HCV infection with DLBCL."

Correct?

A. Yes.

MR. STEKLOFF: Okay. No further questions,

Your Honor.

THE COURT: Okay. Now will be a good time for a break. We'll resume at 2:00 o'clock sharp. Thank you.

THE CLERK: All rise.

(Proceedings were heard out of the presence of the jury:)

THE COURT: You may step down.

THE WITNESS: Thank you.

(Witness excused.)

THE COURT: Okay. So if I remember correctly, you said you have about 55 minutes of video to play?

MS. MOORE: Yes, Your Honor.

MS. WAGSTAFF: Yes, Your Honor. We have a five-minute Farmer clip that we're going to play first, and then I think the Reeves clip is 55 minutes.

THE COURT: Okay. So an hour total. So let's go -- so you can play that stuff until 2:30 or a little bit after 2:30, find a good break time there, and then we'll send the jury home until Friday.

MS. MOORE: Okay. Thank you, Your Honor.

MS. WAGSTAFF: Okay.

THE CLERK: Court is in recess.

(Recess taken at 1:54 p.m.)

(Proceedings resumed at 2:01 p.m.)

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. Go ahead and bring them in.

MS. WAGSTAFF: Your Honor, we have a logical stopping point in the Reeves video that's 40 minutes.

THE COURT: Okay.

MS. WAGSTAFF: Would that be okay?

THE COURT: That's fine. I'll let them know.

MS. WAGSTAFF: And then we'll just do Farmer after. I mean, on Friday. We'll finish the Reeves on Friday and then we'll put Farmer in.

THE COURT: That's fine. Close your case with Farmer?

(Laughter)

MS. WAGSTAFF: Unless we can find more witnesses tomorrow.

THE COURT: Just don't forget to play the Farmer.

MR. STEKLOFF: And, Your Honor, if we just at the end of their case say we reserve a motion, is that sufficient?

THE COURT: From my standpoint, that's perfectly fine, yeah.

MR. STEKLOFF: Okay. So we'll just stand up when they rest.

THE COURT: You can say that now if you want.

MR. STEKLOFF: So I will reserve a motion at the end of their case, and we can argue about it whenever Your Honor feels is appropriate.

THE COURT: From my standpoint, that's fine. Just make sure from an appellate standpoint that's fine.

MR. STEKLOFF: If I need to repeat it at the end of their case, I will.

THE COURT: Yes.

(Proceedings were heard in the presence of the jury:)

THE COURT: Okay. Welcome back. There's going to be some more video --

THE CLERK: Please be seated.

THE COURT: Sorry.

There's going to be some more video testimony for you, and we've identified a good stopping point at about the 40-minute mark. So we will keep you a little bit later than 2:30 today.

Go ahead.

MS. WAGSTAFF: Your Honor, plaintiffs call Monsanto through William Reeves, Dr. William Reeves.

THE COURT: Go ahead.

(Video was played but not reported.)

THE COURT: Okay. Is that it for today?

MS. MOORE: Yes, Your Honor.

THE COURT: All right. So we're done for today. We will resume on Friday at 8:30 sharp. I told you about the scheduling change for Friday. I thank you for paying such close attention.

Remember all my admonitions, and we'll see you on Friday morning. Thank you.

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. So, again, reminder, everybody is required to stay in the courtroom for another five minutes while the jurors clear out.

And, then, so for scheduling -- people can sit down -- we have about another 15 minutes or so of testimony from the plaintiffs, and then the plaintiffs will rest their case; right?

MS. MOORE: Correct, Your Honor.

MS. WAGSTAFF: That's right, Your Honor.

THE COURT: And then Dr. Mucci is the first witness on Friday, or are you switching order?

MR. STEKLOFF: I think we're keeping the same order, Your Honor, but I -- you know, we're a little bit behind where we were. I'm almost certain Dr. Levine cannot be here on Tuesday because that's a major clinical day for her so we need to get her here on Monday. So I think we can go back and reassess, but our -- my current expectation is that Dr. Mucci will be first on Friday.

THE COURT: Okay. And so what do -- obviously we can't anticipate cross, but what is your anticipation on how long Dr. Mucci will take?

MR. STEKLOFF: An hour and a half.

MS. MATTHEWS JOHNSON: I don't think it will be that long. We were just discussing feasibility of getting it done, yes.

MR. STEKLOFF: I would guess maybe an hour and a half or so of the direct. I would guess. Maybe less.

THE COURT: Okay. And then what about Arber and Levine?

MR. STEKLOFF: I think Arber will be 45 minutes or maybe an hour, and I think Levine will be an hour to an hour and 15 minutes if I had to guess. Maybe an hour and a half.

THE COURT: Okay. So, I mean, do you have a sense now -- just for planning next week, I mean, do you have a sense of how long -- I know it's hard to guess and you're not held to anything, but do you have a sense of how long the crosses will be for these people?

MS. WAGSTAFF: I mean, it really depends on the direct examination, but --

THE COURT: Okay. It looks like it is at least possible, based on what you're describing, and you never know how it's going to go, but it looks like it's at least possible that the evidence could be wrapped up at the end of the day on Monday.

And so you should plan on doing your closings on Tuesday, and what I would say is that even if a little bit of the evidence bleeds over into Tuesday, you should still plan on doing your closings on Tuesday because almost all the evidence will have been in over the weekend, and you'll have a chance to assess, and then that final -- almost all the remaining

evidence will come in Monday, and you'll have a chance to prepare your closings on Monday night.

So, you know, if, for example, we were to do, you know, an hour of testimony on Tuesday morning, I would not want to send the jury home and have them come back Wednesday morning for closings. I would want closings to happen on Tuesday. Okay?

MR. STEKLOFF: Yes, Your Honor.

THE COURT: Have you given thought to how long closings will be? Probably not yet.

MS. WAGSTAFF: Not yet, Your Honor.

THE COURT: Okay. So the two things I want to do for closings, and we should talk about jury instructions too in a second, but the two things I want to do for closing, I want to see both sides' slides. So that will be Tuesday morning, I guess, I will review -- I will come in quite early, and I will review both sides' slides. I think it will probably be difficult for you to get me your slides the night before. So on Tuesday morning I want to review both sides' slides.

I also think we should have a discussion -- given what happened in the openings, I think we should have a discussion of certain issues that you're concerned might be raised during closing arguments that you think would be inappropriate, and we can try to -- we can make an effort to get sort of an advance ruling on some of those issues. Of course, you're free to offer those as well.

MS. WAGSTAFF: Thank you, Your Honor.

THE COURT: One thought -- one example could be, and I don't know if this is an example, but one example could be, you know, issues about the Parry evaluation being concealed from the public or something like that. I'm not sure that would be appropriate, and I got a sense that that may be sort of part of the theme. Maybe it would be appropriate. I'm not prejudging that, but that's an example of the kind of thing that maybe we should be talking about in advance.

And then for jury instructions, I'm trying to decide when we should talk about jury instructions. I'll get back to you on that. You may get an e-mail tonight telling you when we want to talk about jury instructions. I have to think about -- probably we'll file them tonight I think. So I've got a couple other things I'm thinking about, so we'll let you know on that.

MR. STEKLOFF: Okay.

MS. MOORE: Thank you, Your Honor.

MR. KILARU: Your Honor, if I could, just one brief point on --

THE COURT: Yes.

MR. KILARU: -- Dr. Arber's testimony.

THE COURT: I know you filed some questions.

MR. KILARU: I was not going to raise that, but if you want to talk about it --

THE COURT: No. I haven't looked at those questions

yet, so I will do that.

MS. WAGSTAFF: Your Honor, we filed a response to the questions as well.

THE COURT: Okay. All right.

MR. KILARU: I was actually going to raise a different point, which is when we spoke about Dr. Arber's testimony on Monday, you had indicated that the scope of Dr. Weisenburger's testimony could potentially open some doors to things that Dr. Arber might talk about, and we think that a very small aspect of the testimony you excluded from Dr. Arber should be back on the table in light of what Dr. Weisenburger said.

So specifically Dr. Weisenburger offered as one of his bases for ruling out the hepatitis C as a cause that there was this gene translocation that's associated with hepatitis C and when someone gets into sustained virological response that gene translocation basically goes away. There was a chart, it was the Gianelli chart, that was displayed.

And then he testified today -- that was yesterday.

He testified today, first, that he looked at the pathology from Mr. Hardeman, and he talked a little bit about what he saw on that pathology; and then he testified that that particular translocation wasn't present in his blood because of the treatment that he received.

So we're not saying -- and I understand your position on this, Your Honor -- we are not trying to have Dr. Arber testify

that hepatitis C was a more likely cause as a result of any gene mutations, but we do think that the door has been open for him to point out that Mr. Hardeman had this BCL6 translocation and that that translocation is associated with hepatitis C based on some published literature. That would be the extent of the testimony.

But I think that today Dr. Weisenburger gave the jury the impression, based on looking at the pathology and looking at the literature, that any mutation that might have been present as a result of hepatitis C was gone as a result of treatment, and I think there's literature and evidence suggesting that's not the case based on the pathology that both sides had a chance to review.

THE COURT: But what I understood Arber's testimony to be, and again I'll have to go back and look at it, but you can't link any translocation to any particular thing.

MR. KILARU: Well, I don't believe he said that in particular in the report, Your Honor. I believe that --

MS. MOORE: Are you talking about Dr. Weisenburger or Dr. Arber?

THE COURT: Arber.

MS. MOORE: Oh, Arber. Sorry.

MR. KILARU: I don't believe he talked about that one way or another in the report. I can go back and look to be 100 percent sure. We could submit something on that if you'd

like.

I believe the issue that prompted the exclusion of the testimony we had suggested is that he said in the report that he can't say that hepatitis C -- that one cause is more likely than another as a result of the pathology, but I think that's different from pointing out that there's something in the pathology that in the literature is associated with hepatitis C if he doesn't take the extra step of then saying something about cause based on that.

And I think given that these exact types of gene issues have come up through Dr. Weisenburger and that he's commented on translocations that are either present or absent in the pathology, we should have an opportunity to respond to them.

THE COURT: Okay. And so I guess there are a couple things about that. One is that you should file something tonight pointing me to the testimony that you're talking about because I don't have a good enough memory of it right now --

MR. KILARU: Yes, of course.

THE COURT: -- to have a full understanding of what you're talking about.

And, number two, it's going to depend whether that was -- something was pulled out of Dr. Weisenburger on cross versus offered during direct I would think, and you seem to be saying that he sort of introduced this concept on direct.

MR. KILARU: Yes.

THE COURT: But, you know, if you sort of pulled something out of him in an effort to open the door to something that you want Arber to say, then I don't know if that would be appropriate.

MR. KILARU: No, I understand that, Your Honor. We'll file. It was on direct. The issue came up on direct, and we actually didn't cross-examine on it.

THE COURT: Okay.

MS. MOORE: And, Your Honor, we just want an opportunity to respond to that.

And there wasn't --

THE COURT: So why don't you file something by 7:00 p.m., and why don't you file a response by 10:00 p.m. tonight. Okay?

MS. MOORE: Great. Thanks, Your Honor.

MR. KILARU: Sure.

MS. MOORE: Sorry.

MR. KILARU: The only slight --

MS. MOORE: I was planning to --

THE COURT: Well, actually, you know what? We have the day off tomorrow --

MS. MOORE: Thank you.

THE COURT: -- so I don't need to push you on that.

MS. MOORE: Thank you, Your Honor. I'd like to sleep tonight.

MR. KILARU: I also would just like to make sure we -- I know the court reporters are working really hard -- I just want to make sure we have the transcript. And we get them very quickly, but 7:00 might be a little --

THE COURT: Yes. So let's change that for both of you.

MS. MOORE: Okay. Thank you, Your Honor.

THE COURT: Why don't you file something by 9:00 a.m. -- the defendants file something by 9:00 a.m. and the plaintiffs file something by 11:00 a.m. tomorrow.

MR. KILARU: Sure.

MS. MOORE: Your Honor, that means they have multiple hours to get their paper together and I have two. I mean, can they file theirs tonight and I'll file mine in the morning? I mean, I don't want to be nit-picky, but --

THE COURT: You can have till noon to file.

MS. MOORE: Thank you, Your Honor. Thank you. I appreciate it.

THE COURT: Okay. And then are people -- if I want to get together on jury instructions tomorrow, would people be available?

MR. KILARU: Sure.

THE COURT: Yeah? So that's one possibility. My law and motion calendar tomorrow -- let's see -- I mean, we could potentially do like 11:00 o'clock or something like that.

MS. MOORE: Your Honor, can we do it after our brief is due, or is that --

THE COURT: Oh, yeah. Right.

MS. MOORE: Thanks.

THE COURT: Well, I'm not sure we can. Anyway, I'll get back to you on --

MS. MOORE: Okay.

THE COURT: -- I'll get back to you on that.

All right.

MS. MOORE: Thank you, Your Honor.

MR. KILARU: Thank you, Your Honor.

THE COURT: In the courtroom people are free to go.

(Proceedings adjourned at 2:53 p.m.)

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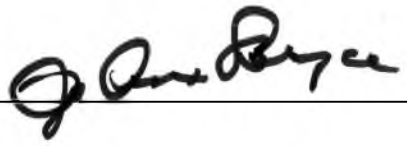
CERTIFICATE OF REPORTERS

I certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

DATE: Wednesday, March 6, 2019



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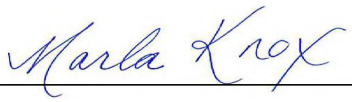

Marla F. Knox, RPR, CRR
U.S. Court Reporter