

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3
4 BEFORE THE PATENT TRIAL AND APPEAL BOARD

5
6 AVATION MEDICAL, INC.

7 Petitioner,

8 v.

9 EMKINETICS, INC.,

10 Patent Owner

11
12 Case No. IPR2024-01375
13 U.S. Patent No. 11,224,742

14 -and-

15 Case No. IPR2024-01378
16 U.S. Patent No. 9,002,477

17
18 DEPOSITION OF
19 DR. BRETT WINGEIER
20 San Francisco, California
21 Thursday, June 5, 2025

22
23 STENOGRAPHICALLY REPORTED BY:

24 Shannon Borge, RPR, CSR No. 9436
25 Job No. 586265
Pages 1-123

1 Deposition of DR. BRETT WINGEIER, taken on
2 behalf of Patent Owner at TheraNova LLC, Southplace
3 Square South, 255 Kansas Street, Suite 300,
4 San Francisco, California 94103, on Thursday,
5 June 5, 2025, beginning at 9:06 a.m. PST and ending at
6 1:23 p.m. PST, before Shannon Borge, a Certified
7 Shorthand Reporter, Registered Professional Reporter.

8
9 ---oOo---

A P P E A R A N C E S

---oOo---

ON BEHALF OF PETITIONER AVATION MEDICAL, INC.:

CALFEE, HALTER & GRISWOLD LLP
BY: KYLE T. DEIGHAN, Reg. No. 75,525
The Calfee Building
1405 East Sixth Street
Cleveland, Ohio 44114
216.622.8551
kdeighan@calfee.com

ON BEHALF OF PATENT OWNER EMKINETICS, INC.:

THE LAW OFFICES OF DAVID A. GERASIMOW, P.C.
BY: DAVID GERASIMOW, Reg. No. 57,512
153 W. Ohio Street
Suite 407
Chicago, Illinois 60654
312.919.4254
dave@gerasimowlaw.com

ALSO PRESENT:

MANISH VAISHYA, Avation CTO/Co-Founder
ERAN STEINBERG, TheraNova Chief Strategy Officer

---oOo---

Transcript of Dr. Brett Wingeier
Conducted on June 5, 2025

4

1	I N D E X		
2	---oOo---		
3	EXAMINATION OF DR. BRETT WINGEIER		PAGE
4	By MR. GERASIMOW		5
5	---oOo---		
6	E X H I B I T S		
7	EXHIBIT	DESCRIPTION	PAGE
8	2001	Notice of Deposition as to Case No. IPR2024-01375	7
9	2002	Notice of Deposition as to Case No. IPR2024-01378	7
10			
11	(PREVIOUSLY MARKED EXHIBITS)		
12	1003	Declaration of Dr. Brett Wingeier as to Case No. IPR2025-01375	8
13	1003	Declaration of Dr. Brett Wingeier as to Case No. IPR2025-01378	8
14	1054	U.S. Patent No. US 6,366,813 B1 4/2/02 - DiLorenzo	92
15	1055	U.S. Patent No. US 7,515,965 B2 4/7/09 - Gerber et al.	110
16	1056	U.S. Patent No. US 7,853,322 B2 12/14/10 - Bourget et al.	101
17	1080	U.S. Patent Application Publication Pub. No.: US 2006/0122660 A1 6/8/06 - Boveja et al.	60
18	1081	U.S. Patent No. US 6,272,383 B1 8/7/01 - Grey et al.	66
19	1084	U.S. Patent No. US 6,941,171 B2 9/6/05 - Mann et al.	45
20	1085	Ponsford Article - Sensory conduction in medial and lateral plantar nerves	69
21			
22			
23			
24			
25			

1 SAN FRANCISCO, CALIFORNIA; THURSDAY, JUNE 5, 2025

2 9:06 a.m. PST

3 ---oOo---

4 DR. BRETT WINGEIER,

5 having been first duly sworn,

6 testified as follows:

7 EXAMINATION

8 By MR. GERASIMOW:

9 Q Good morning.

10 A Good morning.

11 Q My name's David Gerasimow. I'm a patent
12 attorney based in Chicago and I represent EMKinetics,
13 the patent owner in multiple Patent Office proceedings
14 in which I understand you've been involved.

15 Before we begin today, do you have any
16 questions about who I am or what my role is in this
17 proceeding?

18 A No.

19 Q Great. Could you please state your full name
20 for the record.

21 A Brett Matthew Wingeier.

22 Q Will you please state your city and -- I'll
23 start over.

24 Can you please state the city and state of your
25 residence.

1 A San Francisco, California.

2 MR. DEIGHAN: Do you want us to introduce
3 ourselves on the record?

4 MR. GERASIMOW: Yeah, please do.

5 MR. DEIGHAN: Kyle Deighan from Calfee, Halter
6 & Griswold on behalf Petitioner Avation Medical and with
7 me today is Manish Vaishya from Avation.

8 MR. GERASIMOW: And I'll add that with me today
9 is Eran Steinberg of EMKinetics.

10 BY MR. GERASIMOW:

11 Q You understand that you're under oath?

12 A Yes.

13 Q Is there any reason you can't testify
14 truthfully today?

15 A No reason.

16 Q Have you ever been deposed before?

17 A I have actually never been deposed before.

18 Q Have you ever testified at trial before?

19 A No.

20 Q Have you ever submitted a declaration to the
21 Patent Office in relation to any Patent Office
22 proceedings?

23 A Only in this matter here.

24 Q Okay. Thank you.

25 I'd like to introduce an exhibit. This will be

1 called 2001 and I'll actually add another at the same
2 time. We can call this 2002.

3 (Exhibit Number 2001 and 2002 were
4 marked for identification.)

5 BY MR. GERASIMOW:

6 Q You've been handed what's been marked as
7 Exhibits 2001 and 2002. They are notices of deposition,
8 of your deposition.

9 Have you seen these documents before?

10 A I -- I don't recall whether I've seen these
11 before, but it is no surprise to me that I'm being
12 deposed here and -- and what's going on. So I -- but I
13 -- I don't -- I don't recall whether I've seen this
14 deposition document before.

15 Q And that's true of both of them that have been
16 handed to you?

17 A Yes. Yes. I've seen a lot of documents. This
18 is no surprise to me, but I -- I don't -- I can't recall
19 whether I've seen these exact documents before.

20 Q All right. But you nevertheless understand
21 that you're here to testify --

22 A Yes.

23 Q -- today in connection with IPR2024-01375 and
24 -1378 --

25 A Yes.

1 Q -- is that right?

2 A Uh-huh.

3 Q You understand that your testimony may be used
4 in Patent Office proceedings with the assess -- to
5 assess the validity of the patents at issue in those
6 proceedings?

7 A Yes.

8 Q I'd like to hand you exhibits -- two exhibits.
9 Both are Exhibit 1003 but 1003 in the -01375 matter and
10 the other is Exhibit 1003 in the -01378 matter.

11 (Exhibit Numbers 1003 and 1003
12 respectively were previously
13 marked for identification.)

14 BY MR. GERASIMOW:

15 Q You've been handed what are two declarations
16 that have been submitted in the relevant proceedings.

17 Do you recognize these as the declarations that
18 you submitted in connection with those proceedings?

19 A I do. These look like my declarations.

20 Q Feel free to thumb through them.

21 A As much as I can tell from leafing through it,
22 these look like my dec- -- like my declarations, yes.

23 Q Great. And we'll be going through them
24 again --

25 A Yep.

1 Q -- in greater detail today.

2 With respect to Exhibit 1003 in the -01375
3 matter, can you turn to page 14.

4 A Yes.

5 Q And you see that from paragraphs 22 to 31 you
6 describe certain legal principles? Do you see that?

7 A Yes. From paragraphs 22 through -- through 31,
8 yes, with the caveat that I am not a lawyer and I'm --
9 you know, I'm retained to comment on, you know, the
10 validity of the -- of the patents here but not -- you
11 know, I'm not a lawyer and expert in the legal
12 principles.

13 Q But to the extent you understood the legal
14 principles, these are the legal principles that you
15 applied in your analysis?

16 A These are -- yes, these are legal principles
17 that I applied to my analysis.

18 Q Let's do the same with your declaration in the
19 -01378 matter. I think your legal principles start on
20 page 13 --

21 A Yep.

22 Q -- in that matter.

23 A All right. I'm on page 13.

24 Q Thank you. It's the same question but with
25 respect to the -01378 matter.

1 Do paragraphs 22 through 31 describe the legal
2 principles that you applied in your analysis for the
3 -01378 matter?

4 A Yes. Yes.

5 Q Is it your understanding that an invention
6 claimed in a patent must be enabled?

7 A It is my -- it is my understanding that an
8 invention that is claimed in a patent must be -- must be
9 enabled, yes.

10 Q And is it your understanding of the enablement
11 requirement that the patent specification must describe
12 the claimed invention in such terms that one skilled in
13 the art can make and use the claimed invention?

14 MR. DEIGHAN: Objection. Calls for a legal
15 conclusion.

16 THE WITNESS: So, again, I'm -- I'm retained as
17 an expert in neuromodulation, you know, not -- not as a
18 legal expert. I'm aware of the principle of enablement,
19 and if one's going to successfully claim something, then
20 it needs to be enabled. But, you know, I'm not a -- I'm
21 not a lawyer with a legal opinion here.

22 BY MR. GERASIMOW:

23 Q Can you articulate your non-lawyer
24 understanding of the enablement requirement?

25 MR. DEIGHAN: Objection to form. Calls for a

1 legal conclusion.

2 THE WITNESS: So, again -- you know, again --
3 again with that -- you know, with that -- with -- with
4 that -- with that caveat that I'm -- you know, I'm not a
5 -- I'm not a lawyer. I'm aware of the -- I'm aware of
6 the enablement requirement for a -- you know, for a
7 claim. I am -- I'm -- I'm looking for -- I'm looking
8 for a more specific way to phrase this, but, you know,
9 when it comes down to it, you know, I'm -- I'm a -- you
10 know, I'm an expert in neuromodulation, not a -- not a
11 legal expert. You know, if -- if a claim is to be
12 valid, then -- you know, then it -- it needs to be -- it
13 needs to be enabled by -- by the spec- -- by the
14 specification. But, you know, that -- not being a --
15 you know, not being a lawyer, you know, that -- like
16 that is my -- that -- that is my understanding of it.

17 BY MR. GERASIMOW:

18 Q Is it your understanding that enablement is or
19 is not a ground for challenge in an Inter Partes Review
20 patent proceeding?

21 A I can't comment on the fine details of what
22 is -- you know, what is grounds in an IPR proceeding.
23 You know, that's a -- that's a legal expertise that, you
24 know, I'm not -- I'm not -- you know, I'm not retained
25 to -- to opine on here and is -- you know, again, I'm

1 not a lawyer. You know, I would say as a -- as a
2 neuromodulation expert, that -- yeah. Yeah. In the --
3 yeah, my understanding is that enablement is -- is
4 necessary for a claim to be valid, but, you know, beyond
5 that -- you know, again, I -- I can't comment on the
6 fine print details of what's -- what's appropriate
7 grounds in an IPR proceeding.

8 Q Can you please turn to paragraph 51 in your
9 declaration in the -01375 matter.

10 A Yep. Sorry. What was the page number one more
11 time?

12 Q It was actually paragraph 51.

13 A Yep. Okay.

14 Q In the middle of paragraph 51, you use the
15 phrase "afferent signals."

16 A Yes.

17 Q And after "afferent signals," you include the
18 paren "(i.e., signals traveling toward the spinal
19 cord)," end quote.

20 A Uh-huh.

21 Q Do you see that?

22 A Yes.

23 Q Is that, in your opinion, a definition of
24 "afferent signals"?

25 A Yes. But let me -- you know, let me describe

1 that. "Afferent" means, in general, signaling traveling
2 toward the spinal cord. By contrast, "efferent" means
3 signals traveling away from the spinal cord. It's also
4 possible to have -- you could have retrograde conduction
5 over afferent or efferent pathways, which is conduction
6 in the opposite direction.

7 Q Can you move forward to paragraph 69 in your
8 declaration.

9 A Yep. Yep.

10 Q It's under the heading "Claim Construction"?

11 A Uh-huh.

12 Q Do you see that there?

13 A Yes.

14 Q At the end of the paragraph, you write, "Unless
15 noted otherwise below, no terms require construction for
16 purposes of this proceeding."

17 Do you see that?

18 A Yes.

19 Q Is it your opinion sitting here today that no
20 terms require construction for purposes of this
21 proceeding?

22 A So in general, in my opinion here, I found that
23 the terms in the claims, they -- they don't require
24 specialized construction. They -- they have their plain
25 and ordinary meaning. I'd have -- you know, there's a

1 lot of material here. I'd have to -- you know, I say
2 unless other- -- noted otherwise below. I'd have to,
3 you know, go through each of the specific grounds to --
4 to make sure that -- you know, to make sure that there's
5 no fine points. But, you know, in general -- you know,
6 again, unless -- unless there's -- unless there's a fine
7 point here in -- in my grounds that I'm not recalling,
8 all the terms, you know, they -- they just use their
9 plain and ordinary -- plain and ordinary construction.

10 Q Okay. Your declaration in the -01375 matter
11 includes an Appendix A, which is a claim appendix.

12 Does that sound about right to you?

13 A That sounds right and I can flip to it now.

14 Q Thank you.

15 A Yep.

16 Q Do you have Appendix A in front of you?

17 A Yes.

18 Q And it lists the claim language of Claims 1
19 through 13 of the '742 patent; correct?

20 A Yes.

21 Q Claim 1 begins "A method of treating overactive
22 bladder or incontinence." Do you see that?

23 A Yes.

24 Q In your analysis did you treat that language as
25 a limitation or element of the claims?

1 A So it is -- it is part of the claim. I want to
2 make sure that I'm not, you know, missing some fine
3 point of the wording of, you know, the difference
4 between a -- an element and a limitation. It's -- it's
5 part of the claim and I -- you know, I considered it in
6 my declaration. And, you know, the -- in -- you know,
7 in the grounds -- in the grounds that I describe in the
8 declaration, you know, where I -- where I think
9 something is anticipated or obvious, you know, I -- I --
10 my opinion is that it is anticipated or obvious as
11 appropriate, you know, for -- you know, for treating
12 overactive bladder or incontinence certainly, you know,
13 or for some of the claims in, you know, '477, for
14 instance, that talk about other indications. You know,
15 it's anticipated or obvious for those indications, you
16 know, as I've described in my graphs.

17 Q For a reference in the prior art to anticipate
18 Claim 1 in the '742 patent, would that reference, in
19 your view, need to disclose a method of treating
20 overactive bladder or incontinence?

21 A For it to -- I -- I -- on the -- I -- I -- I
22 think there's -- there's a -- you know, again, I feel
23 like in this -- in this question, if -- if there's a --
24 you know, if there's a -- if there's a -- some kind of
25 legal distinction between the preamble and the -- you

1 know, the -- or, the -- the 1.p and 1.a, .b, .c, you
2 know, then -- yeah, I'm -- I'm not going to comment on
3 that -- that legal distinction, but it -- in -- you
4 know, you asked about anticipation. You know, for the
5 grounds that -- for the grounds that relate to
6 anticipation, you know, for instance, the -- you know,
7 the -- the claims that are anticipated by Svihra, it is
8 my -- you know, it's my firm opinion that they are --
9 you know, they are -- they are anticipated. They're
10 anticipated by Svihra and Svihra was -- you know, was --
11 was -- you know, Svihra was explicitly or necessarily
12 treating overactive bladder or incontinence. You know,
13 I -- with -- you know, with -- I -- I could comment
14 further on that if I had the paper in front me. You
15 know, I could -- I could go back to my -- you know, and
16 review some parts of the declaration, but to the extent
17 the question is about anticipation, then the -- my -- my
18 opinion -- my firm opinion is that -- you know, is that
19 -- is that the claims -- the claims that, you know, that
20 I'm -- that are -- the claims that are related to
21 treating overactive bladder or incontinence are -- you
22 know, are anticipated.

23 You know, Svihra was -- you know, Svihra was --
24 and, again, you know, without -- without going back to
25 the -- you know, without going back to Svihra, having it

1 in front of me, I'd want to review, you know, exact --
2 the exact words that they use, but, you know, they were
3 -- they were treating -- they were treating overactive
4 bladder or incontinence.

5 Q My question was whether a prior reference -- a
6 prior art reference would need to disclose a method of
7 treating overactive bladder or incontinence in order to
8 anticipate Claim 1 of the '742 patent. It wasn't clear
9 to me whether your answer was "yes," "no," or "maybe."

10 A You know, let me -- you know, because I'm not a
11 lawyer, you know, let me -- let me go back and refer to
12 where I -- I summarized the legal principles and I'm
13 just -- I think it was in the 30's here.

14 So, yeah, the -- you know, the legal principle
15 as I -- as I understand it and as I summarized it in my
16 declaration, is that, you know, a claim is anticipated
17 if all of the elements are found expressly or inherently
18 within a prior art reference and arranged as in the
19 claim.

20 Q And with respect to Claim 1 of the '742 patent,
21 is that preamble language, "A method of treating
22 overactive bladder or incontinence," an element of the
23 claim that must be shown in prior art for there to be an
24 anticipation under your understanding of the relevant
25 legal principles?

1 A So I -- I -- if -- so if -- if -- if there's a
2 -- you know, if -- if there's a -- if there's a legal
3 fine point here about -- you know, about the -- you
4 know, about the -- the fact that this is the preamble to
5 the claim or, you know, something like that, then, you
6 know, again, I'm -- I'm not a lawyer.

7 You know -- you know, my -- you know, so first
8 and foremost, my -- you know, my opinion is that a
9 method of treating overactive bladder or incontinence,
10 you know, is anticipated, you know, as per the grounds
11 in my declaration. And, you know, to -- to the extent
12 that -- to the extent that that is a -- to the extent
13 that that's a claim element, then -- to the extent that
14 that's a claim element, then, yes, I -- it would be
15 required that that would be found expressly or
16 inherently within a prior art reference.

17 And my -- they -- the reason my answer is
18 complicated is, again, because I'm not a lawyer. If
19 there's some distinction between, you know, that
20 being -- you know, the -- the preamble of the claim
21 here, whether that's an element or not, you know, it is
22 -- it is -- it is part of the claim language and, you
23 know, if that is considered an element, then it's -- you
24 know, then, yes, per my -- per my declaration, per my
25 understanding of the legal principles, a claim is

1 unpatentable as being anticipated, you know, if the
2 claim elements are found expressly or inherently within
3 -- you know, within the prior reference.

4 Q Let's move away from the preamble to element --
5 what you've labeled as element "c" --

6 A Uh-huh.

7 Q -- in Claim 1.

8 A Uh-huh.

9 Q At the end there, it says, "To treat overactive
10 bladder or incontinence." Do you see that?

11 A Uh-huh.

12 Q That's not the preamble; correct?

13 A Correct.

14 Q For a prior art reference to anticipate Claim 1
15 of the '742 patent, would it need to disclose the
16 received electrical stimulation to treat overactive
17 bladder or incontinence?

18 MR. DEIGHAN: Objection to the extent it
19 mischaracterizes the claim.

20 THE WITNESS: Could you -- could you say the
21 question one more time then.

22 BY MR. GERASIMOW:

23 Q Sure. For a prior art reference to anticipate
24 Claim 1 of the '742 patent, would it need to disclose
25 electrical stimulation to treat overactive bladder or

1 incontinence?

2 MR. DEIGHAN: Same objection.

3 THE WITNESS: You know, I -- if -- if we -- if
4 we read that specifically with respect to the exact
5 claim wording, then the -- the claim is unpatentable as
6 being anticipated if -- you know, if -- if all the
7 elements are found expressly or inherently within the
8 prior art reference. So, you know, the -- the question
9 you asked was -- you know, was slightly different from
10 the actual claim wording, you know, but, you know, that
11 principle of anticipation, you know, if -- if -- you
12 know, if worded with the exact wording of the claim
13 here, then that -- that principle of that -- of
14 anticipation is what applies.

15 Q So the wording of the claim as you've
16 reproduced here in Appendix A is "Such that the branch
17 directly receives the electrical stimulation to treat
18 overactive bladder or incontinence." Do you see that?

19 A Yes, I see it.

20 Q Did I read that correctly or incorrectly?

21 A "The branch delivering an electrical stimulus
22 from the electrical stimulator to the branch of the
23 posterior tibial nerve such that the branch" -- I --
24 I -- Claim 1.c as -- you know, as stated here, yes.

25 Q So is it an element of the claim or -- or not?

1 A 1.c, as written, is an element of the claim,
2 yes.

3 Q And a prior art reference would need to show it
4 in order to anticipate Claim 1?

5 A It would need to show it -- according to my
6 understanding of the legal principles, it would need to
7 show it expressly or inherently.

8 Q Earlier when we were discussing claim
9 construction, you mentioned plain and ordinary meaning
10 being applied in your analysis unless otherwise noted;
11 is that right?

12 A Uh-huh. Yes.

13 Q What's the plain in ordinarily mean- -- excuse
14 me.

15 What's the plain and ordinary meaning of
16 "directly" in Claim 1 as you applied it in your
17 analysis?

18 A So the -- the plain and ordinary meaning is
19 that you are stimulating with the intent of -- of having
20 an effect on that structure, and the distinction here is
21 many times in neuromodulation, you are -- you're
22 stimulating -- you know, you're stimulating one thing to
23 have an effect on something else. And, you know,
24 directly here the plain and ord- -- the plain and
25 ordinary meaning in neuromodulation is, you know, you

1 could -- you know, you could have -- you could have
2 something between you and the nerve. You know, you --
3 you necessarily have that because it's a non-invasive
4 technology. You know, you could -- you don't have to be
5 touching the nerve. You know, you -- you know, it
6 directly refers to the distinction between -- between
7 stimulating, you know -- you know, stimulating with the
8 intent of creating an effect in that structure and, of
9 course, that might have its own follow-on effect as
10 opposed to -- as opposed to indirectly.

11 You know, for instance, if I was stimulating
12 the vagus nerve to have a follow-on effect on some
13 distant brain network, then I would be directly
14 stimulating the vagus nerve whether I was here or here
15 or wherever. And I pointed to my neck and my chest.
16 And I -- and I would be having an indirect effect on the
17 brain thereby.

18 Q You referenced "intent" in your answer. What
19 do you -- what do you mean by "intent"?

20 A The -- so in -- in -- in the -- you know, in
21 the -- in the procedure that you are -- you know, in the
22 procedure that you're -- that you're doing -- you know,
23 in -- in your method of neuromodulation, in your method
24 of treating overactive bladder or incontinence, you
25 know, whatever you're -- whatever you're trying to

1 effect, you know, the -- you know, we're -- we're -- you
2 know, we're talking about a -- we're talking about a
3 method here and -- I'm -- I'm -- I'm trying to think
4 how -- how to further clarify -- how to further clarify
5 intent. And, you know, I guess the best way I can
6 phrase it is, you know, there are -- there are cases
7 where in neuromodulation you are stimulating one thing
8 to -- you know, to -- to have a -- you know, to have an
9 effect on another thing and there are cases where you
10 are stimulating a thing to have an effect on that thing
11 that -- you know, that -- that then, you know, may go --
12 you know, may go and propagate to something else.

13 And to clarify further, you know, if -- you
14 know, if I -- if I'm trying to -- you know, if I'm
15 trying to stimulate a nerve, you know, if it's -- you
16 know, if it's the -- you know, if it's the -- the --
17 like the radial nerve or posterior tibial nerve or what
18 have you, you know, if I'm -- you know, if I'm -- if I'm
19 positioning my electrode so that it has a -- a
20 neuromodulatory effect on -- on that nerve, then, you
21 know, by the action of electromagnetic fields on that
22 nerve, then that is direct stimulation.

23 If I'm stimulating a different structure and my
24 electromagnetic energy has an effect on that structure,
25 which then has some, you know, biological effect on

1 something else, you know, then -- you know, it -- let --
2 so -- so stepping back, direct stimulation is if I am --
3 if -- if I'm -- if I'm -- you know, in the case of
4 electrical stimulation or magnetic stimulation or
5 electromagnetic stimulation, if I am -- you know, if I'm
6 stimulating a structure and the electromagnetic energy
7 that I'm delivering is having an effect on that
8 structure, then that is direct stimulation.

9 Q In your work have you observed any examples in
10 which there's an intent to directly stimulate a
11 structure but for some reason the structure is not
12 stimulated?

13 A It is always possible to -- to position an
14 electrode -- you know, you -- you could position your
15 electrode in entirely the wrong place. You know, I
16 could -- if I was -- so if -- if your -- if your
17 electrode was -- if your electrode was entirely in the
18 wrong place and the energy you were delivering through
19 it was not having a neuromodulatory effect on that nerve
20 or structure, then it would not be having a direct
21 effect on that structure.

22 Q What if the electrodes were improperly placed but
23 the intensity of the stimulation were insufficient? Is
24 it possible in that situation not to stimulate the
25 intended structure?

1 A In that case, it is possible for it -- it's
2 possible for it to not have the -- if -- if the -- if
3 the field strength was too low, for instance, or if you
4 were too distant from it, it would be possible to have
5 -- it would be possible to not have the intended
6 therapeutic effect.

7 In -- in at least many cases, the -- there is a
8 real effect of subthreshold fields, and in many of those
9 cases, you would still be having a -- you know, some
10 kind of neuromodulatory effect if -- if the tissue is
11 receiving electromagnetic energy from -- you know, from
12 your -- from your electrode or transducer or whatever.

13 Q In that case there might be stimulation, but it
14 might be insufficient to achieve the intended
15 therapeutic effect?

16 A If you are -- if -- if you're -- if you're --
17 if you're amplitude of energy is too little or if you
18 are -- or if you are too distant or any of these
19 conditions such that -- such that the energy that's
20 received by the structure is too little to have the
21 intended neuromodulatory effect, then -- then, indeed,
22 you would be trying to stimulate but -- but not having
23 the intended effect.

24 Q Your answer referenced distance. Do I recall
25 that correct?

1 A Yeah. One of -- one of several ways that you
2 could not deliver enough electromagnetic energy to the
3 structure is, you know, by distance if you were too far
4 away or if you were -- if your amplitude was too low.

5 Q And with respect to that distance, it could be
6 the distance from the surface of the skin to the nerve
7 that's intended to be stimulated; right?

8 Let me --

9 A Yeah.

10 Q I'll withdraw my question.

11 A Yeah.

12 Q There might be two kinds of distance.

13 A Right.

14 Q I'm suggesting there might be one kind of
15 distance between the surface of the skin and the nerve
16 and there then might be just an overall distance between
17 the nerve and some other location on the body. And so
18 which of the two or both were you referring to?

19 MR. DEIGHAN: Objection. Form.

20 BY MR. GERASIMOW:

21 Q And -- and please feel free to use your own
22 language in your answer.

23 A Yeah. Yeah. So -- so any -- any
24 neuromodulation technology has a certain pattern of, you
25 know, electromagnetic fields that it creates and, you

1 know, if -- if you are -- you know, if -- if that
2 pattern doesn't overlap with your target such that it --
3 you know, such that it induces the desired
4 electromagnetic effects, then -- you know, then it is
5 indeed the case that you're -- you know, you're --
6 you're not going to have your intended neuromodulatory
7 effect. You know, but -- but that said, you know, we're
8 -- you know, we're -- we're talking here about -- we're
9 talking here about directly and the -- you know, as a --
10 as a -- as a -- as an analogy, you know, if I'm -- you
11 know, if -- if I -- if I'm trying to -- if I'm trying to
12 heat up water in my microwave, you know, there's many
13 inches between my transducer and my water and I've got a
14 cup and I've got a container and there's -- there's a
15 lot of things going on but, you know, I'm -- I'm still
16 -- you know, I am -- I am directly heating that water in
17 my microwave.

18 Q Claim 1 of the '742 also references the term
19 "noninvasively." Do you see that?

20 A Uh-huh.

21 Q Can you provide some examples of invasive
22 stimulation techniques?

23 A Yeah. Invasive stimulation techniques would
24 be, you know, for instance, an implantable pulse
25 generator. Implantable coils and transducers connected

1 to electrodes. You know, there is also a class of
2 technologies that you would call percutaneous or
3 minimally invasive that -- you know, where in general --
4 in general, noninvasively does mean -- it does mean
5 outside the skin.

6 Q Did you interpret noninvasively to mean not
7 breaking the skin in your analysis?

8 A So the -- in -- in the field -- in the field
9 the meaning of noninvasively is generally not breaking
10 the skin. Now, one thing that I will note is that in --
11 in the field of neuromodulation, there's a -- there's a
12 broad -- a broad overlap in -- you know, in -- in a
13 spectrum of, you know, noninvasive, minimally invasive,
14 fully invasive technologies and it's -- it -- it --
15 it's -- it's kind of a unitary field in that a lot of
16 the technologies that you would -- you know, you would
17 -- you know, you would apply in one of those domains are
18 -- are at the end of the day obvious to apply in -- you
19 know, in a -- in a -- you know, in -- in one of the
20 other domains. For instance, invasive to minimally
21 invasive or minimally invasive to noninvasive or
22 invasive to noninvasive.

23 Q Do you agree with the following statement:
24 "Implantable stimulation technologies require surgical
25 implantation of stimulation leads"?

1 A Could you say it one more time.

2 Q Sure. "Implantable stimulation technologies
3 require surgical implantation of stimulation leads."

4 A So there are implantable technologies that do
5 not require implantation of leads. You know, for
6 instance, there are -- you know, there are types of
7 implantable pulse generators that -- that don't have any
8 leads and just have electrode contacts on those IPG's or
9 implantable pulse generators. You know, also -- you
10 know, to the extent that -- you know, to the extent that
11 "surgical" is in that sentence, there are implantation
12 technologies that are, you know, arguably not surgical
13 but, you know, are -- you know, are percutaneous, you're
14 injecting something, other ways of getting something to
15 the body.

16 Q In the case of the implantable pulse generators
17 without leads that you mentioned --

18 A Uh-huh.

19 Q -- those would still be implantable within the
20 body; is that right?

21 A If it's an implantable pulse generator, then it
22 would -- it -- it would be implanted in the body with
23 yet another caveat. There are -- there are many cases
24 in the field where, you know, you might be -- you might
25 be doing a -- a trial for a given patient of a certain

1 type of stimulation and you would -- you know, you would
2 use an externalized implantable pulse generator. You
3 know, in other words, you'd have the leads -- you'd have
4 the leads implanted and externalized to the body then
5 and then you would plug in a stimulator outside the
6 body.

7 Q You had mentioned that maybe not all
8 implantation would be performed surgically. What were
9 the other methods that could result in implantation?

10 A There's various percutaneous and injectable
11 sorts of approaches. Those are -- you know, they are --
12 you know -- you know, that -- I wouldn't -- I wouldn't
13 call that surgery. You know, nonetheless, it's -- you
14 know, it's -- approaches like that you would still be
15 putting something inside the body.

16 Q Would you agree with the following statement:
17 "Percutaneous stimulation techniques are less invasive
18 than implantable stimulation techniques but still
19 require the stimulation electrodes to pierce the skin"?

20 A So, by definition, percutaneous means that
21 electrodes are -- or, something is piercing the skin.
22 So if I heard that correctly, I -- I feel strongly about
23 agreeing precisely so --

24 Q I'll read it again.

25 A -- read it one more time, please.

1 Q Sure. "Percutaneous stimulation techniques are
2 less invasive than implantable stimulation techniques
3 but still require the stimulation electrodes to pierce
4 the skin."

5 A Yes, with -- you know, yes, with -- with a few
6 caveats. You know, as in there are -- you know, there
7 are types of neurostimulators that could be implanted
8 percutaneously that -- that don't have leads. The --
9 the electrode is -- the electrode would be on the body
10 of the neurostimulator, but yes -- yes, the -- you know,
11 the percutaneous is less invasive than -- than, you
12 know, a full on surgical implant but still requires
13 something to pierce the skin.

14 Q Do you agree with the following statement:
15 "Implantable technologies are less desirable due to
16 their invasiveness"?

17 A I do not agree with that. There are -- it's
18 different for virtually every patient and every
19 disorder. The -- there are -- you know, there are many
20 cases where the -- the -- the treatment effect or the
21 patient compliance is better with an implantable
22 technology. There are many cases where the safety and
23 acceptability and, you know, many other reasons are
24 preferred with a minimally invasive or a noninvasive
25 technology.

1 Q This is the last one. Do you agree with the
2 following statement: "Implantable technologies are less
3 desirable because they can require the continued or
4 routine attention of specialists"?

5 A There are -- you know, there are some patients
6 and cases where that is true and some where it's not.
7 So I -- I don't agree with it in a blanket sense. There
8 are -- you know, there are cases where -- you know,
9 yeah. You know, there's -- there's cases where, you
10 know, fundamentally you might want to use something
11 implanted and, you know, you accept the fact that it
12 requires specialized programming, you know, because
13 you're achieving a clinical effect that you couldn't
14 otherwise or you are in a patient -- or, a patient
15 population where -- you know, where what's desired is a,
16 you know, treat this and go home rather than requiring
17 somebody to -- you know, to -- to regularly use a -- a
18 noninvasive device, for instance.

19 Q You had mentioned before in one of your
20 answers, I believe, the notion of a trial on a patient.

21 A Uh-huh.

22 Q What were you referring to there?

23 A So in that particular case -- and it -- and
24 it's different from a clinical trial. The -- the type
25 of trial I was referring to there is there's a --

1 there's a type of case, you know, for instance, in -- in
2 spinal cord stimulation for pain where some people
3 respond and some people don't, and at the end of the
4 day, you don't necessarily want to implant somebody who
5 may not be a responder. So you put an electrode
6 where -- you know, you put an electrode in the spinal
7 cord, which you can do fairly easily, and before you
8 implant a big expensive pulse generator, you run the
9 leads outside the body and you attach a stimulator. And
10 then you -- a patient goes for "X" number of days to --
11 to see whether that treatment is going to work and then
12 you make the decision, you know, is this going to be a
13 long-term treatment for this patient or not.

14 Q So you had -- you had mentioned clinical
15 trials. My -- my understanding of the situation you're
16 describing here with a trial is with respect to a given
17 patient to see if they will respond to --

18 A Yeah.

19 Q -- the treatment?

20 A Yeah. And it's called -- it's called -- it's
21 called a trial stimulation. But just to be clear,
22 it's -- you know, it's different from a clinical trial
23 situation.

24 Q And to be clear, some patients in your example
25 don't respond to treatment?

1 A Yeah. Some patients -- every -- every
2 physiology is different. You know, every -- you know,
3 every brain is different. Every, you know, nerve plexus
4 is different. So some patients for -- you know, for
5 many different reasons don't respond.

6 Q You had mentioned clinical trials. What's the
7 -- what's the difference? What were you referring to as
8 clinical trials?

9 A So a clinical trial is -- it's -- it's an
10 experiment where you are trying in some, more or less,
11 controlled way to -- to figure out what the effect of an
12 intervention is. So, you know, there are -- you know,
13 in -- in -- in general, you know, if you do that in one
14 or two people, it's a case study. If you do it in
15 enough people to figure out some, you know, bulk effect,
16 then -- you know, that -- most people would call that a
17 clinical trial. You know, you could have a
18 placebo-controlled trial where you deliver a fake
19 intervention and you keep people blinded and measure the
20 effect. You could have an open-label trial where
21 everybody knows they're getting the treatment and you --
22 you know, you follow them, you know, to -- to observe in
23 that naturalistic setting how well things work. You
24 know, that -- that kind of thing is a clinical trial.

25 Q In the field of neuromodulation, how long do

1 clinical trials take?

2 A So often clinical trials can take a very long
3 time because the -- the -- the goal -- the goal at the
4 end of the day is to collect a lot of data about the
5 treatment. However, in many cases in neuromodulation it
6 takes very little time to -- to see the effect of the
7 treatment. You know, for instance, in the brain
8 stimulation for Parkinson's disease, you know, or -- you
9 know -- you know, radial nerve stimulation for -- for
10 essential tremor, you know, you can turn on the device
11 and you can -- you can see an effect right then and
12 there and it happens very quickly.

13 So the -- the primary evaluation period in that
14 clinical trial might be fairly short. There are --
15 there are other disorders -- epilepsy is one of them --
16 where the effect takes longer to see. So it -- it --
17 you know, the -- the -- the answer depends on the
18 disease and kind of exactly what you're trying to
19 measure.

20 Q All right. So with Parkinson's, you had said
21 short. How -- how long is short for a clinical trial?

22 A Well, you know, as I said, the -- the trial
23 itself would -- would take years because you're -- you
24 know, you're trying to -- you know, you're enrolling
25 many patients doing -- doing surgeries, following those

1 patients for a long time, but the assessment of
2 effectiveness for any given patient could happen very
3 quickly. You know, you -- you can -- in Parkinson's,
4 you could implant somebody and turn the device on and,
5 you know, they -- you know, they -- when -- when -- you
6 know, when they're -- you know, when they -- when they
7 get out of their anesthesia, you know, they're -- you --
8 you turn it on and they're just better right then and
9 there.

10 Q And for other neurolog- -- neuromodulation
11 therapies such as those directed to epilepsy, it may
12 take longer to observe the therapeutic effect?

13 A Yeah. In -- in -- yeah. Yes. Yeah, there's
14 -- yeah. Neural systems or systems that change over
15 time and sometimes it takes longer to have an effect.

16 Q Are there any neuromodulation technologies in
17 use today that are only effective when accomplished by
18 an implantable device?

19 A There -- there's -- there's often a spectrum of
20 effectiveness and there's a -- you know, at -- at
21 certain points in the field, there's -- yeah, there's
22 something on one side or the other of the invasiveness
23 divide that might be FDA approved or not. But in the --
24 in the -- in the literature and in the field, there --
25 you know, there -- there -- in general, there is a --

1 there's a -- a -- a healthy mix of work being done, you
2 know, with at least some positive results on both sides
3 for an indication.

4 And let me -- let me give you an example. So
5 in -- in Parkinson's disease, the -- the clinical
6 standard for neuromodulation for Parkinson's disease is
7 implanted subthalamic nucleus deep brain stimulation.
8 However, there is a -- you know, there's a -- there's a
9 healthy body of long-standing literature with peripheral
10 and noninvasive -- with noninvasive peripheral and
11 noninvasive brain stimulation methods for Parkinson's as
12 well.

13 Q Can you turn to Appendix C in your declaration.
14 It's your C.V.

15 A Yeah.

16 Q This is -01375 case.

17 A Yep.

18 Q Looking at your C.V. now -- I know this was
19 submitted some time ago -- do you have any updates to
20 your experience?

21 A Yes. So in -- on August 30th of last year, I
22 started a full-time role at NeuroPace. We make an
23 implantable responsive nerve stimulator for epilepsy. I
24 am the Vice-President of Research and Development
25 managing product development and advanced research

1 across electrical mechanical data software and
2 collaborate on clinical.

3 Q Are you still Founder and Managing Engineer at
4 LT2 Labs?

5 A That LLC still exists, but I -- I am -- I have
6 greatly stepped down my -- my consulting because now my
7 primary role is full time as VP of R&D for NeuroPace.

8 Q Was the consulting work you did on this matter
9 provided through that corporate entity?

10 A I believe -- I believe my -- I'm actually
11 trying to recall. I believe my billing was through my
12 LLC, which is how I do my consulting. It's a
13 single-member LLC.

14 Q Okay. Can you go back to Exhibit -- I'm sorry
15 -- Appendix B in your declaration.

16 A Yes. Same dec?

17 Q Yes, please.

18 MR. DEIGHAN: We can get you an updated
19 curriculum vitae if you want.

20 MR. GERASIMOW: Sure. We'll request it. Thank
21 you.

22 THE WITNESS: All right. Appendix B.

23 BY MR. GERASIMOW:

24 Q Do you have your materials considered in front
25 of you?

1 A Yes.

2 Q Did you consider any Avation medical patents as
3 part of your review?

4 A I did not consider any Avation patents as part
5 of my review.

6 Q I'd actually like to go back to your C.V.

7 A Yep.

8 Q I apologize for the switching around. And, in
9 particular, can you go to page 152.

10 A Yep.

11 Q You list a reference on there with the first
12 author of Drazkowski?

13 A Yep.

14 Q Do you see that?

15 A Yes.

16 Q It's entitled "Total charge delivered with
17 responsive neurostimulation correlates with degree of
18 seizure reductions." Do you see that?

19 A Yes.

20 Q This study of yours indicates that the total
21 charge delivered by a responsive neurostimulation device
22 is positively correlated to the degree of seizure
23 reduction achieved; is that right?

24 A Yes. That is -- that is the title and the
25 caveat is it's been 20 years, but -- but yes.

1 Q And this finding suggested to you that
2 responsive neurostimulation devices were more effective
3 when they delivered more electrical stimulation; is that
4 right?

5 A So the -- let me -- let me rephrase that being
6 an author of the paper.

7 What we looked at there -- so that technology
8 is responsive neuromodulation, meaning the -- meaning
9 the device is monitoring for abnormal activity. It is
10 choosing when to stimulate and, you know, preferentially
11 stimulating the abnormal activity. And in that device
12 there are about 600 parameters that control what it
13 responds to and how often it does so.

14 So that -- so -- so that analysis, if I recall
15 correctly, noted that if you configure that device such
16 that it is delivering somewhat more energy per
17 stimulation and somewhat more stimulations and we bundle
18 those two together into total charge to sum that up,
19 then in -- in -- that in those epilepsy patients, that
20 correlated with -- with more seizure reduction.

21 Q You had mentioned bundling -- bundling up
22 something. Can you -- can you elaborate on that,
23 please?

24 A So, you know, in -- in that -- you know, in
25 that -- in that very complex treatment delivered by a

1 complex device, there are many ways to -- there are many
2 ways to quantify how much treatment was being delivered.
3 One of those ways is how many times is the device
4 stimulating? Another one of those ways is what is the
5 -- what is the current? What is the number of pulses?
6 What is the -- you know, what's the pulse width? You
7 know, what's the -- how many coulombs are being
8 delivered per pulse.

9 For that study -- for that study, we -- we
10 merged all of those, you know, potential ways to
11 quantify that particular stimulation, you know, by -- by
12 describing the total amount of charge that was delivered
13 to -- to that patient. I don't recall whether it was
14 per day or per month or per -- per programming or what
15 have. You, but that -- that's my recollection.

16 Q So total charge per unit of time can be
17 increased by increasing either or both the time -- the
18 number of times and the duration of treatment while
19 holding, let's say, voltage and current constant
20 throughout those treatments?

21 MR. DEIGHAN: Objection to form.

22 THE WITNESS: So there are -- there -- there
23 are many ways to increase total charge. You could
24 increase total charge by delivering more pulse trains,
25 more pulses, longer pulse width, greater amplitude.

1 You mentioned current and voltage, and one
2 important thing is that those are -- have necessarily
3 linked by Ohm's Law. So if you are -- if you are -- you
4 know, you're -- if you're -- if you're changing the
5 amplitude and increasing the total charge that way, then
6 you're -- you know, you're -- you might have an
7 electrical system that -- that increases current and
8 thereby the voltage increases or you can have a system
9 where increase voltage and thereby the current changes.

10 Q Or you could have a system where voltage and
11 current are constant but are applied more frequently;
12 correct?

13 A You could also -- you could also increase total
14 charge by having the same amplitude properties, which
15 I'm using to say voltage and current, but -- but
16 applying -- applying that more frequently, yes, that
17 would increase total charge.

18 Q Sticking at least with your biography, can we
19 go to paragraph 8 of your declaration.

20 A Uh-huh.

21 Q This is -01375.

22 A Yep. Here we go.

23 Q In paragraph 8, it says that you worked as a
24 clinical scientist to lead analysis of incoming data.
25 Do you see that?

1 A Yes.

2 Q Did that include the analysis of data to
3 determine the therapeutic efficacy of the
4 neurostimulator at issue?

5 A Yes. Part of that was analyzing incoming
6 device and patient data to understand and optimize the
7 effect of the treatment.

8 Q What types of analytical techniques did you
9 employ to make that determination?

10 A The -- so a -- a very broad range and let me --
11 so let me try to summarize. Broadly speaking, in that
12 project, as with many, there are a few -- a few key
13 sources of data about what's going on with the device
14 and the patient. So some of the -- some of the sources
15 of data and techniques that we used -- for instance, we
16 looked at outcomes. You know, at the end of the day,
17 you know, you're trying to have an effect on the disease
18 and, in this case, it was seizures so we looked at -- we
19 looked at seizure counts, you know, which is -- you
20 know, that's your -- that's your gold standard clinical
21 outcome.

22 In projects like this, you also often have --
23 you have data that is gathered by the device that you
24 can use as biomarkers. So, you know, which in some
25 cases help you resolve things better or faster than

1 looking at your clinical outcomes.

2 So in this case -- in this case we used
3 biomarkers of -- of electrographic effects after
4 stimulation. We looked at those near the electrodes,
5 more distant from the electrodes, at other electrodes.
6 We looked at, you know, episodes of abnormal activity
7 that were detected by the device -- we call those long
8 episodes -- and established that those were a biomarker
9 predicting clinical effect. And then, you know, again,
10 broadly speaking, you know, with those outcome measures
11 and proxy outcome measures, we did many statistical and
12 descriptive analyses to -- to determine, you know, which
13 parameter sets and which configurations in which
14 patients on what medications would have the greatest
15 positive effect on the -- both clinical outcomes and the
16 proxy things that we were looking at like -- you know,
17 like electrographic outcomes and device detections.

18 Q Did you do this analysis alone or was it part
19 of a team?

20 A It was part of a -- a -- it was part of a team.
21 You know, there were -- I don't -- I don't recall the
22 exact -- everybody was cross-functional. I don't recall
23 the exact size of the team. But, you know, the company
24 was probably about 80 people at that point and, you
25 know, there were probably, you know, 10 of us engaged in

1 looking at this data.

2 Q How much time of yours did this data analysis
3 consume?

4 A For a -- you know, for a -- for a couple of
5 years, that -- you know, that analysis was -- you know,
6 it probably -- it -- it took more than -- took more than
7 40 hours a week. You know, there are many other points
8 in that project and in my career where -- you know,
9 where I -- where I've spent much more time on the -- you
10 know, on the product development and engineering side of
11 things, but at some points I was very, very deeply
12 involved, indeed, in that -- in that data analysis.

13 Q We've been going for a little more than an
14 hour. Do you want to take a break?

15 A I'm --

16 MR. DEIGHAN: I could use a break if you -- if
17 you don't mind.

18 THE WITNESS: All right. Let's take a break.

19 (Recess.)

20 BY MR. GERASIMOW:

21 Q Welcome back from the break.

22 A Yep.

23 Q I'm handing you what was marked as Exhibit 1084
24 in both the -01375 and -01378 proceedings.

25 A Yep.

1 (Exhibit Number 1084 was previously
2 marked for identification.)

3 BY MR. GERASIMOW:

4 Q This is the -- the Mann patent; correct?

5 A Yes. And -- excuse me -- this is where the
6 witness gets his reading glasses.

7 Q Great. Can you turn to Column 9, line 38, of
8 Mann. Do you have it in front of you?

9 A Yes.

10 Q It says there: "What is needed are ways to
11 effectively use implantable stimulators to chronically
12 stimulate the pudendal nerve and its branches directly,
13 for treating incontinence and/or pelvic pain."

14 Do you see that?

15 A Yes.

16 Q Mann saw a need in the art for ways to
17 effectively use implantable stimulators to chronically
18 stimulate the pudendal nerve and its branches directly,
19 for treating incontinence and/or pelvic pain; correct?

20 A That is what Mann says here. Mann says, you
21 know, what is needed are ways to effectively use, et
22 cetera, et cetera, yes.

23 Q The pudendal nerve is the main nerve of the
24 perineum; correct?

25 A Yeah. I -- I'm -- I'm not a anatomist or

1 physician. You know, my understanding is the pudendal
2 nerve innervates the perineum and, you know, so -- so
3 with that -- with that caveat, yes.

4 Q The pudendal nerve has multiple branches;
5 correct?

6 A With that same caveat, you know, that --
7 that -- that's my understanding. A lot of this anatomy
8 often gets, you know, very complex and -- and varied
9 across patients.

10 Q The urethra branch is a branch of the pudendal
11 nerve; correct?

12 A You know, not being -- you know, I -- I am -- I
13 am -- I am not an expert in perineal nervous anatomy,
14 you know, so I -- to -- to confirm that -- to confirm
15 that I'd have to look through the reference. You know,
16 it sounds -- it sounds reasonable, but I'm not -- I'm
17 not an expert on the urethral nerve.

18 Q Sitting here today do you know whether the
19 urethral nerve is a branch of the pudendal nerve?

20 A Sitting here today I do not know if the
21 urethral nerve is a branch of the pudendal nerve.

22 Q What about the inferior -- excuse me.

23 What about the inferior rectal branch? Isn't
24 that a branch of the pudendal nerve?

25 A Again, you know, not being a -- you know, not

1 being an expert in -- in the neuroanatomy, my -- my
2 understanding is that the -- is that the branches of
3 the -- the pudendal nerve innervate a number of things
4 in the perineum, but I -- you know, without specifically
5 looking for it in these references, I -- I -- I can't --
6 you know, I'm -- I'm not going to swear to the -- the
7 rectal nerve being -- you know, being a branch of the
8 pudendal nerve. I -- it's -- you know, the -- the --
9 it's a strong caveat. You know, I'm not an anatomist of
10 the perineum.

11 Q Same question as to the dorsal nerve of the
12 clitoris or penis. Is that a branch of the pudendal
13 nerve?

14 A My -- my -- my answer -- my answer would be the
15 same. You know, I'm -- I'm seeing here that -- you
16 know, I'm seeing here that Mann -- I'm seeing here that
17 Mann talks about -- excuse me. I see here that Mann
18 talks about the electrical stimulation of the pudendal
19 nerve. You know, Mann is talking about, you know,
20 stimulation of the dorsal nerve of the penis, dorsal
21 nerve of the clitoris, leading to bladder inhibition.

22 You know, my -- my -- my -- my -- my caveats
23 are coming from, you know, not being -- so, you know,
24 yeah. You know, as I have -- you know, specific --
25 specifically looking through the reference here, you

1 know, I -- let -- just -- just give me a second to, you
2 know, again, not -- you know, not being an anatomist,
3 I'm just looking at the reference to -- to refresh my --
4 my memory of the perineal and pudendal nerve anatomy.

5 Q While you keep searching, can I direct your
6 attention to the last line of Column 7 and first line of
7 Column 8.

8 A I will put my searching on hold to -- to come
9 over here to the -- ah, here we go. This is -- this
10 is -- "Distal branches of the pudendal nerve lead to the
11 anal sphincter, the perineum, the urethral sphincter,
12 the penis, the vagina, the glans, the clitoris" -- I --
13 I see that sentence, yes.

14 Q So having seen that sentence in Mann, is it
15 your view that the urethral nerve is a branch of the
16 pudendal nerve?

17 A Assuming that is the nerve that goes through
18 the -- that goes to the urethral sphincter, then, yes,
19 that would be -- that would be a branch of the pudendal
20 nerve.

21 Q Is the posterior tibial nerve a branch of the
22 pudendal nerve?

23 A My understanding is that the posterior tibial
24 nerve is -- it -- it projects to the same -- the same
25 sacral nerve structures at S3, S2, and S4 as the -- as

1 the pudendal nerve does, you know, with -- with the
2 ongoing caveat that I'm not a neuroanatomist. I -- I
3 believe the -- the tibial nerve is a -- is a -- is not a
4 branch of the pudendal nerve.

5 Q In one of your earlier answers, you had used
6 the term "innervation."

7 A Uh-huh.

8 Q Is that a "yes"?

9 A Yes, I had use the term "innervation."

10 Q What does the term "innervation" refer to?

11 A Innervation means that a nerve is -- you know,
12 a nerve goes to a structure. It provides either neural
13 input to that structure or receives sensory or other
14 input from that structure or both.

15 Q Okay. Can you turn to Column 10 of the
16 reference --

17 A Yes.

18 Q -- Mann reference and, in particular, the
19 paragraph starting at about line 17.

20 A Yep.

21 Q And it says that "It is a feature of some
22 embodiments of the invention to meet one or more of the
23 above-identified objects of the invention using
24 stimulation systems and methods for chronically
25 stimulating the pudendal nerve and/or its branches

1 directly, rather than indirectly by sacral nerve
2 stimulation." Do you see that?

3 A Yes.

4 Q How do you understand the difference and
5 distinction that Mann is drawing between direct
6 stimulation of the pudendal nerve and/or its branches
7 and the indirect stimulation of the sacral nerve?

8 A So I think this is consistent with my -- it's
9 consistent with my, you know, previous discussion of
10 what is direct. And, you know, if you are -- if you are
11 -- if -- if you're stimulating such that the -- that the
12 electromagnetic energy that you're delivering is having
13 a neuromodulatory effect on that structure, then you are
14 -- then you're directly stimulating it. If you -- you
15 know, if by contrast -- if you are stimulating a
16 different structure so that your electromagnetic energy
17 has an effect -- has a neuromodulatory effect on that
18 structure and then there's a follow-on effect on a
19 different structure, then by contrast to that would be
20 indirectly.

21 Q Mann discloses the direct stimulation of the
22 pudendal nerve and its branches; correct?

23 A I believe Mann discloses the -- among other
24 things, the direct stimulation of the pudendal nerve
25 and/or its branches.

1 Q Can you go to Column 11 in the Mann reference.

2 A Yep.

3 Q In the second paragraph -- sentence, that
4 paragraph beginning at line 43 at Column 11, it says,
5 "Direct stimulation of the pelvic floor nerves bypasses
6 the potential recruitment of other unrelated nerve
7 groups at the sacral roots." Do you see that?

8 A Yes.

9 Q How do you understand that sentence in Mann?

10 A Well, so my understanding of that is that at
11 the sacral roots, you know, those are -- those are
12 higher level structures in -- in the nervous system.
13 There are more things -- you know, more signals flowing
14 through those structures, and if you're -- if you're --
15 you know, if you're -- if you're thinking about how do
16 you stimulate to maximize a desired effect and minimize
17 other effects, then, you know, you -- you know, you --
18 you may want to stimulate in a way that -- that -- that
19 -- you -- you may want -- you may want to stimulate in a
20 way that -- for instance, if you were stimulating the
21 sacral roots themselves, you would be stimulating a
22 bunch of unrelated things and having potentially
23 undesired effects in addition to your -- your desired
24 effect.

25 Q Can you enumerate examples of such undesirable

1 effects?

2 A So there's a -- you know, with -- you know,
3 with any stimulation like this, there's a broad class of
4 potential undesirable effect that might be -- it might
5 be sensation. It might be -- you know, it might be
6 pain. It might just be an unpleasant sensation. You
7 know, with a -- with a densely innervated structure, you
8 know, you might also have, you know, other effects on --
9 you know, on -- on -- you know, undesired effects on
10 other perineal structures. You may have -- you know, if
11 you stimulate at higher amplitude, you may have
12 undesired motor effects, but in -- in most cases in the
13 field, it's -- you know, it's a -- it's a -- it's a
14 undesirable sensation.

15 Q Is a decrease in the efficacy of the therapy
16 possible when there is the recruitment unintentionally
17 of other nerve groups?

18 A So -- so speaking -- speaking generally for the
19 field -- excuse me -- often -- you know, often what
20 you're trying to do is you're trying to -- you're trying
21 to maximize the energy that you can deliver and the
22 effect that you can ultimately have on -- you know, on,
23 you know, the -- the -- the bladder or the sphincter or,
24 you know, whatever your -- you know, whatever your
25 treatment effect ultimately is, and one of the primary

1 limitations in doing so is -- you know, is undesired
2 sensations or, you know, other -- other adverse effects.

3 And, you know, for instance, with -- you know,
4 with -- you know, with -- with -- with stimulation for
5 -- for tremor, you -- you know, you -- you basically
6 turn things up. You know, you turn things up as -- as
7 far as you can until you get paresthesias, you know,
8 undesired sensations.

9 So, you know, the -- the nervous system is
10 complex. There -- there may be cases where -- where the
11 undesired effects actually -- actually decrease the
12 effect of stimulation, but normally what you seek in the
13 field is you are -- you're -- you're -- you're trying to
14 -- you're trying to minimize -- you're trying to
15 minimize other effects so you can -- so you can maximize
16 the -- the therapeutic effect without having it be
17 uncomfortable for somebody.

18 Q Can you advance to Column 12 in the Mann
19 reference --

20 A Yep.

21 Q -- and, in particular, the paragraph starting
22 at line 42.

23 A Yep.

24 Q It begins "Another preferred stimulation
25 location." Do you see that?

1 A Yep.

2 Q Why don't -- why don't you review that
3 paragraph at Column 12, line 42 to line 54.

4 A Uh-huh.

5 Q Please let me know when you're finished with
6 your review.

7 A (Reviewing document.)

8 Yep.

9 Q Mann explains that the tibial nerve is
10 relatively easily accessible at two sites in the leg;
11 correct?

12 A That is -- that is what Mann describes.

13 Q One of those sites is the level of the ankle;
14 is that right?

15 A Yep, that's what Mann says.

16 Q And then the other is the level of the knee; is
17 that right?

18 A That is what Mann says, yes.

19 Q Mann also says that other sites along the
20 tibial nerve are not as easily accessible as the two
21 sites I just mentioned; is that right?

22 A Mann does say that and then they go on to say
23 that -- that they're also acceptable -- excuse me --
24 acceptable stimulation sites.

25 Q Can you please clarify that once you have a

1 moment.

2 A Yeah. Just the -- the -- excuse me -- Mann
3 does say that other sites are not as easily accessible
4 but, you know, for context, the full sentence is "Other
5 sites on the tibial nerve, although not as easily
6 acceptable, are acceptable stimulation sites."

7 Q Right. So Mann explains that other sites along
8 the tibial nerve are not as easily accessible; correct?

9 A Mann literally says that, yes, other sites
10 along the tibial nerve are not as easily accessible.

11 Q Does Mann express a preference between more
12 accessible or less accessible spots along the tibial
13 nerve?

14 A So, you know, I think -- you know, I think in
15 that -- you know, in that -- in that sentence in -- in
16 this paragraph, Mann is -- Mann is implying a
17 preference. You know, primarily Mann is saying a
18 preferred stimulation location is the tibial nerve and
19 then Mann goes on to describe the -- you know, the more
20 easily accessible parts of it. You know, that's the --
21 the -- the desired site in many cases might depend on --
22 on a whole constellation of factors. You know, there's
23 -- there's -- there's accessibility to a -- there's
24 accessibility to a -- you know, to a -- an implantable
25 approach. There's accessibility to a noninvasive

1 approach. There's, you know, wherever you can get a
2 catheter to. You know, if you're doing percutaneous,
3 there's -- you know, if you're doing implantable
4 technology. There's -- you know, where -- where's a --
5 you know, where's an appropriate spot to implant this
6 where -- you know, where somebody's not going to be able
7 to -- you know, to twiddle the leads back and forth.
8 You know, there -- there's -- you know, I -- and folks
9 in the field view it, you know, as -- as more of a --
10 you know, it's -- it's a little more of kind of a
11 wholistic product decision when it comes down to an
12 individual technology.

13 But, you know, for purposes of this paragraph,
14 you know, Mann -- Mann is saying -- you know, Mann is
15 saying that, you know, for -- you know, in -- you
16 know -- you know, Mann is saying that, you know, there
17 are sites along the tibial nerve that are -- that are
18 more accessible than others.

19 Q And in any case, though, Mann is describing an
20 implantable microstimulator; correct?

21 A Mann is describing an implantable
22 microstimulator, yes.

23 Q Does Mann go over any of those factors you had
24 mentioned in -- anywhere in its disclosure?

25 A So, you know, I think it's -- it's important to

1 point out here that the -- you know, the -- the levels
2 of invasiveness fully implanted, minimally invasive,
3 noninvasive, you know, Mann -- Mann's core technology,
4 you know, is -- it's the -- it's the -- it's the Mann
5 Institute BION. You know, it's a -- it's an implantable
6 microstimulator, you know, but it's -- it's important to
7 note that, you know, in -- in the field of
8 neuromodulation -- you know, all -- all -- all these
9 things exist on a spectrum and you might -- you -- you
10 might -- you might very easily take -- you know, take
11 the learnings of Mann and apply all this to minimally
12 invasive stimulation or to noninvasive stimulation.

13 Q Does Mann make that suggestion?

14 A I would -- so I would have to look through the
15 -- I'd have to -- I'd have to do a closer read of Mann
16 right here in front of me or remind myself of whether
17 Mann does to be sure -- that's the caveat here -- but I
18 think the -- the important -- the important point here
19 is that, you know, what -- what Mann discloses here for
20 -- in the context of implantable microstimulator
21 stimulation is -- is concepts that, you know, for a
22 person of skill in the art at the time, you know, would
23 -- it would make that obvious to apply to, you know,
24 both -- both percutaneous and noninvasive approaches.

25 Q Can you look at FIG. 3 of the Mann reference.

1 A Yes.

2 Q In FIG. 3, item No. 10 is the microstimulator;
3 correct?

4 A I'm not -- I -- I believe so. I've got to look
5 at the figure legend, but I believe that is the
6 microstimulator.

7 Q Please check and confirm.

8 A Yeah. Yep, micro- -- 10 is the
9 microstimulator.

10 Q Is the -- is the medial malleolus a nerve?

11 A The medial malleolus is part of the -- part of
12 the ankle anatomy. I believe it's the -- kind of, you
13 know, one of the bony projections on the ankle. You
14 know, again, not a -- not a -- not an anatomist, but
15 a -- it's -- a medial malleolus is not a nerve
16 structure.

17 Q Is the posterior tibial artery a nerve
18 structure?

19 A No, definitely not.

20 Q What the posterior tibial vein?

21 A No.

22 Q What about the popliteal fossa, is that a nerve
23 structure?

24 A It is -- it -- it is not itself a nerve
25 structure. It's the -- it's the kind of hollow -- you

1 know, the hollow nature of the back of the knee.

2 Q And is the popliteal artery a nerve structure?

3 A No.

4 Q What about popliteal vein?

5 A No.

6 Q Returning to that paragraph -- no. I'll --
7 I'll withdraw that question. You can set aside the --
8 the Mann reference.

9 A Yep.

10 Q I'm handing you what's been marked as
11 Exhibit 1080 in both of the patent proceedings. It's
12 the Boveja reference.

13 A Yep.

14 Q Do you see that?

15 A Yep.

16 (Exhibit Number 1080 was
17 previously marked for
18 identification.)

19 BY MR. GERASIMOW:

20 Q You have Boveja in front of you?

21 A Yes.

22 Q You -- you had mentioned the sacral nerves
23 earlier in your testimony; is that right?

24 A Yes.

25 Q The sacral nerves are the five pairs of spinal

1 nerves which exit the sacrum at the lower end of the
2 vertebral column; correct?

3 A Yes, to the -- to the best of my -- to the best
4 of my knowledge, yeah.

5 Q I know I just gave you Boveja, but if we could
6 return to your declaration in the 1075 [sic] matter for
7 a second.

8 A Yeah.

9 Q And, in particular, paragraph 46 of the
10 1075 [sic] declaration.

11 A Yep.

12 Q The sacral region of the spinal cord is located
13 at the bottom of the spine; correct?

14 A Yes.

15 Q And the bottom of the spine is made up of the
16 sacrum and the coccyx; is that right?

17 A Yes. Yeah.

18 Q Can you go to paragraph 48 of your declaration.

19 A Yep.

20 Q There's a figure included in paragraph 48 of
21 your declaration; correct?

22 A Yes.

23 Q And in this figure, the -- it depicts nerves
24 originating in the sacral and lower lumbar regions of
25 the spinal cord; is that correct?

1 A Yes.

2 Q If you could turn to paragraph 50 of your
3 declaration.

4 A Yep.

5 Q In paragraph 50 you explain that the posterior
6 tibial nerve is a branch of the sciatic nerve and
7 contains nerve fibers originating from the L4, L5 lumbar
8 nerve roots and the S1, S2, and S3 sacral nerve roots.
9 Do you see that?

10 A Yes.

11 Q Does the posterior tibial nerve contain
12 neurofibers originating from the L1 lumbar nerve root?

13 A Yeah. My understanding, being, you know, not
14 an anatomist, is that the posterior tibial nerve
15 contains nerve fibers from L4 through S3 and therefore
16 -- and therefore does not contain nerve fibers from L1.
17 Neuroanatomy is always complicated, but that's -- the --
18 the -- the tibial nerve is, you know, essentially --
19 essentially coming from L4 through S3.

20 Q So understanding that you're not an expert in
21 anatomy, it's your understanding that the posterior
22 tibial nerve does not contain neurofibers originating
23 from the L1 lumbar nerve root; correct?

24 A That is my understanding with the caveat that
25 often in -- often in neuroanatomy, you know, one is --

1 one is surprised by a few fibers from one place turning
2 up at another place. So -- but the -- the -- the
3 conventional picture of anatomy is that -- you know, the
4 -- and I -- and I think the -- the simple answer is the
5 tibial nerve is nothing material is coming from L1 and,
6 you know, rather, it's coming from the -- the levels
7 that we described.

8 Q Is anything material coming from the L2 or L3
9 lumbar nerve roots?

10 A Not to my knowledge with the same caveat.

11 Q And what about the S4 and S5 sacral nerve
12 roots? Anything supplying the posterior tibial nerve
13 coming from either of those sacral nerve roots?

14 A With -- with -- with the -- you know, with --
15 with the same -- with -- with -- with the same caveat,
16 you know, I -- my -- my recollection of the neuroanatomy
17 is that there -- you know, there is somewhat more -- you
18 know, somewhat more potential overlap with S4, but, you
19 know, on -- on bulk you have things coming from -- you
20 know, coming from L4 through S3.

21 Q Does the figure you provided in paragraph 48 of
22 your 1075 [sic] declaration show anything coming from
23 the S4 sacral nerve root supplying the posterior tibial
24 nerve?

25 A That figure -- that figure does not show

1 anything coming from S4 to supply the tibial nerve.

2 Q You can set aside your declaration.

3 A Yep. Okay.

4 Q You're familiar with a condition by the name of
5 nausea; is that right?

6 A Yes.

7 Q Is vomiting a similar condition to nausea in
8 your view?

9 A Not being a -- you know, again, same caveat as
10 we've said many times. You know, not being a physician
11 here, you know, I would say that nausea is -- you know,
12 the -- the definitions of those are somewhat different.
13 Nausea is -- you know, nausea is a -- a sensation and,
14 you know, vomiting is the action of, you know, vomiting,
15 expelling your stomach -- expelling your stomach
16 contents, that -- you know, that's related to nausea but
17 not exactly the same as nausea.

18 Q Nausea often precedes vomiting; is that
19 correct?

20 A Yes.

21 Q Is stomach pain a similar condition to stomach
22 upset?

23 A Yeah, I think they are -- you know, again, it's
24 -- it's, you know, slightly different -- slightly
25 different terms with -- with surely slightly different

1 -- different meanings. Speaking not as a -- not as a
2 physician, you know, stomach upset is, you know, stomach
3 pain might be one type of stomach upset. You know --
4 you know, casually speaking, nausea might be another --
5 you know, another type of stomach upset.

6 Q Is motion sickness sometimes accompanied by
7 nausea?

8 A Motion sickness is sometimes accompanied by
9 nausea, yes.

10 Q Is -- does diarrhea often accompany stomach
11 upset?

12 A Speaking as a -- you know, not as a physician,
13 diarrhea might often accompany stomach upset. You know,
14 diarrhea is a -- it's an intestinal thing, you know, and
15 -- yeah, the -- the stomach is a different anatomical
16 structure, but it's possible for, you know, both the
17 stomach and your intestinal tract to be inflamed and,
18 you know, certainly a -- a layperson might say that they
19 had diarrhea because of stomach upset.

20 Q Is -- does dizziness sometimes accompany
21 nausea?

22 A Dizziness sometimes accompanies nausea. And
23 standard caveat with all these things, you know, is a --
24 you know, I'm not a physician, but dizziness -- you
25 know, dizziness often accompanies nausea.

1 A Yep. Yep. All right. I'm here.

2 Q And in paragraph 53, you quote Grey, a
3 particular portion of Column 2 thereof, in which the
4 traditional SP and BL acupuncture points are referenced.

5 Do you see that in your declaration?

6 A Yes.

7 Q The traditional SP acupuncture point refers to
8 the Spleen Meridian or Channel in traditional Chinese
9 medicine; correct?

10 A Not being a traditional Chinese physician, much
11 of what I know about it comes from Grey, but -- so I --
12 I -- I think so, but I -- I can't -- I -- I honestly
13 can't tell you exactly what "SP" stands for. I see
14 "Spleen Channel" here in Grey. That's -- so according
15 to Grey, SP is Spleen Channel.

16 Q The traditional BL acupuncture point refers to
17 the Bladder Meridian or Channel in traditional Chinese
18 medicine; correct?

19 A I -- you know, again, I would -- I would just
20 have to look at Grey or another reference to -- to -- to
21 confirm that. I could not tell you without finding it
22 in Grey what "BL" actually stands for.

23 Q Well, does Grey tell you what "BL" stands for?

24 A While I am very familiar with the reference, I
25 don't have it memorized so I would -- I would just have

1 to look through it.

2 Q Please do.

3 A (Reviewing document.)

4 I -- I cannot find in Grey, unless I'm missing
5 something as I'm reading it here, a -- a definition of
6 what "BL" is.

7 Q Okay. Can you look at Column 2 of the Grey
8 reference and, in particular, lines 62 to 64.

9 A Yep.

10 Q In there, it says that "The tibial nerve and
11 its branches" -- actually, in the preceding sentence, it
12 says, "The tibial nerve and its branches run along the
13 path established by the BL and SP acupuncture points.
14 This indicates that, for the SP-2, SP-3 and SP-4 (Spleen
15 Channel) acupuncture points, and the BL-55, BL-59, and
16 BL-60 acupuncture points, their associated nerve
17 structures can be stimulated by electrodes at the back
18 of the ankle." Do you see that?

19 A Uh-huh.

20 Q Does Grey depict where the SP-2, SP-3, or SP-4
21 acupuncture points are located?

22 A So Grey depicts where BL-59 and BL-60 are, and
23 in FIG. 3 they depict the -- four of the GB points,
24 S-36, S-37. What were the only ones you asked about?

25 Q I asked only about SB-2, SB-3, and SB-4, and my

1 question is whether Grey shows or describes where any of
2 those points are located in the human body.

3 A Grey does not -- Grey does not go into detail
4 about where those -- where those points are exactly on
5 the human body.

6 Q You had mentioned before that you were not an
7 expert in traditional Chinese medicine. Did I have your
8 testimony from earlier correct?

9 A I am not, in fact, an expert in traditional
10 Chinese medicine.

11 Q In your work do you consult traditional Chinese
12 medicine sources to inform your work?

13 A So in -- in -- in -- in much of my work, I
14 would not directly consult traditional Chinese medicine,
15 but that said, material like Grey is -- it's part of the
16 literature. You know, it's a -- it's a -- it's a --
17 it's a patent -- you know, patent that was filed in 1999
18 and issued -- you know, issued August 7th, 2001. So,
19 you know -- you know, while -- while -- while the cases
20 are -- you know, yeah. Let me -- let me put it this
21 way. I would -- you know, if I was looking around for,
22 you know, materials related to the tibial nerve, which
23 is mentioned in Grey, and how to stimulate things
24 related to the tibial nerve, I would expect to be able
25 to find material like Grey, you know, because it's a --

1 it's a -- it's a published patent -- issued published
2 patent.

3 (Exhibit Number 1085 was
4 previously marked for
5 identification.)

6 BY MR. GERASIMOW:

7 Q I've handed you what was marked as Exhibit 1085
8 in the -01375 matter.

9 Do you have that in front of you?

10 A Yes.

11 Q This is the Ponsford reference; is that right?

12 A Yes.

13 Q Does Ponsford disclose treating overactive
14 bladder or incontinence?

15 A So Ponsford is a -- Ponsford is a study of
16 sensory conduction. While -- in my declaration I've --
17 you know, I've -- I've said that, you know, Ponsford
18 is -- you know, Ponsford is part of the obviousness
19 argument, Ponsford -- Ponsford does not -- you know,
20 Ponsford is not specifically directed toward -- you
21 know, toward overactive bladder. Ponsford is directed
22 toward the -- the mechanisms and what you can do, you
23 know, when you're trying to stimulate a branch of
24 something and, you know, get a signal to go somewhere
25 else from that.

1 Q And Ponsford explains that this is valuable in
2 the diagnosis of various neurological conditions; is
3 that right?

4 A Yes. Ponsford explains that it's valuable in
5 diagnosis.

6 Q And in the summary Ponsford mentions the
7 diagnosis of early peripheral neuropathy?

8 A Yes.

9 Q Do you see that?

10 A Uh-huh.

11 Q Peripheral neuropathy is a condition in --
12 where nerves outside the brain and spinal cord are
13 damaged; is that right?

14 A That is my understanding, yes.

15 Q And then Ponsford mentions a condition -- well,
16 let me rephrase. Then Ponsford mentions the diagnosis
17 of mononeuritis multiplex. Do you see that?

18 A Yes.

19 Q That's a neurological disorder characterized by
20 damaged, two or more, peripheral nerves in separate
21 areas of the body; correct?

22 A Sitting here, I do not know what mononeuritis
23 multiplex is.

24 Q After that, Ponsford mentions tarsal tunnel
25 syndrome?

1 A Uh-huh.

2 Q Is that a "yes"?

3 A Yes.

4 Q Tarsal tunnel syndrome is a condition caused --
5 well, what is tarsal tunnel syndrome?

6 A Not being -- not being a physician, my
7 understanding of tarsal tunnel is it's a -- it's another
8 -- it's another peripheral neural condition, you know,
9 probably associated with some kind of, you know, nerve
10 compression.

11 Q And then, lastly, Ponsford mentions in that
12 sentence L5, S1 lesions. Do you see that?

13 A Yes.

14 Q Is it your understanding that L5 and S1 lesions
15 can result from herniated disks?

16 A That, I believe, is one of -- you know -- you
17 know, one of the number of things that could cause a --
18 an L5 or S1 lesion.

19 Q Well, okay. Spinal stenosis could cause them
20 too; right?

21 A You know -- or, you know, breaking your --
22 breaking your back in the wrong way. You know, there's
23 a lot of things that can cause neural lesions.

24 Q Even pressure on the L5, S1 nerve roots can
25 cause lesions; correct?

1 A I believe pressure can, indeed, cause a neural
2 lesion.

3 Q Can you go to page 189 of Ponsford.

4 A Yep.

5 Q In the first column on page 189, it says that
6 "Medial plantar SAPs were readily obtained in all
7 control subjects including those aged over 80 years.
8 Lateral plantar SAPs were present in all subjects below
9 the age of 60 but absent in the majority above this
10 age." Do you see that?

11 A Yes.

12 Q Ponsford reports they observed different
13 sensory action potentials between stimulation of the
14 medial plantar and lateral plantar nerves; correct?

15 A Yes. Ponsford -- Ponsford shows that -- showed
16 that there's a -- there's a -- a distinction between the
17 SAP results in medial plantar and lateral plantar
18 stimulation.

19 Q And Ponsford reports those differences in
20 Tables 1 and 2 of his article; correct?

21 A So, yes, but there's kind of an important --
22 important -- important point here. So if you -- if you
23 look at what Ponsford is -- is -- is showing here, you
24 know, there's -- you know, depending -- you know,
25 depending on -- depending on how you get a signal into a

1 system, you know, you might have -- you -- you know, you
2 might have different characteristics to, you know, what
3 gets -- what gets transmitted here or there, but it's
4 very key to keep in mind that Ponsford is showing that
5 you can stimulate both of these branches of the tibial
6 nerve. And in both cases you're -- you're stimulating
7 more peripherally and you're able to observe a -- a
8 signal, you know, coming up from the more peripheral
9 branch, you know, into the shared structure and that
10 you're able to see that -- that action potentially.

11 Q What's the shared structure?

12 A Well, they -- both of these are branches of the
13 -- branches of the posterior tibial nerve or tibial
14 nerve. And, you know, certainly to somebody -- to
15 somebody -- to somebody of ordinary skill in the art,
16 you know, you would -- you would also expect -- you'd
17 expect stimulating at any of these branches. You know,
18 you've -- you've shown that it can get to the posterior
19 tibial nerve and then you would expect that also to head
20 upstream and have a follow-on effect on the -- you know,
21 the upstream structure, such as the -- the -- the sacral
22 nerve structures.

23 Q Where does Ponsford disclose that stimulation
24 of either of these branches is observable upstream on
25 the posterior tibial nerve?

1 A So Ponsford is recording the -- Ponsford is --
2 Ponsford is recording the action potential. Make sure
3 I'm reading this correctly here.

4 So Ponsford is recording at the -- as -- you
5 know, as they say, posterior to the medial malleolus
6 using the posterior tibial artery as a landmark, and
7 with that, inherently, what Ponsford is recording is --
8 you know, is -- is signals -- signals from the tibia.

9 Q On page 191 of Ponsford, which is the last
10 page --

11 A Yep. I'm here.

12 Q -- it says that -- he concludes that "recording
13 the medial plantar SAP using surface electrodes
14 stimulating the common digital nerve and recording at
15 the ankle merits routine if not first line use in
16 patients in peripheral neuropathy and provides a
17 reliable complement to the sural," s-u-r-a-l, "SAP in
18 the diagnosis or exclusion of postganglionic lesion
19 involving the lower limb." Do you see that?

20 A Yes.

21 Q Ponsford concludes, based on his research, that
22 these recordings are useful in the diagnosis of
23 peripheral neuropathy and lesion; correct?

24 A That is what Ponsford concludes, yes.

25 Q Does Ponsford disclose using electrical

1 stimulation to treat peripheral neuropathy?

2 A Unless -- unless I'm missing something in the
3 my reading of Ponsford here, Ponsford is directed
4 toward -- you know, the -- the actual paper here is
5 directed toward diagnostic applications. You know --
6 but, again, you know, there's a -- there's a -- an
7 important thing that we need to keep in mind, which is,
8 you know, the -- you know, somebody -- somebody having
9 ordinary skill in the art of neuromodulation, you know,
10 would -- you know, would be -- would be expected to, you
11 know, have a sense of, you know, nerve conduction and,
12 you know, the fact that -- you know, the fact that, you
13 know, if you can -- you know, if you stimulate in -- at
14 this point on a nerve, then, you know, you -- you could
15 have -- you could have a follow-on effect that you can
16 measure in -- you know, upstream or downstream or what
17 have you.

18 And, you know, while -- you know, while
19 Ponsford is specifically directing this work toward
20 diagnostic applications, that -- that doesn't change the
21 fact that somebody having ordinary skill in the art
22 would be expected to find Ponsford and understand from
23 it that you could stimulate the medial branch or the --
24 the lateral branch, you know, or -- or any appropriate
25 branch of the -- of the posterior tibial nerve to -- to

1 -- to have an effect that you're successfully
2 transmitting upstream through the system.

3 Q Ponsford does not disclose using electrical
4 stimulation to treat any disease; correct?

5 A Not to my knowledge but, you know, I -- I have
6 to make that same point, that, you know, the -- the --
7 the knowledge and the scope of somebody having ordinary
8 skill in the art of neuromodulation, you know, would --
9 you know, would be -- would be expected to, you know,
10 identify material like Ponsford's work and understand
11 that that is -- that that -- that's -- that principle is
12 directly applicable to therapeutic stimulation as well.

13 Q The principle being that nerves travel
14 upstream?

15 A The -- the principle being that, you know, if
16 you had a -- if you had a branching structure, you know,
17 you can -- you can -- you know, you can stimulate -- you
18 can stimulate one of the branches, you know, in order to
19 have a desired effect in the -- you know, in the
20 structure proximal to the branch.

21 Q You can set Ponsford aside. I think we've been
22 going for about an hour. I'd like to take a break if
23 that's all right.

24 A Yeah. Thank you.

25 (Recess.)

1 BY MR. GERASIMOW:

2 Q Welcome back from the break. Could you pull
3 out your declaration from the -01375 matter --

4 A Yep.

5 Q -- and go to page 137 of that declaration.

6 And in paragraph 186 on page 137, you summarize
7 your conclusions; right?

8 A Yes.

9 Q I'd like me to help your -- help me understand
10 your conclusions and, in particular, let's look at the
11 first bullet point. It says, "Claims 1-13 would have
12 been obvious under 35 U.S.C. Section 103 by Svihra (Ex.
13 1004) in view of Mann (Ex. 1084), Ponsford (Ex. 1085),
14 and the knowledge of a POSA," which is a percent of
15 ordinary skill in the art.

16 Do you see that?

17 A Yes.

18 Q For your obviousness conclusion, would a person
19 of ordinary skill in the art have combined Svihra with
20 -- let me -- let me start that over.

21 Is it sufficient in your view for this
22 conclusion that the combination of Svihra, Mann, and the
23 knowledge of a person of ordinary skill is sufficient or
24 does it require Ponsford? In other words, is there an
25 "or" before Mann and Ponsford or is it an "and"?

1 A When we get to precise wording like that, let
2 me take a moment to just review so let me answer in a
3 moment.

4 All right. So, yeah, let me -- let me -- let
5 me answer that. So on -- on the question of whether --
6 on the question of whether both Mann and Ponsford are
7 needed, I want to be sure to answer that. In -- in the
8 context of -- the context of a -- of a knowl- -- of --
9 of the knowledge of a person having ordinary skill in
10 the art, you know, before the priority date in 2006. So
11 as -- as you can tell from my declaration, I lay out an
12 argument that -- that uses both -- I -- I lay out an
13 argument that uses both Mann and Ponsford.

14 Mann -- Mann discloses -- you know, discloses a
15 -- Mann -- Mann -- Mann discloses material related to
16 the -- related to the branching. Mann also discloses
17 material related to, you know, sensing -- sensing and
18 responding to the -- the effects of a stimulation, if I
19 recall correctly. You know, I would -- you know, I
20 would -- I would certainly say that the -- it is -- it
21 -- it is -- it is my opinion -- it is my opinion that --
22 that the -- that the claims are obvious, you know, with
23 Svihra in view of Mann and the knowledge of a person
24 ordinar- -- a person of ordinary skill in the art.

25 You know, that said, to the extent -- to the

1 extent that one might say that it's not obvious with
2 that argument, then, you know Ponsford makes it very
3 clear indeed that -- you know, that -- that stimulating
4 -- you know, stimulating the branches, you know, would
5 be expected to have a similar upstream effect. You
6 know, so the -- the -- the -- the argument that I've
7 laid out uses Ponsford. You know, but it -- I -- I also
8 -- I also do believe that Mann discloses -- you know,
9 discloses so much that a -- a -- a person of ordinary
10 skill in the art would -- you know, would have found
11 this obvious, you know, even without Ponsford. I mean,
12 Ponsford -- Ponsford strengthens the case still further
13 and gives a very concrete example of -- you know, of
14 something that a person of ordinary skill in the art
15 would have looked at and, you know, known very clearly,
16 if they did not know that already, that -- you know,
17 that -- that you can stimulate the branches to have the
18 same upstream effect.

19 Q What about the opposite, without Mann?

20 A You know, again, the -- so the -- the -- the
21 argument -- the argument that I've laid out in my
22 declaration, as -- as you can see, uses both Mann and
23 Ponsford. You know, yeah, a -- a -- and the knowledge
24 of a person of ordinary skill in the art, you know, I
25 think -- you know, again getting -- you know, getting --

1 you know, getting to the knowledge of a person of
2 ordinary skill in the art, I would expect such a person
3 in -- you know, I'd expect such a person, before this
4 priority date, you know, actually to -- to -- to
5 understand already, you know, some of the stuff that we
6 cite Mann for.

7 You know, we -- I -- I -- I cite Mann as a --
8 you know, as a -- as a -- a very clear example of, you
9 know, talking about both branches that you could
10 stimulate and, you know, ways that you could stimulate
11 -- stimulate and -- and monitor the effect and, you
12 know, use that in some way. You know, but -- but I -- I
13 would actually expect somebody having ordinary skill in
14 the art to -- to have understood that back at that time
15 potentially without even needing to refer to Mann.

16 You know, I -- I was -- you know, I was some
17 years into my career at that point and, you know, I -- I
18 was -- you know, I -- I -- you know, that -- that would
19 have been my -- my expectation for somebody with
20 ordinary skill in the art.

21 So I -- I guess what I'm saying is the -- you
22 know, the -- the argument that -- you know, the argument
23 that I've laid out here gives both Mann and Ponsford. I
24 would expect somebody having ordinary skill in the art
25 to -- you know, to -- to -- to -- to -- to have found this

1 obvious back in the day. Mann and Ponsford are examples
2 of -- they're -- they're examples -- they're very clear
3 examples of concepts that a -- a person of ordinary
4 skill in the art, you know, would -- would have -- would
5 have known from the field.

6 Q You express your opinion as to the experience
7 and education a person of ordinary skill in the art
8 would have had at the time as mentioned in paragraph 21
9 of your -01375 declaration?

10 A Uh-huh.

11 Q Can you please go there.

12 A Yep. Sorry. What was the number?

13 Q Twenty-one.

14 A Twenty-one?

15 Q Paragraph.

16 A I was already there. There we go.

17 Q Could you please read that to yourself and let
18 us know when you're done.

19 A Yes. Yes.

20 Q As of today, you personally meet the education
21 and experience requirements that you set forth for a
22 person of ordinary skill in the art in paragraph 21;
23 correct?

24 A Well, I mean, as of today, you know, I am an
25 expert in the field of neuromodulation. I -- I've been,

1 you know, doing this for a very long time, but for this
2 opinion, I am putting myself in the shoes of somebody
3 who would have had ordinary skill in the art as defined
4 here.

5 Q Right. My question is as of today you exceed
6 both the educational and experiential requirements --

7 A Yes.

8 Q -- for that person that you have in
9 paragraph 21?

10 A Yes.

11 Q And that was true in 2006 as well; correct?

12 A That was -- it -- it was -- it was -- it was --
13 it was true by -- it was true by a couple -- well, let
14 me see. It was true in 2006, but -- but that said, in
15 -- in my opinion here, I am -- I am putting myself in
16 the shoes and speaking from the perspective of somebody
17 having ordinary skill of the art as -- as defined in my
18 paragraph 21 here.

19 Q And I am saying you personally are a person of
20 extraordinary skill in the art; right?

21 A I -- I -- I -- I -- I am now. Everybody has a
22 -- everybody has a journey of learning more as they go.

23 Q Is that -- is that "yes" to my question?

24 A So sitting here right now, I mean, I'm -- I'm
25 engaged as -- I'm engaged as an expert witness. I --

1 you know, if I could say this with any modesty at all,
2 I'm an expert, you know, as far as that goes in
3 neuromodulation so...

4 Q Okay. You can set aside that declaration.

5 A Yep.

6 Q Throughout your declarations, you used the
7 acronym "EMG." What does the acronym "EMG" stand for?

8 A Electromyograph. Sometimes you see
9 electromyelograph.

10 Q And these are measurements that show electrical
11 activity in a model?

12 A EMG is the electrical potentials that you're --
13 the electrical potentials that you're gen- -- that
14 you're measuring with EMG are generated at the
15 neuromuscular junction. They are -- in -- in that
16 sense, they are -- they are coming from the muscle.
17 What they are -- in -- in many cases, what you're
18 measuring with that is not muscle activity, but you're
19 measuring something like nerve conduction. You're --
20 you're measuring -- you're using it -- you're using it
21 to measure -- you're using it to measure neural input to
22 the muscle.

23 Q And that neural input can come from the brain
24 as opposed to an external source; correct?

25 A Well, neural input comes from -- comes from a

1 nerve and what triggers that could be -- it could be
2 voluntary signals from the brain. It could be impulses
3 from -- from the spinal cord. It could be, you know,
4 artificially generated impulses from neuromodulation.

5 Q Can muscle stimulation be observed visually?

6 A If you are -- so if -- if you're stimulating --
7 if -- if you're stimulating a muscle such that you can
8 see it twitch, then you would be -- you would be
9 observing muscle stimulation visually. You could also
10 imagine a -- you know, a subthreshold stimulation or a
11 -- or a suprathreshold stimulation that you just weren't
12 able to see visually. Depending -- I mean, depending on
13 the definition of visual -- of visually, I mean, you
14 could also be measuring this with EMG and displaying it
15 on a screen or...

16 Q By visually, I mean with the human eye unaided
17 by any technical device --

18 A Yeah.

19 Q -- you can -- you can sometimes visually
20 observe the effect of electrical stimulation on a
21 muscle?

22 A You can -- yes, you can sometimes visibly
23 observe the effect of electrical stimulation on a
24 muscle.

25 Q Yeah. Are you familiar with an

1 electromyographic device called a Nicolet Viking 2?

2 A That -- yeah, to my knowledge, that is an
3 electromyographic device. I've used a few different
4 kinds in my research and at least a couple of them have
5 been -- have been Nicolet devices.

6 Q How big are they?

7 A How big are they?

8 Q Yeah.

9 A I have seen EMG devices -- everything from --
10 you know, everything from something -- a centimeter --
11 centimeter scale or even less to a rack mounted piece of
12 equipment, you know, in the size of a -- the size of a
13 -- of a small television, you know, with -- with leads
14 that you plug into it and so on.

15 Q What are the sizes of the Nicolet devices that
16 you have used?

17 A The -- the ones that I've used were kind of on
18 the smaller side of rack mounted equipment. You know,
19 they were maybe, you know, kind of 10 centimeters high
20 and, you know, a foot deep and, you know, the width of
21 an equipment rack.

22 Q So it's not something the patient would carry
23 around with them?

24 A The -- so the -- the ones that I've used in --
25 the ones that I've used in my research, you know, have

1 been the rack mounted type. I have worked on designing
2 -- I've worked on designing EMG technology that is --
3 that's actually implantable at the centimeter scale and
4 I am familiar with things like wearable EMG technology
5 that -- that could be on wearable patches or, you know
6 -- you know, where the amplifiers and electronics and
7 processing are bundled entirely in a wearable -- you
8 know, at centimeter scale, inch scale, things like that.
9 So there's a very broad -- there's a very broad field of
10 -- of EMG. You know, it means -- it means -- it means
11 electromyograph. You know, if you are -- if you are
12 collecting those signals, then it's -- it's EMG.

13 Q In the case of the rack mounted EMG devices,
14 can you paint the scene, how that interfaces with the
15 patient? Are there wires that connect this device to
16 the patient?

17 A Yeah. So in -- in the context of -- in the
18 context of rack mounted EMG, there are -- you know,
19 there are electrodes that are -- you know, often they
20 are conductive patches. They snap onto the end of a --
21 of a lead or a wire and that goes back to the -- to the
22 rack mounted device. You know, just for -- for
23 completeness -- for completeness, there's a lot of form
24 factors. And EMG -- you could also have EMG with a --
25 with a -- with a wearable device that has -- you know,

1 that's built into a patch electrode. You can have EMG
2 in an implantable device where you're measuring on the
3 same or different electrodes from your stimulating
4 electrodes. You know, there's -- there's a -- a lot of
5 different form factors to EMG.

6 Q In the case of the rack mounted EMG devices and
7 you mentioned leads or wires, how long are those
8 typically?

9 A I mean, I -- you know, for a -- you know, for a
10 very traditional kind of rack mounted EMG device, you
11 might have wires that are, you know, four feet long, six
12 feet, ten feet. There's -- you know, there's probably a
13 -- you know, there's probably a practical limit at some
14 point, but they can be fairly long. There's also --
15 there's also EMG -- EMG technologies that I've seen and
16 used where -- and actually this is -- I'm -- I'm
17 recalling now that this is -- this is another technology
18 I directly used in my research where there's a --
19 there's an amplifier that's actually a wearable
20 amplifier and then you -- you have a -- you have a bay
21 station that's -- that's communicating with -- you know,
22 with wireless or Bluetooth or whatever and -- and
23 collecting signals that way.

24 Q Can you pick up your -01378 declaration.

25 A Yep.

1 Q In the final sentence of paragraph 90 of your
2 -01378 declaration, you write, "Thus, when electrodes
3 and/or catheters of a stimulator are implanted, for
4 example, near the dorsal nerve of the clitoris (a branch
5 of the pudendal nerve), the signals from an EMG sensor
6 built into the stimulator may be used to adjust
7 stimulation parameters." Do you see that?

8 A Yes. I believe I was quoting Mann there.

9 Q Yes. So Mann describes an embodiment in which
10 the EMG sensor is built into the stimulator; correct?

11 A Yes. That -- that -- so -- let me -- so -- so
12 -- so with that specific example, Mann is describing,
13 you know, literally an EMG sensor built into the
14 stimulator.

15 Q And if the EMG sensor is built into the
16 stimulator, when they are both implanted into the
17 patient, they're at the same location in the patient;
18 correct?

19 A You know, there's a -- there's a few ways to do
20 it. I mean, you could -- if -- you could -- you could
21 certainly have -- you could have an EMG sensor that is,
22 you know, fully built into the stimulator. You could
23 have an EMG sensor where the -- where the amplifier is
24 -- is part of the same form factor as the stimulator,
25 but you have a -- a -- one or more leads or electrodes

1 projecting to some other location. You could have --
2 you know, there's a number -- there's a number of form
3 factors that you -- that you could actually use. You
4 know, what -- because Mann -- you know, Mann's -- you
5 know, Mann's -- Mann's technology is this
6 microstimulator thing. The -- you know, in that
7 specific case, the sensor's built into the stimulator.
8 It may or may not use the same electrodes, but, you
9 know, there's many form factors that -- you know, that
10 are kind of pervasive in the -- in the art of EMG.

11 Q So when the EMG sensor is built into the
12 stimulator, they're in the same location in the body;
13 right?

14 A When the -- so when the EMG sensor is built
15 into the stimulator, in -- you know, in -- in some sense
16 they're in -- in some sense they're in the same
17 location, but just to be clear, there's -- there are
18 many possible form factors where you could have the EMG
19 -- an EMG -- an EMG system that is built into the
20 stimulator, but there's a -- there's a -- there's a lead
21 or a -- or a wire that goes to a -- to an electrode that
22 is -- that is in a -- in a slightly or -- you know, or
23 substantially different location from the stimulator
24 itself.

25 Q Okay. Can you bring out the Mann reference?

1 A Yep. All right. I have it.

2 Q And can you go to Column 12, line 52.

3 A Yep.

4 Q Mann explains, quote, "For instance, a
5 microstimulator may be implanted unilaterally, or two or
6 more microstimulators may be implanted bilaterally," end
7 quote. Do you see that?

8 A Yes, I do.

9 Q Mann discloses embodiment in which there are
10 two or more stimulators that are implanted bilaterally;
11 correct?

12 A Mann does disclose that.

13 Q What does "bilateral implantation" mean to you?

14 A Bilateral typically, to me, would mean -- you
15 know, there's a -- the -- the body is symmetric and
16 bilaterally generally would mean that you're -- you
17 know, you're implanting something -- something in one
18 structure on one side of the body and then you're
19 implanting something -- something in the analogous
20 structure on the other side of the body. You know,
21 sometimes it could also mean you're implanting on both
22 sides of a structure.

23 Q So Mann discloses an embodiment in which two or
24 more microstimulators are implanted on corresponding
25 analogous sides of the structure in question?

1 can be 'implanted within' or be 'adjacent to' (i.e.,
2 noninvasive) various stimulation sites, including ' a
3 peripheral nerve' in the 'lower extremities.'" Do you
4 see that?

5 A I do, yes.

6 Q Can invasive stimulation electrodes be
7 implanted adjacent to a stimulation site?

8 A Say that one more time.

9 Q Can invasive stimulating electrodes be
10 implanted adjacent to a stimulation site?

11 A Invasive, as with noninvasive, electrodes could
12 be -- could be implanted adjacent to a stimulation site
13 or any -- any other given piece of anatomy.

14 Q If you look at DiLorenzo and, in particular,
15 Column 1, line 17 to 21, it says, quote, "The present
16 invention relates generally to neurological disease and,
17 more particularly, to intracranial stimulation for
18 optimal control of movement disorders and other
19 neurological disease." Do you see that?

20 A Yes. Uh-huh.

21 Q The invention of DiLorenzo relates to
22 neurological disease; correct?

23 A The invention of Di- -- of DiLorenzo relates,
24 you know, as he describes here, to neurological disease.
25 That said, it's similar to -- you know, similar to some

1 other caveats here.

2 The neuromodulation is a -- you know, is a big
3 tent and, you know, I -- I would expect -- I -- I
4 would -- I would expect DiLorenzo's art here to be -- to
5 be also app- -- applicable to in many cases and known to
6 a person of ordinary skill in the art, you know, simply
7 in the field of neuromodulation.

8 Q If you look at line 58 of Column 1, it mentions
9 incontinence; right?

10 A Yes.

11 Q And it mentions incontinence as an undesirable
12 side effect of the tissue ablation approach to the
13 treatment of neurological disease?

14 MR. DEIGHAN: Objection. Form.

15 THE WITNESS: So, I mean, what DiLorenzo is
16 specifically saying is, you know, quote, "bilateral
17 interventions place the patient at considerable risk for
18 developing permanent neurologic side effects, including
19 incontinence, aphasia, and grave psychic disorders."
20 Yeah, so that -- which is a little bit -- a little bit
21 different from -- from how -- you know, from how the
22 question's phrased.

23 BY MR. GERASIMOW:

24 Q Well, it references incontinence as an
25 undesirable side effect; correct?

1 A Yes, it does -- it does reference incontinence
2 as an undesirable side effect.

3 Q And an undesirable side effect of what?

4 A So -- so -- so DiLorenzo is talking here about
5 -- about a common goal in neurological treatments, which
6 is treatment of movement disorders.

7 And one -- you know, one -- one common
8 treatment that was, you know, even more common, you
9 know, in 1998 and is -- you know, has been over time --
10 you know, gradually -- gradually decreased in favor of
11 neuromodulation -- you know, one -- you know, one
12 possible in common treatment for movement disorders is
13 ablation, ablation of brain nuclei, like the globus
14 pallidus, parts of the thalamus structures, you know,
15 subthalamic structures, subthalamic nucleus. You know,
16 what DiLorenzo is saying here is that those procedures,
17 you know, are moderately effective, but in that case,
18 you know, you are -- you're -- in those particular
19 treatments, you're literally destroying brain tissue.
20 When you do that, then there's -- there's many -- you
21 know, many potential neurologic consequences and
22 incontinence is indeed one of them.

23 Q All right. So DiLorenzo mentions incontinence
24 as an undesirable side effect potentially of tissue
25 ablation?

1 A Yes. DiLorenzo is mentioning incontinence as a
2 -- as a potential undesirable side effect of a
3 substantial amount of tissue ablation and particularly
4 saying bilateral interventions.

5 Q Can you go to Column 6 of DiLorenzo.

6 A Uh-huh.

7 Q And there's a paragraph starting around
8 line 30. It's the beginning of the detailed
9 description. Do you see that?

10 A Uh-huh.

11 Q And about halfway or a little bit more through
12 that paragraph, there is a sentence, "However, it should
13 become apparent to those of ordinary skill in the
14 relevant art after reading the present disclosure that
15 the stimulating electrodes may also be extracranial;
16 that is, attached to a peripheral nerve in addition to
17 or in place of being located within the cranium." Do
18 you see that?

19 A Yes.

20 Q Peripheral nerves are part of the peripheral
21 nervous system; is that correct?

22 A Yes.

23 Q And that's to be distinguished from the central
24 nervous system; correct?

25 A Yes. Peripheral is distinguished from central.

1 Q Right. And peripheral nerves connect the
2 central nervous system to the rest of the body; correct?

3 A Yes, with the caveat that there's -- you know,
4 there's a lot of parts of the body that are directly
5 innervated by the -- by the central nervous.

6 Q Is the face directly innervated by the central
7 nervous system?

8 A The -- the face is primarily innervated -- and
9 not -- not an anatomist. I'm not a physician. The face
10 is primarily innervated by the cranial nerves in which I
11 -- I believe neuroanatomists would call peripheral.
12 But, you know, I'm -- I'm -- I'm -- I'm not -- I'm not a
13 physician or an anatomist.

14 Q Well, let me ask it a different way.

15 A Okay.

16 Q Does the face contain any peripheral nerves?

17 A Yes. Uh-huh.

18 Q Does the head contain any peripheral nerves?

19 A Yes. Uh-huh.

20 Q Does the neck?

21 A The neck contains peripheral nerves, yeah.

22 Q What about the thoracic region of the human
23 body?

24 A The thoracic region does indeed contain
25 peripheral nerves.

1 Q What about the abdominal region?

2 A Yes, it does.

3 Q And the pelvic region?

4 A Yes, it does.

5 Q Can you go to Column 9 of DiLorenzo.

6 A Yep.

7 Q I won't read it, but there's a paragraph
8 starting at line 54 and ending at paragraph 65. Do you
9 see it?

10 A Yes. Uh-huh.

11 Q How many sites on the human body are
12 encompassed by DiLorenzo's description in this
13 paragraph?

14 A So in this paragraph DiLorenzo mentions --
15 mentions the shoulder and then refers to other locations
16 and gives as examples the "masseter, temporalis,
17 sternocleidomastoid, other portion of the head and neck,
18 pectoralis, torso, abdomen, upper extremities, lower
19 extremities, and other locations." So, you know, that
20 -- that is, you know, one, two, three, four, five, six,
21 seven, eight, nine -- you know, at least nine
22 references, a couple of which are more general like the
23 masseter and some of which are less general like the
24 lower extremities. Or, sorry. Some of which are more
25 specific like the masseter and some of which are less

1 specific like the lower extremities.

2 Q Does DiLorenzo admit -- omit any part of the
3 human body from his description in that paragraph?

4 A Well, so -- you know, kind of with the -- you
5 know, with the -- with the literal reading, DiLorenzo
6 refers generally to "other locations," you know, so with
7 -- with no -- you know, with no further -- with -- with
8 no further constraints on it. So I -- I think
9 DiLorenzo's -- DiLorenzo's -- DiLorenzo's point here is
10 that, you know, you could -- you know, you could locate
11 this electrode array, you know, in, as he says, a -- a
12 variety of locations.

13 Q Just any location on the human body -- human
14 body would work?

15 A Well, so, you know, while -- while it could be
16 many, many potential locations, EMG does have to be --
17 it does have to be located at an appropriate point to
18 measure what you are -- you know, to measure whatever
19 you're trying to assess. You know, so -- so while
20 DiLorenzo says very generally "other locations," you
21 know, that -- that -- that's referring to physical
22 location and there are, indeed, many, many appropriate
23 places for -- for EMG electrodes. But if you are doing
24 EMG, then it -- it -- it does need to be in -- it does
25 need to be in an appropriate place where the electrical

1 potentials from whatever you're trying to measure are --
2 are -- are able to reach your EMG electrodes.

3 Q In Column 10 of DiLorenzo and, in particular,
4 starting at line 24, DiLorenzo describes an embodiment
5 in which the peripheral nerve electrode array is located
6 in the neck; correct?

7 A Proximal peripheral nerve electrode array in 98
8 is shown located in the neck region. So yes.

9 Q Does -- let me start over.

10 DiLorenzo never mentions the posterior tibial
11 nerve by name; correct?

12 A So to the best of my knowledge, DiLorenzo does
13 not refer to the posterior tibial nerve by name, but he
14 does say -- he does mention peripheral nerve in the
15 lower extremities and, you know, that -- per my
16 declaration, that is -- let me confirm that I have the
17 right reference there. There's a lot of material in
18 DiLorenzo so it's taking me a minute to make sure I
19 refer you to the right place.

20 All right. So, for example, in -- in
21 Column 10, which is -- if I recall correctly, we were
22 referring to earlier. In Column 10, while DiLorenzo
23 doesn't -- you know, doesn't talk specifically about the
24 posterior tibial nerve, DiLorenzo refers to -- refers to
25 peripheral nerves and refers to, you know, the fact that

1 you could put one of these peripheral nerve electrode
2 arrays in the lower extremities.

3 Q So you agree that DiLorenzo does not
4 specifically reference the posterior tibial nerve?

5 A I -- so -- so to the -- to the best of my
6 knowledge, DiLorenzo does not use the words "posterior
7 tibial." However, it's -- it -- it's still certainly my
8 opinion that the principles in DiLorenzo are applicable
9 to posterior tibial nerve stimulation and there would
10 be -- you know, obviously seen to be so by somebody
11 having an ordinary skill set.

12 (Exhibit Number 1056 was
13 previously marked for
14 identification.)

15 THE WITNESS: Thanks.

16 BY MR. GERASIMOW:

17 Q I've handed you what's been marked as
18 Exhibit 1056 in the -01378 proceedings. It's the
19 Bourget patent. Is that how you say it?

20 A Either that or Bourget. It depends on how long
21 they've been in the U.S.

22 Q Can you say that one more time?

23 A I would say Bourget.

24 Q Bourget. If you look on the -- the first page
25 of Bourget, there's item number (60) under "Related U.S.

1 Application Data." Do you see that?

2 A Number (60) under related -- yep. Yes, I do.

3 Q And it looks like a provisional application
4 there filed on December 2, 2005. Do you see that?

5 A I do.

6 Q Does your report contain any opinion about
7 whether or not that provisional application contains
8 subject matter sufficient to support the later filing on
9 April 28th, 2006, that led to the Bourget patent?

10 MR. DEIGHAN: Objection. Form.

11 THE WITNESS: Yeah, this -- yeah, I know
12 questions of -- questions of priority are often, you
13 know, complex legal questions and I am not a lawyer.
14 I'm glad to -- I'm going to, again, take a moment to
15 review my declaration and -- but, you know, I'm -- I'm
16 not a -- my -- my opinions on Bourget are as stated in
17 the declaration. And I -- I can take a -- I can take a
18 brief look through it, but I -- you know, again, I'm --
19 I'm not a -- I'm not a -- I'm not a lawyer. I was --
20 I'm not retained as a legal expert on -- on questions
21 of -- on questions of -- you know, the legal details of
22 questions of priority date.

23 BY MR. GERASIMOW:

24 Q So does your report contain analysis of whether
25 that original application supports the later Bourget

1 application or not?

2 A I'm just taking a moment to refresh myself on
3 the -- on the -- the scope of my opinion on Bourget.

4 So, you know, let me -- let me come back to --
5 you know, my -- my -- my opinion here is, you know, on
6 the material -- material described by the Bourget
7 reference here. I -- I don't have in front of me
8 Bourget's provisional application. You know, I -- I see
9 the dates as -- as expressed here. You know, I -- I
10 don't -- I don't have the provisional in front of me
11 and, you know, moreover I -- I don't have a legal
12 opinion on -- on -- on priority date matters here, you
13 know. But, furthermore, I don't -- to the extent this
14 is a question about the provisional, I don't have the
15 provisional in front of me.

16 Q All right. So you were not asked to offer an
17 opinion on the date on which a reference would be
18 considered prior art. You were asked, instead, to opine
19 on what the reference discloses or not; correct?

20 A Yeah. So -- so the -- the understanding of --
21 the understanding of prior art date that -- you know,
22 that -- that is -- that -- that I've used in my -- in my
23 -- in my declaration here is, you know, per my
24 paragraph 31, the earliest claimed priority date for the
25 '477 patent is October 2nd, 2006. Yeah, that's -- but

1 I -- I don't -- I'm not -- you know, I'm not offering a
2 legal opinion on -- you know, on -- on details of
3 priority date, you know, beyond what I've said in the
4 declaration.

5 Q Your "Materials Considered" list for the -01378
6 matter doesn't include the provisional reflected on the
7 face of the Bourget reference; correct?

8 A In my materials considered for the -- for the
9 -01378, the -- the Bourget material that I have
10 considered here is -- is Exhibit 1056 as shown here.

11 Q Bourget never mentions the posterior -- excuse
12 me.

13 Bourget never specifically mentions the
14 posterior tibial nerve; correct?

15 A So Bourget is another example of -- of --
16 principles of -- principles of detecting a value of a
17 parameter, sensing things while you stimulate closing
18 the loop. I don't believe Bourget uses the term
19 posterior tibular. You know, again, these are -- you
20 know, these are principles that are -- are common in the
21 field of neuromodulation and -- you know, and -- and
22 would have -- you know, would have been so, you know, at
23 the time as well.

24 Q Bourget never mentions overactive bladder or
25 incontinence; correct?

1 A Again, you know, without -- without a detailed
2 re-read, I am not aware of anyplace sitting here when
3 Bourget mentions that. Although, these are -- these are
4 principles that are -- principles general to the field
5 of neuromodulation.

6 Q If you can turn to Column 4 of the Bourget
7 reference.

8 A Yeah.

9 Q Bourget throughout refers to a device by the
10 acronym of IMD; correct?

11 A Yes. And I -- actually, I -- I -- I think in
12 the previous question -- I can't remember if you said
13 overactive bladder or incontinence and, you know, at the
14 bottom of that paragraph, Bourget does mention
15 incontinence.

16 Q Where is that?

17 A At the bottom of -- so line 50 on Column 4.

18 Q Okay. Returning to acronym for IMD, that
19 refers to implantable medical device, correct, in -- in
20 Bourget?

21 A Yes.

22 Q And if you turn to FIG. 2 of Bourget, it
23 discloses the -- the sensor, 40, being a part of the
24 implantable medical device, 12. Do you see that in
25 FIG. 2?

1 A Yes.

2 Q So Bourget discloses an embodiment in which the
3 sensor is built into the implantable medical device?

4 A Bourget does, indeed, disclose embodiment where
5 the sensor -- the sensor, 40, is implanted into the
6 implantable medical device.

7 Q If you could turn to Column 9 of the Bourget
8 reference --

9 A Yep.

10 Q -- and, in particular, the paragraph starting
11 at line 36.

12 A Uh-huh.

13 Q Could you please review the paragraph starting
14 at line 36 through line 44 in Column 9 of Bourget and
15 let me know when you're done.

16 A (Reading document.)

17 Q Are you through, sir?

18 A Yes.

19 Q In this paragraph, Bourget is describing
20 various sensors that may be used with it; correct?

21 A Uh-huh.

22 Q And he says, "One or more sensors may take the
23 form of, for example, a thermistore, a pressure
24 transducer, or electrodes to detect thoracic impedance
25 or an electrogram." Do you see that?

1 A Uh-huh.

2 Q What's a thermistore?

3 A It is a temperature sensor.

4 Q And a pressure transducer?

5 A It's a -- usually mechanical sensor of
6 pressure.

7 Q And what is thoracic impedance?

8 A Thoracic impedance is the -- the complex
9 electrical resistivity of the thoracic cavity. You can
10 detect respiration that way by pumping in a signal and
11 looking at the -- at the -- at the resulting reactants.

12 Q Go ahead and turn to Column 12 of Bourget --

13 A Uh-huh.

14 Q -- and, in particular, line 64 -- I'm sorry --
15 line 59 of Column 12. There's a paragraph starting
16 there "FIG. 7."

17 A Uh-huh.

18 Q And FIG. 7 is a chart; right?

19 A Uh-huh.

20 Q Is that a "yes"?

21 A I'm turning to it.

22 Q Thank you.

23 A FIG. 7 is a chart, yes.

24 Q And looking at both FIG. 7 and that portion of
25 Column 12 together --

1 A Uh-huh.

2 Q -- Bourget is saying that the amplitude pulse
3 with frequency and electrode configuration for the
4 treatment depends on the accelerometer output; correct?

5 MR. DEIGHAN: Objection. Form.

6 THE WITNESS: So in that paragraph Bourget
7 shows that -- says that each record contains an
8 accelerometer output. And let me -- it's -- it's
9 important to note here that -- you know, the -- the
10 context that we view this in. You know, in the -- you
11 know, in -- in the section that we've talked about a
12 minute ago, electrogram was in that list, you know, with
13 thermistores and transducers and whatnot.

14 And then, you know, if we -- if we look at
15 Column 7 and, you know, line 32 onwards, you know,
16 Bourget is also saying physiological parameters may
17 include heart rate, electromyography, EMG, and so on.
18 So, you know, the fact that, you know, there's an
19 example of a -- you know, yes, FIG. 7 shows a table
20 containing accelerometry output.

21 Q And in Columns 12 and 13 of Bourget, he
22 explains that you use the accelerometer output to
23 determine these characteristics of the electrical
24 stimulation; correct?

25 MR. DEIGHAN: Objection. Form.

1 THE WITNESS: Bourget is -- you know, is -- is
2 talking a lot about accelerometers, but it's important
3 to remember that -- that throughout this, Bourget is
4 very clearly pointing out that one of the -- you know,
5 one of the key things that you could use in a closed
6 loop algorithm is an electrogram or an electromyogram.
7 BY MR. GERASIMOW:

8 Q That's not shown in FIG. 7; correct?

9 A FIG. 7 shows -- you know, it's a table with
10 accelerometer output. You know, that -- again, that
11 doesn't change the fact that -- you know, the figure
12 shows a -- the figure shows -- the figure shows what it
13 shows. You know, but throughout, Bourget is clear that
14 -- that EMG could be a -- could be the thing that is
15 sensed and is an input to a closed loop algorithm.

16 Q I'm just trying to understand FIG. 7.

17 A Yeah.

18 Q That's not shown in FIG. 7; right?

19 A FIG. 7 shows exactly what it shows. It shows
20 six columns: Program Table Record -- whatever that
21 is -- Accelerometer Output; Amplitude in volts; Pulse
22 Width in microseconds; Frequency in hertz; and Electrode
23 Configuration.

24 Q Right. And right in conjunction with
25 Columns 12 and 13 of Bourget, it explains that the

1 amplitude, pulse width, frequency, and electrode
2 configuration of the therapy are determined based on the
3 accelerometer output; correct?

4 A So one of -- one of -- one of the many things
5 and the -- the -- one of the embodiments Bourget is
6 disclosing in how to do this uses -- uses accelerometry.

7 Q You can set Bourget aside.

8 A Yep.

9 Q I still have some more questions. Is it all
10 right if we take a -- a break now?

11 A Yep.

12 (Recess.)

13 (Exhibit Number 1055 was
14 previously marked for
15 identification.)

16 BY MR. GERASIMOW:

17 Q Welcome back. I'm handing you what has been
18 marked as Exhibit 1055 in the -01378 proceeding. It's
19 the Gerber reference.

20 Do you have that in front of you?

21 A I do.

22 Q Turn to Column 3 of the Gerber reference.

23 Gerber discloses an embodiment in which the
24 neurostimulator includes at least one lead bearing one
25 or more electrodes for the delivery of neurostimulation

1 pulses to sacral nerves within the pelvic floor of the
2 patient; correct?

3 A I believe that is correct. I'm looking for the
4 exact paragraph here, but that -- I believe that's
5 correct.

6 Q Yeah, I'm looking at the paragraph starting at
7 line 35 of Column 3 --

8 A Yep.

9 Q -- about halfway down. It says that the
10 neurostimulator may include at least one lead.

11 A Yeah.

12 Q Do you see that sentence?

13 A Yeah, that's correct.

14 Q All right. So I'll -- I'll ask again. Gerber
15 discloses an embodiment in which the neurostimulator may
16 include at least one lead carrying one or more
17 electrodes for delivery of neurostimulation pulses to
18 sacral nerves within the pelvic floor of the patient;
19 correct?

20 A Yes. Uh-huh.

21 Q Are sacral nerves upstream or downstream
22 compared to the nerves that control bladder function?

23 MR. DEIGHAN: Objection to form.

24 THE WITNESS: Just taking a moment here.

25 All right. So -- so your question was are --

1 are sacral nerves upstream or down? Could you rephrase
2 the question one more time?

3 BY MR. GERASIMOW:

4 Q Sure. Are sacral nerves upstream or downstream
5 compared to the nerves that control bladder function?

6 MR. DEIGHAN: Objection to form.

7 THE WITNESS: Let -- let me -- let me -- let me
8 phrase my -- let me phrase my actual understanding here
9 because I -- I don't know -- I don't know that I would
10 phrase it as upstream or downstream. You know, up- --
11 up- -- you know, upstream or downstream, you know, im-
12 -- implies something about what -- what direction the --
13 you know, what direction the signals are -- are going.
14 So I -- I would say that the -- I would say that the
15 sacral and pudendal nerves, they are -- they -- you
16 know, if you -- if you follow those upstream
17 anatomically to the -- to the -- to the spinal cord,
18 then those arrive at -- they -- they arrive at the same
19 sacral nerve structures and the nerve roots that the --
20 that -- that the tibial nerve also eventually funnels
21 into and through the sciatic nerve.

22 BY MR. GERASIMOW:

23 Q Right. And I asked the relationship -- about
24 the relationship between the sacral nerves and the
25 nerves that control bladder function. You had mentioned

1 the -- the tibial nerve.

2 A Oh, I -- sorry. You -- you did say bladder
3 function.

4 So I'm just taking a moment because the -- the
5 neuroanatomy is always -- is always very complicated
6 here.

7 All right. So -- so -- not being a
8 neuroanatomist, I am -- not -- not being a
9 neuroanatomist, I can't -- I can't -- I can't reproduce
10 for you the -- the anatomy of the nerves that -- you
11 know, the exact nerves that are going to the bladder.
12 However, the nerves that innervate the bladder that are
13 involved in bladder control, they are -- you know, they
14 are -- they are nerves that come from the same sacral
15 nerve structures that the -- for instance, the pudendal
16 nerve also projects from. And one -- one reason I am --
17 it's -- it's a little bit of a hard question to answer.
18 You know, when we talk about the sacral nerves, you
19 know, that -- there -- you know, when we talk about the
20 sacral nerves, you know, there are -- there's the -- you
21 know, there's the -- there's the sacral roots. There's
22 -- you know, so it -- it's -- it -- it's -- it's hard to
23 answer that as -- it's hard to answer that as upstream
24 or downstream.

25 The -- the believed mechanism for -- or, you

1 know, there -- there -- there are still things that are
2 -- there's still some scientific work that continues to
3 be done on -- you know, on how -- you know, on the
4 mechanism of neuromodulation for overactive bladder but,
5 you know, one of the primary candidates for that
6 mechanism is, you know, when you're -- when you're
7 stimulating -- you're stimulating nerves that ultimately
8 -- that ultimately come back up to the sacral roots and
9 those are shared structures with the -- the -- the
10 nerves that innervate the bladder and are responsible
11 for bladder control. So it -- it -- it's -- it's hard
12 to say upstream or downstream. It's a -- it's a -- it's
13 a more complicated system than that.

14 Q If you look further in that same paragraph in
15 Column 3 of Gerber --

16 A Uh-huh.

17 Q -- it says, "Sensor may be implanted within
18 bladder, urethra, or elsewhere within the body of
19 patient." Do you see that?

20 A Yes.

21 Q How do you understand "elsewhere within the
22 body of the patient"? Could it be anywhere or is it
23 more limited than that?

24 A So elsewhere within the body of the patient is
25 a -- is a broad statement, but there's the -- there's --

1 there's the -- there -- there is the constraint that you
2 -- you fundamentally need to have your sensor someplace
3 where it -- you know, where, from a physics standpoint,
4 it -- it can -- it can sense the energy from whatever
5 you're trying to measure.

6 Q So not just anywhere; right?

7 A It -- it -- right. I mean, in that sense -- in
8 that sense -- in that sense, not just anywhere. I mean,
9 fundamentally for a sensor to -- for a sensor to measure
10 something or give you insight into something, it -- it
11 needs to -- it needs to be able to receive the energy
12 that it's supposed to be sensing, you know, with enough
13 of a signal.

14 Q Could you go to Column 5 with the Gerber
15 reference and, in particular, the paragraph starting at
16 line 39.

17 A Yep.

18 Q That paragraph runs from line 39 to 48. Can
19 you please review it and let me know when you're done.

20 A Yep.

21 Q That paragraph describes examples of parameters
22 that may be monitored; correct?

23 A Yeah, that paragraph describes examples of --
24 some examples of -- of parameters that can be modified.
25 There are -- you know, there's a few other examples

1 elsewhere -- elsewhere in this -- in this document.

2 Q We'll get to those.

3 A Yeah.

4 Q Starting with these, there's bladder pressure.

5 Do you see that?

6 A Yes, bladder pressure.

7 Q What is bladder pressure monitor?

8 A You could measure bladder pressure with -- with
9 a -- with a forced transducer. That's -- that's kind of
10 the obvious one.

11 Q Could you use that same mechanism for bladder
12 contractile force?

13 A For bladder contractile force, you could
14 measure that -- you could measure with a force
15 transducer. You actually -- you -- you could measure
16 that with EMG. You could assess contractile force with
17 the EMG.

18 Q What about urinary sphincter pressure?

19 A You would measure that with a -- you know, with
20 a mechanical pressure sensor or you could also get at
21 that with EMG.

22 Q What about urine flow rate?

23 A That would probably be some kind of mechanical
24 sensor or, you know, maybe -- you know, there's probably
25 thermal or electrical ways to do it as well.

1 Q Urine flow pressure, how would you measure that
2 parameter?

3 A That's probably some kind of mechanical
4 deflection sensor.

5 Q Voiding amount, how would you measure that?

6 A By integrating flow or using -- using a --
7 using a cup.

8 Q You had mentioned other examples of parameters
9 that Gerber discloses besides those we just reviewed in
10 that paragraph. What other parameters does it disclose?

11 A You know, I mean, Gerb- -- you know,
12 Gerber's -- you know, Gerber talks about urine flow
13 velocity, bladder -- you know, urine or bladder
14 temperature, impedance, pH, or chemical constituency,
15 excessive contractile force. You know, the -- in a --
16 in the context of paragraph at line 60, Gerber talks
17 about electromyographic activity. The -- the -- those
18 are -- those are some examples of the other things that
19 Gerber mentions.

20 Q Does Gerber disclose what type of
21 electromyographic activity?

22 A Gerber does not disclose what -- in -- so in
23 line 60 -- one, two, three -- in line 63 Gerber does not
24 disclose what type of electromyographic activity. You
25 know, however, you know, again, something like --

1 something like bladder contractile force or -- or
2 sphincter pressure. You know, as a -- as a practitioner
3 in medical device person, I would actually find it --
4 find it a lot easier to -- to look at that using EMG
5 because it's electrical as opposed to -- and trying to
6 -- trying to fit a physical sens- -- pressure sensor in
7 there somehow.

8 Q Gerber generally relates to implantable
9 devices; correct?

10 A In general, Gerber relates to implantable
11 devices, yes.

12 Q And, in particular, Gerber discloses
13 implantation of a sensor, right, in either the -- well,
14 I'll just stop there.

15 Gerber discloses implantation of a sensor;
16 right?

17 A Yeah, in -- you know, in FIG. 2, for instance,
18 Gerber is depicting an implantable sensor.

19 Q And Gerber discloses implanting the sensor and
20 the -- the bladder or urethra specifically?

21 A Well, so -- so Gerber discloses implanting in
22 the bladder in the urethra or elsewhere within the body
23 of a patient.

24 Q Right. And the only other two structures
25 mentioned are the bladder or urethra in Gerber, correct,

1 for implantation?

2 A Yeah, and so in that -- in that description of
3 sensor 20 on -- yeah, starting on line 46 at
4 Column 3, yes, what Gerber mentions specifically is
5 bladder and -- bladder and urethra. Gerber does -- you
6 know, in -- you know, in -- in saying something like --
7 you know, like urinary sphincter pressure, for example,
8 you know, if -- you know, whether you were doing that by
9 EMG or some physical sensor, you know, you may -- you
10 may inherently want to have that -- to have that sensor
11 in proximity to the sphincter muscle rather than --
12 rather than some kind of urethral -- urethral sensor.
13 You know, in general, you know, you don't want to -- you
14 don't want to kind of perforate the urethra and, you
15 know, put a -- put a sensor in there to -- to -- to look
16 at pressure or what have you.

17 Q Gerber does not describe a sensor that is not
18 implanted; correct?

19 A That is not what?

20 Q That is not implanted.

21 A So Gerber -- Gerber is focused on implantable
22 applications. I'm just, you know, paging through this,
23 you know, to make sure that I haven't missed someplace
24 where -- you know, where they say noninvasive, but more
25 broadly -- more broadly neuromodulation is -- it's a --

1 it's a field that's -- it's a field that's, you know,
2 kind of integrated across noninvasive to less invasive
3 to -- to implantable applications. And practitioners
4 tend to pick and choose from the arsenal of things that
5 we can use. You know, what's the best fit for a -- you
6 know, for a -- for a certain product so -- like -- like
7 some of these other references. So, yes, Gerber --
8 Gerber's work is focused towards implantable
9 applications, but it's something that -- it's something
10 that I expect a person of ordinary skill in the art to
11 -- you know, to be -- you know, even if they were
12 working on a noninvasive project, I would expect them to
13 be aware of material like this and be ready to
14 incorporate it into their work.

15 Q Gerber does not describe a sensor that is not
16 implanted; correct?

17 A What Gerber specifically describes is -- is --
18 is implanted sensors but, you know, that -- that same
19 caveat applies. It's -- you know, I -- the -- my -- my
20 -- my use of Gerber to -- you know, my use of Gerber in
21 my opinion that -- that -- you know, that -- that the
22 relevant claims are -- are obvious, you know, in light
23 of Gerber, you know, as I've said in my declaration,
24 that -- that -- that doesn't change based on the fact of
25 whether or not Gerber specifically talks about implanted

1 or noninvasive or, you know, minimally invasive or
2 whatever sensors.

3 Q I -- I understand that your opinion is that a
4 person of ordinary skill in the art might use Gerber --

5 A Uh-huh.

6 Q -- to inform noninvasive situations.

7 My question is does Gerber disclose a sensor
8 that is not implanted?

9 A So with all those caveats, I -- I don't think
10 Gerber -- I don't think Gerber specifically discloses a
11 sensor that is -- that is not implanted, again, with all
12 those caveats.

13 Q Well, Gerber doesn't disclose those caveats
14 either; right? Gerber doesn't suggest that the
15 implantable sensor that he describes could be made
16 non-implantable?

17 MR. DEIGHAN: Objection to form.

18 THE WITNESS: You know, the -- you know, in --
19 in that case, yeah, I'm going to go back to, you know,
20 my -- my opinion in my declaration, which is, you know,
21 we -- I mean, we have -- we have -- we have the Gerber
22 reference in front of us. You know, we have -- we have,
23 in my -- in my firm opinion, which is, you know, what
24 I'm discussing here, you know, somebody having --
25 somebody having ordinary skill in the art and would --

1 would look at a reference like Gerber and -- and would
2 -- would be -- and would be perfectly well-motivated to
3 take learnings from Gerber and apply it to noninvasive
4 stimulation.

5 BY MR. GERASIMOW:

6 Q But Gerber doesn't say that?

7 A You know, Gerber -- Gerber doesn't say that.
8 But, you know, I'm not a lawyer, but it's my
9 understanding that Gerber is not required to say that.

10 MR. GERASIMOW: I have no further questions at
11 this time and thank the witness for his time and yield
12 the floor to Mr. Deighan.

13 MR. DEIGHAN: Could we just go off --

14 MR. GERASIMOW: Yeah, that's fine.

15 MR. DEIGHAN: -- the record for just literally
16 two minutes? Let me just look over my notes really
17 quick.

18 (Brief recess.)

19 MR. DEIGHAN: I have no questions.

20 MR. GERASIMOW: I have no further questions at
21 this time. Thank you.

22 (Whereupon, proceedings were adjourned.)

23 ---oOo---

24

25

CERTIFICATE OF CERTIFIED SHORTHAND REPORTER

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, SHANNON BORGE, RPR, CSR No. 9436, Certified
Shorthand Reporter, do hereby certify:

That prior to being examined, the witness in
the foregoing proceedings was by me duly sworn to

testify to the truth, the whole truth, and nothing but
the truth;

That said proceedings were taken by me in
shorthand and thereafter transcribed into typewriting

under my direction and supervision;

That I am neither counsel for, nor related to,
any party to said proceedings, nor in any way interested
in the outcome thereof.

I further certify that I am not a party to any
stipulation, if made, that would waive my duties

mandated by the Court Reporters Board of California.

In witness whereof, I have hereunto subscribed
my name.

Dated: Thursday, June 19, 2025.

Shannon Borge

Shannon Borge, RPR, CSR
Certificate No. 9436

A			
a1	above-identified	105:18	adverse
4:29	50:23	across	54:2
abdomen	absent	38:1, 47:9,	afferent
98:18	73:9	120:2	12:15, 12:17,
abdominal	accelerometer	action	12:24, 13:1,
98:1	108:4, 108:8,	23:21, 64:14,	13:5
ablation	108:22, 109:10,	73:13, 74:10,	after
94:12, 95:13,	109:21, 110:3	75:2	12:17, 44:3,
95:25, 96:3	accelerometers	activity	71:24, 96:14
able	109:2	40:9, 40:11,	again
57:6, 69:24,	accelerometry	44:6, 84:11,	8:24, 10:16,
74:7, 74:10,	108:20, 110:6	84:18, 117:17,	11:2, 11:3,
85:12, 100:2,	accept	117:21, 117:24	11:25, 12:5,
115:11	32:11	actual	14:6, 15:22,
abnormal	acceptability	20:10, 76:4,	16:24, 18:6,
40:9, 40:11,	31:23	112:8	18:18, 30:24,
44:6	acceptable	actually	44:9, 47:25,
about	55:23, 55:24,	6:17, 7:1,	49:2, 59:14,
5:16, 14:12,	56:6	12:12, 38:10,	64:9, 64:23,
15:14, 16:4,	accessibility	39:6, 54:11,	67:19, 76:6,
16:17, 18:3,	56:23, 56:24,	67:22, 68:11,	80:20, 80:25,
18:4, 23:2,	56:25	81:4, 81:13,	102:14, 102:18,
27:8, 27:9,	accessible	87:3, 88:16,	104:19, 105:1,
30:22, 35:4,	55:10, 55:20,	88:19, 90:3,	109:10, 111:14,
40:12, 43:13,	56:3, 56:8,	105:11, 116:15,	117:25, 121:11
44:24, 47:22,	56:10, 56:12,	118:3	age
47:23, 48:17,	56:20, 57:18	acupuncture	73:9, 73:10
48:18, 48:19,	accompanied	66:23, 67:4,	aged
50:19, 52:15,	65:6, 65:8,	67:7, 67:16,	73:7
59:22, 60:4,	66:2, 66:4, 66:5	68:13, 68:15,	ago
63:11, 67:11,	accompanies	68:16, 68:21	37:19, 108:12
68:24, 68:25,	65:22, 65:25	add	agree
69:4, 77:22,	accompany	6:8, 7:1	28:23, 30:16,
80:19, 81:9,	65:10, 65:13,	addition	31:14, 31:17,
92:24, 95:4,	65:20	52:23, 96:16	32:1, 32:7,
95:5, 96:11,	accomplished	adjacent	101:3
97:22, 98:1,	36:17	93:1, 93:7,	agreeing
100:23, 102:6,	according	93:10, 93:12	30:23
103:14, 108:11,	21:5, 67:14,	adjourned	ah
109:2, 111:9,	92:25	122:22	49:9
112:12, 112:23,	achieve	adjust	ahead
113:18, 113:19,	25:14	89:6	107:12
116:18, 116:22,	achieved	admit	al
117:12, 117:17,	39:23	99:2	4:24, 4:26,
120:25	achieving	advance	4:30, 4:33, 4:35
above	32:13	54:18	algorithm
73:9	acronym	advanced	109:6, 109:15
	84:7, 105:10,	37:25	all
			7:20, 9:23,

14:8, 17:17, 20:6, 30:7, 35:20, 38:22, 41:10, 45:18, 58:8, 58:11, 65:23, 67:1, 73:6, 73:8, 77:23, 79:4, 84:1, 91:1, 95:23, 100:20, 103:16, 110:9, 111:14, 111:25, 113:7, 121:9, 121:11 alone 44:18 along 55:19, 56:7, 56:10, 56:12, 57:17, 68:12 already 80:16, 81:5, 82:16 also 3:23, 13:3, 27:18, 28:1, 29:9, 42:13, 43:22, 53:8, 55:19, 55:23, 74:16, 74:19, 79:16, 80:7, 80:8, 85:9, 85:14, 87:24, 88:14, 88:15, 91:21, 94:5, 96:15, 108:16, 112:20, 113:16, 116:20 although 56:5, 105:3 always 24:13, 62:17, 113:5 among 51:23, 92:1, 92:20 amount 41:12, 96:3,	117:5 amplifier 88:19, 88:20, 89:23 amplifiers 87:6 amplitude 25:17, 26:4, 41:25, 42:5, 42:14, 53:11, 108:2, 109:21, 110:1 anal 49:11 analogous 91:19, 91:25 analogy 27:10 analyses 44:12 analysis 9:15, 9:17, 10:2, 14:24, 21:10, 21:17, 28:7, 40:14, 42:24, 43:2, 44:18, 45:2, 45:5, 45:12, 102:24 analytical 43:8 analyzing 43:5 anatomical 65:15 anatomically 112:17 anatomist 46:25, 48:9, 49:2, 59:14, 62:14, 97:9, 97:13 anatomy 47:7, 47:13, 49:4, 59:12, 62:21, 63:3, 93:13, 113:10 anesthesia 36:7	ankle 55:13, 59:12, 59:13, 68:18, 75:15 another 7:1, 23:9, 29:23, 41:4, 54:24, 63:2, 65:4, 65:5, 67:20, 72:7, 72:8, 88:17, 92:7, 104:15 answer 17:9, 18:17, 22:18, 25:24, 26:22, 35:17, 48:14, 63:4, 79:2, 79:5, 79:7, 113:17, 113:23 answers 32:20, 50:5 anticipate 15:17, 17:8, 19:14, 19:23, 21:4 anticipated 15:9, 15:10, 15:15, 16:7, 16:9, 16:10, 16:22, 17:16, 18:10, 19:1, 20:6 anticipation 16:4, 16:6, 16:17, 17:24, 20:11, 20:14 any 5:15, 6:13, 6:21, 24:9, 25:18, 26:23, 29:7, 36:2, 36:16, 37:19, 39:2, 39:4, 53:3, 57:19, 57:23, 69:1, 74:17, 76:24, 77:4, 84:1,	85:17, 93:13, 97:16, 97:18, 99:2, 99:13, 102:6, 123:17, 123:19 anyplace 105:2 anything 63:8, 63:12, 63:22, 64:1 anywhere 57:24, 114:22, 115:6, 115:8 aphasia 94:19 apologize 39:8 app 94:5 apparent 96:13 appeal 1:4 appendix 14:11, 14:16, 20:16, 37:13, 38:15, 38:22 applicable 77:12, 94:5, 101:8 application 4:28, 102:1, 102:3, 102:7, 102:25, 103:1, 103:8 applications 76:5, 76:20, 119:22, 120:3, 120:9 applied 9:15, 9:17, 10:2, 21:10, 21:16, 42:11 applies 20:14, 120:19 apply 28:17, 28:18, 58:11, 58:23,
---	--	--	---

122:3 applying 42:16 approach 56:25, 57:1, 94:12 approaches 30:11, 30:14, 58:24 appropriate 12:6, 15:11, 57:5, 76:24, 99:17, 99:22, 99:25 approved 36:23 april 102:9 areas 71:21 arguably 29:12 argument 70:19, 79:12, 79:13, 80:2, 80:6, 80:21, 81:22 around 39:8, 69:21, 86:23, 96:7 arranged 17:18 array 99:11, 100:5, 100:7 arrays 101:2 arrive 112:18 arsenal 120:4 art 10:13, 15:17, 17:6, 17:18, 17:23, 18:16, 19:14, 19:23, 20:8, 21:3, 46:16, 58:22,	74:15, 76:9, 76:21, 77:8, 78:15, 78:19, 79:10, 79:24, 80:10, 80:14, 80:24, 81:2, 81:14, 81:20, 81:24, 82:4, 82:7, 82:22, 83:3, 83:17, 83:20, 90:10, 94:4, 94:6, 96:14, 103:18, 103:21, 120:10, 121:4, 121:25 artery 59:17, 60:2, 75:6 article 4:37, 73:20 articulate 10:23 artificially 85:4 aside 60:7, 64:2, 77:21, 84:4, 110:7 asked 16:4, 20:9, 68:24, 68:25, 103:16, 103:18, 112:23 aspects 92:2 assess 8:4, 8:5, 99:19, 116:16 assessment 36:1 associated 68:16, 72:9 assuming 49:17 attach 33:9 attached 96:16	attention 32:4, 49:6, 66:24 attorney 5:12 august 37:21, 69:18 author 39:12, 40:6 avation 1:8, 3:4, 3:25, 6:6, 6:7, 39:2, 39:4 aware 10:18, 11:5, 105:2, 120:13 away 13:3, 19:4, 26:4 B b1 4:20, 4:32 b2 4:23, 4:25, 4:34 back 16:15, 16:24, 16:25, 17:11, 24:2, 38:14, 39:6, 45:21, 57:7, 60:1, 68:17, 72:22, 78:2, 81:14, 82:1, 87:21, 103:4, 110:17, 114:8, 121:19 based 5:12, 75:21, 110:2, 120:24 basically 54:5 bay 88:20 bearing 110:24 because 17:10, 18:18,	22:3, 32:3, 32:12, 35:3, 35:23, 38:6, 65:19, 69:25, 90:4, 112:9, 113:4, 118:5 become 96:13 been 5:5, 5:14, 6:16, 6:17, 7:6, 7:15, 8:15, 8:16, 39:25, 45:13, 60:10, 66:8, 66:9, 66:10, 66:12, 77:21, 78:12, 81:19, 82:25, 86:5, 87:1, 92:8, 95:9, 101:17, 101:21, 104:22, 110:17 before 1:4, 2:6, 5:15, 6:16, 6:17, 6:18, 7:9, 7:11, 7:14, 7:19, 32:19, 33:7, 69:6, 78:25, 79:10, 81:3 begin 5:15 beginning 2:5, 52:4, 96:8 begins 14:21, 54:24 behalf 2:2, 3:4, 3:14, 6:6 being 7:11, 11:14, 11:15, 18:20, 19:1, 20:6, 21:10, 37:1, 40:5, 41:2, 41:7, 47:12, 47:25, 48:1, 48:7, 48:23,
--	---	--	---

49:2, 62:13, 64:9, 64:10, 67:10, 72:6, 77:13, 77:15, 96:17, 105:23, 113:7, 113:8, 123:9 believe 32:20, 38:10, 38:11, 50:3, 51:23, 59:4, 59:5, 59:12, 66:8, 72:16, 73:1, 80:8, 89:8, 97:11, 104:18, 111:3, 111:4 believed 113:25 below 13:15, 14:2, 73:8 besides 117:9 best 23:5, 61:3, 100:12, 101:5, 120:5 better 31:21, 36:8, 43:25 between 15:4, 15:25, 18:19, 22:2, 22:6, 26:15, 26:16, 27:13, 51:5, 56:11, 73:13, 73:16, 112:24 beyond 12:4, 104:3 big 33:8, 86:6, 86:7, 94:2 bilateral 91:13, 91:14, 92:4, 92:5, 94:16, 96:4	bilaterally 91:6, 91:10, 91:16 billing 38:11 biography 42:18 biological 23:25 biomarker 44:8 biomarkers 43:24, 44:3 bion 58:5 bit 94:20, 96:11, 113:17 bl 66:22, 67:4, 67:16, 67:22, 67:23, 68:6, 68:13, 68:15, 68:16, 68:22 bladder 14:22, 15:12, 15:20, 16:12, 16:21, 17:4, 17:7, 17:22, 18:9, 19:10, 19:17, 19:25, 20:18, 22:24, 48:21, 53:23, 67:17, 70:14, 70:21, 104:24, 105:13, 111:22, 112:5, 112:25, 113:2, 113:11, 113:12, 113:13, 114:4, 114:10, 114:11, 114:18, 116:4, 116:6, 116:7, 116:8, 116:11, 116:13, 117:13, 118:1, 118:20, 118:22, 118:25, 119:5 blanket 32:7	blinded 34:19 bluetooth 88:22 board 1:4, 123:21 body 26:17, 29:15, 29:20, 29:22, 30:4, 30:6, 30:15, 31:9, 33:9, 37:9, 69:2, 69:5, 71:21, 90:12, 91:15, 91:18, 91:20, 97:2, 97:4, 97:23, 98:11, 99:3, 99:13, 99:14, 114:18, 114:22, 114:24, 118:22 bony 59:13 borge 1:33, 2:6, 123:7, 123:29 both 7:15, 8:9, 26:18, 37:2, 41:17, 44:15, 45:24, 50:14, 58:24, 60:11, 65:16, 74:5, 74:6, 74:12, 79:6, 79:12, 79:13, 80:22, 81:9, 81:23, 83:6, 89:16, 91:21, 107:24 bottom 61:13, 61:15, 105:14, 105:17 bourget 4:26, 101:19, 101:20, 101:23, 101:24, 101:25, 102:9, 102:16, 102:25, 103:3,	103:6, 104:7, 104:9, 104:11, 104:13, 104:15, 104:18, 104:24, 105:3, 105:6, 105:9, 105:14, 105:20, 105:22, 106:2, 106:4, 106:7, 106:14, 106:19, 107:12, 108:2, 108:6, 108:16, 108:21, 109:1, 109:3, 109:13, 109:25, 110:5, 110:7 bourget's 103:8 boveja 4:30, 60:12, 60:20, 61:5 brain 22:13, 22:17, 34:3, 35:7, 37:7, 37:11, 71:12, 84:23, 85:2, 95:13, 95:19 branch 20:16, 20:21, 20:22, 20:23, 47:10, 47:19, 47:21, 47:23, 47:24, 48:7, 48:12, 49:15, 49:19, 49:21, 50:4, 62:6, 70:23, 74:9, 76:23, 76:24, 76:25, 77:20, 89:4 branches 46:12, 46:18, 47:4, 48:2, 49:10, 50:25, 51:6, 51:22, 51:25, 68:11, 68:12, 74:5, 74:12, 74:13,
---	---	---	--

74:17, 74:24, 77:18, 80:4, 80:17, 81:9 branching 77:16, 79:16 break 45:14, 45:16, 45:18, 45:21, 77:22, 78:2, 110:10 breaking 28:7, 28:9, 72:21, 72:22 brett 1:25, 2:1, 4:4, 4:15, 4:18, 5:4, 5:21 brief 102:18, 122:18 bring 90:25 broad 28:12, 43:10, 53:3, 87:9, 114:25 broadly 43:11, 44:10, 119:25 building 3:8 built 88:1, 89:6, 89:10, 89:13, 89:15, 89:22, 90:7, 90:11, 90:14, 90:19, 106:3 bulk 34:15, 63:19 bullet 78:11 bunch 52:22 bundle 40:17 bundled 87:7 bundling 40:21	bypasses 52:5 C c 19:5 calfee 3:6, 3:8, 6:5 california 1:27, 2:4, 5:1, 6:1, 123:3, 123:21 call 7:2, 28:2, 30:13, 34:16, 44:7, 97:11 called 7:1, 33:20, 33:21, 86:1 calls 10:14, 10:25 can't 6:13, 7:18, 11:21, 12:5, 48:5, 67:12, 67:13, 105:12, 113:9 candidates 114:5 cannot 68:4 career 45:8, 81:17 carry 86:22 carrying 111:16 case 1:14, 1:19, 4:10, 4:13, 4:16, 4:19, 24:3, 25:1, 25:13, 27:5, 29:16, 32:23, 33:1, 34:14, 37:16, 43:18, 44:2, 57:19, 80:12, 87:13,	88:6, 90:7, 95:17, 121:19 cases 23:6, 23:9, 25:7, 25:9, 29:23, 31:20, 31:22, 32:6, 32:8, 32:9, 35:5, 43:25, 53:12, 54:10, 56:21, 69:19, 74:6, 84:17, 94:5 casually 65:4 catheter 57:2 catheters 89:3 cause 72:17, 72:19, 72:23, 72:25, 73:1 caused 72:4 caveat 9:8, 11:4, 29:23, 39:25, 47:3, 47:6, 48:9, 50:2, 58:17, 62:24, 63:10, 63:15, 64:9, 65:23, 97:3, 120:19 caveats 31:6, 48:22, 94:1, 121:9, 121:12, 121:13 cavity 107:9 centimeter 86:10, 86:11, 87:3, 87:8 centimeters 86:19 central 96:23, 96:25, 97:2, 97:5, 97:6	certain 9:6, 26:24, 29:25, 36:21, 120:6 certainly 15:12, 65:18, 74:14, 79:20, 89:21, 101:7 certificate 123:1, 123:30 certified 2:6, 123:1, 123:7 certify 123:8, 123:19 cetera 46:22 challenge 11:19 change 36:14, 76:20, 109:11, 120:24 changes 42:9 changing 42:4 channel 67:8, 67:14, 67:15, 67:17, 68:15 characteristics 74:2, 108:23 characterized 71:19 charge 39:16, 39:21, 40:18, 41:12, 41:16, 41:23, 41:24, 42:5, 42:14, 42:17 chart 107:18, 107:23 check 59:7 chemical 117:14 chest 22:15
--	---	---	--

chicago 3:19, 5:12 chief 3:27 chinese 67:8, 67:10, 67:17, 69:7, 69:10, 69:11, 69:14 choose 120:4 choosing 40:10 chronically 46:11, 46:17, 50:24 cite 81:6, 81:7 city 5:22, 5:24 claim 10:19, 11:7, 11:11, 12:4, 13:10, 14:11, 14:18, 14:21, 15:1, 15:5, 15:18, 17:8, 17:16, 17:19, 17:20, 17:23, 18:5, 18:13, 18:14, 18:20, 18:22, 18:25, 19:2, 19:7, 19:14, 19:19, 19:24, 20:5, 20:10, 20:12, 20:15, 20:24, 20:25, 21:1, 21:4, 21:8, 21:16, 27:18 claimed 10:6, 10:8, 10:12, 10:13, 103:24 claims 13:23, 14:18, 14:25, 15:13, 16:7, 16:19,	16:20, 78:11, 79:22, 120:22 clarify 23:4, 23:13, 55:25, 66:11 class 28:1, 53:3 clear 17:8, 33:21, 33:24, 80:3, 81:8, 82:2, 90:17, 109:13 clearly 80:15, 109:4 cleveland 3:10 clinical 32:13, 32:24, 33:14, 33:22, 34:6, 34:8, 34:9, 34:17, 34:24, 35:1, 35:2, 35:14, 35:21, 37:5, 38:2, 42:24, 43:20, 44:1, 44:9, 44:15 clitoris 48:12, 48:21, 49:12, 89:4 closed 109:5, 109:15 closer 58:15 closing 104:17 co-founder 3:25 coccyx 61:16 coils 27:25 collaborate 38:2 collect 35:4 collecting 87:12, 88:23	column 46:7, 49:6, 49:7, 50:15, 52:1, 52:4, 54:18, 55:3, 61:2, 67:3, 68:7, 73:5, 91:2, 93:15, 94:8, 96:5, 98:5, 100:3, 100:21, 100:22, 105:6, 105:17, 106:7, 106:14, 107:12, 107:15, 107:25, 108:15, 110:22, 111:7, 114:15, 115:14, 119:4 columns 108:21, 109:20, 109:25 com 3:12, 3:21 combination 78:22 combined 78:19 come 49:8, 84:23, 103:4, 113:14, 114:8 comes 11:9, 57:11, 67:11, 84:25 coming 48:23, 62:19, 63:5, 63:6, 63:8, 63:13, 63:19, 63:20, 63:22, 64:1, 74:8, 84:16 comment 9:9, 11:21, 12:5, 16:2, 16:13 common 75:14, 95:5, 95:7, 95:8,	95:12, 104:20 communicating 88:21 company 44:23 compared 111:22, 112:5 complement 75:17 completeness 87:23 complex 40:25, 41:1, 47:8, 54:10, 102:13, 107:8 compliance 31:21 complicated 18:18, 62:17, 113:5, 114:13 compression 72:10 concepts 58:21, 82:3 concludes 75:12, 75:21, 75:24 conclusion 10:15, 11:1, 78:18, 78:22 conclusions 78:7, 78:10 concrete 80:13 condition 64:4, 64:7, 64:21, 71:11, 71:15, 72:4, 72:8 conditions 25:19, 71:2 conduction 4:37, 13:4, 13:5, 70:16, 76:11, 84:19 conductive 87:20 configuration 108:3, 109:23,
---	---	---	--

110:2 configurations 44:13 configure 40:15 confirm 47:14, 59:7, 67:21, 100:16 conjunction 109:24 connect 87:15, 97:1 connected 27:25 connection 7:23, 8:18 consequences 95:21 consider 39:2, 39:4 considerable 94:17 considered 15:5, 18:23, 38:24, 103:18, 104:5, 104:8, 104:10 consistent 51:8, 51:9 constant 41:19, 42:11 constellation 56:22 constituency 117:14 constraint 115:1 constraints 99:8 construction 13:10, 13:15, 13:20, 13:24, 14:9, 21:9 consult 69:11, 69:14 consulting 38:6, 38:8, 38:12	consume 45:3 contacts 29:8 contain 62:11, 62:16, 62:22, 97:16, 97:18, 97:24, 102:6, 102:24 container 27:14 containing 108:20 contains 62:7, 62:15, 97:21, 102:7, 108:7 contents 64:16 context 56:4, 58:20, 79:8, 87:17, 87:18, 108:10, 117:16 continued 32:3 continues 114:2 contractile 116:12, 116:13, 116:16, 117:15, 118:1 contrast 13:2, 51:15, 51:19 control 40:12, 73:7, 93:18, 111:22, 112:5, 112:25, 113:13, 114:11 controlled 34:11 conventional 63:3 copy 66:13 cord 12:19, 13:2,	13:3, 33:2, 33:7, 61:12, 61:25, 71:12, 85:3, 112:17 core 58:3 corporate 38:9 correct 14:19, 19:12, 19:13, 25:25, 42:12, 46:4, 46:19, 46:24, 47:5, 47:11, 51:22, 55:11, 56:8, 57:20, 59:3, 61:2, 61:13, 61:21, 61:25, 62:23, 64:19, 67:9, 67:18, 69:8, 71:21, 72:25, 73:14, 73:20, 75:23, 77:4, 82:23, 83:11, 84:24, 89:10, 89:18, 91:11, 92:21, 92:23, 93:22, 94:25, 96:21, 96:24, 97:2, 100:6, 100:11, 103:19, 104:7, 104:14, 104:25, 105:10, 105:19, 106:20, 108:4, 108:24, 109:8, 110:3, 111:2, 111:3, 111:5, 111:13, 111:19, 115:22, 118:9, 118:25, 119:18, 120:16 correctly 20:20, 30:22, 40:15, 75:3, 79:19, 100:21 correlated 39:22, 40:20	correlates 39:17 corresponding 91:24 could 5:19, 13:4, 16:13, 16:15, 19:20, 22:1, 22:4, 24:14, 24:16, 26:2, 26:5, 29:1, 30:9, 31:7, 34:17, 34:20, 36:2, 36:4, 41:23, 42:10, 42:13, 45:16, 61:5, 62:2, 66:4, 66:5, 67:21, 72:17, 72:19, 76:14, 76:15, 76:23, 78:2, 81:9, 81:10, 82:17, 84:1, 85:1, 85:2, 85:3, 85:9, 85:14, 87:5, 87:24, 89:20, 89:21, 89:22, 90:1, 90:3, 90:18, 91:21, 93:11, 93:12, 99:10, 99:15, 101:1, 106:7, 106:13, 109:5, 109:14, 112:1, 114:22, 115:14, 116:8, 116:11, 116:13, 116:14, 116:15, 116:16, 116:20, 121:15, 122:13 couldn't 32:13 coulombs 41:7 counsel 123:16 counts 43:19
---	--	---	--

county 123:5 couple 45:4, 83:13, 86:4, 98:22 course 22:9 court 123:21 cramps 66:2, 66:4 cranial 97:10 cranium 96:17 creates 26:25 creating 22:8 cross-functional 44:22 csr 1:33, 123:7, 123:29 cto 3:25 cup 27:14, 117:7 current 41:5, 41:19, 42:1, 42:7, 42:9, 42:11, 42:15 curriculum 38:19	102:22, 103:12, 103:17, 103:21, 103:24, 104:3 dated 123:24 dates 103:9 dave@gerasimowlaw 3:21 david 3:15, 3:16, 5:11 day 28:18, 33:4, 35:4, 41:14, 43:16, 82:1 days 33:10 dec 8:22, 38:16 december 102:4 decision 33:12, 57:11 declaration 4:15, 4:18, 6:20, 9:18, 12:9, 13:8, 14:10, 15:6, 15:8, 16:16, 17:16, 18:11, 18:24, 37:13, 38:15, 42:19, 61:6, 61:10, 61:18, 61:21, 62:3, 63:22, 64:2, 66:21, 66:24, 67:5, 70:16, 78:3, 78:5, 79:11, 80:22, 82:9, 84:4, 88:24, 89:2, 92:21, 100:16, 102:15, 102:17, 103:23, 104:4, 120:23, 121:20 declarations 8:15, 8:17,	8:19, 8:22, 84:6 decrease 53:15, 54:11 decreased 95:10 deep 37:7, 86:20 deeply 45:11 defined 83:3, 83:17 definitely 59:19 definition 12:23, 30:20, 68:5, 85:13 definitions 64:12 deflection 117:4 degree 39:17, 39:22 deighan 3:7, 6:2, 6:5, 10:14, 10:25, 19:18, 20:2, 26:19, 38:18, 41:21, 45:16, 94:14, 102:10, 108:5, 108:25, 111:23, 112:6, 121:17, 122:12, 122:13, 122:15, 122:19 deliver 26:2, 34:18, 53:21 delivered 39:16, 39:21, 40:3, 40:25, 41:2, 41:8, 41:12 delivering 20:21, 24:7, 24:18, 40:16, 41:24, 51:12 delivery 110:25, 111:17	densely 53:7 depend 56:21 depending 73:24, 73:25, 85:12 depends 35:17, 101:20, 108:4 depict 68:20, 68:23 depicting 118:18 depicts 61:23, 68:22 deposed 6:16, 6:17, 7:12 deposition 1:23, 2:1, 4:9, 4:12, 7:7, 7:8, 7:14 describe 9:6, 10:1, 10:11, 12:25, 15:7, 56:19, 119:17, 120:15 described 15:16, 63:7, 92:7, 103:6 describes 55:12, 69:1, 89:9, 92:2, 93:24, 100:4, 115:21, 115:23, 120:17, 121:15 describing 33:16, 41:12, 57:19, 57:21, 89:12, 106:19 description 4:8, 96:9, 98:12, 99:3, 119:2 descriptive 44:12 designing 87:1, 87:2
D damaged 71:13, 71:20 data 35:4, 38:1, 42:24, 43:2, 43:6, 43:13, 43:15, 43:23, 45:1, 45:2, 45:12, 102:1 date 79:10, 81:4,			

desirable 31:15, 32:3 desired 27:3, 32:15, 52:16, 52:23, 56:21, 77:19 destroying 95:19 detail 9:1, 69:3 detailed 92:7, 96:8, 105:1 details 11:21, 12:6, 102:21, 104:2 detect 106:24, 107:10 detected 44:7 detecting 104:16 detections 44:17 determination 43:9 determine 43:3, 44:12, 108:23 determined 110:2 developing 94:18 development 37:24, 37:25, 45:10 device 32:18, 35:10, 36:4, 36:18, 39:21, 40:9, 40:11, 40:15, 41:1, 41:3, 43:6, 43:13, 43:23, 44:7, 44:17, 85:17, 86:1, 86:3, 87:15, 87:22, 87:25, 88:2,	88:10, 105:9, 105:19, 105:24, 106:3, 106:6, 118:3 devices 40:2, 86:5, 86:9, 86:15, 87:13, 88:6, 118:9, 118:11 di 93:23 diagnosis 71:2, 71:5, 71:7, 71:16, 75:18, 75:22 diagnostic 76:5, 76:20 diarrhea 65:10, 65:13, 65:14, 65:19 difference 15:3, 34:7, 51:4 differences 73:19 different 20:9, 23:23, 31:18, 32:24, 33:22, 34:2, 34:3, 34:4, 34:5, 51:16, 51:19, 64:12, 64:24, 64:25, 65:1, 65:15, 73:12, 74:2, 86:3, 88:3, 88:5, 90:23, 94:21, 97:14 digital 75:14 dilorenzo 4:21, 92:16, 92:19, 92:22, 92:25, 93:14, 93:21, 93:23, 94:15, 95:4, 95:16, 95:23, 96:1, 96:5,	98:5, 98:14, 99:2, 99:5, 99:20, 100:3, 100:4, 100:10, 100:12, 100:18, 100:22, 100:24, 101:3, 101:6, 101:8 dilorenzo's 94:4, 98:12, 99:9 direct 23:22, 24:2, 24:8, 24:20, 49:5, 51:5, 51:10, 51:21, 51:24, 52:5, 66:24 directed 36:11, 70:20, 70:21, 76:3, 76:5 directing 76:19 direction 13:6, 112:12, 112:13, 123:15 directly 20:17, 21:16, 21:24, 22:6, 22:13, 24:10, 27:9, 27:16, 46:12, 46:18, 51:1, 51:14, 69:14, 77:12, 88:18, 97:4, 97:6 disclose 15:19, 17:6, 19:15, 19:24, 70:13, 74:23, 75:25, 77:3, 91:12, 92:3, 106:4, 117:10, 117:20, 117:22, 117:24, 121:7, 121:13 disclosed 66:23	discloses 51:21, 51:23, 58:19, 79:14, 79:15, 79:16, 80:8, 80:9, 91:9, 91:23, 103:19, 105:23, 106:2, 110:23, 111:15, 117:9, 118:12, 118:15, 118:19, 118:21, 121:10 disclosing 110:6 disclosure 57:24, 96:14 discuss 92:19 discussed 92:16 discussing 21:8, 121:24 discussion 51:9 disease 35:8, 35:18, 37:5, 37:6, 43:17, 77:4, 93:16, 93:19, 93:22, 93:24, 94:13 disks 72:15 disorder 31:19, 71:19 disorders 35:15, 93:18, 94:19, 95:6, 95:12 displaying 85:14 distal 49:10 distance 25:24, 26:3, 26:5, 26:6, 26:12, 26:15, 26:16
--	---	---	---

distant 22:13, 25:4, 25:18, 44:5 distinction 15:25, 16:3, 18:19, 21:20, 22:6, 51:5, 73:16 distinguished 96:23, 96:25 divide 36:23 dizziness 65:20, 65:22, 65:24, 65:25 document 7:14, 55:7, 68:3, 106:16, 116:1 documents 7:9, 7:17, 7:19 doing 22:22, 29:25, 35:25, 54:1, 57:2, 57:3, 83:1, 99:23, 119:8 domains 28:17, 28:20 done 37:1, 82:18, 106:15, 114:3, 115:19 dorsal 48:11, 48:20, 89:4 down 11:9, 38:6, 57:11, 111:9, 112:1 downstream 76:16, 111:21, 112:4, 112:10, 112:11, 113:24, 114:12 dr 1:25, 2:1, 4:4, 4:15, 4:18, 5:4	drawing 51:5 drazkowski 39:12 due 31:15 duly 5:5, 123:10 duration 41:18 duties 123:20 E each 14:3, 108:7 earlier 21:8, 50:5, 60:23, 69:8, 100:22 earliest 103:24 early 71:7 easier 118:4 easily 33:7, 55:10, 55:20, 56:3, 56:5, 56:8, 56:10, 56:20, 58:10 east 3:9 education 82:7, 82:20 educational 83:6 effect 21:20, 21:23, 22:8, 22:9, 22:12, 22:16, 23:1, 23:9, 23:10, 23:20, 23:24, 23:25, 24:7, 24:19, 24:21, 25:6, 25:8, 25:10,	25:15, 25:21, 25:23, 27:7, 31:20, 32:13, 34:11, 34:15, 34:20, 35:6, 35:11, 35:16, 36:12, 36:15, 43:7, 43:17, 44:9, 44:15, 51:13, 51:17, 51:18, 52:16, 52:24, 53:4, 53:22, 53:25, 54:12, 54:16, 74:20, 76:15, 77:1, 77:19, 80:5, 80:18, 81:11, 85:20, 85:23, 94:12, 94:25, 95:2, 95:3, 95:24, 96:2 effective 36:17, 40:2, 95:17 effectively 46:11, 46:17, 46:21 effectiveness 36:2, 36:20 effects 27:4, 44:3, 52:17, 52:23, 53:1, 53:8, 53:9, 53:12, 54:2, 54:11, 54:15, 79:18, 94:18 efferent 13:2, 13:5 efficacy 43:3, 53:15 eight 98:21 either 41:17, 50:12, 63:13, 74:24, 101:20, 118:13,	121:14 elaborate 40:22 electrical 19:16, 19:25, 20:17, 20:21, 20:22, 24:4, 38:1, 40:3, 42:7, 48:18, 75:25, 77:3, 84:10, 84:12, 84:13, 85:20, 85:23, 99:25, 107:9, 108:23, 116:25, 118:5 electrode 23:19, 24:14, 24:15, 24:17, 25:12, 29:8, 31:9, 33:5, 33:6, 88:1, 90:21, 99:11, 100:5, 100:7, 101:1, 108:3, 109:22, 110:1 electrodes 24:22, 28:1, 30:19, 30:21, 31:3, 44:4, 44:5, 68:17, 75:13, 87:19, 88:3, 88:4, 89:2, 89:25, 90:8, 92:25, 93:6, 93:9, 93:11, 96:15, 99:23, 100:2, 106:24, 110:25, 111:17 electrogram 106:25, 108:12, 109:6 electrographic 44:3, 44:17 electromagnetic 23:21, 23:24, 24:5, 24:6, 25:11, 26:2,
---	---	---	--

26:25, 27:4, 51:12, 51:16 electromyelogram 109:6 electromyelograph 84:9 electromyograph 84:8, 87:11 electromyographic 86:1, 86:3, 117:17, 117:21, 117:24 electromyography 108:17 electronics 87:6 element 14:25, 15:4, 17:22, 18:13, 18:14, 18:21, 18:23, 19:4, 19:5, 20:25, 21:1 elements 17:17, 19:2, 20:7 else 21:23, 23:12, 24:1, 70:25 elsewhere 114:18, 114:21, 114:24, 116:1, 118:22 embodiment 89:9, 91:9, 91:23, 92:3, 100:4, 106:2, 106:4, 110:23, 111:15 embodiments 50:22, 92:2, 110:5 emg 84:7, 84:12, 84:14, 85:14, 86:9, 87:2, 87:4, 87:10, 87:12, 87:13,	87:18, 87:24, 88:1, 88:5, 88:6, 88:10, 88:15, 89:5, 89:10, 89:13, 89:15, 89:21, 89:23, 90:10, 90:11, 90:14, 90:18, 90:19, 99:16, 99:23, 99:24, 100:2, 108:17, 109:14, 116:16, 116:17, 116:21, 118:4, 119:9 emkinetics 1:11, 3:14, 5:12, 6:9 employ 43:9 enabled 10:6, 10:9, 10:20, 11:13 enablement 10:10, 10:18, 10:24, 11:6, 11:18, 12:3 encompassed 98:12 end 12:19, 13:14, 19:9, 28:18, 33:3, 35:4, 43:16, 61:1, 87:20, 91:6 ending 2:5, 98:8 energy 23:24, 24:6, 24:18, 25:11, 25:17, 25:19, 26:2, 40:16, 51:12, 51:16, 53:21, 115:4, 115:11 engaged 44:25, 83:25 engineer 38:3	engineering 45:10 enough 26:2, 34:15, 115:12 enrolling 35:24 entirely 24:15, 24:17, 87:7 entitled 39:16 entity 38:9 enumerate 52:25 epilepsy 35:15, 36:11, 37:23, 40:19 episodes 44:6, 44:8 equipment 86:12, 86:18, 86:21 eran 3:27, 6:9 essential 35:10 essentially 62:18, 62:19 established 44:8, 68:13 et 4:24, 4:26, 4:30, 4:33, 4:35, 46:21, 46:22 evaluation 35:13 even 72:24, 80:11, 81:15, 86:11, 95:8, 120:11 eventually 112:20 ever 6:16, 6:18, 6:20	every 31:18, 34:1, 34:2, 34:3 everybody 34:21, 44:22, 83:21, 83:22 everything 86:9, 86:10 ex 78:12, 78:13 exact 7:19, 17:1, 17:2, 20:4, 20:12, 44:22, 44:23, 111:4, 113:11 exactly 35:18, 64:17, 67:13, 69:4, 109:19 examination 4:4, 5:7 examined 123:9 example 33:24, 37:4, 80:13, 81:8, 89:4, 89:12, 100:20, 104:15, 106:23, 108:19, 119:7 examples 24:9, 27:21, 52:25, 82:1, 82:2, 82:3, 98:16, 115:21, 115:23, 115:24, 115:25, 117:8, 117:18 exceed 83:5 excessive 117:15 exclusion 75:18 excuse 21:13, 46:5, 47:22, 48:17,
--	---	--	---

53:19, 55:23, 56:2, 104:11 exhibit 4:8, 6:25, 7:3, 8:9, 8:10, 8:11, 9:2, 38:14, 45:23, 46:1, 60:11, 60:16, 66:6, 66:12, 66:15, 70:3, 70:7, 92:9, 92:10, 101:12, 101:18, 104:10, 110:13, 110:18 exhibits 4:14, 7:7, 8:8 exist 58:9 exists 38:5 exit 61:1 expect 69:24, 74:16, 74:17, 74:19, 81:2, 81:3, 81:13, 81:24, 94:3, 94:4, 120:10, 120:12 expectation 81:19 expected 76:10, 76:22, 77:9, 80:5 expelling 64:15 expensive 33:8 experience 37:20, 82:6, 82:21 experiential 83:6 experiment 34:10 expert 9:11, 10:17, 10:18, 11:10,	11:11, 12:2, 47:13, 47:17, 48:1, 62:20, 69:7, 69:9, 82:25, 83:25, 84:2, 102:20 expertise 11:23 explain 62:5 explains 55:9, 56:7, 71:1, 71:4, 91:4, 108:22, 109:25 explicitly 16:11 express 56:11, 82:6 expressed 103:9 expressly 17:17, 18:15, 19:2, 20:7, 21:7 extent 9:13, 16:16, 18:11, 18:12, 18:13, 19:18, 29:10, 79:25, 80:1, 103:13 external 84:24 externalized 30:2, 30:4 extracranial 96:15 extraordinary 83:20 extremities 93:3, 98:18, 98:19, 98:24, 99:1, 100:15, 101:2 eye 85:16 F face 97:6, 97:8,	97:9, 97:16, 104:7 fact 18:4, 32:11, 69:9, 76:12, 76:21, 100:25, 108:18, 109:11, 120:24 factor 89:24 factors 56:22, 57:23, 87:24, 88:5, 90:3, 90:9, 90:18 fairly 33:7, 35:14, 88:14 fake 34:18 familiar 64:4, 67:24, 85:25, 87:4 far 26:3, 54:7, 84:2 faster 43:25 favor 95:10 fda 36:23 feature 50:21 feel 8:20, 15:22, 26:21, 30:22 feet 88:11, 88:12 few 31:5, 43:12, 63:1, 86:3, 89:19, 115:25 fibers 62:7, 62:15, 62:16, 63:1 field 25:3, 28:8,	28:11, 28:15, 29:24, 34:25, 36:21, 36:24, 53:13, 53:19, 54:13, 57:9, 58:7, 82:5, 82:25, 87:9, 94:7, 104:21, 105:4, 120:1 fields 23:21, 25:8, 26:25 fig 58:25, 59:2, 68:23, 105:22, 105:25, 107:16, 107:18, 107:23, 107:24, 108:19, 109:8, 109:9, 109:16, 109:18, 109:19, 118:17 figure 34:11, 34:15, 59:5, 61:20, 61:23, 63:21, 63:25, 109:11, 109:12 filed 69:17, 102:4 filing 102:8 final 89:1 find 68:4, 69:25, 76:22, 118:3, 118:4 finding 40:1, 67:21 fine 11:21, 12:6, 14:5, 14:6, 15:2, 18:3, 122:14 finished 55:5 firm 16:8, 16:18,
--	--	---	---

121:23 first 5:5, 18:7, 39:11, 49:6, 73:5, 75:15, 78:11, 101:24 fit 118:6, 120:5 five 60:25, 98:20 flip 14:13 floor 52:5, 111:1, 111:18, 122:12 flow 116:22, 117:1, 117:6, 117:12 flowing 52:13 focused 119:21, 120:8 folks 57:8 follow 34:22, 112:16 follow-on 22:9, 22:12, 51:18, 74:20, 76:15 following 28:23, 30:16, 31:14, 32:2, 35:25 follows 5:6 foot 86:20 force 116:12, 116:13, 116:14, 116:16, 117:15, 118:1 forced 116:9 foregoing 123:10 foremost 18:8	form 10:25, 26:19, 41:21, 87:23, 88:5, 89:24, 90:2, 90:9, 90:18, 94:14, 102:10, 106:23, 108:5, 108:25, 111:23, 112:6, 121:17 forth 57:7, 82:21 forward 13:7 fossa 59:22 found 13:22, 17:17, 18:15, 19:2, 20:7, 80:10, 81:25 founder 38:3 four 68:23, 88:11, 98:20 francisco 1:27, 2:4, 5:1, 6:1 free 8:20, 26:21 frequency 108:3, 109:22, 110:1 frequently 42:11, 42:16 front 14:16, 16:14, 17:1, 38:24, 46:8, 58:16, 60:20, 66:19, 70:9, 92:14, 103:7, 103:10, 103:15, 110:20, 121:22 full 5:19, 31:12, 38:7, 56:4	full-time 37:22 fully 28:14, 58:2, 89:22 function 111:22, 112:5, 112:25, 113:3 fundamentally 32:10, 115:2, 115:9 funnels 112:20 further 16:14, 23:4, 23:13, 80:12, 99:7, 99:8, 114:14, 122:10, 122:20, 123:19 furthermore 103:13 G gathered 43:23 gave 61:5 gb 68:23 gen 84:13 general 13:1, 13:22, 14:5, 28:3, 28:4, 34:13, 36:25, 98:22, 98:23, 105:4, 118:10, 119:13 generally 28:9, 53:18, 91:16, 93:16, 99:6, 99:20, 118:8 generated 84:14, 85:4 generator 27:25, 29:21, 30:2, 33:8	generators 29:7, 29:9, 29:16 gerasimow 3:15, 3:16, 4:5, 5:8, 5:11, 6:4, 6:8, 6:10, 7:5, 8:14, 10:22, 11:17, 19:22, 26:20, 38:20, 38:23, 45:20, 46:3, 60:19, 66:18, 70:6, 78:1, 92:13, 94:23, 101:16, 102:23, 109:7, 110:16, 112:3, 112:22, 122:5, 122:10, 122:14, 122:20 gerb 117:11 gerber 4:24, 110:19, 110:22, 110:23, 111:14, 114:15, 115:14, 117:9, 117:12, 117:16, 117:19, 117:20, 117:22, 117:23, 118:8, 118:10, 118:12, 118:15, 118:18, 118:19, 118:21, 118:25, 119:4, 119:5, 119:17, 119:21, 120:7, 120:15, 120:17, 120:20, 120:23, 120:25, 121:4, 121:7, 121:10, 121:13, 121:14, 121:21, 122:1, 122:3, 122:6, 122:7, 122:9 gerber's 117:12, 120:8 getting 29:14, 34:21,
---	---	---	--

80:25, 81:1 give 37:4, 49:1, 115:10 given 29:25, 33:16, 36:2, 93:13 gives 80:13, 81:23, 98:16 glad 102:14 glans 49:12 glasses 46:6 globus 95:13 go 14:3, 16:15, 17:11, 23:11, 23:12, 32:16, 38:14, 39:6, 39:9, 42:19, 42:22, 49:9, 52:1, 55:22, 57:23, 61:18, 69:3, 70:24, 73:3, 78:5, 82:11, 82:16, 83:22, 91:2, 96:5, 98:5, 107:12, 115:14, 121:19, 122:13 goal 35:3, 95:5 goes 33:10, 49:17, 49:18, 50:12, 56:19, 84:2, 87:21, 90:21 going 7:12, 8:23, 10:19, 16:2, 16:24, 16:25, 27:6, 27:15, 33:11, 33:12, 43:13, 45:13,	48:6, 57:6, 77:22, 102:14, 112:13, 113:11, 121:19 gold 43:20 good 5:9, 5:10 gradually 95:10 graphs 15:16 grave 94:19 great 5:19, 8:23, 46:7 greater 9:1, 41:25 greatest 44:14 greatly 38:6 grey 4:33, 66:19, 66:23, 67:2, 67:11, 67:14, 67:15, 67:20, 67:22, 67:23, 68:4, 68:7, 68:20, 68:22, 69:1, 69:3, 69:15, 69:23, 69:25 griswold 3:6, 6:6 ground 11:19 grounds 11:22, 12:7, 14:3, 14:7, 15:7, 16:5, 18:10 groups 52:7, 53:17 guess 23:5, 81:21 H halfway 96:11, 111:9	halter 3:6, 6:5 hand 8:8 handed 7:6, 7:16, 8:15, 66:11, 70:7, 101:17 hanging 45:23, 60:10, 66:6, 92:8, 110:17 happen 36:2 happens 35:12 hard 113:17, 113:22, 113:23, 114:11 head 74:19, 97:18, 98:17 heading 13:10 healthy 37:1, 37:9 heard 30:22 heart 108:17 heat 27:12 heating 27:16 help 43:25, 78:9 here 6:23, 7:12, 7:21, 9:10, 10:21, 11:25, 13:19, 13:22, 14:1, 14:7, 17:13, 18:3, 18:21, 20:13, 20:16, 20:24, 21:20, 21:24, 22:14, 23:3, 27:8, 27:9,	33:16, 42:22, 46:20, 47:18, 47:20, 48:15, 48:16, 48:17, 48:25, 49:9, 58:1, 58:16, 58:17, 58:18, 58:19, 64:11, 67:1, 67:14, 68:5, 71:22, 73:22, 73:23, 74:3, 75:3, 75:11, 76:3, 76:4, 81:23, 83:4, 83:15, 83:18, 83:24, 92:5, 92:7, 93:24, 94:1, 94:4, 95:4, 95:16, 99:9, 103:5, 103:7, 103:9, 103:12, 103:23, 104:10, 105:2, 108:9, 111:4, 111:24, 112:8, 113:6, 121:24 hereby 123:8 hereunto 123:22 herniated 72:15 hertz 109:22 high 86:19 higher 52:12, 53:11 hold 49:8 holding 41:19 hollow 59:25, 60:1 home 32:16 honestly 67:12
---	--	--	--

hour 45:14, 77:22 hours 45:7 however 35:5, 37:8, 96:12, 101:7, 113:12, 117:25 human 69:2, 69:5, 85:16, 97:22, 98:11, 99:3, 99:13 I identification 7:4, 8:13, 46:2, 60:18, 66:17, 70:5, 92:12, 101:14, 110:15 identify 77:10 illinois 3:19 im 112:11 imagine 85:10 imd 105:10, 105:18 impedance 106:24, 107:7, 107:8, 117:14 implant 31:12, 33:4, 33:8, 36:4, 57:5 implantable 27:24, 27:25, 28:24, 29:2, 29:4, 29:7, 29:9, 29:16, 29:19, 29:21, 30:2, 30:18, 31:2, 31:15, 31:21, 32:2, 36:18, 37:23, 46:11, 46:17,	56:24, 57:3, 57:20, 57:21, 58:5, 58:20, 87:3, 88:2, 105:19, 105:24, 106:3, 106:6, 118:8, 118:10, 118:18, 119:21, 120:3, 120:8, 121:15 implantation 28:25, 29:3, 29:5, 29:11, 30:8, 30:9, 91:13, 118:13, 118:15, 119:1 implanted 29:22, 30:4, 31:7, 32:11, 37:7, 58:2, 89:3, 89:16, 91:5, 91:6, 91:10, 91:24, 93:1, 93:7, 93:10, 93:12, 106:5, 114:17, 119:18, 119:20, 120:16, 120:18, 120:25, 121:8, 121:11 implanting 91:17, 91:19, 91:21, 118:19, 118:21 implies 112:12 implying 56:16 important 42:2, 57:25, 58:6, 58:18, 73:21, 73:22, 76:7, 108:9, 109:2 improper 24:22 impulses 85:2, 85:4	inc 1:8, 1:11, 3:4, 3:14 inch 87:8 inches 27:13 include 12:17, 43:2, 104:6, 108:17, 111:10, 111:16 included 61:20 includes 14:11, 110:24 including 73:7, 93:2, 94:18 incoming 42:24, 43:5 incontinence 14:22, 15:12, 15:20, 16:12, 16:21, 17:4, 17:7, 17:22, 18:9, 19:10, 19:17, 20:1, 20:18, 22:24, 46:13, 46:19, 70:14, 94:9, 94:11, 94:19, 94:24, 95:1, 95:22, 95:23, 96:1, 104:25, 105:13, 105:15 incorporate 120:14 incorrectly 20:20 increase 41:23, 41:24, 42:9, 42:13, 42:17 increased 41:17 increases 42:7, 42:8 increasing 41:17, 42:5	indeed 25:21, 27:5, 45:12, 73:1, 80:3, 92:3, 95:22, 97:24, 99:22, 106:4 indicates 39:20, 68:14 indication 37:3 indications 15:14, 15:15 indirect 22:16, 51:7 indirectly 22:10, 51:1, 51:20 individual 57:12 induces 27:3 inferior 47:22, 47:23 inflamed 65:17 inform 69:12, 121:6 inherently 17:17, 18:16, 19:2, 20:7, 21:7, 75:7, 119:10 inhibition 48:21 injectable 30:10 injecting 29:14 innervate 48:3, 113:12, 114:10 innervated 53:7, 97:5, 97:6, 97:8, 97:10 innervates 47:2 innervation 50:6, 50:9,
--	---	--	---

50:10, 50:11 input 50:13, 50:14, 84:21, 84:23, 84:25, 109:15 inside 30:15 insight 115:10 instance 15:14, 16:6, 22:11, 25:3, 27:24, 28:20, 29:6, 32:18, 33:1, 35:7, 43:15, 52:20, 54:3, 91:4, 113:15, 118:17 instead 103:18 institute 58:5 insufficient 24:23, 25:14 integrated 120:2 integrating 117:6 intended 24:25, 25:5, 25:14, 25:21, 25:23, 26:7, 27:6 intensity 24:23 intent 21:19, 22:8, 22:18, 22:19, 23:5, 24:10 inter 11:19 interested 123:17 interfaces 87:14 interpret 28:6 interpretation 92:5	intervention 34:12, 34:19 interventions 94:17, 96:4 intestinal 65:14, 65:17 intracranial 93:17 introduce 6:2, 6:25 invasive 27:21, 27:23, 28:3, 28:13, 28:14, 28:20, 28:21, 28:22, 30:17, 31:2, 31:11, 31:24, 58:2, 58:12, 93:6, 93:9, 93:11, 120:2, 121:1 invasiveness 31:16, 36:22, 58:2 invention 10:5, 10:8, 10:12, 10:13, 50:22, 50:23, 93:16, 93:21, 93:23 involved 5:14, 45:12, 113:13 involving 75:19 ipg's 29:8 ipr 1:14, 1:19, 4:10, 4:13, 4:16, 4:19, 7:23, 11:22, 12:7 issue 8:5, 43:4 issued 69:18, 70:1 item 59:2, 101:25	itself 35:23, 59:24, 90:24 J job 1:34 journey 83:22 junction 84:15 june 1:29, 2:5, 5:1, 123:24 K kansas 2:3 kdeighan@calfee 3:12 keep 34:19, 49:5, 74:4, 76:7 key 43:12, 74:4, 109:5 kind 15:24, 25:10, 26:14, 28:15, 34:24, 35:18, 57:10, 59:12, 59:25, 72:9, 73:21, 86:17, 86:19, 88:10, 90:10, 99:4, 116:9, 116:23, 117:3, 119:12, 119:14, 120:2 kinds 26:12, 86:4 knee 55:16, 60:1 knowl 79:8 knowledge 61:4, 63:10, 77:5, 77:7, 78:14, 78:23,	79:9, 79:23, 80:23, 81:1, 86:2, 100:12, 101:6 known 80:15, 82:5, 94:5 knows 34:21 kyle 3:7, 6:5 L 11 62:12, 62:16, 62:23, 63:5 12 63:8 13 63:8 14 62:7, 62:15, 62:19, 63:20 15 62:7, 72:12, 72:14, 72:18, 72:24 labeled 19:5 labs 38:4 laid 80:7, 80:21, 81:23 landmark 75:6 language 14:18, 14:24, 17:21, 18:22, 26:22 last 32:1, 37:21, 49:6, 75:9 lastly 72:11 later 102:8, 102:25 lateral 4:38, 73:8,
---	--	---	---

73:14, 73:17, 76:24 law 3:15, 42:3 lawyer 9:8, 9:11, 10:21, 11:5, 11:15, 12:1, 17:11, 18:6, 18:18, 102:13, 102:19, 122:8 lay 79:11, 79:12 layperson 65:18 lead 42:24, 49:10, 87:21, 90:20, 110:24, 111:10, 111:16 leading 48:21 leads 28:25, 29:3, 29:5, 29:8, 29:17, 30:3, 30:4, 31:8, 33:9, 57:7, 86:13, 88:7, 89:25 leafing 8:21 learning 83:22 learnings 58:11, 122:3 least 25:7, 37:2, 42:18, 86:4, 98:21, 110:24, 111:10, 111:16 led 102:9 leg 55:10 legal 9:6, 9:11, 9:13, 9:14,	9:16, 9:19, 10:1, 10:14, 10:18, 10:21, 11:1, 11:11, 11:23, 15:25, 16:3, 17:12, 17:14, 17:25, 18:2, 18:25, 21:6, 102:13, 102:20, 102:21, 103:11, 104:2 legend 59:5 lesion 72:18, 73:2, 75:18, 75:23 lesions 72:12, 72:14, 72:23, 72:25 less 30:17, 31:2, 31:11, 31:15, 32:2, 34:10, 56:12, 86:11, 98:23, 98:25, 120:2 let's 9:18, 19:4, 41:19, 45:18, 78:10 level 52:12, 55:13, 55:16 levels 58:1, 63:6 light 120:22 limb 75:19 limit 88:13 limitation 14:25, 15:4 limitations 54:1 limited 114:23 line 46:7, 49:6,	50:19, 52:4, 54:22, 55:3, 75:15, 91:2, 93:15, 94:8, 96:8, 98:8, 100:4, 105:17, 106:11, 106:14, 107:14, 107:15, 108:15, 111:7, 115:16, 115:18, 117:16, 117:23, 119:3 lines 68:8 linked 42:3 list 39:11, 104:5, 108:12 lists 14:18 literal 99:5 literally 56:9, 89:13, 95:19, 122:15 literature 36:24, 37:9, 69:16 little 25:17, 25:20, 35:6, 45:13, 57:10, 94:20, 96:11, 113:17 llc 2:2, 38:5, 38:12, 38:13 llp 3:6 locate 99:10 located 61:12, 68:21, 69:2, 96:17, 99:17, 100:5, 100:8 location 26:17, 54:25,	56:18, 89:17, 90:1, 90:12, 90:17, 90:23, 99:13, 99:22 locations 98:15, 98:19, 99:6, 99:12, 99:16, 99:20 long 34:25, 35:2, 35:21, 36:1, 44:7, 83:1, 88:7, 88:11, 88:14, 101:20 long-standing 37:9 long-term 33:13 longer 35:16, 36:12, 36:15, 41:25 look 8:19, 8:22, 47:15, 58:14, 58:25, 59:4, 67:20, 68:1, 68:7, 73:23, 78:10, 93:14, 94:8, 101:24, 102:18, 108:14, 114:14, 118:4, 119:15, 122:1, 122:16 looked 40:7, 43:16, 43:18, 43:19, 44:4, 44:6, 80:15 looking 11:7, 37:18, 44:1, 44:16, 45:1, 48:5, 48:25, 49:3, 69:21, 107:11, 107:24, 111:3, 111:6 looks 102:3
--	--	---	--

loop 104:18, 109:6, 109:15 lot 7:17, 14:1, 27:15, 28:15, 35:4, 47:7, 72:23, 87:23, 88:4, 97:4, 100:17, 109:2, 118:4 low 25:3, 26:4 lower 61:1, 61:24, 75:19, 93:3, 98:18, 98:24, 99:1, 100:15, 101:2 lt2 38:4 lumbar 61:24, 62:7, 62:12, 62:23, 63:9	managing 37:25, 38:3 mandated 123:21 manish 3:25, 6:7 mann 4:35, 46:4, 46:8, 46:16, 46:20, 48:16, 48:17, 48:19, 49:14, 50:18, 51:5, 51:21, 51:23, 52:1, 52:9, 54:18, 55:9, 55:12, 55:15, 55:18, 55:19, 55:22, 56:2, 56:7, 56:9, 56:11, 56:16, 56:17, 56:19, 57:14, 57:16, 57:19, 57:21, 57:23, 58:3, 58:4, 58:11, 58:13, 58:15, 58:17, 58:19, 58:25, 60:8, 78:13, 78:22, 78:25, 79:6, 79:13, 79:14, 79:15, 79:16, 79:23, 80:8, 80:19, 80:22, 81:6, 81:7, 81:15, 81:23, 82:1, 89:8, 89:9, 89:12, 90:4, 90:25, 91:4, 91:9, 91:12, 91:23, 92:2, 92:3, 92:5 mann's 58:3, 90:4, 90:5 many 21:21, 25:7,	25:8, 27:12, 29:23, 31:19, 31:22, 31:23, 34:5, 35:5, 35:25, 41:1, 41:3, 41:7, 41:23, 43:12, 44:11, 45:7, 56:21, 64:10, 84:17, 90:9, 90:18, 92:1, 94:5, 95:20, 95:21, 98:11, 99:16, 99:22, 110:4 marked 4:14, 7:4, 7:6, 8:13, 45:23, 46:2, 60:10, 60:17, 66:6, 66:12, 66:16, 70:4, 70:7, 92:8, 92:11, 101:13, 101:17, 110:14, 110:18 masseter 98:16, 98:23, 98:25 material 14:1, 63:5, 63:8, 69:15, 69:25, 77:10, 79:15, 79:17, 100:17, 103:6, 104:9, 120:13 materials 38:24, 69:22, 104:5, 104:8 matter 6:23, 8:9, 8:10, 9:3, 9:19, 9:22, 9:25, 10:3, 12:9, 14:10, 38:8, 61:6, 66:7, 66:12, 66:22, 70:8, 78:3, 102:8, 104:6	matters 103:12 matthew 5:21 maximize 52:16, 53:21, 54:15 maybe 17:9, 30:7, 86:19, 116:24 mean 21:13, 22:19, 28:4, 28:6, 80:11, 82:24, 83:24, 85:12, 85:13, 85:16, 88:9, 89:20, 91:13, 91:14, 91:16, 91:21, 92:1, 94:15, 115:7, 115:8, 117:11, 121:21 meaning 13:25, 21:9, 21:15, 21:18, 21:25, 28:9, 40:8, 66:9 meanings 65:1 means 13:1, 13:2, 30:20, 50:11, 87:10 measure 34:19, 35:19, 76:16, 84:21, 99:18, 100:1, 115:5, 115:9, 116:8, 116:14, 116:15, 116:19, 117:1, 117:5 measurements 84:10 measures 44:10, 44:11 measuring 84:14, 84:18, 84:19, 84:20,
M			
made 61:15, 121:15, 123:20 magnetic 24:4 main 46:23 majority 73:9 make 10:13, 14:4, 15:2, 33:12, 37:22, 43:9, 58:13, 58:23, 75:2, 77:6, 100:18, 119:23 makes 80:2 malleolus 59:10, 59:11, 59:15, 75:5			

85:14, 88:2 mechanical 38:1, 107:5, 116:20, 116:23, 117:3 mechanism 113:25, 114:4, 114:6, 116:11 mechanisms 70:22 medial 4:38, 59:10, 59:11, 59:15, 73:6, 73:14, 73:17, 75:5, 75:13, 76:23 medical 1:8, 3:4, 6:6, 39:2, 105:19, 105:24, 106:3, 106:6, 118:3 medications 44:14 medicine 67:9, 67:18, 69:7, 69:10, 69:12, 69:14 meet 50:22, 82:20 memorized 67:25 memory 49:4 menstrual 66:3 mention 100:14, 105:14 mentioned 21:9, 29:17, 30:7, 32:19, 33:14, 34:6, 40:21, 42:1, 55:21, 57:24, 60:22, 69:6, 69:23, 82:8, 88:7, 112:25, 117:8, 118:25 mentioning 96:1	mentions 71:6, 71:15, 71:16, 71:24, 72:11, 94:8, 94:11, 95:23, 98:14, 98:15, 100:10, 104:11, 104:13, 104:24, 105:3, 117:19, 119:4 merged 41:10 meridian 67:8, 67:17 merits 75:15 method 14:21, 15:19, 17:6, 17:21, 18:9, 22:23, 23:3 methods 30:9, 37:11, 50:24 micro 59:8 microseconds 109:22 microstimulator 57:20, 57:22, 58:6, 58:20, 59:2, 59:6, 59:9, 90:6, 91:5 microstimulators 91:6, 91:24 microwave 27:12, 27:17 middle 12:14, 92:24 might 22:9, 25:13, 25:14, 26:12, 26:14, 26:16, 29:24, 32:10, 35:14, 36:23, 42:6, 53:4, 53:5, 53:6, 53:8, 56:21,	58:9, 58:10, 65:3, 65:4, 65:13, 65:18, 74:1, 74:2, 80:1, 88:11, 121:4 mind 45:17, 74:4, 76:7 minimally 28:3, 28:13, 28:20, 28:21, 31:24, 58:2, 58:11, 121:1 minimize 52:16, 54:14, 54:15 minute 100:18, 108:12 minutes 122:16 mischaracterizes 19:19 missed 119:23 missing 15:2, 68:4, 76:2 mix 37:1 model 84:11 moderately 95:17 modesty 84:1 modified 115:24 moment 56:1, 79:2, 79:3, 102:14, 103:2, 111:24, 113:4 monitor 81:11, 116:7 monitored 115:22 monitoring 40:9	mononeuritis 71:17, 71:22 month 41:14 more 11:8, 12:10, 19:21, 29:1, 30:25, 34:10, 40:2, 40:3, 40:16, 40:17, 40:20, 41:24, 41:25, 42:11, 42:16, 44:5, 45:6, 45:9, 45:13, 50:22, 52:13, 56:11, 56:19, 57:9, 57:10, 57:18, 63:17, 63:18, 71:20, 74:7, 74:8, 83:22, 89:25, 91:6, 91:10, 91:24, 93:8, 93:17, 95:8, 96:11, 98:22, 98:24, 101:22, 106:22, 110:9, 110:25, 111:16, 112:2, 114:13, 114:23, 119:24, 119:25 moreover 103:11 morning 5:9, 5:10 most 34:16, 53:12 motion 65:6, 65:8 motor 53:12 mounted 86:11, 86:18, 87:1, 87:13, 87:18, 87:22, 88:6, 88:10 move 13:7, 19:4
---	--	---	--

movement 93:18, 95:6, 95:12 much 8:21, 41:2, 45:2, 45:9, 67:10, 69:13, 80:9 multiple 5:13, 47:4 multiplex 71:17, 71:23 muscle 84:16, 84:18, 84:22, 85:5, 85:7, 85:9, 85:21, 85:24, 119:11 must 10:6, 10:8, 10:11, 17:23 myself 58:16, 83:2, 83:15, 103:2	33:4, 42:2 necessary 12:4 neck 22:15, 97:20, 97:21, 98:17, 100:6, 100:8 need 15:19, 17:6, 19:15, 19:24, 21:3, 21:5, 21:6, 46:16, 76:7, 99:24, 99:25, 115:2 needed 46:10, 46:21, 79:7 needing 81:15 needs 10:20, 11:12, 11:13, 115:11 neither 123:16 nerves 4:38, 52:5, 60:22, 60:25, 61:1, 61:23, 71:12, 71:20, 73:14, 77:13, 96:20, 97:1, 97:10, 97:16, 97:18, 97:21, 97:25, 100:25, 111:1, 111:18, 111:21, 111:22, 112:1, 112:4, 112:5, 112:15, 112:24, 112:25, 113:10, 113:11, 113:12, 113:14, 113:18, 113:20, 114:7, 114:10 nervous 47:13, 52:12, 54:9, 96:21, 96:24, 97:2, 97:5, 97:7	network 22:13 neural 36:14, 50:12, 72:8, 72:23, 73:1, 84:21, 84:23, 84:25 neuroanatomist 50:2, 113:8, 113:9 neuroanatomists 97:11 neuroanatomy 48:1, 62:17, 62:25, 63:16, 113:5 neurofibers 62:12, 62:22 neurolog 36:10 neurologic 94:18, 95:21 neurological 71:2, 71:19, 93:16, 93:19, 93:22, 93:24, 94:13, 95:5 neuromodulation 10:17, 11:10, 12:2, 21:21, 21:25, 22:23, 23:7, 26:24, 28:11, 34:25, 35:5, 36:10, 36:16, 37:6, 40:8, 58:8, 76:9, 77:8, 82:25, 84:3, 85:4, 94:2, 94:7, 95:11, 104:21, 105:5, 114:4, 119:25 neuromodulatory 23:20, 24:19, 25:10, 25:21, 27:6, 51:13, 51:17 neuromuscular 84:15	neuropace 37:22, 38:7 neuropathy 71:7, 71:11, 75:16, 75:23, 76:1 neurostimulation 39:17, 39:21, 40:2, 110:25, 111:17 neurostimulator 31:10, 43:4, 110:24, 111:10, 111:15 neurostimulators 31:7 never 6:17, 100:10, 104:11, 104:13, 104:24 nevertheless 7:20 nicolet 86:1, 86:5, 86:15 nine 98:21 non-implantable 121:16 non-invasive 22:3 non-lawyer 10:23 nonetheless 30:13 noninvasive 28:13, 28:21, 28:22, 31:24, 32:18, 37:10, 37:11, 56:25, 58:3, 58:12, 58:24, 93:2, 93:11, 119:24, 120:2, 120:12, 121:1, 121:6, 122:3 noninvasively 27:19, 28:4,
N			
name 5:19, 64:4, 100:11, 100:13, 123:23 name's 5:11 naturalistic 34:23 nature 60:1 nausea 64:5, 64:7, 64:11, 64:13, 64:16, 64:17, 64:18, 65:4, 65:7, 65:9, 65:21, 65:22, 65:25 near 44:4, 89:4 necessarily 16:11, 22:3,			

28:6, 28:9 normally 54:12 note 28:10, 58:7, 108:9 noted 13:15, 14:2, 21:10, 40:15 notes 122:16 nothing 63:5, 123:11 notice 4:9, 4:12 notices 7:7 notion 32:20 nuclei 95:13 nucleus 37:7, 95:15 number 7:3, 12:10, 33:10, 41:5, 41:18, 46:1, 48:3, 60:16, 66:15, 70:3, 72:17, 82:12, 90:2, 92:10, 101:12, 101:25, 102:2, 110:13 numbers 8:11	observable 74:24 observe 34:22, 36:12, 74:7, 85:20, 85:23 observed 24:9, 73:12, 85:5 observing 85:9 obtained 73:6 obvious 15:9, 15:10, 15:15, 28:18, 58:23, 78:12, 79:22, 80:1, 80:11, 82:1, 116:10, 120:22 obviously 101:10 obviousness 70:18, 78:18 october 103:25 offer 103:16 offering 104:1 office 1:1, 5:13, 6:21, 8:4 officer 3:27 offices 3:15 often 35:2, 36:19, 40:13, 43:22, 47:8, 53:19, 62:25, 64:18, 65:10, 65:13, 65:25, 87:19, 102:12 oh 113:2 ohio 3:10, 3:17	ohm's 42:3 okay 6:24, 12:13, 14:10, 38:14, 50:15, 64:3, 68:7, 72:19, 84:4, 90:25, 97:15, 105:18 omit 99:2 once 55:25 one 10:12, 12:10, 19:21, 21:22, 23:7, 26:1, 26:14, 28:10, 28:17, 28:19, 29:1, 30:25, 32:1, 32:19, 34:13, 35:15, 36:22, 41:3, 41:4, 42:1, 50:5, 50:22, 53:25, 55:13, 59:13, 62:25, 63:1, 65:3, 72:16, 72:17, 77:18, 80:1, 89:25, 91:17, 91:18, 92:23, 93:8, 95:7, 95:11, 95:22, 98:20, 101:1, 101:22, 106:22, 109:4, 109:5, 110:4, 110:5, 110:24, 111:10, 111:16, 112:2, 113:16, 114:5, 116:10, 117:23 one's 10:19 ones 68:24, 86:17, 86:24, 86:25 ongoing 50:2	only 6:23, 36:17, 68:24, 68:25, 118:24 onwards 108:15 open-label 34:20 opine 11:25, 103:18 opinion 10:21, 12:23, 13:19, 13:22, 15:10, 16:8, 16:18, 18:8, 79:21, 82:6, 83:2, 83:15, 101:8, 102:6, 103:3, 103:5, 103:12, 103:17, 104:2, 120:21, 121:3, 121:20, 121:23 opinions 102:16 opposed 22:10, 84:24, 118:5 opposite 13:6, 80:19 optimal 93:18 optimize 43:6 ord 21:24 order 17:7, 21:4, 77:18 ordinar 79:24 ordinarily 21:13 ordinary 13:25, 14:9, 21:9, 21:15, 21:18, 21:25, 74:15, 76:9,
O			
oath 6:11 objection 10:14, 10:25, 19:18, 20:2, 26:19, 41:21, 94:14, 102:10, 108:5, 108:25, 111:23, 112:6, 121:17 objects 50:23			

76:21, 77:7, 78:15, 78:19, 78:23, 79:9, 79:24, 80:9, 80:14, 80:24, 81:2, 81:13, 81:20, 81:24, 82:3, 82:7, 82:22, 83:3, 83:17, 94:6, 96:13, 101:11, 120:10, 121:4, 121:25 original 102:25 originating 61:24, 62:7, 62:12, 62:22 other 8:10, 14:2, 15:14, 26:17, 28:20, 29:14, 30:3, 30:9, 31:23, 35:15, 36:10, 36:22, 44:5, 45:7, 50:13, 51:23, 52:6, 52:17, 53:8, 53:10, 53:17, 54:2, 54:15, 55:16, 55:19, 56:3, 56:4, 56:7, 56:9, 78:24, 90:1, 91:20, 92:20, 93:13, 93:18, 94:1, 98:15, 98:17, 98:19, 99:6, 99:20, 115:25, 117:8, 117:10, 117:18, 118:24, 120:7 others 57:18 otherwise 13:15, 14:2, 21:10, 32:14	ourselves 6:3 out 34:11, 34:15, 36:7, 58:1, 78:3, 79:11, 79:12, 80:7, 80:21, 81:23, 90:25, 109:4 outcome 43:21, 44:10, 44:11, 123:18 outcomes 43:16, 44:1, 44:15, 44:17 output 108:4, 108:8, 108:20, 108:22, 109:10, 109:21, 110:3 outside 28:5, 30:5, 33:9, 71:12 over 5:23, 13:5, 36:14, 49:9, 57:23, 73:7, 78:20, 95:9, 100:9, 122:16 overactive 14:21, 15:12, 15:20, 16:12, 16:21, 17:3, 17:7, 17:22, 18:9, 19:9, 19:16, 19:25, 20:18, 22:24, 70:13, 70:21, 104:24, 105:13, 114:4 overall 26:16 overlap 27:2, 28:12, 63:18 own 22:9, 26:21 owner 1:12, 2:2,	3:14, 5:13 P page 4:3, 4:8, 9:3, 9:20, 9:23, 12:10, 39:9, 73:3, 73:5, 75:9, 75:10, 78:5, 78:6, 101:24 pages 1:35 paging 119:22 pain 33:2, 46:13, 46:19, 53:6, 64:21, 65:3, 66:2, 66:5 paint 87:14 pairs 60:25 pallidus 95:14 paper 16:14, 40:6, 76:4 paragraph 12:8, 12:12, 12:14, 13:7, 13:14, 42:19, 42:23, 50:19, 52:3, 52:4, 54:21, 55:3, 56:16, 57:13, 60:6, 61:9, 61:18, 61:20, 62:2, 62:5, 63:21, 66:21, 66:25, 67:2, 78:6, 82:8, 82:15, 82:22, 83:9, 83:18, 89:1, 92:20, 92:23, 92:24, 96:7, 96:12,	98:7, 98:8, 98:13, 98:14, 99:3, 103:24, 105:14, 106:10, 106:13, 106:19, 107:15, 108:6, 111:4, 111:6, 114:14, 115:15, 115:18, 115:21, 115:23, 117:10, 117:16 paragraphs 9:5, 9:7, 10:1 parameter 44:13, 104:17, 117:2 parameters 40:12, 89:7, 108:16, 115:21, 115:24, 117:8, 117:10 paren 12:18 paresthesias 54:7 parkinson's 35:8, 35:20, 36:3, 37:5, 37:6, 37:11 part 15:1, 15:5, 18:22, 39:3, 39:4, 43:5, 44:18, 44:20, 59:11, 69:15, 70:18, 89:24, 96:20, 99:2, 105:23 partes 11:19 particular 32:23, 39:9, 41:11, 50:18, 54:21, 61:9, 67:3, 68:8, 78:10, 93:14, 95:18, 100:3, 106:10, 107:14,
---	---	--	---

115:15, 118:12 particularly 93:17, 96:3 parts 16:16, 56:20, 95:14, 97:4 party 123:17, 123:19 patch 88:1 patches 87:5, 87:20 patent 1:1, 1:4, 1:12, 1:15, 1:20, 2:2, 3:14, 4:20, 4:23, 4:25, 4:28, 4:32, 4:34, 5:11, 5:13, 6:21, 8:4, 10:6, 10:8, 10:11, 11:20, 14:19, 15:18, 17:8, 17:20, 19:15, 19:24, 46:4, 60:11, 69:17, 70:1, 70:2, 101:19, 102:9, 103:25 patents 8:5, 9:10, 39:2, 39:4 path 68:13 pathways 13:5 patient 29:25, 31:18, 31:21, 32:14, 32:20, 33:10, 33:13, 33:17, 36:2, 41:13, 43:6, 43:14, 86:22, 87:15, 87:16, 89:17, 94:17, 111:2, 111:18, 114:19, 114:22, 114:24,	118:23 patients 32:5, 33:24, 34:1, 34:4, 35:25, 36:1, 40:19, 44:14, 47:9, 75:16 pattern 26:24, 27:2 pectoralis 98:18 pelvic 46:13, 46:19, 52:5, 98:3, 111:1, 111:18 penis 48:12, 48:20, 49:12 people 33:2, 33:3, 34:14, 34:15, 34:16, 34:19, 44:24 percent 78:14 percutaneous 28:2, 29:13, 30:10, 30:17, 30:20, 31:1, 31:11, 57:2, 58:24 percutaneously 31:8 perfectly 122:2 perforate 119:14 performed 30:8 perineal 47:13, 49:4, 53:10 perineum 46:24, 47:2, 48:4, 48:10, 49:11 period 35:13	peripheral 37:9, 37:10, 71:7, 71:11, 71:20, 72:8, 74:8, 75:16, 75:23, 76:1, 93:3, 96:16, 96:20, 96:25, 97:1, 97:11, 97:16, 97:18, 97:21, 97:25, 100:5, 100:7, 100:14, 100:25, 101:1 peripherally 74:7 permanent 94:18 person 58:22, 78:18, 78:23, 79:9, 79:23, 79:24, 80:9, 80:14, 80:24, 81:1, 81:2, 81:3, 82:3, 82:7, 82:22, 83:8, 83:19, 94:6, 118:3, 120:10, 121:4 personally 82:20, 83:19 perspective 83:16 pervasive 90:10 petitioner 1:9, 3:4, 6:6 ph 117:14 phrase 11:8, 12:15, 23:6, 112:8, 112:10 phrased 94:22 physical 99:21, 118:6,	119:9 physician 47:1, 64:10, 65:2, 65:12, 65:24, 67:10, 72:6, 97:9, 97:13 physics 115:3 physiological 108:16 physiology 34:2 pick 88:24, 120:4 picture 63:3 piece 86:11, 93:13 pierce 30:19, 31:3, 31:13 piercing 30:21 place 24:15, 24:18, 63:1, 63:2, 94:17, 96:17, 99:25, 100:19 placebo-controll- ed 34:18 placed 24:22 places 92:20, 99:23 plain 13:24, 14:9, 21:9, 21:13, 21:15, 21:18, 21:24 plantar 4:38, 73:6, 73:8, 73:14, 73:17, 75:13 please 5:19, 5:22, 5:24, 6:4, 12:8,
---	--	---	---

26:21, 30:25, 38:17, 40:23, 55:5, 55:25, 59:7, 68:2, 82:11, 82:17, 106:13, 115:19 plexus 34:3 plug 30:5, 86:14 point 14:7, 15:3, 18:3, 44:24, 58:1, 58:18, 66:24, 67:7, 67:16, 73:22, 76:14, 77:6, 78:11, 81:17, 88:14, 99:9, 99:17 pointed 22:15 pointing 109:4 points 14:5, 36:21, 45:7, 45:11, 66:23, 67:4, 68:13, 68:15, 68:16, 68:21, 68:23, 69:2, 69:4 ponsford 4:37, 70:11, 70:13, 70:15, 70:17, 70:18, 70:19, 70:20, 70:21, 71:1, 71:4, 71:6, 71:15, 71:16, 71:24, 72:11, 73:3, 73:12, 73:15, 73:19, 73:23, 74:4, 74:23, 75:1, 75:2, 75:4, 75:7, 75:9, 75:21, 75:24,	75:25, 76:3, 76:19, 76:22, 77:3, 77:21, 78:13, 78:24, 78:25, 79:6, 79:13, 80:2, 80:7, 80:11, 80:12, 80:23, 81:23, 82:1 ponsford's 77:10 popliteal 59:22, 60:2, 60:4 population 32:15 portion 67:3, 98:17, 107:24 posa 78:14 position 24:13, 24:14 positioning 23:19 positive 37:2, 44:15 positively 39:22 possible 13:4, 24:13, 24:24, 25:1, 25:2, 25:4, 25:5, 53:16, 65:16, 90:18, 95:12 post-menstrual 66:1 posterior 20:23, 23:17, 49:21, 49:23, 59:17, 59:20, 62:5, 62:11, 62:14, 62:21, 63:12, 63:23, 74:13, 74:18, 74:25, 75:5, 75:6, 76:25,	100:10, 100:13, 100:24, 101:4, 101:6, 101:9, 104:11, 104:14, 104:19 postganglionic 75:18 potential 41:10, 52:6, 53:4, 63:18, 75:2, 95:21, 96:2, 99:16 potentially 52:22, 74:10, 81:15, 95:24 potentials 73:13, 84:12, 84:13, 100:1 practical 88:13 practitioner 118:2 practitioners 120:3 preamble 15:25, 17:21, 18:4, 18:20, 19:4, 19:12 precedes 64:18 preceding 68:11 precise 79:1 precisely 30:23 predicting 44:9 preference 56:11, 56:17 preferentially 40:10 preferred 31:24, 54:24, 56:18 present 3:23, 73:8, 93:15, 96:14	pressure 72:24, 73:1, 106:23, 107:4, 107:6, 116:4, 116:6, 116:7, 116:8, 116:18, 116:20, 117:1, 118:2, 118:6, 119:7, 119:16 previous 51:9, 105:12 previously 4:14, 8:12, 46:1, 60:17, 66:16, 70:4, 92:11, 101:13, 110:14 primarily 56:17, 97:8, 97:10 primary 35:13, 38:7, 53:25, 114:5 principle 10:18, 17:14, 20:11, 20:13, 77:11, 77:13, 77:15 principles 9:6, 9:12, 9:14, 9:16, 9:19, 10:2, 17:12, 17:25, 18:25, 21:6, 101:8, 104:16, 104:20, 105:4 print 12:6 prior 15:17, 17:5, 17:6, 17:18, 17:23, 18:16, 19:3, 19:14, 19:23, 20:8, 21:3, 103:18, 103:21, 123:9 priority 79:10, 81:4,
--	---	---	--

102:12, 102:22, 103:12, 103:24, 104:3 probably 44:24, 44:25, 45:6, 72:9, 88:12, 88:13, 116:23, 116:24, 117:3 procedure 22:21, 22:22 procedures 95:16 proceeding 5:17, 11:20, 11:22, 12:7, 13:16, 13:21, 92:9, 110:18 proceedings 5:13, 6:22, 8:4, 8:6, 8:16, 8:18, 45:24, 60:11, 66:9, 101:18, 122:22, 123:10, 123:13, 123:17 processing 87:7 product 37:25, 45:10, 57:11, 120:6 professional 2:7 program 109:20 programming 32:12, 41:14 project 43:12, 45:8, 120:12 projecting 90:1 projections 59:13 projects 43:22, 49:24, 113:16 propagate 23:12	properties 42:14 provide 27:21 provided 38:9, 63:21 provides 50:12, 75:16 provisional 102:3, 102:7, 103:8, 103:10, 103:14, 103:15, 104:6 proximal 77:20, 100:7 proximity 119:11 proxy 44:11, 44:16 pst 2:5, 2:6, 5:2 psychic 94:19 pub 4:29 publication 4:28 published 70:1 pudendal 46:12, 46:18, 46:23, 47:1, 47:4, 47:10, 47:19, 47:21, 47:24, 48:3, 48:8, 48:12, 48:18, 49:4, 49:10, 49:16, 49:19, 49:22, 50:1, 50:4, 50:25, 51:6, 51:22, 51:24, 89:5, 112:15, 113:15 pull 78:2 pulse 27:24, 29:7,	29:9, 29:16, 29:21, 30:2, 33:8, 41:6, 41:8, 41:24, 41:25, 108:2, 109:21, 110:1 pulses 41:5, 41:25, 111:1, 111:17 pumping 107:10 punct 66:23 purposes 13:16, 13:20, 57:13 put 33:5, 33:6, 49:8, 69:20, 101:1, 119:15 putting 30:15, 83:2, 83:15 Q quantify 41:2, 41:11 question 9:24, 15:23, 16:17, 17:5, 19:21, 20:8, 26:10, 48:11, 60:7, 69:1, 79:5, 79:6, 83:5, 83:23, 91:25, 103:14, 105:12, 111:25, 112:2, 113:17, 121:7 question's 94:22 questions 5:16, 102:12, 102:13, 102:20, 102:21, 102:22, 110:9, 122:10, 122:19, 122:20 quick 122:17	quickly 35:12, 36:3 quote 12:19, 67:2, 91:4, 91:7, 93:15, 94:16 quoting 89:8 R r&d 38:7 rack 86:11, 86:18, 86:21, 87:1, 87:13, 87:18, 87:22, 88:6, 88:10 radial 23:17, 35:9 range 43:10 rate 108:17, 116:22 rather 32:16, 51:1, 63:6, 119:11, 119:12 re-read 105:2 reach 100:2 reactants 107:11 read 20:4, 20:20, 30:24, 30:25, 58:15, 82:17, 92:7, 98:7 readily 73:6 reading 46:6, 68:5, 75:3, 76:3, 96:14, 99:5, 106:16 ready 120:13
--	---	--	--

real 25:8 really 122:16 reason 6:13, 6:15, 18:17, 24:11, 113:16 reasonable 47:16 reasons 31:23, 34:5 recall 7:10, 7:13, 7:18, 25:24, 38:11, 40:14, 41:13, 44:21, 44:22, 79:19, 100:21 recalling 14:7, 88:17 receive 115:11 received 19:16, 25:20 receives 20:17, 50:13 receiving 25:11 recess 45:19, 77:25, 110:12, 122:18 recognize 8:17 recollection 41:15, 63:16 record 5:20, 6:3, 66:11, 108:7, 109:20, 122:15 recording 75:1, 75:2, 75:4, 75:7, 75:12, 75:14 recordings 75:22 recruitment 52:6, 53:16	rectal 47:23, 48:7 reduction 39:23, 40:20 reductions 39:18 refer 17:11, 50:10, 81:15, 100:13, 100:19 reference 15:17, 15:18, 17:5, 17:6, 17:18, 18:16, 19:3, 19:14, 19:23, 20:8, 21:3, 39:11, 47:15, 48:25, 49:3, 50:16, 50:18, 52:1, 54:19, 58:25, 60:8, 60:12, 66:19, 66:22, 67:20, 67:24, 68:8, 70:11, 90:25, 92:17, 92:19, 95:1, 100:17, 101:4, 103:7, 103:17, 103:19, 104:7, 105:7, 106:8, 110:19, 110:22, 115:15, 121:22, 122:1 referenced 22:18, 25:24, 67:4 references 27:18, 48:5, 92:23, 94:24, 98:22, 120:7 referring 26:18, 32:22, 32:25, 34:7, 99:21, 100:22 refers 22:6, 67:7, 67:16, 98:15,	99:6, 100:24, 100:25, 105:9, 105:19 reflected 104:6 refresh 49:3, 103:2 reg 3:7, 3:16 region 61:12, 97:22, 97:24, 98:1, 98:3, 100:8 regions 61:24 registered 2:7 regularly 32:17 relate 16:5 related 16:20, 64:16, 69:22, 69:24, 79:15, 79:16, 79:17, 101:25, 102:2, 123:16 relates 93:16, 93:21, 93:23, 118:8, 118:10 relation 6:21 relationship 112:23, 112:24 relatively 55:10 relevant 8:16, 17:24, 96:14, 120:22 reliable 75:17 remember 105:12, 109:3 remind 58:16 rephrase 40:5, 71:16,	112:1 report 102:6, 102:24 reported 1:32 reporter 2:7, 123:1, 123:8 reporters 123:21 reports 73:12, 73:19 represent 5:12 reproduce 113:9 reproduced 20:16 request 38:20 require 13:15, 13:20, 13:23, 28:24, 29:3, 29:5, 30:19, 31:3, 32:3, 78:24 required 18:15, 122:9 requirement 10:11, 10:24, 11:6 requirements 82:21, 83:6 requires 31:12, 32:12 requiring 32:16 research 37:24, 37:25, 75:21, 86:4, 86:25, 88:18 residence 5:25 resistivity 107:9 resolve 43:25 respect 9:2, 9:25,
---	--	---	---

17:20, 20:4, 26:5, 33:16 respectively 8:12 respiration 107:10 respond 33:3, 33:17, 33:25, 34:5 responder 33:5 responding 79:18 responds 40:13 responsible 114:10 responsive 37:23, 39:17, 39:21, 40:2, 40:8 rest 97:2 result 30:9, 72:15 resulting 107:11 results 37:2, 73:17 retained 9:9, 10:16, 11:24, 102:20 retrograde 13:4 return 61:6 returning 60:6, 105:18 review 11:19, 16:16, 17:1, 39:3, 39:5, 55:2, 55:6, 79:2, 102:15, 106:13, 115:19 reviewed 117:9 reviewing 55:7, 68:3	right 7:20, 8:1, 9:23, 14:12, 14:13, 21:11, 26:7, 26:13, 29:20, 35:11, 35:20, 36:8, 38:22, 39:23, 40:4, 45:18, 55:14, 55:17, 55:21, 56:7, 58:16, 60:23, 61:16, 64:5, 67:1, 70:11, 71:3, 71:13, 72:20, 77:23, 78:7, 79:4, 83:5, 83:20, 83:24, 90:13, 91:1, 92:17, 94:9, 95:23, 97:1, 100:17, 100:19, 100:20, 103:16, 107:18, 109:18, 109:24, 110:10, 111:14, 111:25, 112:23, 113:7, 115:6, 115:7, 118:13, 118:16, 118:24, 121:14 risk 94:17 role 5:16, 37:22, 38:7 root 62:12, 62:23, 63:23 roots 52:7, 52:11, 52:21, 62:8, 63:9, 63:12, 63:13, 72:24, 112:19, 113:21, 114:8 routine 32:4, 75:15	rpr 1:33, 123:7, 123:29 run 33:8, 68:12 runs 115:18 s s 17:13, 68:24 s-u-r-a-l 75:17 s1 62:8, 72:12, 72:14, 72:18, 72:24 s2 49:25, 62:8 s3 49:25, 62:8, 62:15, 62:19, 63:20 s4 49:25, 63:11, 63:18, 63:23, 64:1 s5 63:11 sacral 49:25, 51:1, 51:7, 52:7, 52:11, 52:21, 60:22, 60:25, 61:12, 61:24, 62:8, 63:11, 63:13, 63:23, 74:21, 111:1, 111:18, 111:21, 112:1, 112:4, 112:15, 112:19, 112:24, 113:14, 113:18, 113:20, 113:21, 114:8 sacramento 123:5 sacrum 61:1, 61:16	safety 31:22 said 27:7, 35:20, 35:22, 64:10, 69:15, 70:17, 79:25, 83:14, 92:4, 93:25, 104:3, 105:12, 120:23, 123:13, 123:17 same 7:1, 9:18, 9:24, 20:2, 38:16, 42:14, 47:6, 48:11, 48:15, 49:24, 63:10, 63:15, 64:9, 64:17, 77:6, 80:18, 88:3, 89:17, 89:24, 90:8, 90:12, 90:16, 112:18, 113:14, 114:14, 116:11, 120:18 san 1:27, 2:4, 5:1, 6:1 sap 73:17, 75:13, 75:17 saps 73:6, 73:8 saw 46:16 say 12:1, 14:1, 19:20, 29:1, 41:19, 42:15, 55:22, 56:3, 64:11, 65:18, 66:9, 75:5, 79:20, 80:1, 84:1, 92:25, 93:8, 100:14, 101:19, 101:22, 101:23, 112:14,
--	--	---	--

113:2, 114:12, 119:24, 122:6, 122:7, 122:9 saying 56:17, 57:14, 57:15, 57:16, 66:8, 81:21, 83:19, 94:16, 95:16, 96:4, 108:2, 108:16, 119:6 says 19:9, 42:23, 46:10, 46:20, 50:21, 52:4, 55:15, 55:18, 55:19, 56:9, 68:10, 68:12, 73:5, 75:12, 78:11, 93:15, 99:11, 99:20, 106:22, 108:7, 111:9, 114:17 sb-2 68:25 sb-3 68:25 sb-4 68:25 scale 86:11, 87:3, 87:8 scene 87:14 sciatic 62:6, 112:21 scientific 114:2 scientist 42:24 scope 77:7, 103:3 screen 85:15 searching 49:5, 49:8 second 49:1, 52:3,	61:7 section 78:12, 108:11 see 9:5, 9:6, 12:21, 13:12, 13:17, 14:22, 19:10, 20:18, 20:19, 27:19, 33:11, 33:17, 35:6, 35:11, 35:16, 39:14, 39:18, 42:25, 46:14, 48:17, 49:13, 51:2, 52:7, 54:25, 60:14, 62:9, 67:5, 67:13, 68:18, 71:9, 71:17, 72:12, 73:10, 74:10, 75:19, 78:16, 80:22, 83:14, 84:8, 85:8, 85:12, 89:7, 91:7, 93:4, 93:19, 96:9, 96:18, 98:9, 102:1, 102:4, 103:8, 105:24, 106:25, 111:12, 114:19, 116:5 seeing 48:15, 48:16 seek 54:12 seen 7:9, 7:10, 7:13, 7:17, 7:19, 49:14, 86:9, 88:15, 101:10 seizure 39:18, 39:22, 40:20, 43:19 seizures 43:18 sens 118:6	sensation 53:5, 53:6, 53:14, 64:13 sensations 54:2, 54:8 sense 32:7, 76:11, 84:16, 90:15, 90:16, 115:4, 115:7, 115:8 sensed 109:15 sensing 79:17, 104:17, 115:12 sensor 89:5, 89:10, 89:13, 89:15, 89:21, 89:23, 90:11, 90:14, 105:23, 106:3, 106:5, 107:3, 107:5, 114:17, 115:2, 115:9, 116:20, 116:24, 117:4, 118:6, 118:13, 118:15, 118:18, 118:19, 119:3, 119:9, 119:10, 119:12, 119:15, 119:17, 120:15, 121:7, 121:11, 121:15 sensor's 90:7 sensors 106:20, 106:22, 120:18, 121:2 sensory 4:37, 50:13, 70:16, 73:13 sentence 29:11, 49:13, 49:14, 52:3, 52:9, 56:4, 56:15, 68:11, 72:12, 89:1, 96:12, 111:12	separate 71:20 set 60:7, 64:2, 77:21, 82:21, 84:4, 101:11, 110:7 sets 44:13 setting 34:23 seven 98:21 several 26:1 shannon 1:33, 2:6, 123:7, 123:29 shared 74:9, 74:11, 114:9 shoes 83:2, 83:16 short 35:14, 35:21 shorthand 2:7, 123:1, 123:8, 123:14 should 96:12 shoulder 98:15 show 21:3, 21:5, 21:7, 63:22, 63:25, 84:10 showed 73:15 showing 73:23, 74:4 shown 17:23, 74:18, 100:8, 104:10, 109:8, 109:18 shows 69:1, 73:15, 108:7, 108:19, 109:9, 109:12,
---	---	--	---

109:13, 109:19 sic 61:6, 61:10, 63:22 sickness 65:6, 65:8 side 36:22, 45:10, 86:18, 91:18, 91:20, 94:12, 94:18, 94:25, 95:2, 95:3, 95:24, 96:2 sides 37:2, 91:22, 91:25 signal 70:24, 73:25, 74:8, 107:10, 115:13 signaling 13:1 signals 12:15, 12:17, 12:18, 12:24, 13:3, 52:13, 75:8, 85:2, 87:12, 88:23, 89:5, 112:13 signature-plkal 123:26 similar 64:7, 64:21, 80:5, 93:25 simple 63:4 simply 94:6 single-member 38:13 sir 106:17 site 56:21, 93:7, 93:10, 93:12 sites 55:10, 55:13, 55:19, 55:21,	55:24, 56:3, 56:5, 56:6, 56:7, 56:9, 57:17, 93:2, 98:11 sitting 13:19, 47:18, 47:20, 71:22, 83:24, 105:2 situation 24:24, 33:15, 33:23 situations 121:6 six 88:11, 98:20, 109:20 sixth 3:9 size 44:23, 86:12 sizes 86:15 skill 58:22, 74:15, 76:9, 76:21, 77:8, 78:15, 78:19, 78:23, 79:9, 79:24, 80:10, 80:14, 80:24, 81:2, 81:13, 81:20, 81:24, 82:4, 82:7, 82:22, 83:3, 83:17, 83:20, 94:6, 96:13, 101:11, 120:10, 121:4, 121:25 skilled 10:12 skin 26:6, 26:15, 28:5, 28:7, 28:10, 30:19, 30:21, 31:4, 31:13 slightly 20:9, 64:24,	64:25, 90:22 small 86:13 smaller 86:18 snap 87:20 software 38:1 some 15:2, 15:13, 15:24, 16:16, 18:19, 22:12, 23:25, 24:11, 25:9, 26:17, 27:21, 32:5, 32:6, 33:2, 33:3, 33:24, 34:1, 34:4, 34:10, 34:15, 37:2, 37:19, 43:14, 43:24, 45:11, 50:21, 72:9, 81:5, 81:12, 81:16, 88:13, 90:1, 90:15, 90:16, 93:25, 98:23, 98:24, 98:25, 110:9, 114:2, 115:24, 116:23, 117:3, 117:18, 119:9, 119:12, 120:7 somebody 32:17, 33:4, 36:4, 54:17, 74:14, 74:15, 76:8, 76:21, 77:7, 81:13, 81:19, 81:24, 83:2, 83:16, 101:10, 121:24, 121:25 somebody's 57:6 somehow 118:7	someplace 115:2, 119:23 something 10:19, 15:9, 18:5, 21:23, 22:2, 23:12, 24:1, 29:14, 30:15, 30:21, 31:13, 32:10, 36:22, 40:22, 68:5, 70:24, 76:2, 80:14, 84:19, 86:10, 86:22, 91:17, 91:19, 112:12, 115:10, 117:25, 118:1, 119:6, 120:9 sometimes 36:15, 65:6, 65:8, 65:20, 65:22, 66:2, 84:8, 85:19, 85:22, 91:21 somewhat 40:16, 40:17, 63:17, 63:18, 64:12 somewhere 70:24 sorry 12:10, 38:14, 66:7, 82:12, 98:24, 107:14, 113:2 sorts 30:11 sound 14:12 sounds 14:13, 47:16 source 84:24 sources 43:13, 43:14, 69:12 south 2:3
--	---	--	--

southplace 2:2 sp 66:22, 67:4, 67:7, 67:13, 67:15, 68:13 sp-2 68:14, 68:20 sp-3 68:14, 68:20 sp-4 68:14, 68:20 speaking 43:11, 44:10, 53:18, 65:1, 65:4, 65:12, 83:16 spec 11:13 specialists 32:4 specialized 13:24, 32:12 specific 11:8, 14:3, 48:24, 89:12, 90:7, 98:25, 99:1 specifically 20:4, 48:4, 48:25, 70:20, 76:19, 94:16, 100:23, 101:4, 104:13, 118:20, 119:4, 120:17, 120:25, 121:10 specification 10:11, 11:14 spectrum 28:13, 36:19, 58:9 spent 45:9 sphincter 49:11, 49:18, 53:23, 116:18, 118:2, 119:7, 119:11	spinal 12:18, 13:2, 13:3, 33:2, 33:6, 60:25, 61:12, 61:25, 71:12, 72:19, 85:3, 112:17 spine 61:13, 61:15 spleen 67:8, 67:14, 67:15, 68:14 spot 57:5 spots 56:12 square 2:3 ss 123:4 stand 84:7 standard 37:6, 43:20, 65:23 standpoint 115:3 stands 67:13, 67:22, 67:23 start 5:23, 9:19, 78:20, 100:9 started 37:22 starting 50:19, 54:21, 96:7, 98:8, 100:4, 106:10, 106:13, 107:15, 111:6, 115:15, 116:4, 119:3 state 5:19, 5:22, 5:24, 123:3 stated 20:24, 102:16 statement 28:23, 30:16, 31:14, 32:2, 114:25 states 1:1 station 88:21 statistical 44:11 steinberg 3:27, 6:9 stenographically 1:32 stenosis 72:19 stepped 38:6 stepping 24:2 sternocleidomast- oid 98:17 sticking 42:18 still 25:9, 27:15, 29:19, 30:14, 30:18, 31:3, 31:12, 38:3, 38:5, 80:12, 101:7, 110:9, 114:1, 114:2 stimulate 23:15, 24:10, 24:24, 25:22, 40:10, 46:12, 46:18, 52:16, 52:18, 52:19, 53:11, 69:23, 70:23, 74:5, 76:13, 76:23, 77:17, 77:18, 80:17, 81:10, 81:11, 104:17 stimulated 24:12, 26:7, 68:17 stimulating 21:19, 21:22, 22:7, 22:11, 22:14, 23:7, 23:10, 23:23, 24:6, 40:11, 41:4, 50:25, 51:11, 51:14, 51:15, 52:20, 52:21, 74:6, 74:17, 75:14, 80:3, 80:4, 85:6, 85:7, 88:3, 92:25, 93:9, 96:15, 114:7 stimulation 19:16, 19:25, 20:17, 23:22, 24:2, 24:4, 24:5, 24:8, 24:23, 25:13, 27:22, 27:23, 28:24, 28:25, 29:2, 29:3, 30:1, 30:17, 30:18, 30:19, 31:1, 31:2, 31:3, 33:2, 33:21, 35:8, 35:9, 37:7, 37:11, 40:3, 40:17, 41:11, 44:4, 48:18, 48:20, 50:24, 51:2, 51:6, 51:7, 51:21, 51:24, 52:5, 53:3, 54:4, 54:12, 54:24, 55:24, 56:6, 56:18, 58:12, 58:21, 73:13, 73:18, 74:23, 76:1, 77:4, 77:12, 79:18, 85:5, 85:9, 85:10, 85:11, 85:20, 85:23, 89:7, 93:2,
---	---

93:6, 93:7, 93:10, 93:12, 93:17, 101:9, 108:24, 122:4 stimulations 40:17 stimulator 20:22, 30:5, 33:9, 37:23, 89:3, 89:6, 89:10, 89:14, 89:16, 89:22, 89:24, 90:7, 90:12, 90:15, 90:20, 90:23 stimulators 46:11, 46:17, 91:10 stimulus 20:21 stipulation 123:20 stomach 64:15, 64:21, 65:2, 65:3, 65:5, 65:10, 65:13, 65:15, 65:17, 65:19, 66:2, 66:5 stop 118:14 strategy 3:27 street 2:3, 3:9, 3:17 strength 25:3 strengthens 80:12 strong 48:9 strongly 30:22 structure 21:20, 22:8, 23:23, 23:24, 24:6, 24:8, 24:11, 24:20,	24:21, 24:25, 25:20, 26:3, 50:12, 50:13, 50:14, 51:13, 51:16, 51:18, 51:19, 53:7, 59:16, 59:18, 59:23, 59:25, 60:2, 65:16, 74:9, 74:11, 74:21, 77:16, 77:20, 91:18, 91:20, 91:22, 91:25 structures 49:25, 52:12, 52:14, 53:10, 68:17, 74:22, 95:14, 95:15, 112:19, 113:15, 114:9, 118:24 study 34:14, 39:20, 41:9, 70:15 stuff 81:5 subject 102:8 subjects 73:7, 73:8 submitted 6:20, 8:16, 8:18, 37:19 subscribed 123:22 substantial 96:3 substantially 90:23 subthalamic 37:7, 95:15 subthreshold 25:8, 85:10 successfully 10:19, 77:1 sufficient 78:21, 78:23, 102:8	suggest 121:14 suggested 40:1 suggesting 26:14 suggestion 58:13 suite 2:3, 3:18 sum 40:18 summarize 43:11, 78:6 summarized 17:12, 17:15 summary 71:6 supervision 123:15 supply 64:1 supplying 63:12, 63:23 support 102:8 supports 102:25 supposed 115:12 suprathreshold 85:11 sural 75:17 sure 14:4, 15:2, 19:23, 29:2, 31:1, 38:20, 58:17, 75:2, 79:7, 100:18, 112:4, 119:23 surely 64:25 surface 26:6, 26:15, 75:13 surgeries 35:25	surgery 30:13 surgical 28:24, 29:3, 29:11, 29:12, 31:12 surgically 30:8 surprise 7:11, 7:18 surprised 63:1 svihra 16:7, 16:10, 16:11, 16:23, 16:25, 78:12, 78:19, 78:22, 79:23 swear 48:6 switching 39:8 sworn 5:5, 123:10 symmetric 91:15 syndrome 71:25, 72:4, 72:5 system 42:7, 42:8, 42:10, 52:12, 54:9, 74:1, 77:2, 90:19, 96:21, 96:24, 97:2, 97:7, 114:13 systems 36:14, 50:24 T table 108:19, 109:9, 109:20 tables 73:20 take 35:1, 35:2,
--	---	---	---

35:23, 36:12, 45:14, 45:18, 58:10, 77:22, 79:2, 102:14, 102:17, 106:22, 110:10, 122:3 taken 2:1, 123:13 takes 35:6, 35:16, 36:15 taking 100:18, 103:2, 111:24, 113:4 talk 15:14, 100:23, 113:18, 113:19 talked 108:11 talking 23:2, 27:8, 27:9, 48:19, 81:9, 95:4, 109:2 talks 48:17, 48:18, 117:12, 117:16, 120:25 target 27:2 tarsal 71:24, 72:4, 72:5, 72:7 team 44:19, 44:20, 44:23 technical 85:17 techniques 27:22, 27:23, 30:17, 30:18, 31:1, 31:2, 43:8, 43:15 technologies 28:2, 28:14, 28:16, 28:24, 29:2, 29:4, 29:12, 31:15,	32:2, 36:16, 88:15 technology 22:4, 26:24, 31:22, 31:25, 40:7, 57:4, 57:12, 58:3, 87:2, 87:4, 88:17, 90:5 television 86:13 tell 8:21, 67:13, 67:21, 67:23, 79:11 temperature 107:3, 117:14 temporalis 98:16 ten 88:12 tend 120:4 tent 94:3 term 27:18, 50:6, 50:9, 50:10, 104:18 terms 10:12, 13:15, 13:20, 13:23, 14:8, 64:25 testified 5:6, 6:18 testify 6:13, 7:21, 123:11 testimony 8:3, 60:23, 69:8 th 37:21, 102:9 thalamus 95:14 thank 6:24, 9:24, 14:14, 38:20,	77:24, 107:22, 122:11, 122:21 thanks 101:15 themselves 52:21 theranova 2:2, 3:27 therapeutic 25:6, 25:15, 36:12, 43:3, 54:16, 77:12 therapies 36:11 therapy 53:15, 110:2 thereafter 123:14 thereby 22:17, 42:8, 42:9 therefore 62:15, 62:16 thereof 67:3, 123:18 thermal 116:25 thermistore 106:23, 107:2 thermistores 108:13 thing 21:22, 23:7, 23:9, 23:10, 28:10, 34:24, 42:2, 65:14, 76:7, 90:6, 109:14 things 27:15, 34:23, 43:25, 44:16, 45:11, 48:3, 51:24, 52:13, 52:22, 54:6, 58:9, 63:19, 65:23, 69:23, 72:17, 72:23, 87:4, 87:8,	92:1, 92:2, 104:17, 109:5, 110:4, 114:1, 117:18, 120:4 think 9:19, 15:8, 15:22, 17:13, 23:3, 51:8, 56:14, 57:25, 58:18, 63:4, 64:23, 66:10, 67:12, 77:21, 80:25, 99:8, 105:11, 121:9, 121:10 thinking 52:15 thoracic 97:22, 97:24, 106:24, 107:7, 107:8, 107:9 three 98:20, 117:23 through 8:20, 8:21, 8:23, 9:7, 10:1, 14:3, 14:19, 24:18, 38:9, 38:11, 47:15, 48:25, 49:17, 52:14, 58:14, 62:15, 62:19, 63:20, 68:1, 77:2, 96:11, 102:18, 106:14, 106:17, 112:21, 119:22 throughout 41:20, 66:8, 84:6, 105:9, 109:3, 109:13 thumb 8:20 thursday 1:29, 2:4, 5:1, 123:24 tibia 75:8
--	--	---	---

tibial 20:23, 23:17, 49:21, 49:23, 50:3, 55:9, 55:20, 56:5, 56:8, 56:10, 56:12, 56:18, 57:17, 59:17, 59:20, 62:6, 62:11, 62:14, 62:18, 62:22, 63:5, 63:12, 63:23, 64:1, 68:10, 68:12, 69:22, 69:24, 74:5, 74:13, 74:19, 74:25, 75:6, 76:25, 100:10, 100:13, 100:24, 101:4, 101:7, 101:9, 104:14, 112:20, 113:1 tibular 104:19 time 7:2, 12:11, 19:21, 29:1, 30:25, 35:3, 35:6, 36:1, 36:15, 37:19, 38:7, 41:16, 41:17, 45:2, 45:9, 58:22, 81:14, 82:8, 83:1, 93:8, 95:9, 101:22, 104:23, 112:2, 122:11, 122:21 times 21:21, 41:3, 41:18, 64:10 tissue 25:10, 94:12, 95:19, 95:24, 96:3 title 39:24	today 5:15, 6:7, 6:8, 6:14, 7:23, 9:1, 13:19, 36:17, 47:18, 47:20, 82:20, 82:24, 83:5 together 40:18, 107:25 took 45:6 torso 98:18 total 39:16, 39:20, 40:18, 41:12, 41:16, 41:23, 41:24, 42:5, 42:13, 42:17 touching 22:5 toward 12:18, 13:2, 70:20, 70:21, 70:22, 76:4, 76:5, 76:19 towards 120:8 tracking 66:10 tract 65:17 trademark 1:1 traditional 66:22, 67:4, 67:7, 67:8, 67:10, 67:16, 67:17, 69:7, 69:9, 69:11, 69:14, 88:10 trains 41:24 transcribed 123:14 transducer 25:12, 27:13, 106:24, 107:4,	116:9, 116:15 transducers 27:25, 108:13 transmitted 74:3 transmitting 77:2 travel 77:13 traveling 12:18, 13:1, 13:3 treat 14:24, 19:9, 19:16, 19:25, 20:17, 32:16, 76:1, 77:4 treating 14:21, 15:11, 15:19, 16:12, 16:21, 17:3, 17:7, 17:21, 18:9, 22:24, 46:13, 46:19, 70:13 treatment 31:20, 33:11, 33:13, 33:19, 33:25, 34:21, 35:5, 35:7, 40:25, 41:2, 41:18, 43:7, 53:25, 94:13, 95:6, 95:8, 95:12, 108:4 treatments 41:20, 95:5, 95:19 tremor 35:10, 54:5 trial 1:4, 6:18, 29:25, 32:20, 32:24, 32:25, 33:16, 33:21, 33:22, 34:9, 34:17, 34:18, 34:20, 34:24,	35:14, 35:21, 35:22 trials 33:15, 34:6, 34:8, 35:1, 35:2 triggers 85:1 true 7:15, 32:6, 83:11, 83:13, 83:14 truth 123:11, 123:12 truthfully 6:14 try 43:11 trying 22:25, 23:3, 23:14, 23:15, 25:22, 27:11, 34:10, 35:18, 35:24, 38:11, 43:17, 53:20, 54:13, 54:14, 70:23, 99:19, 100:1, 109:16, 115:5, 118:5, 118:6 tunnel 71:24, 72:4, 72:5, 72:7 turn 9:3, 12:8, 35:10, 36:4, 36:8, 37:13, 46:7, 50:15, 54:6, 62:2, 105:6, 105:22, 106:7, 107:12, 110:22 turning 63:1, 107:21 twenty-one 82:13, 82:14 twiddle 57:7 twitch 85:8
---	--	---	---

two 8:8, 8:15, 26:12, 26:18, 34:14, 40:18, 55:10, 55:20, 71:20, 91:5, 91:10, 91:23, 92:22, 98:20, 117:23, 118:24, 122:16 type 30:1, 32:24, 33:1, 65:3, 65:5, 87:1, 117:20, 117:24 types 29:6, 31:7, 43:8 typewriting 123:14 typically 88:8, 91:14 U uh-huh 8:2, 12:20, 13:11, 19:6, 19:8, 19:11, 21:12, 27:20, 29:18, 32:21, 42:20, 50:7, 55:4, 68:19, 71:10, 72:1, 82:10, 93:20, 96:6, 96:10, 97:17, 97:19, 98:10, 106:12, 106:21, 107:1, 107:13, 107:17, 107:19, 108:1, 111:20, 114:16, 121:5 ultimately 53:22, 53:25, 114:7, 114:8 unaided 85:16 uncomfortable 54:17	under 6:11, 13:10, 17:24, 78:12, 101:25, 102:2, 123:15 understand 5:14, 6:11, 7:20, 8:3, 17:15, 43:6, 51:4, 52:9, 76:22, 77:10, 78:9, 81:5, 109:16, 114:21, 121:3 understanding 10:5, 10:7, 10:10, 10:24, 11:16, 11:18, 12:3, 17:24, 18:25, 21:6, 33:15, 47:1, 47:7, 48:2, 49:23, 52:10, 62:13, 62:20, 62:21, 62:24, 66:1, 66:3, 71:14, 72:7, 72:14, 103:20, 103:21, 112:8, 122:9 understood 9:13, 81:14 undesirable 52:25, 53:4, 53:14, 94:11, 94:25, 95:2, 95:3, 95:24, 96:2 undesired 52:23, 53:9, 53:12, 54:1, 54:8, 54:11 unilaterally 91:5 unintentionally 53:16 unit 41:16	unitary 28:15 united 1:1 unless 13:14, 14:2, 14:6, 21:10, 68:4, 76:2 unpatentable 19:1, 20:5 unpleasant 53:6 unrelated 52:6, 52:22 until 54:7 updated 38:18 updates 37:19 upper 98:18 upset 64:22, 65:2, 65:3, 65:5, 65:11, 65:13, 65:19 upstream 74:20, 74:21, 74:24, 76:16, 77:2, 77:14, 80:5, 80:18, 111:21, 112:1, 112:4, 112:10, 112:11, 112:16, 113:23, 114:12 urethra 47:10, 114:18, 118:20, 118:22, 118:25, 119:5, 119:14 urethral 47:17, 47:19, 47:21, 49:11, 49:15, 49:18, 119:12 urinary 116:18, 119:7	urine 116:22, 117:1, 117:12, 117:13 use 10:13, 12:14, 14:8, 17:2, 26:21, 30:2, 32:10, 32:17, 36:17, 43:24, 45:16, 46:11, 46:17, 46:21, 50:9, 75:15, 81:12, 90:3, 90:8, 101:6, 108:22, 109:5, 116:11, 120:5, 120:20, 121:4 useful 75:22 uses 79:12, 79:13, 80:7, 80:22, 104:18, 110:6 using 42:15, 50:23, 75:6, 75:13, 75:25, 77:3, 84:20, 84:21, 117:6, 117:7, 118:4 usually 107:5 V vagina 49:12 vagus 22:12, 22:14 vaishya 3:25, 6:7 valid 11:12, 12:4 validity 8:5, 9:10 valuable 71:1, 71:4 value 104:16
---	---	---	--

varied 47:8	W	110:17	withdraw 26:10, 60:7
variety 99:12	waive 123:20	well-motivated 122:2	within 17:18, 18:16,
various 30:10, 71:2, 93:2, 106:20	want 6:2, 15:1, 17:1, 32:10, 33:4, 38:19, 45:14, 52:18, 52:19, 79:7, 119:10, 119:13, 119:14	weren't 85:11	19:2, 19:3, 20:7, 29:19, 93:1, 96:17, 111:1, 111:18, 114:17, 114:18, 114:21, 114:24, 118:22
vein 59:20, 60:4	water 27:12, 27:13, 27:16	whatever 22:25, 25:12, 53:24, 88:22, 99:18, 100:1, 109:20, 115:4, 121:2	without 16:24, 16:25, 29:17, 48:4, 54:16, 67:21, 80:11, 80:19, 81:15, 92:6, 105:1
vertebral 61:2	way 11:8, 23:5, 34:11, 42:5, 52:18, 52:20, 69:21, 72:22, 81:12, 88:23, 97:14, 107:10, 123:17	whatnot 108:13	witness 10:16, 11:2, 19:20, 20:3, 38:22, 41:22, 45:18, 46:6, 83:25, 94:15, 101:15, 102:11, 108:6, 109:1, 111:24, 112:7, 121:18, 122:11, 123:9, 123:22
vice-president 37:24	ways 26:1, 29:14, 41:1, 41:2, 41:3, 41:4, 41:10, 41:23, 46:10, 46:16, 46:21, 81:10, 89:19, 116:25	whereof 123:22	worded 20:12
view 15:19, 49:15, 57:9, 64:8, 78:13, 78:21, 79:23, 108:10	we'll 8:23, 38:20, 116:2	whereupon 122:22	wording 15:3, 20:5, 20:10, 20:12, 20:15, 79:1
viking 86:1	we're 23:1, 23:2, 27:7, 27:8	wherever 22:15, 57:1	words 17:2, 30:3, 78:24, 101:6
virtually 31:18	we've 45:13, 64:10, 66:10, 77:21, 108:11	whether 7:10, 7:13, 7:19, 17:5, 17:9, 18:21, 22:14, 33:11, 41:13, 47:18, 58:16, 69:1, 79:5, 79:6, 102:7, 102:24, 119:8, 120:25	work 24:9, 33:11, 34:23, 37:1, 38:8, 69:11, 69:12, 69:13, 76:19, 77:10, 99:14, 114:2, 120:8, 120:14
visibly 85:22	wearable 87:4, 87:5, 87:7, 87:25, 88:19	whole 56:22, 123:11	worked 42:23, 87:1,
visual 85:13	we 8:23, 38:20, 116:2	wholistic 57:11	
visually 85:5, 85:9, 85:12, 85:13, 85:16, 85:19	width 41:6, 41:25, 86:20, 109:22, 110:1	whole 56:22, 123:11	
vitae 38:19	wire 87:21, 90:21	wholistic 57:11	
voiding 117:5	wireless 88:22	width 41:6, 41:25, 86:20, 109:22, 110:1	
voltage 41:19, 42:1, 42:8, 42:9, 42:10, 42:15	wires 87:15, 88:7, 88:11	wireless 88:22	
volts 109:21	welcome 45:21, 78:2,	wireless 88:22	
voluntary 85:2		wires 87:15, 88:7, 88:11	
vomiting 64:7, 64:14, 64:18			
vp 38:7			

Transcript of Dr. Brett Wingeier
Conducted on June 5, 2025

159

87:2 working 120:12 wouldn't 30:12 write 13:14, 89:2 written 21:1 wrong 24:15, 24:18, 72:22	years 35:23, 39:25, 45:5, 73:7, 81:17 yep 8:25, 9:21, 12:10, 12:13, 13:9, 14:15, 37:17, 39:7, 39:10, 39:13, 42:22, 45:22, 45:25, 50:20, 52:2, 54:20, 54:23, 55:1, 55:8, 55:15, 59:8, 60:9, 60:13, 60:15, 61:11, 61:19, 62:4, 64:3, 66:14, 67:1, 68:9, 73:4, 75:11, 78:4, 82:12, 84:5, 88:25, 91:1, 91:3, 98:6, 102:2, 106:9, 110:8, 110:11, 111:8, 115:17, 115:20 yield 122:11 yourself 82:17	42:21, 45:24, 66:7, 66:9, 66:12, 66:22, 70:8, 78:3, 82:9 01378 1:19, 4:13, 4:19, 8:10, 9:19, 9:25, 10:3, 45:24, 66:10, 88:24, 89:2, 92:9, 92:20, 101:18, 104:5, 104:9, 110:18 06 2:5, 5:2	63:22, 66:8 1080 4:28, 60:11, 60:16 1081 4:32, 66:6, 66:12, 66:15 1084 4:34, 45:23, 46:1, 78:13 1085 4:37, 70:3, 70:7, 78:13 11 52:1, 52:4 11,224,742 1:15 110 4:24 12 4:26, 54:18, 55:3, 91:2, 105:24, 107:12, 107:15, 107:25, 108:21, 109:25 123 1:35 13 9:20, 9:23, 14:19, 78:11, 108:21, 109:25 137 78:5, 78:6 1378 7:24 14 4:26, 9:3 1405 3:9 152 39:9 153 3:17 17 50:19, 93:15 186 78:6 189 73:3, 73:5
x			
x 33:10			
y		1	
yeah 6:4, 12:2, 12:3, 16:2, 17:14, 26:1, 26:9, 26:11, 26:23, 27:23, 32:9, 33:18, 33:20, 34:1, 36:13, 36:14, 36:21, 37:15, 46:25, 48:24, 56:2, 59:8, 61:4, 61:8, 61:17, 62:13, 64:23, 65:15, 69:20, 77:24, 79:4, 80:23, 85:18, 85:25, 86:2, 86:8, 87:17, 94:20, 97:21, 102:11, 103:20, 103:25, 105:8, 109:17, 111:6, 111:11, 111:13, 115:23, 116:3, 118:17, 119:2, 119:3, 121:19, 122:14 year 37:21		1 1:35, 2:6, 78:11 10 4:26, 44:25, 50:15, 59:2, 59:8, 66:7, 86:19, 100:3, 100:21, 100:22 1003 4:15, 4:18, 8:9, 8:10, 8:11, 9:2 1004 78:13 101 4:26 103 78:12 1054 4:20, 92:9, 92:10 1055 4:23, 110:13, 110:18 1056 4:25, 101:12, 101:18, 104:10 1075 61:6, 61:10,	
	.4254 3:20 .8551 3:11		
	0		
	0122660 4:29 01375 1:14, 4:10, 4:16, 7:23, 8:9, 9:2, 12:9, 14:10, 37:16,		

Transcript of Dr. Brett Wingeier
Conducted on June 5, 2025

160

19 123:24 191 75:9 1998 95:9 1999 69:17	3 30 17:13, 37:21, 96:8 300 2:3 31 9:5, 9:7, 10:1, 103:24 312.919 3:20 32 108:15 35 78:12, 111:7 36 68:24, 106:11, 106:14 37 68:24 38 46:7 39 115:16, 115:18	477 15:13, 103:25 48 61:18, 61:20, 63:21, 115:18 5 50 62:2, 62:5, 105:17 51 12:8, 12:12, 12:14 52 91:2 53 66:21, 66:25, 67:2 54 55:3, 98:8 55 68:15 57,512 3:16 58 94:8 586265 1:34 59 68:15, 68:22, 107:15 6 6,272,383 4:32 6,366,813 4:20 6,941,171 4:34 6/8/06 4:30 60 4:30, 68:16, 68:22, 73:9, 101:25, 102:2, 117:16, 117:23 600 40:12	60654 3:19 62 68:8 63 117:23 64 68:8, 107:14 65 98:8 66 4:33 69 4:38, 13:7 7 109:8, 109:18 7,515,965 4:23 7,853,322 4:25 742 14:19, 15:18, 17:8, 17:20, 19:15, 19:24, 27:18 75,525 3:7 7th 69:18 8 8/7/01 4:33 80 44:24, 73:7 9 9 2:5, 5:2 9,002,477 1:20 9/6/05 4:35 90 89:1 92 4:21, 92:20,
2 20 39:25, 119:3 2001 4:9, 7:1, 7:3, 7:7, 69:18 2002 4:12, 7:2, 7:3, 7:7 2005 102:4 2006 4:29, 79:10, 83:11, 83:14, 102:9, 103:25 2024 1:14, 1:19, 4:10, 4:13, 7:23 2025 1:29, 2:5, 4:16, 4:19, 5:1, 123:24 21 82:8, 82:22, 83:9, 83:18, 93:15 216.622 3:11 22 9:5, 9:7, 10:1 23 2:6 24 100:4 255 2:3 28 102:9 2nd 103:25	4 4/2/02 4:21 4/7/09 4:24 40 45:7, 105:23, 106:5 407 3:18 42 54:22, 55:3 43 52:4 44 106:14 44114 3:10 45 4:35 46 61:9, 119:3	5 51 12:8, 12:12, 12:14 52 91:2 53 66:21, 66:25, 67:2 54 55:3, 98:8 55 68:15 57,512 3:16 58 94:8 586265 1:34 59 68:15, 68:22, 107:15 6 6,272,383 4:32 6,366,813 4:20 6,941,171 4:34 6/8/06 4:30 60 4:30, 68:16, 68:22, 73:9, 101:25, 102:2, 117:16, 117:23 600 40:12	7 109:8, 109:18 7,515,965 4:23 7,853,322 4:25 742 14:19, 15:18, 17:8, 17:20, 19:15, 19:24, 27:18 75,525 3:7 7th 69:18 8 8/7/01 4:33 80 44:24, 73:7 9 9 2:5, 5:2 9,002,477 1:20 9/6/05 4:35 90 89:1 92 4:21, 92:20,

92:23, 92:24
94103
2:4
9436
1:33, 123:7,
123:30
98
100:7