1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 _____

3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4 _____

5 AVANOS MEDICAL, INC.,

6 Petitioner,

7 v.

8 STRATUS MEDICAL, LLC,

9 Patent Owner.

10 _____

11 Case IPR2024-01212, IPR2024-01210, IPR2024-01211,

12 IPR2024-01209/U.S. Patent Nos. 10,925,664,

13 10,736,688, 10,966,782

14 _____

15 Videotaped Videoconference Deposition of

16 ROBERT DENNIS TUCKER, M.D., Ph.D.

17 Wednesday, May 7, 2025

18 10:02 a.m. Eastern Time Zone

19

20 Job No.: 581508

21 Pages: 1 - 201

22 Reported By: Dawn M. Hart, RPR/RMR/CRR

1 Pursuant to Notice, before Dawn M. Hart,
2 RPR/RMR/CRR and Notary Public.
3 A P P E A R A N C E S
4 ON BEHALF OF THE PETITIONER:
5 CHRIS KELLY, ESQUIRE
6 LEE G. HAMILTON, ESQUIRE
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10 (404) 645-7700
11 ON BEHALF OF THE PATENT OWNER:
12 MATTHEW PHILLIPS, ESQUIRE
13 KEVIN LAURENCE, ESQUIRE
14 DAN HIGGS, ESQUIRE
15 LAURENCE & PHILLIPS IP LAW
16 1050 Connecticut Avenue, Northwest
17 Suite 500
18 Washington, DC 20036
19 (503) 964-1129
20 ALSO PRESENT: Lauren Phillips,
21 Clark Wilson, Esquire, Avanos; Harold Rodriguez,
22 Videographer; Nya Estep, AV Technician

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C O N T E N T S

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By Mr. Kelly 195

By Mr. Phillips 196

E X H I B I T S

(Exhibits were retained by Mr. Phillips.)

TUCKER DEPOSITION EXHIBITS PAGE

Exhibit 1009 U.S. Patent 6,146,380 (Racz) 42

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1 P R O C E E D I N G S

2 THE VIDEOGRAPHER: Here begins Media No. 10:01:36

3 1 in the videotaped deposition of Dr. Robert 10:01:37

4 Tucker, M.D., in the matter of Avanos Medical, 10:01:41

5 Inc., vs. Stratus Medical, LLC, PTAB, in the 10:01:43

6 U.S. Patent and Trademark Office before the Patent 10:01:49

7 Trial and Appeal Board, Case Nos. IPR 2024-01209, 10:01:52

8 1210, 1211 and 1212. 10:02:00

9 Today's date is May 7th, 2025. The time 10:02:05

10 on the video monitor is 10:02 a.m. The remote 10:02:10

11 videographer today is Harold Rodriguez, 10:02:14

12 representing Planet Depos. All parties of this 10:02:16

13 video deposition are attending remotely. 10:02:18

14 Would counsel please voice identify 10:02:19

15 themselves and state whom they represent. 10:02:22

16 MR. PHILLIPS: Hi. I'm 10:02:25

17 Matthew Phillips. I'm with the law firm of 10:02:26

18 Laurence & Phillips, and we represent the Patent 10:02:29

19 Owner, Stratus. 10:02:33

20 With me today are Dan Higgs, also with 10:02:35

21 Laurence & Phillips; Kevin Laurence, also with 10:02:40

22 Laurence & Phillips; and Lauren Phillips, who is 10:02:43

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1 also working with us on this case. 10:02:47
2 MR. KELLY: This is Chris Kelly. I'm 10:02:52
3 counsel at Meunier Carlin & Curfman. We're -- I'm 10:02:56
4 lead counsel for Petitioner, Avanos Medical, Inc. 10:02:58
5 With me on the call today I have 10:03:03
6 Lee Hamilton, also of Meunier Carlin & Curfman, 10:03:04
7 for Avanos, and also Clark Wilson, who is in-house 10:03:06
8 counsel at Avanos. 10:03:12
9 THE VIDEOGRAPHER: The Court Reporter 10:03:16
10 today is Dawn Hart, representing Planet Depos. 10:03:17
11 Will the witness now be sworn in, please. 10:03:18
12 ROBERT DENNIS TUCKER, M.D., Ph.D. 10:03:21
13 being first duly sworn or affirmed to 10:21:52
14 testify to the truth, the whole truth, and nothing 10:21:52
15 but the truth, was examined and testified as 10:21:52
16 follows: 10:21:52
17 EXAMINATION BY COUNSEL FOR THE PATENT OWNER 10:21:52
18 BY MR. PHILLIPS: 10:03:38
19 Q Good morning, Dr. Tucker. Welcome to 10:03:39
20 your deposition. 10:03:42
21 How are you feeling this morning? 10:03:42
22 A Pretty good. 10:03:45

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1 Q Good. 10:03:47
2 Is there any reason you cannot 10:03:47
3 competently testify today? 10:03:50
4 A No, there is not. 10:03:51
5 Q Wonderful. 10:03:53
6 Could you please state your full name 10:03:54
7 for the record? 10:03:57
8 A Robert Dennis Tucker. 10:03:59
9 Q And do you prefer Dr. Tucker or 10:04:01
10 Professor Tucker? 10:04:03
11 A I answer to a lot of things. Dr. Tucker 10:04:06
12 is fine. 10:04:12
13 Q Okay. You have been placed under oath, 10:04:13
14 so do you understand that you must give truthful 10:04:18
15 and complete answers to my questions? 10:04:21
16 A I do. 10:04:24
17 Q Okay. We have a Reporter making a 10:04:25
18 transcript of this deposition, putting everything 10:04:30
19 we say on the record, so we need to speak clearly, 10:04:33
20 one at a time, without interrupting each other. 10:04:38
21 I'll do my best not to ask another 10:04:40
22 question before you're done answering the last 10:04:44

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1 question, and I also ask that you let me finish 10:04:47
2 the question before you begin to answer. 10:04:51
3 Is that fair? 10:04:53
4 A That's fair. 10:04:56
5 Q Mr. Kelly has the right to make short, 10:04:59
6 non-suggestive objections for the record to any of 10:05:02
7 my questions, but do you understand that you still 10:05:06
8 need to answer my questions unless you are 10:05:09
9 instructed not to do so? 10:05:11
10 A I do. 10:05:13
11 Q Okay. Please tell me if any question I 10:05:15
12 ask is unclear, and I will do my best to try to 10:05:19
13 clarify it or rephrase it, okay? 10:05:24
14 A Sounds good. 10:05:27
15 Q If you answer my question, I will assume 10:05:29
16 that you have understood it; is that fair? 10:05:31
17 A That's fair. 10:05:35
18 Q And let me know whenever you want to 10:05:38
19 take a break and we will do that. I only ask that 10:05:41
20 if a question is pending, please complete your 10:05:45
21 answer to that question before we take a break, 10:05:49
22 okay? 10:05:53

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1 A I'll try. 10:05:53
2 Q Okay. If it's an emergency, just -- we 10:05:55
3 can make an exception. 10:05:58
4 This is a remote deposition, and I'm in 10:05:59
5 my home office in Puerto Rico. Where are you 10:06:05
6 right now? 10:06:09
7 A I'm at the offices of counsel, 10:06:10
8 999 Peachtree, in Atlanta. 10:06:14
9 Q And who is with you in the room? 10:06:19
10 A No one. 10:06:22
11 Q And I understand that you have before 10:06:25
12 you paper copies of the papers and exhibits in 10:06:27
13 these cases; is that right? 10:06:32
14 A I do. 10:06:35
15 Q Are there any other materials with you 10:06:39
16 in the room? 10:06:41
17 A My little bag of candy and a Coke, and 10:06:46
18 that's about it. 10:06:50
19 Q Sounds good. Okay. 10:06:52
20 Do you have a cell phone with you at the 10:06:55
21 moment? 10:06:59
22 A I do not. 10:07:00

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1 Q Okay. Excellent. 10:07:00
2 A laptop computer perhaps? 10:07:03
3 A I do not. 10:07:05
4 Q Okay, all right. 10:07:05
5 You are a pathologist, correct? 10:07:05
6 A Well, correct. 10:07:17
7 Q Do you presently practice medicine as a 10:07:18
8 pathologist? 10:07:24
9 A As a research pathologist, yes. 10:07:26
10 Q What is pathology? 10:07:34
11 A It's a very broad field. 10:07:36
12 Surgical pathology would be someone 10:07:37
13 looking at glass slides to diagnose cancer and 10:07:42
14 other diseases. 10:07:47
15 Clinical pathology, we're mostly -- we 10:07:48
16 run chemistry labs, so we analyze patients' blood, 10:07:55
17 serum, to pick up abnormal chemistry values that 10:08:01
18 can be indicative of certain diseases. We run 10:08:06
19 blood banks. 10:08:09
20 Immunology has exploded in the last 10:08:10
21 decade, where we can diagnose many diseases by the 10:08:14
22 types of cells and the spikes that are on those 10:08:20

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1 cells and how the body reacts to them. 10:08:27
2 So it's a very broad field. 10:08:30
3 Q And are you a clinical pathologist? 10:08:34
4 A I am. 10:08:37
5 Q Do you treat live human patients? 10:08:39
6 A No, no. Pathologists rarely see the 10:08:45
7 patients. They rarely go in and treat a patient. 10:08:47
8 We have a phlebotomy service that draws their 10:08:55
9 blood. At this in -- my institution, we don't 10:08:59
10 even perform bone marrows, so someone else does 10:09:04
11 that. So we never really see the patient, and we 10:09:07
12 don't really treat the patient. 10:09:13
13 What we do is give diagnoses, and 10:09:16
14 sometimes you can't even diagnose a disease, but 10:09:22
15 you can give indications of it, and -- so you can 10:09:25
16 supply that to the clinician. We're more or less 10:09:29
17 forensic people, I guess, would be the way to 10:09:36
18 describe it. 10:09:41
19 Q And is pathology a specialty in which 10:09:43
20 you need to have a Board certification to practice 10:09:45
21 as a pathologist? 10:09:50
22 MR. KELLY: Objection. Form. 10:09:52

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1 A You don't -- in any subspecialty you do 10:09:55
2 not have to be Board-certified to practice. Board 10:09:59
3 certification is a step up from people that first 10:10:03
4 have started to practice. You have to practice a 10:10:12
5 while before you get the Boards -- be eligible for 10:10:14
6 the Boards. 10:10:17
7 I have a Ph.D. in engineering and had no 10:10:18
8 intention of doing pathology on patient samples 10:10:23
9 day-to-day. I wanted to combine my Ph.D. in 10:10:31
10 engineering with pathology to develop 10:10:35
11 instrumentation. Medical instrumentation. So I 10:10:40
12 never was Board-certified. Instead of Boards, I 10:10:44
13 got a Ph.D. 10:10:52
14 Q Okay. Thank you. 10:10:53
15 Are you familiar with the medical 10:10:53
16 specialty known as pain medicine? 10:10:57
17 A Of course. 10:11:01
18 Q And you are not a pain medicine 10:11:04
19 specialist, correct? 10:11:07
20 A No. Most of those guys are 10:11:08
21 anesthesiologists, interestingly enough. 10:11:10
22 Q So is it correct to assume that you have 10:11:16

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1 never performed an RF neurotomy procedure? 10:11:19
2 A I have performed -- that's a detailed 10:11:25
3 question. 10:11:30
4 I have performed, because it's a medical 10:11:30
5 instrument, experiments on animals, dogs and 10:11:35
6 pigs -- I try and use pigs -- and I do the 10:11:41
7 opposite of the neurotomy. I take a device and 10:11:47
8 see how close I can get to that spinal nerve or 10:11:51
9 the nerve root as it comes out in the tissue 10:11:55
10 before I effect the nerve. 10:12:00
11 So I will use different power settings, 10:12:03
12 different instruments, and look for the thermal 10:12:07
13 spread to give clinicians an idea when they do the 10:12:11
14 neurotomy, what the spread of the heat will be to 10:12:17
15 the surrounding tissue. 10:12:21
16 Q So have you ever performed an RF 10:12:25
17 neurotomy procedure on a live human patient? 10:12:28
18 A Oh, heavens no. You know, I'm not -- 10:12:31
19 that's -- I'm not an anesthesiologist or a 10:12:34
20 surgeon. 10:12:37
21 Q And is another word used to describe an 10:12:39
22 RF neurotomy procedure denervation? 10:12:43

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1 MR. KELLY: Objection. Form. 10:12:49
2 A Well, denervation occurs in a lot of 10:12:53
3 places in the body, not just around spines. So it 10:13:00
4 would -- that would -- a neurotomy would be a 10:13:03
5 subset. 10:13:07
6 Q So is RF neurotomy a subset of 10:13:12
7 denervation? 10:13:15
8 MR. KELLY: Objection. Form. 10:13:17
9 A I would say that's true. You can -- you 10:13:21
10 could perform, say on kidneys, around the renal 10:13:26
11 artery, you can denervate the kidney and control 10:13:32
12 blood pressure by destroying the nerves there, and 10:13:39
13 that would be a peripheral nerve. 10:13:43
14 Q Okay. Dr. Tucker, are you familiar with 10:13:47
15 the NIMBUS device sold by Stratus? 10:13:52
16 A No, I am not. 10:13:57
17 Q How about the TRIDENT device made and 10:14:00
18 sold by Avanos? 10:14:03
19 A Again, no. 10:14:06
20 Q Are you a member of any pain medicine 10:14:22
21 association? 10:14:24
22 A No. I don't treat patients, so there'd 10:14:28

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1 be no reason to. 10:14:32
2 Q Are you a member of any association that 10:14:35
3 focuses specifically on RF neurotomy? 10:14:38
4 A No. 10:14:44
5 Q Have you ever attended a professional 10:14:46
6 conference about RF neurotomy specifically? 10:14:48
7 A No, but professional conferences on the 10:14:53
8 safe use of electrosurgery where they would be 10:14:57
9 discussing that, among many others. 10:15:00
10 Q Is RF neurotomy one example of 10:15:05
11 electrosurgery? 10:15:09
12 A Yes. It uses radiofrequency surgery -- 10:15:12
13 waves to perform the tissue heating. 10:15:16
14 Q Is RF ablation one example of 10:15:20
15 electrosurgery? 10:15:23
16 A It is electrosurgery. 10:15:25
17 Q Okay. Are there other forms of 10:15:27
18 electrosurgery that do not qualify as RF ablation? 10:15:29
19 MR. KELLY: Objection. Form. 10:15:36
20 A Well, you could use it to create 10:15:40
21 hyperthermia, but its standard use is that of 10:15:42
22 cutting, coagulating, ablating tissue, and that's 10:15:46

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1 its primary function. 10:15:50
2 Q Have you ever authored a paper about RF 10:15:59
3 neurotomy specifically? 10:16:01
4 A Not specifically. 10:16:03
5 Q Do you regularly read journals relating 10:16:11
6 specifically to RF neurotomy? 10:16:13
7 A I don't read journals anymore. The way 10:16:18
8 I do it is I've gone to the library and I search 10:16:20
9 keywords, and they pull every paper that has my 10:16:26
10 keywords in it, and then they copy them and send 10:16:31
11 them to me -- actually, they do it electronically 10:16:35
12 now. So that's the way I would get neurotomy -- 10:16:37
13 electrosurgery -- 10:16:40
14 Q What are the -- 10:16:42
15 A -- neurotomy. 10:16:42
16 Q Oh, I'm sorry. Are you done with your 10:16:45
17 answer? 10:16:47
18 A Yes. 10:16:47
19 Q What are the keywords that you use in 10:16:48
20 the process you just described? 10:16:51
21 A I would have to go to the library and 10:16:58
22 ask them exactly, but they'd be things like, first 10:16:59

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1 of all, just "electrosurgery." And you don't want 10:17:05
2 to put it in "humans," you want "animals," too. 10:17:10
3 So you try and not use "humans" and "animals," but 10:17:13
4 you would do "effects of electrosurgery." You can 10:17:19
5 use "safety measures in electrosurgery," just 10:17:29
6 general things like that, and you can pick up a 10:17:37
7 lot of instrumentation. 10:17:40
8 Q Have you ever designed a device whose 10:17:50
9 intended use is RF neurotomy? 10:17:53
10 MR. KELLY: Objection. Form. 10:17:57
11 A Not whose sole device is neurotomy, no. 10:18:07
12 There are things we've designed that could be used 10:18:11
13 for it, but the main function was not that of 10:18:14
14 neurotomy. 10:18:19
15 Q Referring to RF -- sorry, referring to 10:18:27
16 an RF neurotomy procedure to treat a medial nerve 10:18:31
17 along the spine, are you familiar with what's 10:18:37
18 called the parallel approach? 10:18:47
19 A Again, I'm not a clinician, so the 10:18:50
20 answer would be no. I don't know if you're 10:18:53
21 referring to going in parallel to the spinal 10:18:57
22 cord -- I don't know the answer to that. 10:19:00

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1 Q Yeah, let me clarify. 10:19:07
2 I meant approaching with the RF 10:19:08
3 neurotomy needle the nerve, the intended target, 10:19:14
4 in a parallel orientation to that nerve. 10:19:19
5 MR. KELLY: Objection. Form. 10:19:24
6 Q Does that explanation change your answer 10:19:29
7 to the last question? 10:19:30
8 A No, because I don't know where they're 10:19:32
9 going into that nerve. They use fluoroscopy. 10:19:34
10 Where are they trying to hit? Do they want 10:19:37
11 perpendicular to the space in spine? 10:19:42
12 I can't imagine you going parallel to 10:19:45
13 the spine. The usual approach is perpendicular, 10:19:48
14 which could be parallel to that nerve. 10:19:53
15 Q I see. 10:19:56
16 And so do you know which type of 10:19:57
17 approach to a medial nerve is preferred by RF -- 10:20:07
18 I'm sorry, by doctors performing RF neurotomy; a 10:20:12
19 parallel approach, or perpendicular approach? 10:20:17
20 MR. KELLY: Objection. Form. 10:20:20
21 A No. 10:20:23
22 Q Are you familiar, Dr. Tucker, with a 10:20:24

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1 feature on a vertebrae that is referred to as the 10:20:29
2 eye of the Scotty dog? 10:20:34
3 A I've never heard that before. 10:20:37
4 Q Okay. Dr. Tucker, are you the inventor 10:20:39
5 on -- or an inventor -- on any patents? 10:20:48
6 A Yes. 10:20:52
7 Q How many? 10:20:53
8 A Six. 10:20:54
9 Q Do any of those six patents -- are any 10:20:56
10 of those six patents in the field of RF neurotomy? 10:21:00
11 A No, but they all involve RF devices. 10:21:04
12 Q So your patents relate to RF devices 10:21:11
13 generally but not to RF neurotomy specifically; is 10:21:15
14 that correct? 10:21:18
15 A Well, again, like I said earlier, many 10:21:19
16 of the devices that I have been associated with 10:21:21
17 could be used for neurotomies. They're not 10:21:25
18 intended for that, but doctors can take a 10:21:28
19 neurotomy needle and use it in the liver. 10:21:33
20 So there's a lot of cross-usage of these 10:21:36
21 devices, but I've never sat down and tried to 10:21:41
22 design a neurotomy needle, cannula. 10:21:44

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1 Q Okay. 10:21:49
2 (Exhibit 1035 was marked for 10:21:49
3 identification and was retained by Mr. Phillips.) 10:21:49
4 Q Now, you mentioned you have a Ph.D. in 10:21:49
5 engineering. On your CV, so Exhibit 1035 in all 10:21:56
6 cases -- 10:22:10
7 A Do you mind if I look at it? 10:22:11
8 Q Please, go ahead. 10:22:13
9 A Thank you very much. 10:22:13
10 Q And as you may know, this just was 10:22:14
11 produced yesterday or the day before. 10:22:23
12 A Correct, I knew that. 10:22:25
13 Okay, I've got it. 10:22:27
14 Q Okay. On page 1 it says under the 10:22:34
15 heading Education, 1975, Ph.D. biophysics from the 10:22:39
16 University of Minnesota. Is that correct? 10:22:48
17 A That is correct. 10:22:51
18 Q So is your Ph.D. in biophysics or 10:22:54
19 engineering? 10:22:58
20 A Minnesota did not have a Ph.D. in 10:23:01
21 biomedical engineering, so I got a Ph.D. in 10:23:04
22 biophysics, and then took all the physics courses, 10:23:09

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1 chemistry courses and the engineering courses. 10:23:14
2 So it was in biophysics the typical 10:23:17
3 Ph.D., and engineering would have taken 42 hours. 10:23:21
4 I had 120 credit hours of coursework. So it was a 10:23:26
5 long slog, and it was because they didn't have a 10:23:31
6 Ph.D. in biomedical engineering. 10:23:34
7 Q Okay. Thank you. 10:23:40
8 And you are presently a Professor at the 10:23:41
9 University of Iowa, correct? 10:23:49
10 A That is correct. 10:23:52
11 Q And -- 10:23:55
12 A In the College of Medicine. 10:23:56
13 Q Is your professorship in the College of 10:24:00
14 Engineering as well? 10:24:04
15 A Correct. 10:24:05
16 Q Both? 10:24:07
17 A Yes. 10:24:07
18 Q Okay. Are you a tenured Professor? 10:24:08
19 A Yes. 10:24:14
20 Q When did you get tenure? 10:24:16
21 A Oh, gee whiz. Early '90s. It says 10:24:19
22 right here, '92. 10:24:25

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1 Q Is that when your academic appointment 10:24:34
2 switched from Adjunct Assistant Professor to 10:24:38
3 Assistant Professor? 10:24:41
4 A Associate Professor. 10:24:43
5 Q Oh. I'm going in the wrong direction -- 10:24:46
6 A Yeah. 10:24:49
7 Q -- right? 10:24:49
8 A Yeah. 10:24:50
9 Q Thank you. 10:24:51
10 And that tenure position is in the 10:24:52
11 College of Medicine, correct? 10:24:59
12 A And in Engineering. 10:25:01
13 Q In both? 10:25:04
14 A Correct. 10:25:05
15 Q Okay. Would you say that your principal 10:25:07
16 occupation is as a pathologist or a Professor of 10:25:15
17 biomedical engineering? 10:25:20
18 MR. KELLY: Objection. Form. 10:25:23
19 A Well, I -- for pathology, I have a 10:25:26
20 number of things that I do, and it's definitely 10:25:29
21 pathology. 10:25:35
22 I am Course Coordinator, and I give 10:25:37

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1 60 percent of the lectures for Introduction to 10:25:41
2 Human Pathology, which is an upper-level course of 10:25:44
3 graduate students, medical students, dentists, 10:25:50
4 pharmacists, et cetera. 10:25:56
5 And the second thing I do for the 10:25:57
6 department is I have the ungodly task of checking 10:26:05
7 all of our billing. I seem to be the only one 10:26:08
8 that can handle numbers in our department, so I do 10:26:13
9 that, and I look at well over 100 cases every week 10:26:19
10 to check to see if we're billing it correctly. 10:26:29
11 When I took over, we misbilled $750,000 10:26:31
12 a year. We've cut that down, not as much as I'd 10:26:37
13 like, but we've cut it down to about 500,000. So 10:26:42
14 that's for my department. 10:26:47
15 The Engineering Department, I'm a guest 10:26:48
16 lecturer. I take their graduate students -- all 10:26:53
17 my students have been undergrads, master's degree 10:26:57
18 and Ph.D. students, biomedical engineering. I 10:27:02
19 have no one at the current moment, but all my 10:27:05
20 research is basically in biomedical engineering. 10:27:10
21 So when I'm not doing code checking or teaching in 10:27:15
22 fall semester, I'm doing research. And that 10:27:21

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1 research is 100 percent biomedical engineering. 10:27:24
2 Q In your teaching -- so I'm not asking 10:27:31
3 about your research or your billing work -- but in 10:27:36
4 your teaching, have you ever taught courses 10:27:41
5 focused on device design? 10:27:48
6 A Not in the College of Medicine. I've 10:27:57
7 talked to -- I've talked about that and how 10:28:00
8 devices get approved going through the FDA, so all 10:28:05
9 that, to engineers. Taught that to engineers. 10:28:11
10 Q Do you teach your students how to do the 10:28:18
11 engineering to develop a medical device? 10:28:20
12 A Yes. 10:28:23
13 MR. KELLY: Objection. Form. 10:28:24
14 A Yes. 10:28:25
15 Q Can you describe for me the -- that 10:28:35
16 teaching and what that entails? 10:28:39
17 MR. KELLY: Objection. Form. 10:28:43
18 A Well, the first thing is, is you want to 10:28:46
19 decide if they want to do an open procedure or a 10:28:49
20 minimally invasive procedure. That would include 10:28:54
21 percutaneous needles or using body orifices to get 10:28:58
22 the device into the patient. So nasal passages, 10:29:04

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1 mouth, rectum, urethra, vagina. And talk a little 10:29:10
2 bit about what has to be done on each of those. 10:29:19
3 I personally think minimally invasive is 10:29:22
4 the way medicine is going. It certainly has been 10:29:25
5 that in the last couple decades, and I think it's 10:29:29
6 only going to get more used -- used even more than 10:29:33
7 it is now. 10:29:38
8 So then I move into minimally invasive 10:29:39
9 procedures, the definition of it, and then we talk 10:29:44
10 about what problems that each of the routes of 10:29:47
11 delivery of a medical device pose. So you have to 10:29:55
12 teach them some anatomy and where they're going to 10:29:59
13 try and put this thing. 10:30:03
14 Then what you've got to do is teach them 10:30:04
15 biomaterials. What biomaterials are -- are 10:30:09
16 biocompatible for what you're trying to do. Not 10:30:16
17 only they have to be biocompatible, since they're 10:30:23
18 electrosurgical, you have to have enough 10:30:27
19 insulation to withstand the -- any insulation 10:30:30
20 breakdown caused by the electrosurgical voltage. 10:30:36
21 So we talk about that. 10:30:40
22 And we talk about some of the effects of 10:30:41

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1 high voltages, capacity of a couple stray currents 10:30:46
2 specifically, and so biomaterials is very 10:30:54
3 important. 10:30:57
4 The other thing is you have to talk 10:30:59
5 about what electrode do you want, what are you 10:31:02
6 trying to do with it, what electrode materials are 10:31:06
7 biocompatible, what aren't, is this going to be an 10:31:08
8 implant. If it's an implant, it's very important. 10:31:12
9 And you can't use things like copper electrodes. 10:31:16
10 The body just won't tolerate it. 10:31:19
11 So we go into what biocompatible 10:31:24
12 materials for insulation, for electrode, and then 10:31:29
13 ultimately you can design something. 10:31:34
14 Say they design a -- one of the last 10:31:37
15 groups designed a tissue dissector that was meant 10:31:45
16 for plastic surgery. And it -- normally when they 10:31:54
17 do some plastic surgery, they pull the skin off 10:31:59
18 your face and put back your forehead and then trim 10:32:01
19 off the excess and then put it back on your face. 10:32:05
20 The problem is, is they dissect that 10:32:07
21 bluntly. So they take a pair of forceps and just 10:32:12
22 peel your skin away, or sharp dissect it very 10:32:16

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1 carefully. 10:32:21
2 They invented a plane dissector to go 10:32:22
3 under the layer of the skin and go along the fat 10:32:29
4 layer, and it was shaped like a wedge, and it had 10:32:35
5 multiple electrodes, so it passed RF current so 10:32:39
6 they could easily dissect that plane and not cause 10:32:43
7 any bleeding. Because electrosurgery ablates 10:32:48
8 blood vessels, and it seals the blood vessels so 10:32:55
9 you have no bleeding. 10:32:58
10 So they had to do a device that was 10:33:00
11 biocompatible, the electrode did not deposit 10:33:08
12 anything into the tissue that could withstand the 10:33:13
13 voltages they used and that wouldn't have 10:33:16
14 insulation breakdown. 10:33:20
15 So it's a little bit of everything, and 10:33:21
16 you just do it in stages. 10:33:23
17 Q Thank you. That's fascinating. 10:33:31
18 Have you personally ever designed a 10:33:33
19 medical device that has been FDA approved? 10:33:44
20 A Yes. 10:33:51
21 Q How many? 10:33:51
22 A Well, design isn't done by one person 10:33:55

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1 now, it's done by a group. Typically it'll be 10:33:58
2 done with couple of engineers. In electrosurgery, 10:34:02
3 you're going to have to throw in an electrical 10:34:07
4 engineer in there as long -- as well as mechanical 10:34:11
5 engineer, maybe a biomedical engineer. 10:34:13
6 You'll also have a marketing person, 10:34:16
7 because you can't develop something that they 10:34:22
8 can't sell and that doctors won't like. And so 10:34:26
9 there's usually a marketing person in there that 10:34:30
10 knows -- that's interactive with physicians. 10:34:34
11 And having said that, the number of 10:34:40
12 those groups that I've either Chaired or been 10:34:42
13 involved in, over 100. 10:34:45
14 Q So you've been involved to some extent 10:34:55
15 in the design of over 100 FDA-approved medical 10:34:59
16 devices? 10:35:02
17 A Yeah. Maybe 200. 10:35:03
18 Q Okay. 10:35:05
19 A I mean if you touch a bipolar instrument 10:35:06
20 today, it was one that I designed. Now, they've 10:35:08
21 got offshoots of them now, but the base design 10:35:14
22 came out of Everest Medical, and I was one of the 10:35:18

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1 founders of that company. 10:35:23
2 I've worked for Johnson & Johnson, Bard, 10:35:24
3 Medtronic, St. Jude, and then a lot of startup 10:35:32
4 companies, doing the same thing with them. 10:35:37
5 I've testified in front of the FDA to 10:35:41
6 get products through the FDA. I've wroten [sic] 10:35:47
7 parts of FDA submissions. No one writes the whole 10:35:50
8 submission, but I've written major sections of FDA 10:35:54
9 submissions. 10:35:59
10 Q And were any of these 100 or 200 devices 10:36:00
11 RF neurotomy devices? 10:36:08
12 A Not specifically, but some could have 10:36:11
13 been used for that. 10:36:14
14 Q Can you think of the ones that could 10:36:21
15 have been used for RF neurotomy? 10:36:23
16 A Well, fine hollow needles, single tip. 10:36:26
17 Problem with that is, is -- we'll probably discuss 10:36:30
18 later -- is -- is single tip doesn't necrose much 10:36:35
19 tissue, and so it's -- I -- only -- as far as I 10:36:40
20 understand, it's not very popular anymore. 10:36:46
21 So just because you could use something 10:36:49
22 doesn't mean you want to use something, just 10:36:59

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1 something that's designed for another purpose. 10:37:01
2 Q Right. 10:37:05
3 A I've tested liver metastases devices, 10:37:05
4 and those certainly could have been used for 10:37:11
5 neurotomy. You know, I've tested single just 10:37:17
6 straight electrodes that were insulated, except 10:37:29
7 for the tip, with saline irrigation or some 10:37:34
8 irrigation down the center, which is used for 10:37:38
9 peripheral dissection around nerves. That could 10:37:43
10 be used. 10:37:47
11 Q Are you aware of any concrete instance 10:37:51
12 in which one of the 100 or 200 devices that you 10:37:54
13 designed or participated in the design of has been 10:37:58
14 used for RF neurotomy? 10:38:02
15 MR. KELLY: Objection. Form. 10:38:05
16 A No, and -- given the number of 10:38:07
17 procedures in a year in western medicine, there's 10:38:12
18 no way I'd know that. 10:38:15
19 Q All right. Let's turn to your 10:38:19
20 Declaration. Well, you have four Declarations. 10:38:22
21 A Yes. 10:38:27
22 10:38:28

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1 (Exhibit 1031 was marked for 10:38:28
2 identification and was retained by Mr. Phillips.) 10:38:28
3 Q Let's start with Exhibit 1031, which is 10:38:28
4 part of IPR2024-01209, I believe. And -- so I'm 10:38:35
5 just going to ask you about this particular 10:38:46
6 Declaration. 10:38:49
7 A Okay. 10:38:50
8 Q Can you describe for me the process you 10:38:59
9 went through to prepare this Declaration? 10:39:01
10 A How long and drawn out? 10:39:07
11 Yeah, I first was given a -- the 10:39:09
12 patents, the '664, the '782, and the '688. I was 10:39:16
13 given those patents and asked to read those and 10:39:28
14 form an opinion. I read them, and I gave my -- 10:39:33
15 what was just a preliminary read of the patents. 10:39:37
16 I was then supplied with a group of 10:39:46
17 prior art and asked to look at the prior art and 10:39:51
18 decide if the patents -- three patents were -- 10:39:58
19 should have been issued. 10:40:08
20 I read the prior art, and I think it was 10:40:12
21 plain to me that the Patent Office missed some of 10:40:18
22 the patents -- prior patents that would make the 10:40:24

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1 findings of those three patents in question 10:40:29
2 obvious. 10:40:37
3 So having formed that, I started 10:40:37
4 detailing why I believed that. And you make 10:40:41
5 outlines. And then there were many conversations 10:40:45
6 with the lawyers, Chris Kelly, and I discussed 10:40:51
7 what I thought each report should contain. So we 10:41:01
8 had multiple conversations. 10:41:10
9 They would draft something, I would read 10:41:13
10 it, suggest changes, we added things, took things 10:41:16
11 out that weren't clear, and it was just a -- it's 10:41:19
12 a back-and-forth process all the way through. So 10:41:26
13 we did that for each of the reports. 10:41:28
14 Q And you refer to prior art that was 10:41:34
15 supplied to you. Does that include Racz, Fitz, 10:41:36
16 Lee, and the other prior art references noted in 10:41:41
17 your Declaration? 10:41:48
18 A Yes. 10:41:49
19 Q So those prior art references were not 10:41:51
20 found by you, they were supplied to you, correct? 10:41:57
21 A That's correct. 10:42:03
22 Q So in other words, you did not do the 10:42:05

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1 prior art searching to find those references, 10:42:09
2 correct? 10:42:11
3 A No, I did not. It's interesting that 10:42:13
4 I'd seen some of them supplied to me by the 10:42:16
5 library, but -- (shrugging shoulders.) 10:42:20
6 Q And you said that there were many 10:42:23
7 conversations about this Declaration. Were all of 10:42:25
8 those conversations with Avanos' counsel? 10:42:33
9 A No, there was one Zoom call with the 10:42:40
10 draftsman, because I wanted a particular diagram, 10:42:45
11 and had a discussion with him what it should look 10:42:49
12 like. And then he reproduced it. So I had that 10:42:55
13 one discussion with him. I might have had two. 10:43:01
14 Q And is that diagram in this Declaration? 10:43:07
15 A Yes, it is. 10:43:10
16 Q Could you please tell me where it is? 10:43:12
17 A Yeah. It's on page 108 and 109. 10:43:14
18 Q Now, it appears that what is shown on 10:43:43
19 page 109 is a enlargement of a portion of what is 10:43:46
20 on page 108. Is that correct? 10:43:51
21 A Yes, it is. 10:43:56
22 Q And I believe that the drawing on page 10:43:59

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1 108 appears in other places in your Declaration. 10:44:03
2 Let's see. For example, could you look at page 85 10:44:15
3 and tell me if that's the same diagram but for the 10:44:18
4 annotations, the words? 10:44:22
5 A It wouldn't surprise me. 10:44:23
6 Yep, it is, same diagram. 10:44:25
7 Q Okay. So this diagram was generated by 10:44:28
8 a draftsman at your request, correct? 10:44:31
9 A Correct. 10:44:36
10 Q And what is the name of that draftsman? 10:44:36
11 A I knew you'd ask me that. I don't 10:44:41
12 remember his name. I'm sorry. 10:44:43
13 Q That's okay. 10:44:46
14 A I just don't remember it. 10:44:47
15 Q How did you communicate with the 10:44:49
16 draftsperson? 10:44:51
17 A Zoom. 10:44:53
18 Q Did you exchange emails with the 10:44:55
19 draftsperson? 10:45:00
20 A I don't think I had his. I think that 10:45:04
21 the law firm had contacted him, so he had my 10:45:10
22 email. I think they may have set up the Zoom 10:45:15

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1 call. I don't remember the details of it, how it 10:45:19
2 occurred. 10:45:23
3 Q How many Zoom calls -- I'm sorry. 10:45:29
4 You said there were one or two Zoom 10:45:31
5 calls with this person? 10:45:34
6 A Correct. 10:45:35
7 Q And the -- no lawyers for Avanos were 10:45:37
8 present during those Zoom calls, correct? 10:45:42
9 A I don't recall. 10:45:48
10 Q What did you discuss with the 10:45:52
11 draftsperson during those Zoom calls? 10:45:55
12 MR. KELLY: I'll instruct the witness 10:45:57
13 not to answer. 10:45:58
14 Dr. Tucker, we can't talk about 10:45:59
15 privileged work product. 10:46:02
16 Q Dr. Tucker, I'm going to ask you again. 10:46:08
17 Do you know whether any counsel for 10:46:10
18 Avanos was present during that Zoom call or those 10:46:14
19 Zoom calls? 10:46:17
20 A I'm not sure of that answer, but I would 10:46:20
21 think if -- and they set it up -- that there would 10:46:23
22 have been somebody on the call. I just don't 10:46:27

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1 recall. 10:46:29
2 Q Okay. Did the draftsperson prepare any 10:46:31
3 drafts of this diagram that are different from 10:46:44
4 what is shown in your Declaration? 10:46:48
5 A I'd like to say I think so, but I'm not 10:46:58
6 sure if he did. I don't know if he hit exact -- I 10:47:01
7 mean we were pretty detailed in our description, 10:47:05
8 so he could have hit it just the first time. 10:47:08
9 Now, it may be when he first showed us, 10:47:12
10 the cutaway wasn't as obvious as it is now. There 10:47:15
11 would have been small changes. 10:47:23
12 Q Do you remember specifically any of 10:47:28
13 those small changes? 10:47:29
14 A No. I just remember I was really happy 10:47:31
15 with the way it turned out. 10:47:35
16 Q When do you think these Zoom calls with 10:47:51
17 the draftsperson took place? 10:47:53
18 A Oh, boy. I have no recollection of 10:47:55
19 that. I mean you're talking two phone calls made 10:48:03
20 within the last two years. Yeah, I don't 10:48:11
21 remember. 10:48:17
22 Q Well, the petitions were filed in July 10:48:21

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1 of 2024. So can we assume that these 10:48:24
2 conversations took place before then? 10:48:27
3 A Yeah, they were probably in '23. I mean 10:48:30
4 if they were filed in '24, I'm -- we would have 10:48:35
5 been drafting things, and he would have been 10:48:39
6 working on these before that. And it wouldn't 10:48:44
7 have been just last-minute. So probably '23. 10:48:47
8 Yeah, I just don't have any idea what date. 10:48:52
9 Q How long, in terms of a span of time, 10:49:06
10 did it take you to prepare this Declaration from 10:49:08
11 beginning to end? 10:49:14
12 I'm sorry, that's not a good question. 10:49:19
13 Let me ask -- try to ask it in a better way. 10:49:22
14 How much time do you think you've spent 10:49:25
15 on the preparation of this Declaration? 10:49:28
16 A Oh, it seemed endless, but I don't have 10:49:37
17 -- I don't know the answer to that. I keep track 10:49:40
18 of hours. My wife does that, I don't. And I 10:49:45
19 don't do any of the billing, she does it all. So 10:49:49
20 I don't know, but a hell of a lot of time. 10:49:55
21 Q Okay. 10:49:59
22 A I mean these aren't trivial. 10:49:59

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1 Q So you do the university billing, and 10:50:09
2 she does your billing; is that right? 10:50:11
3 A Correct, yeah, that is the truth. 10:50:13
4 Q Did you provide drafts of this 10:50:21
5 Declaration to anyone other than counsel for 10:50:24
6 Avanos? 10:50:27
7 A Oh, no, no, that's verboten. You don't 10:50:28
8 do things like that. 10:50:33
9 Q Did you discuss the content of this 10:50:34
10 Declaration with anyone else other than Avanos 10:50:35
11 counsel? 10:50:39
12 A No. Not at all. 10:50:42
13 Q Well, I guess I should include in that 10:50:44
14 question the draftsperson. 10:50:47
15 A Yeah. 10:50:48
16 Q Okay. So let me -- let me ask again so 10:50:48
17 the record is clear. 10:50:53
18 Other than the draftsperson that you 10:50:54
19 mentioned, whose name you can't remember, and 10:50:57
20 counsel for Avanos, did you discuss the content of 10:50:59
21 this Declaration with anyone else? 10:51:04
22 A No. 10:51:06

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1 Q Did anyone else other than counsel for 10:51:11
2 Avanos and the draftsperson you mentioned 10:51:15
3 participate in creating this Declaration? 10:51:17
4 MR. KELLY: Okay. Matt, I'm sorry, the 10:51:20
5 connection is a little unstable. I wasn't able to 10:51:21
6 hear that last question. 10:51:25
7 MR. PHILLIPS: Yeah. 10:51:27
8 MR. KELLY: And also, Dr. Tucker is 10:51:28
9 frozen on my screen. I don't know if you're 10:51:29
10 seeing the same thing. 10:51:32
11 MR. PHILLIPS: It looks good to me, 10:51:34
12 but -- 10:51:34
13 MR. KELLY: Okay. I think we're good 10:51:34
14 now. Sorry for the interruption. 10:51:37
15 THE WITNESS: Yeah, you froze there for 10:51:40
16 a minute. 10:51:42
17 MR. PHILLIPS: Okay. Thank you for 10:51:43
18 letting me know. I'll try to repeat the question. 10:51:43
19 THE WITNESS: Okay. 10:51:46
20 BY MR. PHILLIPS: 10:51:47
21 Q Did anyone else participate in creating 10:51:49
22 this Declaration other than yourself, Avanos 10:51:52

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1 counsel, and the draftsperson you mentioned? 10:51:57
2 A Certainly not that I'm aware. 10:52:02
3 Q Are you aware of any mis -- oh, I'm 10:52:05
4 sorry, please -- 10:52:07
5 A Not on my end, anyway. 10:52:08
6 Q Are you aware of any mistakes or 10:52:15
7 inaccuracies in this Declaration? 10:52:18
8 A No. I think I found a couple typos here 10:52:21
9 and there, but just nothing of any importance. 10:52:24
10 Q Okay. The same question for the other 10:52:28
11 three Declarations. Are you aware of any mistakes 10:52:29
12 or inaccuracies in those Declarations? 10:52:32
13 A No, I'm not. 10:52:36
14 Q Can you please tell me, Dr. Tucker, what 10:52:48
15 you have done to prepare for this deposition 10:52:51
16 today? 10:52:53
17 A I've gone back and read all my reports. 10:52:58
18 I have looked at a large number of prior art 10:53:05
19 patents. Coming out here I met with Chris on 10:53:10
20 Monday and Tuesday where we went over certain -- 10:53:18
21 certain details of the reports and certain details 10:53:21
22 of the patents. 10:53:28

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1 MR. KELLY: Dr. Tucker, I caution you 10:53:30
2 not to reveal privileged conversations between 10:53:31
3 myself and you, but you're free to discuss how you 10:53:33
4 prepared for the deposition in response to Matt's 10:53:37
5 question, thank you. 10:53:39
6 A That was the end of my response. 10:53:40
7 Q How much time have you spent preparing 10:53:49
8 for this deposition? 10:53:50
9 A I am not sure. It would have been a 10:54:01
10 week times, say, 25 hours, maybe more, and then 10:54:07
11 eight hours Monday and Tuesday of this week. 10:54:20
12 Q Eight hours each day or eight hours -- 10:54:27
13 A Eight hours each day. 10:54:30
14 I'm sorry to interrupt you. 10:54:31
15 Q Okay. Other than Mr. Kelly, who was 10:54:36
16 present in your meetings on Monday and Tuesday? 10:54:41
17 A No one sat in on them. It was -- it was 10:54:49
18 Mr. Kelly. 10:54:51
19 Q In preparing for this deposition, did 10:54:57
20 you look at any documents that are not referenced 10:54:59
21 in your Declarations? 10:55:03
22 A No. I think you have, in the beginning 10:55:10

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1 of each report, what documents I considered, and 10:55:14
2 it was only those. 10:55:19
3 MR. PHILLIPS: All right. We've been 10:55:21
4 going for about an hour. Shall we take a little 10:55:26
5 break? 10:55:30
6 THE WITNESS: Perfect, thank you. 10:55:31
7 MR. PHILLIPS: Okay. How long of a 10:55:32
8 break do you want? 10:55:33
9 THE WITNESS: Oh, five minutes. 10:55:34
10 MR. PHILLIPS: Okay. 10:55:37
11 THE VIDEOGRAPHER: Stand by. Going off 10:55:37
12 the record, 10:55 a.m. 10:55:38
13 (A recess was taken.) 10:55:40
14 THE VIDEOGRAPHER: Back on the record, 10:55:40
15 11:03 a.m. 11:03:20
16 BY MR. PHILLIPS: 11:03:21
17 Q Dr. Tucker, I forgot to ask you a couple 11:03:24
18 basic questions. 11:03:25
19 What is your home address? 11:03:26
20 A It's on the back -- the last page of my 11:03:31
21 CV, by the way, in case you -- but it's 11:03:33
22 4008 Mehaffey, M-E-H-A-F-F-E-Y, Lane, Northeast, 11:03:36

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1 and that's in Solon, S-O-L-O-N, IA 52333. 11:03:45
2 Q Thank you. 11:03:52
3 What is the nearest major city that I 11:03:55
4 might recognize to Solon? 11:03:58
5 A Are you a football fan? 11:04:01
6 Q Sure. 11:04:04
7 A Iowa City. 11:04:05
8 Q Okay. 11:04:06
9 A The Hawks. 11:04:06
10 Q That's where the University of Iowa is? 11:04:09
11 A That's correct. 11:04:12
12 Q And what is your date of birth? 11:04:14
13 A Oh, do you have to? April 18, 1957. 11:04:17
14 Q Well, belated Happy Birthday. What, 11:04:31
15 three weeks ago? 11:04:34
16 A I have unbirthdays. 11:04:35
17 Q All right. 11:04:40
18 (Exhibit 1009 was marked for 11:04:41
19 identification and was retained by Mr. Phillips.) 11:04:41
20 Q I'd like to ask you about the Racz 11:04:41
21 reference, which is Exhibit 1009 in all cases. 11:04:44
22 A Correct. 11:04:52

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1 Q I believe -- I actually haven't 11:04:54
2 doublechecked, but I'm pretty sure it's the same 11:04:56
3 exhibit number in all four cases. In any event, I 11:04:58
4 will be referring to the version of it in the 11:05:02
5 first case, the 1209 case. 11:05:07
6 A Correct. 11:05:11
7 Q Do you understand Racz to describe a 11:05:20
8 device for RF neurotomy? 11:05:26
9 A Yes, I do. You know, if you look at my 11:05:42
10 report on the overview of Racz on page 65, 11:05:48
11 paragraph 110, an apparatus for pain relief that 11:05:53
12 delivers electric stimulation pulses or 11:05:58
13 high-frequency signals in the vicinity of a neural 11:06:02
14 structure via an electrical needle or cannula. 11:06:08
15 Q Does Racz describe any use of his device 11:06:13
16 other than neurotomy? 11:06:16
17 A (Reviewing.) 11:07:11
18 Yeah, if you look at the patent on 11:07:36
19 column 9, Racz states that: 11:07:39
20 While certain exemplary structures and 11:07:42
21 operations have been described, the invention is 11:07:48
22 not so limited, and its scope is to be determined 11:07:51

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1 according to the claims set forth below. 11:07:55
2 So I read that, so yes, you can use it 11:07:58
3 on other parts of the body. 11:08:07
4 Q Other than that passage you just read, 11:08:09
5 are you aware of any specific disclosure in Racz 11:08:12
6 involving an application other than RF neurotomy? 11:08:19
7 A Let me -- my report shows that he does 11:08:59
8 disclose the -- and I read it before -- in the 11:09:43
9 vicinity of a neural structure. That would 11:09:57
10 certainly include things other than just a 11:10:02
11 neurotomy. It's used to generate high-frequency 11:10:05
12 heat lesions to modify or coagulate nerves along 11:10:12
13 the patient's spine. But it could be used in just 11:10:17
14 nerve tissue in general. 11:10:22
15 So I don't think it's limited to a 11:10:25
16 neurotomy, but certainly I think that was his -- 11:10:28
17 one of -- I just don't think it's limited to that. 11:10:31
18 Q Does the Racz device have deployable 11:10:45
19 tines or filaments? 11:10:46
20 A No, it does not. 11:10:52
21 Q Why is the tip of Racz's device curved 11:10:57
22 or bent? 11:11:00

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1 MR. KELLY: Objection. Form. 11:11:02
2 A (Reviewing.) 11:13:32
3 Q Dr. Tucker, sorry to interrupt your 11:13:33
4 study. It looks like you are rereading Racz. 11:15:56
5 It's been several minutes. I don't want to rush 11:15:58
6 you, but if you have an estimate of how much 11:16:04
7 longer it will -- 11:16:07
8 A Well -- 11:16:08
9 Q -- take you to answer my question? 11:16:08
10 A Yeah. I mean, the point was to reach 11:16:10
11 into areas that a straight-tipped probe cannot 11:16:16
12 reach. And I was looking for his exact words on 11:16:21
13 that, and I ... 11:16:25
14 Q Again, Dr. Tucker, I don't want to rush 11:17:23
15 you through your process, but I will note that 11:17:24
16 column 2 may have what you're looking for. 11:17:31
17 A Yeah, I was in column 6, and it -- 11:17:36
18 that's exactly -- if you look on through 56, 57, 11:17:57
19 bent tip would make it possible to redirect 11:18:03
20 position and orientation of the tip near neural 11:18:06
21 structures and, you know, around bone or closer to 11:18:12
22 bone, without having to fully withdraw and 11:18:17

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1 reinsert the needle. That would be one advantage, 11:18:20
2 and that would avoid other organs. 11:18:28
3 And on 6 -- column 6, improved lines -- 11:18:34
4 line 40, bent tip probes according to the 11:18:46
5 invention provide improved target positioning and 11:18:54
6 safer placement in -- compared to traditional 11:18:59
7 modalities. And then he goes into directional 11:19:03
8 steering by the curved tip. 11:19:10
9 So -- and if we go to 46, directional 11:19:15
10 changes during needle insertion can be achieved 11:19:20
11 more easily and less traumatically than would 11:19:24
12 otherwise be possible with straight-tipped 11:19:29
13 electrode, reducing the need for painful 11:19:32
14 withdrawals and reinsertions. So ... 11:19:36
15 Q Okay, thank you. 11:19:47
16 In your opinion, would you agree that 11:19:48
17 the passages you just read reflect important 11:19:50
18 clinical reasons for having a curved tip? 11:19:57
19 MR. KELLY: Objection. Form. 11:20:00
20 A Well, I think in some cases that it is 11:20:09
21 true; although, he does state that the amount of 11:20:12
22 bend can be varied to a practitioner of ordinary 11:20:24

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1 skill in applications. So that would mean that in 11:20:32
2 some applications straight might be better. 11:20:41
3 Q Which passage of Racz were you looking 11:20:54
4 to when you gave your last answer? 11:20:58
5 A Various -- I'm sorry. Column 8 he 11:21:51
6 states, starting on line 57: 11:21:56
7 Various forms and embodiments of the 11:21:59
8 bent tip needle are provided herein involving 11:22:03
9 various shapes, sizes, forms, associated even with 11:22:08
10 the shape of the cannula. 11:22:15
11 And then you go down to 65: 11:22:19
12 For example, as discussed above, various 11:22:24
13 configurations of tip geometry, bluntness or 11:22:26
14 sharpness, degree of curvature, position of fluid 11:22:31
15 port and insulation configuration may be devised. 11:22:37
16 So he recognizes that the amount of bend 11:22:42
17 can be varied. 11:22:51
18 Q And, Dr. Tucker, is it your opinion that 11:22:56
19 the paragraph you're referring to, which starts on 11:23:01
20 column 8, line 58, of Racz should be interpreted 11:23:04
21 as encompassing zero bend? 11:23:12
22 MR. KELLY: Objection. Form. 11:23:18

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1 A Well, I think that one skilled in the 11:23:25
2 art would see that the degree of curvature can be 11:23:28
3 varied, geometry, so yes, it could include zero. 11:23:34
4 Q Okay. 11:23:39
5 (Exhibit 1011 was marked for 11:23:39
6 identification and was retained by Mr. Phillips.) 11:23:39
7 Q Let's turn to the Fitz patent -- I'm 11:23:39
8 sorry, it's a Patent Application Publication. 11:23:51
9 It's Exhibit 1011. Let me know when you have that 11:23:54
10 before you. 11:24:17
11 A All right. I have an overview of Fitz 11:24:32
12 on my report starting on page 69. 11:24:35
13 Q Right. 11:24:46
14 And by "your report," you mean your 11:24:46
15 Declaration; specifically, Exhibit 1031, correct? 11:24:50
16 A Correct. 11:24:54
17 Q All right. Dr. Tucker, is it your 11:25:00
18 understanding of Fitz that all of the electrodes 11:25:01
19 he discloses are insulated except for a small 11:25:07
20 portion at the distal end? 11:25:14
21 MR. KELLY: Objection. Form. 11:25:17
22 A (Reviewing.) 11:25:48

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1 Could you repeat that again? Are you 11:25:49
2 asking about the cannula or the electrode itself? 11:26:14
3 Q I'm asking about the electrodes and 11:26:18
4 whether you understand them to be insulated except 11:26:20
5 for their tips. 11:26:25
6 MR. KELLY: Same objection. 11:26:28
7 A (Reviewing.) 11:26:59
8 No, I don't believe he is requiring 11:27:50
9 that. Certainly one of his diagrams show it, but 11:27:53
10 one showed simply electrodes that are not 11:27:58
11 insulated. That would be his Figure 5. 11:28:03
12 Q Okay, let me ask you about Figure 5. 11:28:10
13 Are the -- do you understand Figure 5 to show 11:28:18
14 eight electrodes coming out of a cannula? 11:28:30
15 A Eight deployable electrodes coming out 11:28:41
16 of the side ports of the cannula, correct. 11:28:43
17 Q And can you tell from Figure 5 how those 11:28:52
18 electrodes are arranged within the cannula? 11:28:56
19 A No, you really can't. He doesn't give a 11:29:05
20 cutaway view. 11:29:09
21 Q And can you tell from Figure 5 the 11:29:12
22 design of the side ports? 11:29:17

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1 A No, no, you cannot. They appear to be 11:29:23
2 symmetrical. 11:29:28
3 Q Are you interpreting or understanding 11:29:30
4 Figure 5 to show that those electrodes deploy out 11:29:33
5 perpendicular to the cannula? 11:29:42
6 A In Figure 5 they appear to be. 11:29:46
7 Q Do you recall seeing in Fitz any 11:29:59
8 description of how to design Figure 5 to achieve 11:30:00
9 that configuration of electrodes? 11:30:09
10 A How to design the cannula? 11:30:14
11 Q How to design the cannula and the 11:30:17
12 electrodes and how to make it so that you can 11:30:19
13 achieve the configuration shown in Figure 5. 11:30:22
14 My question is, is that described 11:30:24
15 anywhere in Fitz? 11:30:30
16 MR. KELLY: Objection. Form. 11:30:33
17 A Well, in paragraph 21 he states: 11:30:43
18 Although side electrodes are shown 11:30:47
19 emanating from more or less the same distance from 11:30:50
20 the tip, this is not necessary. A helix or spiral 11:30:53
21 apertures may be an alternative used. 11:30:58
22 He just says they're deployed outwardly 11:31:02

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1 from the cannula and leaves it up to one of 11:31:07
2 ordinary skill in the art to do that. 11:31:15
3 Q Uh-humh. 11:31:42
4 (Exhibit 1010 was marked for 11:31:42
5 identification and was retained by Mr. Phillips.) 11:31:42
6 Q Okay, let's turn to Lee, Exhibit 1010. 11:31:42
7 A Okay. 11:31:53
8 Q Do you understand Lee to be directed to 11:31:54
9 RF ablation of uterine fibroids? 11:31:57
10 A Well, again, he has -- states that it 11:32:02
11 can be used for other uses, not just uterine 11:32:06
12 fibroids. Certainly work well in the liver. 11:32:13
13 Q Does Lee ever mention the liver? 11:32:21
14 A I'm going to look at the Lee patent, if 11:32:48
15 you don't mind. 11:32:50
16 Q Yes, please do. 11:32:52
17 A (Reviewing.) 11:32:54
18 Q And while you're looking, I will note 11:33:35
19 that paragraph 5 of Lee in the Background section 11:33:38
20 on page 1 does refer to the liver. 11:33:44
21 A Yes, it does. 11:33:48
22 In an attempt to address these issues, 11:33:49

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1 an RF ablation probe of this type is used to treat 11:33:51
2 liver tumors by hyperthermia and uterine -- 11:33:56
3 eliminate uterine fibroids. 11:34:06
4 I mean I think liver mets would be an 11:34:08
5 excellent use for this. 11:34:14
6 Q I'm sorry, what did you just say, liver 11:34:17
7 what? 11:34:19
8 A Metastases. 11:34:22
9 Q I see. Thank you. 11:34:23
10 A I mean he does in the next column, in 11:34:27
11 paragraph 7, "various portions of the tumor to be 11:34:31
12 ablated," and that's very general as far as tumor. 11:34:40
13 He doesn't say where the tumor has to be. 11:34:50
14 Q Do you recall, just off the top of your 11:35:00
15 head, anywhere in Lee that refers to ablation of 11:35:03
16 nerves? 11:35:07
17 MR. KELLY: Objection. Form. 11:35:08
18 A Well, paragraph 12: 11:36:11
19 When these stylets, or filaments, exit 11:36:12
20 the mandrel of the tissue, they define ablation 11:36:16
21 volume in the target tissue. 11:36:20
22 So he's not limiting it to fibroids, 11:36:23

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1 it's any target tissue, which makes sense. I mean 11:36:26
2 it destroys target tissue over a large volume. 11:36:36
3 Very controllable volume. 11:36:43
4 Q Are you aware off the top of your head 11:36:49
5 based upon your recollection of Lee anywhere where 11:36:52
6 it specifically says that the target tissue may be 11:36:57
7 a nerve? 11:37:02
8 MR. KELLY: Objection. Form. 11:37:04
9 A Other than what I just disclosed to you, 11:37:13
10 defines an ablation volume in the target tissue. 11:37:15
11 If the target tissue is a nerve, it can certainly 11:37:17
12 be used there. 11:37:23
13 Q I'm not sure I understood what you said. 11:37:30
14 I think you said -- tell me if I'm wrong -- that 11:37:33
15 if the target tissue is a nerve, it could be used 11:37:36
16 there. 11:37:40
17 Am I understanding you correctly? 11:37:40
18 A Well, it says: 11:37:42
19 The stylets, or filaments, exit the 11:37:42
20 mandrel into the tissue that the doc defines an 11:37:47
21 ablation volume in the target tissue. 11:37:54
22 So any target tissue could be ablated 11:37:58

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1 with it. 11:38:02
2 Q Yeah, and I guess my question is -- 11:38:03
3 A Nerve (indiscernible). It does not say 11:38:08
4 that, spinal nerve, but it does say that you can 11:38:11
5 use it on any tissue to ablate. 11:38:17
6 So I think that a -- certainly one 11:38:22
7 normally skilled in the art, or ordinary skill in 11:38:30
8 the art, would certainly read it that way, it 11:38:34
9 just -- ablate anything. You pick the volume, and 11:38:37
10 it will have good control because of the filaments 11:38:41
11 to necrose any volume you want. 11:38:49
12 Q Dr. Tucker, can you please direct me to 11:38:54
13 the paragraph and line number that you're reading 11:38:56
14 from? 11:39:02
15 A Yeah, I was quoting from -- 11:39:03
16 MR. KELLY: Objection. Form. 11:39:05
17 A He discusses it in paragraphs 9 through 11:39:45
18 10 and 18 through 21, to an area to be treated. 11:39:49
19 Q And you're interpreting that to mean 11:40:04
20 that it could be any area of the body, correct? 11:40:06
21 A Well, not any area. Any area of tumor, 11:40:13
22 any area of neural ablation, and I think one of 11:40:21

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1 ordinary skill in the art would look at those 11:40:26
2 electrodes and say Lee is saying that you have 11:40:29
3 more control of the area of ablation, whether it 11:40:33
4 be a fibroid or anything. Any tissue to be 11:40:41
5 ablated. 11:40:46
6 Q Dr. Tucker, are you aware of any 11:40:53
7 commercial embodiments of the Lee patent? 11:40:54
8 A No, I wasn't asked to do that, so -- 11:41:01
9 Q I'm not asking what you were asked to 11:41:04
10 do, I'm asking if you are aware of any commercial 11:41:06
11 embodiments of the Lee patent. 11:41:10
12 MR. KELLY: Objection. Form. 11:41:12
13 A Again, I have not looked for that 11:41:30
14 information, so ... and I have no information on 11:41:32
15 it. 11:41:35
16 Q Okay. 11:41:36
17 A I know that -- that -- and I don't know 11:41:36
18 if it uses it, but certainly liver metastases are 11:41:42
19 destroyed by filaments that look a lot like Lee's. 11:41:47
20 And that was commercially available, but I do not 11:41:53
21 know whose it was and if it was using this patent. 11:41:57
22 Q Are you familiar with the access system? 11:42:05

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1 A No, I am not. 11:42:12
2 MR. KELLY: Objection to form. 11:42:13
3 Q Okay. 11:42:14
4 A No, I'm not. 11:42:15
5 Q Are you aware of any device actually 11:42:21
6 used for RF neurotomy that resembles the 11:42:27
7 embodiments in the Lee patent? 11:42:33
8 MR. KELLY: Objection. Form. 11:42:36
9 A I have not looked for it, so I have no 11:42:42
10 information on it. 11:42:45
11 Q Do you understand the stylets in Lee to 11:42:53
12 have sharp points at their ends? 11:42:55
13 A (Reviewing.) 11:43:38
14 Q I'm actually going to withdraw that 11:44:40
15 question. And let me rephrase it. 11:44:43
16 Actually, let's start with Figure 1. 11:44:46
17 Okay. Referring to what is shown in Figure 1 11:44:58
18 specifically, do you understand the stylets, 22, 11:45:01
19 to have pointed ends, 24? 11:45:05
20 A In Figure 1 they appear to be. 11:45:38
21 Q And do you have an opinion, Dr. Tucker, 11:45:40
22 whether it would be appropriate to use stylets 11:45:43

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1 with a pointed end near the spine? 11:45:47
2 A I certainly think that anyone of 11:45:55
3 ordinary skill in the art would understand that 11:45:57
4 the stylets, filaments, could have blunt ends. I 11:46:00
5 mean we're talking about a device that's very 11:46:06
6 thin. 11:46:10
7 Q So are you saying that if such stylets 11:46:18
8 were used near the spine, they would have blunt 11:46:25
9 ends? 11:46:29
10 A No, I did not. I said if you look at 11:46:31
11 Figure 5, those don't appear to be pointed at 11:46:35
12 ends. 11:46:40
13 Q Okay. 11:46:45
14 A So I think what you would do -- there 11:46:47
15 are many things one could make with these designs, 11:46:53
16 and I think it's left up to -- to ordinary skill 11:46:57
17 in the art to determine what needs to be done. If 11:47:01
18 you're going into a fibroid, maybe they have to be 11:47:07
19 pointed. 11:47:11
20 Q So my question is, if you are using this 11:47:14
21 device near the spine, in your opinion, should the 11:47:18
22 stylets have pointed ends or not? 11:47:25

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1 MR. KELLY: Objection. Form. 11:47:28
2 A I don't think it would matter possibly, 11:47:36
3 but again, that would be something that -- that 11:47:40
4 would -- one of ordinary skill would test. I 11:47:47
5 don't see that a pointed end is required, even 11:47:53
6 near the spine. If you're removing a tumor near 11:47:58
7 the spine, I think you could use a blunt-end tip 11:48:07
8 on all the electrodes or not. 11:48:10
9 Q What would happen if a stylet with a 11:48:35
10 pointed end pierced a nerve near the spine during 11:48:37
11 an RF neurotomy procedure? 11:48:44
12 MR. KELLY: Objection. Form. 11:48:48
13 A That's a little broad. Is it the nerve 11:48:52
14 you're trying to actually ablate? If it is -- 11:48:56
15 Q Let's start with that scenario, yes. 11:49:01
16 A You're going to -- 11:49:03
17 (Simultaneous speaking.) 11:49:05
18 MR. PHILLIPS: I'm sorry, what was the 11:49:05
19 objection, Chris? 11:49:09
20 MR. KELLY: I was repeating my objection 11:49:12
21 to your earlier question. 11:49:14
22 MR. PHILLIPS: Thank you. 11:49:15

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1 A I mean if you're going to ablate that 11:49:16
2 nerve, it wouldn't matter. As soon as you pass 11:49:18
3 the RF, that nerve's going to be necrosed. 11:49:21
4 Q What about the scenario in which the 11:49:29
5 stylet pierces a nerve near the spine other than 11:49:32
6 the target nerve to be ablated? 11:49:37
7 MR. KELLY: Objection. Form. 11:49:41
8 A You're putting these in under 11:49:47
9 fluoroscopy, so the physician will know what 11:49:50
10 nerves are in that area. He wouldn't possibly 11:49:54
11 deploy them all the way, he'd make his area 11:50:00
12 smaller that he's going to ablate. I mean if 11:50:04
13 you'll notice, Lee has a -- in his diagram, I 11:50:11
14 believe, fluoroscopic control. 11:50:16
15 Q By "fluoroscopy," you're referring to 11:50:23
16 X-rays, right? 11:50:26
17 A Yes, realtime. Can be with dye, in 11:50:27
18 which you can see a lot of the anatomy. 11:50:32
19 Q Are nerves visible in an X-ray? 11:50:41
20 A Under certain dyes they can be. 11:50:45
21 Q Which dyes are those? 11:50:51
22 A I'm not a -- I am not a radiologist, so 11:50:52

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1 I can't answer that. 11:50:57
2 Q Do you know whether these dyes that are 11:51:06
3 visible under X-ray -- or cause nerves to be 11:51:08
4 visible under X-ray are typically used in an RF 11:51:11
5 neurotomy procedure? 11:51:15
6 A I have no experience with that, so I do 11:51:22
7 not know. 11:51:24
8 Q All right. I think you said that the 11:51:30
9 stylets are small, or words to that effect. Do 11:51:33
10 you understand Lee to disclose any dimensions for 11:51:40
11 the stylets? 11:51:43
12 Let me narrow the question to the 11:51:50
13 diameter of the stylets. 11:51:53
14 A No, but you're going to -- go back to 11:51:59
15 Racz, who says that small gauges, 30 gauge to 11:52:03
16 larger gauge is 10, and 10 gauge is about three 11:52:06
17 and a half millimeter diameter. I don't know what 11:52:12
18 the ID is, but I know it's in here. 11:52:14
19 Young states they're .2 millimeters 11:52:17
20 wide, so if they're .2 millimeters, that's small. 11:52:30
21 Q Did you say Young? 11:52:34
22 A Young, in the '965. 11:52:37

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1 Q Oh, you're reading from Young '965. 11:52:39
2 A Uh-humh. 11:52:43
3 Q Which exhibit number is that? 11:52:44
4 A 1012. 11:53:00
5 Q Okay. 11:53:00
6 A So they're very small. 11:53:00
7 Q What material would one of ordinary 11:53:09
8 skill in the art understand the stylets to be 11:53:17
9 formed of? 11:53:20
10 MR. KELLY: Objection. Form. 11:53:21
11 Q Or made from. 11:53:22
12 A Well, I think nitinol is very -- because 11:53:26
13 it's a shaped memory, if you want curves. 11:53:30
14 Otherwise, stainless steel could work, but 11:53:33
15 anything that is relatively springy. I mean 11:53:38
16 nitinol with no memory shape to it'll be straight. 11:53:46
17 If you have a shaped memory to it, it can curve, 11:53:51
18 any curvature you want. 11:53:55
19 Q And you said stainless steel. Is 11:53:58
20 stainless steel a medical-grade material suitable 11:54:03
21 for insertion in the human body? 11:54:09
22 A It sure is. Not all stainless steel, 11:54:12

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1 but there are low nickel alloys of stainless steel 11:54:15
2 that are. 11:54:19
3 Q And do you understand Lee to disclose 11:54:24
4 the dimensions for his needle or cannula? 11:54:29
5 A (Reviewing.) 11:55:46
6 Q And by the way, Dr. Tucker, just to 11:56:16
7 clarify, I'm referring to what is labeled in 11:56:18
8 Figure 1, for example, as 16, that cannula. 11:56:21
9 A Oh, you're not referring to the 11:56:29
10 electrodes themselves? I understand. 11:56:31
11 Q Yeah, right. 11:56:33
12 A No, I don't believe he specifies, but 11:57:26
13 again, you know, it would be left up to the 11:57:28
14 physician, what they are trying to pierce, what 11:57:30
15 they're trying to go into. 11:57:35
16 I mean I can see where you want 11:57:36
17 smaller -- you know, Racz does say 10 gauge is 11:57:41
18 large, 30 gauge is small. So it would probably be 11:57:45
19 in that area. 11:57:51
20 Q In your professional opinion, what do 11:57:57
21 you believe an appropriate size range would be 11:57:59
22 specifically for RF ablation of uterine fibroids? 11:58:03

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1 And I'm asking about the size of the cannula. 11:58:07
2 A You could certainly do it with a 10 11:58:18
3 gauge. 11:58:20
4 Q How big is a typical uterine fibroid? 11:58:24
5 A There is no typical. They go from -- 11:58:28
6 from a quarter of an inch to -- some women let 11:58:29
7 them go and they can be 23 pounds. 11:58:33
8 Q Oh, my God. 11:58:37
9 A And those are taken out with sharp 11:58:39
10 scalpels. 11:58:42
11 Q Going back to Lee's stylets, what would 11:58:50
12 happen if one of those stylets contacted bone 11:58:54
13 during deployment? 11:58:59
14 MR. KELLY: Objection. Form. 11:59:04
15 A I doubt that they would do anything. 11:59:10
16 They'd just sit there. They would -- they 11:59:12
17 wouldn't go through bone. 11:59:15
18 Q If one of the stylets in Lee were to 11:59:19
19 contact bone, could that deform the stylet? 11:59:22
20 A Possibly. It may just stop deployment, 11:59:35
21 back it up into the cannula. 11:59:41
22 Q If one of Lee's stylets were deformed, 11:59:45

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1 would it be possible to retract it back into the 11:59:51
2 needle? 11:59:56
3 MR. KELLY: Objection. Form. 11:59:58
4 A Well, again, we're under fluoroscopy, 11:59:59
5 you can see the needle, you can see the bone. So 12:00:03
6 the trick is don't deploy it into the bone. It's 12:00:05
7 not a trick. These guys are experienced. And in 12:00:09
8 fluoroscopy, they can look. And I think most of 12:00:15
9 these procedures are done under fluoroscopy. So I 12:00:17
10 would see that as a non-problem. 12:00:24
11 Q I guess I'm asking a "what if" question. 12:00:30
12 And so I'll repeat it. 12:00:33
13 No matter how likely, unlikely the 12:00:34
14 scenario might be, what is your opinion about the 12:00:39
15 prospect for retracting one of Lee's stylets if it 12:00:47
16 has become bent or deformed for any reason? 12:00:53
17 MR. KELLY: Objection. Form. 12:00:57
18 A If it's nitinol, nothing would happen. 12:01:01
19 It would bend and then when you retracted it, it 12:01:05
20 would come back into the cannula. 12:01:08
21 Q You're saying it would unbend, in 12:01:13
22 effect? 12:01:15

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1 A Exactly. I don't think it would get 12:01:16
2 deployed, actually, but ... 12:01:21
3 Q Are you aware of any situations where a 12:01:39
4 stylet such as the ones disclosed in Lee break off 12:01:46
5 in the human body? 12:01:52
6 A No, I have not seen any reports of 12:02:07
7 stylets in either liver, kidney, or bone that have 12:02:10
8 broken off. And nitinol would not tend to break, 12:02:21
9 bend. 12:02:30
10 Q Would it be a serious condition if a 12:02:43
11 stylet were to break off and -- in the human body 12:02:46
12 and not be retracted? 12:02:53
13 MR. KELLY: Objection. Form. 12:02:57
14 A Again, it would depend upon where it is, 12:03:03
15 what it impinges. I know that small -- small 12:03:06
16 devices -- staples are large according to stylets, 12:03:10
17 are left in the body all the time. So ... 12:03:20
18 Q Are there any disadvantages associated 12:03:25
19 with leaving a piece of nitinol material in the 12:03:27
20 human body? 12:03:33
21 A That's a very general question. You'd 12:03:38
22 have to -- where are we working? I've seen 12:03:41

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1 nitinol wire left in the bowel, and you go in and 12:03:47
2 retrieve it, because it can perforate the bowel. 12:03:53
3 Just a piece of nitinol or a staple can be left in 12:04:01
4 the lung, just ignore it. 12:04:06
5 Q Okay. 12:04:17
6 MR. KELLY: Matt, we've been going about 12:04:25
7 another hour, if you want to take a break soon. 12:04:27
8 MR. PHILLIPS: Yeah, I was going to say, 12:04:31
9 and it's noon Eastern time. Dr. Tucker, when do 12:04:32
10 you want to take a lunch break? 12:04:35
11 THE WITNESS: I don't eat lunch, so I 12:04:38
12 really don't care if you want to just push on 12:04:40
13 through. 12:04:43
14 MR. PHILLIPS: Well, that's fine with 12:04:45
15 me, but I think maybe -- 12:04:46
16 THE WITNESS: I have a bag of candy. 12:04:47
17 MR. PHILLIPS: All right. That looks 12:04:50
18 delicious. 12:04:51
19 THE VIDEOGRAPHER: Counsel, want to go 12:04:54
20 off the record first? 12:04:55
21 MR. PHILLIPS: Yes. 12:04:57
22 THE VIDEOGRAPHER: Okay, stand by. We 12:04:57

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1 are going off the record. The time is now 12:04:58
2 12:05 p.m. 12:05:00
3 (A recess was taken.) 12:05:01
4 THE VIDEOGRAPHER: We are back on the 12:05:01
5 record, 12:22 p.m. 12:22:25
6 BY MR. PHILLIPS: 12:22:27
7 Q Dr. Tucker, did you do any engineering 12:22:30
8 calculations to calculate the forces under which 12:22:33
9 Lee's stylets would deform? 12:22:38
10 A No, not for this case. I have a device 12:22:49
11 that I'm working on that has eight electrodes 12:22:51
12 that's deployed through a urethane catheter, a 12:22:55
13 bladder catheter, and there's no holes in it, and 12:23:02
14 the stylets aren't sharp ended, they're blunt, and 12:23:05
15 they're so small they'll go right through the 12:23:09
16 urethane right into the tissue. 12:23:13
17 So it -- and they're nitinol. They 12:23:14
18 do -- we make them with a little bend so they 12:23:22
19 will -- as they come out, they will have a natural 12:23:25
20 tendency to bend, and none of them have ever 12:23:28
21 broken. 12:23:32
22 I know that I sent them to a test 12:23:32

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1 facility in Minneapolis, and I know that they did 12:23:36
2 some durometer testing on them, and it all came 12:23:40
3 back beautiful. So nitinol just is really hardy 12:23:44
4 substance. 12:23:48
5 Q But for this case, did you do any 12:23:51
6 engineering calculations to determine the forces 12:23:53
7 under which Lee's stylets would break? 12:23:55
8 A No, not at all. I didn't. 12:24:01
9 Q Okay. Does -- 12:24:06
10 A Based on my work that I've done on 12:24:10
11 nitinol, they just don't break. They bend. 12:24:13
12 So ... 12:24:19
13 Q Do you understand Lee to disclose any 12:24:29
14 mechanism for injecting fluid out the tip of the 12:24:34
15 needle? 12:24:38
16 A No, I don't believe he does. 12:24:41
17 Q What is the purpose of the anchors 12:24:49
18 disclosed in Lee? 12:24:52
19 A Well, if you were -- if you're pricking 12:24:56
20 on a piece of tissue and you want to deploy the 12:25:01
21 anchors with a slider, or deploy the electrodes 12:25:06
22 with a slider, sometimes you'll push -- push the 12:25:12

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1 electrodes out. You have the tendency to move the 12:25:16
2 tip of it. So you get the tip situated where it's 12:25:20
3 where you want it and now you've moved it. 12:25:24
4 Anchors will allow it not to move. 12:25:28
5 He does state that they're optional. So 12:25:31
6 many times you don't need them. Certainly with a 12:25:34
7 rotatable deployment system, which was pretty 12:25:38
8 well-known, you don't have that problem. 12:25:42
9 So I think I look on them as a 12:25:46
10 deployable -- another set of deployable 12:25:51
11 electrodes, if you want, or a fixation device, if 12:25:55
12 you want, and if you don't want, you don't need 12:25:58
13 it. If you don't need it, you don't need it. 12:26:00
14 Q So just to be clear, in what 12:26:06
15 circumstances would they -- would the anchors in 12:26:09
16 Lee not be needed? 12:26:14
17 A I see the big benefit to those are in 12:26:20
18 the slider mechanism, the plunger, where you move 12:26:24
19 to deploy the electrodes. In that case you have 12:26:29
20 the tendency to move the whole device, and once 12:26:33
21 you've done it with fluoroscopy and got it where 12:26:37
22 you want it, that could be painful. You don't 12:26:42

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1 want that to happen. 12:26:44
2 So if you're not use -- if you're using 12:26:46
3 a sliding device, you might want that. If you're 12:26:50
4 using a screw device, you don't have to worry 12:26:53
5 about them because they don't -- you don't move 12:26:56
6 the main part of the device, whether it's a 12:26:59
7 catheter or a cannula. 12:27:03
8 Q Are there any other circumstances under 12:27:11
9 which the anchors in Lee are optional? 12:27:13
10 A Well, if you're using the anchors as 12:27:21
11 electrodes, you increase the volume of ablation 12:27:23
12 significantly. If you've got a big tumor, then 12:27:27
13 they might be useful as an electrodes. But I -- I 12:27:30
14 don't -- I don't foresee, other than deploying the 12:27:34
15 electrodes with a plunger-type device, a slider, 12:27:39
16 you'd need anchors. 12:27:44
17 Q Is it possible, Dr. Tucker, that just 12:27:48
18 the act of the stylet coming out of the needle 12:27:52
19 could cause a backward force that would urge the 12:27:58
20 needle in the proximal direction? 12:28:03
21 MR. KELLY: Objection. Form. 12:28:05
22 A No, I don't think so. I mean it doesn't 12:28:10

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1 move. If you have a cannula in place, where you 12:28:15
2 want it, with a screw -- a rotational, I should 12:28:18
3 say, device, that drives by gear your electrodes 12:28:23
4 out, there's not much backward force. 12:28:32
5 Q Okay. Thank you. 12:28:39
6 Well, what type of actuation mechanism 12:28:40
7 on the proximal end does Lee disclose? 12:28:44
8 A He leaves it up -- because it's so 12:28:49
9 well-known at the time he had -- this is a 12:28:52
10 rotational or a slide device. And that was all 12:28:55
11 he -- basically all he really talks about. He 12:28:58
12 doesn't give a lot of detail to it. He leaves it 12:29:02
13 up to one of ordinary skill in the art to pick 12:29:07
14 whatever you want. 12:29:10
15 Q In Lee are all the stylets connected 12:29:22
16 together at the proximal end? 12:29:26
17 A What do you mean "connected"? Do you 12:29:31
18 mean physically or electrically? 12:29:34
19 Q Let's start with a physical connection. 12:29:38
20 So I'll reask the question. 12:29:40
21 In your understanding of Lee, are all of 12:29:41
22 the stylets physically connected together at the 12:29:46

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1 proximal end? 12:29:50
2 A No. Electrically they certainly are. 12:29:51
3 You make the tip out of metal, an add-on tip on 12:29:57
4 the end of your cannula, and electrically as they 12:30:01
5 go through that deflector, that's metal, and you 12:30:07
6 have a center piece from Racz, center of 12:30:12
7 withdrawal electrode, that would touch that metal 12:30:20
8 tip, and they're all electrically connected. 12:30:22
9 Q Oh, I'm just asking you about Lee, I'm 12:30:27
10 sorry. Does that change your answer? 12:30:30
11 A No, I think they're all -- they're not 12:30:31
12 physically connected I think, they are 12:30:35
13 electrically connected. And I think that he even 12:30:39
14 talks about using less. And that's left up to 12:30:43
15 the -- again, someone of ordinary skill in the art 12:30:50
16 to decide how to connect them to a generator so 12:30:59
17 they'd be separate. Some generators can do that, 12:31:03
18 you can have more than one output. 12:31:09
19 Q So when the stylets in Lee are deployed, 12:31:13
20 are they deployed with separate actuators for each 12:31:18
21 stylet? 12:31:25
22 MR. KELLY: Objection. Form. 12:31:26

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1 Q Well, the reason for the question, 12:31:29
2 Dr. Tucker, is you just testified that the stylets 12:31:31
3 in Lee are not physically connected together at 12:31:36
4 the proximal end. So basically my question is, 12:31:39
5 how are they deployed, individually? 12:31:43
6 THE WITNESS: I'm sorry. 12:31:48
7 MR. KELLY: Objection. Form. 12:31:49
8 THE WITNESS: I am sorry. 12:31:50
9 A Yes, they're connected together at the 12:31:51
10 proximal end by a -- usually a plate that drives 12:31:54
11 them down the shaft to the distal end. 12:31:57
12 I'm sorry. 12:32:01
13 Q Okay. That's fine. 12:32:03
14 A Yeah. So they are physically connected 12:32:05
15 there. That plate can be either metal or it could 12:32:07
16 be plastic. But they are physically connected to 12:32:14
17 that. 12:32:18
18 Q And does that mean that when the stylets 12:32:20
19 are deployed, they all deploy together? 12:32:23
20 A It can, but Lee talks about deploying 12:32:29
21 only one or two electrodes, and I see dollar signs 12:32:34
22 in marketing's eyes. You could have an offset 12:32:43

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1 where you only want to deploy three electrodes, 12:32:49
2 and that's a different -- could be a different 12:32:53
3 device, still made likely -- instead of driving 12:32:57
4 all eight out at the same time, maybe you only 12:33:02
5 drive three out, and it would be a different 12:33:06
6 device. 12:33:10
7 So docs have an option of how big of an 12:33:12
8 area of volume, and is it offset from the center 12:33:18
9 axis, and they would choose the correct device. 12:33:21
10 Q For a given device according to the 12:33:29
11 teachings of Lee, would all of the stylets that 12:33:32
12 are going to be deployed, be deployed together in 12:33:35
13 unison? 12:33:39
14 MR. KELLY: Objection. Form. 12:33:41
15 A I'm -- you're going to have to let me 12:33:49
16 look at that. I think that the answer is -- he 12:33:52
17 talks about putting two out and then another two, 12:33:54
18 in which case the answer would be no. 12:33:58
19 (Reviewing.) 12:34:01
20 If you go to 146 in Lee, and it starts 12:34:33
21 off: 12:34:40
22 Relative motion of two hypotubes is 12:34:40

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1 achieved through the use of a handle incorporating 12:34:43
2 first slider member connected to a hypotube, and a 12:34:47
3 second slider member connected to another 12:34:51
4 hypotube. Hypotubes are slidably mounted within 12:34:54
5 the handle and rigidly connected to the slider 12:34:58
6 members numbers respectively, thus providing 12:35:03
7 movement of these members at the ablation end of 12:35:06
8 the trocar. 12:35:09
9 You could push them out in different 12:35:09
10 amounts or you could push them out at different 12:35:14
11 timing. 12:35:18
12 Q In Lee, is a stylet a hypotube? 12:35:20
13 A No, a stylet is a filament. Stylet, 12:35:25
14 filament, electrode. It's equal. 12:35:31
15 Q And these stylets in Lee, are they 12:35:35
16 hollow or solid? 12:35:38
17 A They'll be solid. 12:35:40
18 Q And a hypotube is hollow -- 12:35:43
19 A Correct. 12:35:46
20 Q -- right? 12:35:47
21 Okay. Where in Lee is a rotational 12:35:47
22 deployment mechanism disclosed? 12:36:00

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1 A Okay, let me look at my report. I think 12:36:08
2 I talk about that. 12:36:12
3 Q Sure. 12:36:14
4 A (Reviewing.) 12:36:15
5 Q Dr. Tucker, are you looking for 12:41:41
6 paragraph 30? 12:41:42
7 A Isn't it 38? No, that's the other Lee. 12:41:50
8 Q I'm sorry, what is the other Lee? 12:41:59
9 A The '486 or the '201. 12:42:02
10 Q Are you referring to patent numbers? 12:42:12
11 A Correct. 12:42:14
12 1028 and 1016. 12:42:14
13 Q Those are exhibit numbers for other Lee 12:42:26
14 references? 12:42:28
15 A Correct. 12:42:29
16 Sorry for being so vague. Those are 12:42:32
17 exhibit numbers. 12:42:34
18 Q Okay, thank you. 12:42:37
19 So, Dr. Tucker, sorry to interrupt, but 12:42:38
20 Exhibit 1016 is not Lee, it's Young '201. 12:42:58
21 A I'm sorry. 12:43:02
22 Q And 1028 is Young -- 12:43:03

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1 A Yes. 12:43:07
2 Q -- '486? 12:43:07
3 A Yes, those are Young's. Young. Sorry 12:43:08
4 to confuse you. 12:43:13
5 Q Yeah, yeah. Just for the sake of 12:43:14
6 clarity here. 12:43:16
7 Are you aware of any other reference in 12:43:17
8 this case called Lee other than the one marked as 12:43:21
9 Exhibit 1010? 12:43:26
10 A I am not. 12:43:28
11 Q Okay. Thank you. 12:43:29
12 A And you said paragraph 38? 12:43:39
13 Q No, you mentioned paragraph 38. I 12:43:43
14 mentioned paragraph 30. 12:43:46
15 A (Reviewing.) 12:43:51
16 No, that's -- they were talking about 12:44:00
17 the anchors there. 12:44:02
18 Q Okay. 12:44:12
19 A I think it was ... 12:44:13
20 (Reviewing.) 12:44:24
21 Q Dr. Tucker, if at any point you decide 12:48:20
22 you cannot find what you're looking for, please 12:48:22

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1 let me know. 12:48:25
2 A Yeah, I am having trouble, but I know I 12:48:26
3 read it. 12:48:29
4 (Reviewing.) 12:48:50
5 Let me go back to my report and see if I 12:48:50
6 overlooked it. 12:50:32
7 Q Yeah, sure, go ahead. I'll just 12:50:34
8 mention, in case this is helpful, that I'm not 12:50:37
9 aware of any disclosure in Lee of a rotational 12:50:41
10 deployment mechanism for the stylets. 12:50:46
11 A I thought it was simply one sentence. 12:50:49
12 Q But there are disclosures in Lee 12:50:58
13 regarding the deployment of anchors, and we 12:51:00
14 discussed one of them, but right, please take your 12:51:04
15 time. If you find that sentence, let me know. 12:51:08
16 A Okay. 12:51:11
17 (Reviewing.) 12:51:12
18 Well, I cannot find it. However, if you 12:52:09
19 look at my report starting on 134 to 135, I mean 12:52:13
20 there are other patents that do disclose rotation, 12:52:20
21 and again, I mean rotational actuators were 12:52:22
22 pretty -- weren't new back then. I mean even 12:52:27

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1 ballpoint pens I point out had it. I like the 12:52:32
2 rotational much better. Supra 77 to 78. 12:52:38
3 Q Are you referring to paragraph numbers 12:53:08
4 in your Declaration? 12:53:10
5 A Yeah, I was just looking at 12:53:11
6 rotational -- top of 135, the first bullet point, 12:53:13
7 rotational action actuators for precise deployment 12:53:16
8 of filaments using threads like a screw or gears 12:53:22
9 to translate, and supra 77 through 78. 12:53:29
10 Q Right, I believe paragraph 77 and 78 of 12:53:43
11 your Declaration refer to other documents. 12:53:47
12 A Yeah, I think it may. 12:53:51
13 Q Okay. Well, I mean just to wrap up this 12:54:06
14 point, then, in your examination of Lee right here 12:54:09
15 right now, you could not find any disclosure of a 12:54:16
16 rotational action actuator for the stylets? 12:54:20
17 A No, but again, with the caveat that one 12:54:24
18 of ordinary skill in the art has seen them and 12:54:27
19 employed them in the literature -- 12:54:31
20 Q I understand. 12:54:33
21 (Simultaneous speaking.) 12:54:33
22 Q Couple more questions. 12:54:36

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1 MR. KELLY: Counsel, could you let the 12:54:38
2 witness finish his answer, please. 12:54:39
3 MR. PHILLIPS: Sure. 12:54:41
4 Q Are you done, Dr. Tucker? 12:54:42
5 A I just said they were well-known at the 12:54:44
6 time. 12:54:46
7 Q Okay. Just a couple more questions 12:54:47
8 about Lee, and then we can take a lunch break. 12:54:50
9 So can you please take a look at Figure 12:54:53
10 50 of Lee. It's the last sheet of drawings. And 12:55:00
11 it shows some slidable actuation mechanisms. Can 12:55:09
12 you describe -- 12:55:22
13 A I'm not there yet. 50. 12:55:23
14 Q Yes. Let me start over so it's clear. 12:55:27
15 A 50, got it. 12:55:30
16 Q Yeah, Figure 50. This is showing an 12:55:32
17 operator handle for use with the embodiments in 12:55:37
18 Figures 48 and 49. It's a cross-section view. 12:55:41
19 And I believe it discloses a -- some slidable 12:55:45
20 operator actuated handles. Can you describe your 12:55:54
21 understanding of this figure? 12:56:00
22 MR. KELLY: Objection. Form. 12:56:03

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1 A Well, it wasn't very important to me 12:56:09
2 because it's a slider, but 1653 appears to be the 12:56:11
3 slider that connected all the way down to the 12:56:15
4 distal end. So it pushes -- actually pushes the 12:56:17
5 device out. 12:56:22
6 1653. Filament out. 12:56:26
7 Q Are you done with your answer? 12:56:43
8 A No, I'm trying to get to the patent to 12:56:45
9 read about 1653. 12:56:48
10 (Reviewing.) 12:56:53
11 Q Well, I would love for you to -- 1653 is 12:57:08
12 discussed in paragraph 146? 12:57:11
13 A Yeah, I just got there. 12:57:13
14 Q Yeah. I believe you read from that 12:57:15
15 earlier. 12:57:17
16 A Yeah, it's a slider member. So 53 and 12:57:19
17 1610 -- yeah, well, great, 1610 is on a different 12:57:28
18 drawing. But that is a slidable actuator. 12:57:36
19 Q And so is it your testimony that 1653 is 12:57:48
20 the actuator which causes deployment or retraction 12:57:55
21 of the stylets? 12:57:59
22 A Yes. 12:58:00

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1 Q Not the anchors, but the stylets, right? 12:58:02
2 A (Reviewing.) 12:58:07
3 At the ablation end, power to the 12:58:15
4 stylets, they can use it to have the power system 12:58:17
5 retract and move it forward. Yeah, those are the 12:58:24
6 stylets for the stylets -- the slider. 12:58:27
7 Q Dr. Tucker, what is the relationship in 12:58:34
8 this embodiment between any of the hypotubes and 12:58:35
9 the stylets? 12:58:40
10 A What is the relationship -- well, the 12:58:49
11 way I read it is that you can run the stylets down 12:58:53
12 a hypotube, or multiple hypotubes. 12:58:57
13 (Reviewing.) 12:59:13
14 Q Does relative motion of the hypotubes 12:59:23
15 cause the stylets to deploy or retract? 12:59:26
16 MR. KELLY: Objection. Form. 12:59:33
17 A No, I don't believe so. 12:59:44
18 The hypotube just contains the wires to 12:59:57
19 the electrodes. Although, incorporating the first 13:00:01
20 slider member connected to a hypotube, the second 13:00:13
21 slider member coupled to another hypotube. 13:00:17
22 In this embodiment that you're referring 13:00:19

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1 to, that figure, it appears that the hypotubes are 13:00:26
2 slidably mounted within the handle, so ... In 13:00:30
3 other cases, the hypotubes are just fixed tubes 13:00:44
4 inside that contain the filaments. 13:00:47
5 Q Okay. If you're ready, let's turn back 13:01:02
6 to Figure 1 of Lee. It illustrates a piece 13:01:05
7 labeled 14 called a trocar point. 13:01:13
8 A Correct. 13:01:18
9 Q And a piece 16 described as a cannula? 13:01:18
10 A Correct. 13:01:26
11 Q What is your understanding of the 13:01:33
12 relationship of the trocar point 14 and the 13:01:35
13 cannula 16? 13:01:38
14 A Well, it's two pieces, so he has a 13:01:46
15 cannula that you can make -- insert the trocar 13:01:48
16 point into the cannula. 13:01:53
17 Q Why do you think there are two pieces? 13:02:02
18 MR. KELLY: Objection. Form. 13:02:04
19 A Well, that's the way I do it, because 13:02:09
20 it'd be easier to manufacture it that way. I 13:02:12
21 could make the tip metal, the electrodes, then 13:02:15
22 come out of the metal tip, and I could have an 13:02:20

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1 insulated cannula that the metal tip fits into. 13:02:23
2 Q Would the cannula be metal with an 13:02:29
3 insulated coating on the outside, or would the 13:02:33
4 cannula be just an insulated material throughout? 13:02:35
5 A Could be either. 13:02:41
6 Q Okay. And the trocar point could be 13:02:43
7 made of plastic according to Lee, right? 13:02:49
8 A It could be. I think that I explain 13:02:52
9 in -- the reason to combine, why you want it 13:02:58
10 metal. 13:03:02
11 Q But ignoring the reasons to combine and 13:03:05
12 the other references, just looking at Lee by 13:03:09
13 itself, what are the advantages and disadvantages 13:03:13
14 of having the trocar point metal as compared to 13:03:18
15 plastic? 13:03:22
16 MR. KELLY: Objection. Form. 13:03:26
17 A I would say the advantage is another 13:03:28
18 electrode. You could control the size of it by 13:03:33
19 how much of it is exposed up under the cannula. 13:03:37
20 Other times, if you just want your 13:03:43
21 ablation to be around the electrodes and the 13:03:48
22 ablation will be around the electrode, you might 13:03:55

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1 want it plastic. It would depend upon the 13:04:00
2 surgeon. 13:04:08
3 Q And I believe you said that it would be 13:04:15
4 easier to make the trocar point as a separate 13:04:17
5 piece. Did I understand that correctly? 13:04:21
6 A No, it'd be easy to make it out of 13:04:30
7 plastic, too. I mean both can be extruded. 13:04:34
8 Q Are you saying it would be easier to 13:04:40
9 make it out of plastic than metal? 13:04:43
10 A No, I think both would be about the 13:04:45
11 same. 13:04:47
12 Q Well, regardless -- I'm sorry, please 13:04:47
13 continue. 13:04:49
14 A Because they extrude. So you make a 13:04:50
15 machine and you pay for the die, and then you just 13:04:53
16 plug in and crank out thousands of them a day when 13:04:57
17 you extrude things. 13:05:01
18 Q Are you referring to a molding process? 13:05:07
19 A Extrusion. You have a mold, and then 13:05:11
20 you push the material through that mold. That's 13:05:14
21 how catheters are made, they have a die, and then 13:05:26
22 they put the polyurethane through an extrusion 13:05:29

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1 system. 13:05:34
2 Q Are you saying the cannula or the trocar 13:05:35
3 point would be made by extrusion? 13:05:38
4 A Either. 13:05:40
5 Q Either. 13:05:41
6 A Could be. 13:05:42
7 Q Can you describe in more detail how the 13:05:52
8 trocar point would be made by extrusion? I'm 13:05:53
9 sorry, that's my question. 13:06:00
10 A You have a die, and it could come out as 13:06:02
11 a metal tip. You then would use -- you could do a 13:06:06
12 laser. Again, something you don't have to -- you 13:06:14
13 program it and it does it, to cut the hole in it 13:06:17
14 and the hole for each of the side ports. 13:06:19
15 Q What do you mean "the hole," the first 13:06:24
16 hole that you referred to? 13:06:25
17 A Well, that's the center, the center 13:06:27
18 electrode, if I had to make this, and then the 13:06:30
19 eight other holes for the side ports. And you do 13:06:33
20 it with a laser. 13:06:37
21 Q Is the trocar fatter at the more distal 13:06:45
22 end and skinnier at the more proximal end? 13:06:50

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1 MR. KELLY: Objection. Form. 13:06:56
2 A Sure looks like it. It looks like it in 13:06:56
3 this drawing, but it's not. I mean it fits in 13:06:59
4 because it's tapered on -- if you look at 32, see 13:07:02
5 how that's tapered in, into the cannula. 13:07:07
6 Q Uh-humh. 13:07:11
7 A And maybe it's spot welded, maybe it's 13:07:12
8 one of the fancy glues that we use now, or then. 13:07:15
9 Q And in this extrusion process that 13:07:25
10 you're referring to, how do you achieve the 13:07:28
11 smaller, less fat proximal end, the part that's 13:07:35
12 inside the cannula, how do you get that from an 13:07:43
13 extrusion process? 13:07:46
14 MR. KELLY: Objection. Form. 13:07:49
15 A Well, I'm not a manufacturing engineer, 13:07:58
16 but I know you can extrude things in strange 13:08:01
17 shapes. And maybe you don't extrude it. Maybe 13:08:04
18 you cut it and weld it. Maybe you do it all with 13:08:09
19 laser. But that's not -- certainly not one that 13:08:15
20 he discusses. Lee discusses how to do it. It's 13:08:20
21 not a manufacturing patent. I think a person of 13:08:24
22 ordinary skill in the art that's a manufacturing 13:08:30

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1 guy would know how to do that. 13:08:33
2 Q In preparing your Declaration, did you 13:08:40
3 consult with any manufacturing engineers? 13:08:43
4 A No, because this is not a manufacturing 13:08:49
5 patent. There was no reason to. 13:08:51
6 Q Okay. Give me just a moment, I think 13:08:55
7 that's all my questions before we break for lunch, 13:09:01
8 but let me verify. 13:09:04
9 MR. PHILLIPS: Yeah, that's it. Let's 13:09:20
10 take a break. 13:09:22
11 THE VIDEOGRAPHER: Stand by. We're 13:09:24
12 going off the record at 1:09 p.m. 13:09:25
13 (A recess was taken.) 13:09:29
14 AFTERNOON SESSION 13:09:29
15 THE VIDEOGRAPHER: Back on the record. 13:09:29
16 2:04 p.m. 14:04:43
17 BY MR. PHILLIPS: 14:04:44
18 Q Okay, Dr. Tucker, I hope you enjoyed 14:04:47
19 your lunch. 14:04:51
20 Next, I'd like to ask you about your 14:04:52
21 definition of a person of ordinary skill in the 14:04:54
22 art, and so I will refer you to paragraph 105 of 14:04:57

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1 your Declaration that is Exhibit 1031. And that's 14:05:03
2 -- that begins on page 62. 14:05:11
3 A Got it. 14:05:19
4 Q Okay. You refer in two places I believe 14:05:20
5 to experience with thermal ablation systems and 14:05:29
6 methods, and so my question is, does that 14:05:33
7 experience that you reference in this paragraph 14:05:38
8 have to include manufacturing experience? 14:05:43
9 A No. It doesn't include that. 14:05:50
10 (Court Reporter clarification.) 14:06:02
11 Q All right. Let's turn in your 14:06:02
12 Declaration to page 85. Same Declaration, Exhibit 14:06:06
13 1031. 14:06:12
14 A Okay. 14:06:20
15 Q Okay. So this is the rendition of what 14:06:21
16 you call Racz's modified device that was generated 14:06:26
17 after you talked to a draftsperson on some Zoom 14:06:32
18 calls, right? 14:06:35
19 A Correct. 14:06:36
20 Q Did you physically build one of Racz's 14:06:41
21 modified devices? 14:06:46
22 A No. 14:06:50

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1 Q Did you try to physically build one of 14:06:51
2 Racz's modified devices? 14:06:55
3 A No. 14:06:57
4 Q Why not? 14:06:59
5 A I wasn't -- 14:07:01
6 MR. KELLY: Objection to form. 14:07:02
7 A I wasn't asked to do it. 14:07:03
8 Q Okay. Did you do any engineering 14:07:07
9 calculations regarding the feasibility of Racz's 14:07:10
10 modified device? 14:07:16
11 A No. I mean I've worked with enough 14:07:21
12 physically that I know what -- how it works with 14:07:24
13 filaments and active electrodes. 14:07:30
14 Q Is it fair to say, Dr. Tucker, that this 14:07:34
15 is a paper design? 14:07:38
16 MR. KELLY: Objection. Form. 14:07:43
17 A Well, I think the important thing is as 14:07:47
18 you call it paper design, you're taking components 14:07:50
19 that have been in the literature and you're using 14:07:57
20 them for the same purpose and in the same fashion 14:08:02
21 as they were used in the patents. Everything in 14:08:06
22 here. 14:08:11

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1 So with that said, because it is a 14:08:12
2 design that has the components that have shown 14:08:17
3 that they work, the chance for success of making 14:08:24
4 it is very high. And anyone of ordinary skill in 14:08:27
5 the art can make this. 14:08:33
6 Q You say the chances are high. Can you 14:08:38
7 quantify that? 14:08:40
8 A 90 percent. Routine engineering. Maybe 14:08:46
9 95. I mean this is nothing special. 14:08:51
10 Q How did you come up with Racz's modified 14:09:03
11 design? 14:09:08
12 MR. KELLY: Objection. Form. 14:09:09
13 A I put these three patents together, and 14:09:16
14 then with the help of a few others, like Young and 14:09:18
15 Scheibe, added things that these guys -- these 14:09:23
16 three people, Racz, Fitz and Lee, did not describe 14:09:30
17 well, or maybe not in detail, and combined those 14:09:35
18 patents together. 14:09:42
19 I mean that's what these patents are, 14:09:42
20 that's what obvious analysis is. It's looking at 14:09:45
21 the past art. 14:09:54
22 Q And when you came up with Racz's 14:10:00

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1 modified design, had you already read the Stratus 14:10:03
2 patents, any one of them at issue in these cases? 14:10:12
3 A I had read all of the Stratus patents 14:10:15
4 prior to looking at the prior art. 14:10:19
5 Q Did you personally come up with Racz's 14:10:35
6 modified design? 14:10:39
7 MR. KELLY: Objection. Form. 14:10:41
8 A Yes. One of ordinary skill in the art 14:10:47
9 could come up with it. 14:10:53
10 Q So just to be clear, no one suggested to 14:10:55
11 you that this is what the combination of Racz, 14:10:59
12 Fitz and Lee should look like; is that your 14:11:03
13 testimony? 14:11:06
14 A Correct. 14:11:07
15 Q Did you ask any engineers about how 14:11:21
16 Racz's modified design could be made? 14:11:25
17 A No. First of all, I think that's -- I 14:11:32
18 don't do that when I do cases, legal cases, go 14:11:38
19 around and canvass people. I think it's a bad 14:11:41
20 idea. Most lawyers tell me not to do it. 14:11:45
21 Q Okay. Did you ask anyone with medical 14:11:48
22 device manufacturing experience how to make Racz's 14:11:56

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1 modified design? 14:12:00
2 A No. I've been involved in a lot of 14:12:05
3 design work of monopolar and bipolar electrodes. 14:12:07
4 I can't tell you which is the cheapest way to do 14:12:14
5 things, that's out of my league, but certainly I 14:12:17
6 can manufacture things like this in onesies and 14:12:20
7 twosies. I mean that's what researchers do, not 14:12:24
8 with an eye towards mass production. 14:12:28
9 Q But I just want to make clear, you did 14:12:37
10 not make onesie or twosies of Racz's modified 14:12:39
11 design, correct? 14:12:43
12 A As I said, I was not asked to do that. 14:12:44
13 No, I did not. 14:12:46
14 Q You mention in your Declaration that 14:12:51
15 there are -- well, you specifically mentioned two 14:12:53
16 examples of Racz's modified design, but I only see 14:12:57
17 one rendition of Racz's modified design. 14:13:05
18 Is this single rendition intended to 14:13:08
19 illustrate both of your examples? 14:13:11
20 MR. KELLY: Objection. Form. 14:13:14
21 A No, there's two examples there. 14:13:16
22 Q Yeah, and looking at the drawing on page 14:13:20

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1 85, does it depict both your first example and 14:13:25
2 your second example? 14:13:30
3 MR. KELLY: Objection. Form. 14:13:33
4 A Well, it could be both of them. It is 14:13:41
5 ambiguous maybe a little, but that certainly could 14:13:45
6 look like example 1 with a metal cannula is built 14:13:49
7 in with filament. It could also be this could be 14:13:57
8 the inserted part that goes into a larger sheath. 14:14:01
9 So it could be both. 14:14:07
10 Q What are the differences between what 14:14:17
11 you describe as the first example of Racz's 14:14:19
12 modified design and the second example? 14:14:22
13 A The second example has a removable tip. 14:14:24
14 The rest is built into the entire cannula -- 14:14:28
15 Q Looking -- I'm sorry, please continue. 14:14:36
16 A -- except that monopolar probe that 14:14:37
17 comes out the tip, metal tip. 14:14:40
18 Q Okay. Is there a difference in the RF 14:14:46
19 probe between the two examples? 14:14:50
20 A None. 14:14:52
21 Q Then the difference is in the tip 14:14:54
22 portion; is that correct? 14:14:59

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1 A Correct. One is built into the cannula, 14:15:00
2 and one is a tip -- a tip attached to the cannula. 14:15:03
3 Q Okay. And it's the second example in 14:15:09
4 which the tip is a separate piece attached to a 14:15:13
5 cannula; is that right? 14:15:17
6 A Correct. 14:15:19
7 Q With reference to the figure on page 85, 14:15:24
8 where is that interface between the tip and the 14:15:27
9 rest of the cannula? 14:15:32
10 A Well, if -- you're saying if this is the 14:15:37
11 second one I discussed, the tip that's removable? 14:15:41
12 Q Yes. 14:15:45
13 A It would be off screen to the left. 14:15:46
14 Q How far off screen to the left? 14:15:49
15 A However far the engineer that has 14:15:52
16 sufficient knowledge wants it. Does the doctor 14:15:56
17 want coagulation back along this cannula or does 14:16:00
18 it want it covered with insulation. So only the 14:16:04
19 filaments in the very tip defines the area of 14:16:08
20 ablation. I mean those are all variables that a 14:16:14
21 person of ordinary skill in the art would have to 14:16:18
22 play with. 14:16:22

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1 Q And we talked about Lee's filaments 14:16:25
2 being nitinol. Are Lee's filaments in this Racz's 14:16:31
3 modified design intended to be nitinol? 14:16:39
4 A I think they certainly could be. Were I 14:16:45
5 doing it, I would, because maybe I don't want them 14:16:48
6 straight. Maybe I want them curved. And that's 14:16:50
7 nitinol. 14:16:54
8 Q Going back to what you were saying about 14:17:02
9 the second example, there's a cannula piece off 14:17:05
10 the screen to the left and a tip piece to the 14:17:13
11 right as it's illustrated here on page 85. Are 14:17:17
12 the outer diameters of the cannula and the tip 14:17:24
13 piece the same? 14:17:28
14 MR. KELLY: Objection. Form. 14:17:30
15 A I think in answer to your question, you 14:17:32
16 need to go back and look at Lee's Figure 1 on page 14:17:34
17 42. 14:17:51
18 Q Okay. 14:17:55
19 A That tip, 18, and the little nub that 14:17:57
20 fits into the cannula is 32, that's all metal. 14:18:06
21 The cannula is 16, inside the cannula is 20. So 14:18:11
22 they fit together. Smooth interface. 14:18:19

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1 Q So in the second example of Racz's 14:18:29
2 modified device, is there a portion of the tip 14:18:32
3 piece that has, what did you call it, a little 14:18:39
4 stub? 14:18:47
5 A Marked 32. Where the diameter 14:18:48
6 decreases. That's off screen left. 14:18:51
7 Q Okay. And I understand Lee's Figure 1 14:19:03
8 to be that the outer diameter of the cannula 16 is 14:19:10
9 the same as the outer diameter of the trocar point 14:19:15
10 14 in the portion of the trocar point near the 14:19:21
11 distal end where it's biggest; is that correct? 14:19:24
12 A So the part that sticks in the cannula 14:19:31
13 is off screen. 14:19:33
14 Q And I'm not asking about that. I'm 14:19:35
15 asking about the part that is distal from the 14:19:37
16 cannula. 14:19:43
17 Can you tell me, is that part -- does it 14:19:47
18 have the same outer diameter as the outer diameter 14:19:49
19 of the cannula? 14:19:53
20 MR. KELLY: Objection. Form. 14:19:55
21 Q Do you understand my question? 14:19:56
22 A Yeah, I don't think it has to. There's 14:19:57

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1 nothing that says it has to. I think that it 14:19:59
2 would be better that it's either A, smaller, or B, 14:20:01
3 the same diameter. 14:20:06
4 Q Okay. And the cannula -- so in example 14:20:14
5 1, the red part is just a portion of the cannula, 14:20:23
6 right? 14:20:28
7 A Metal cannula, or plastic cannula. 14:20:28
8 Q Okay. 14:20:31
9 A That's correct. Or metal cannula. It's 14:20:32
10 insulated somewhere. 14:20:34
11 Q That's actually my question. 14:20:36
12 A Not in this diagram. 14:20:38
13 Q In the first example, is the red portion 14:20:41
14 metal or plastic or some other material? 14:20:44
15 A This would be metal, covered with 14:20:48
16 insulation, if you want. I mean he -- Lee talks 14:20:52
17 about how maybe you want to coagulate the track as 14:20:57
18 you pull it out so you don't have bleeding. 14:21:00
19 I could see in a liver that would be 14:21:03
20 really important and not a bad idea to leave it so 14:21:07
21 you could coagulate off of it. 14:21:10
22 Q Did you say in a liver? 14:21:12

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1 A Yeah. I don't think this design is 14:21:13
2 necessarily a neurotomy. It can be applied 14:21:20
3 everywhere, anywhere -- well, not anywhere, but in 14:21:23
4 many instances. Neurotomy, liver metastases, 14:21:27
5 probably even kidney tumor. 14:21:34
6 Q Okay. In the second example, where the 14:21:41
7 red piece as shown here on page 85 is separate, a 14:21:45
8 separate piece from the cannula, is the red piece 14:21:50
9 also metal? 14:21:54
10 A Yes. 14:21:57
11 Q What kind of metal? 14:21:58
12 A Don't care. It's stainless steel. If I 14:22:01
13 was making it, it would be stainless steel. I 14:22:04
14 don't know if that's cost-effective, but that's 14:22:06
15 what I would use. 14:22:09
16 Q And the green portion shown here on page 14:22:12
17 85 is the RF probe, right? 14:22:16
18 A Correct. 14:22:23
19 Q And it is also metal, right? 14:22:24
20 A Correct. 14:22:28
21 Q The same metal as the active tip, the 14:22:31
22 red portion, or different? 14:22:35

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1 A It doesn't matter. 14:22:38
2 Q Okay. In Racz's modified device, does 14:22:40
3 the green probe have a thermocouple built into it? 14:22:45
4 A Could, could not. I mean I think that 14:22:54
5 depends on what the doc wants. He could have a 14:22:56
6 high-speed thermistor instead of a thermocouple, 14:22:59
7 but yeah, you could have a thermistor on the end 14:23:04
8 of that to measure tissue temperature easily 14:23:07
9 because it's the farthest off the tip. And I 14:23:13
10 would put it in there. 14:23:17
11 Q Does having a temperature sensor on the 14:23:23
12 RF probe in Racz's modified device put any 14:23:27
13 constraints on the size of the RF probe? 14:23:31
14 MR. KELLY: Objection. Form. 14:23:36
15 A No. Quite small. If there was a 14:23:40
16 constraint, you could use a thermocouple and make 14:23:44
17 these two different metals and thermocouple off of 14:23:47
18 it with one wire and run -- 14:23:51
19 Q Can you explain to me how a thermocouple 14:23:54
20 works? 14:23:57
21 A Yeah, there's two pieces of metal, and 14:24:00
22 it sets up, depending upon temperature, a 14:24:02

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1 potential between the two pieces of metal. So 14:24:05
2 there's a wire connected to the -- say the tip and 14:24:09
3 a wire connected to the cannula, and that 14:24:15
4 potential is the temperature at the tip. 14:24:19
5 Q If the metal in the tip are two 14:24:25
6 different types of metal? 14:24:28
7 A Correct. 14:24:30
8 Q Got it. 14:24:31
9 As shown here on page 85, it looks like 14:24:34
10 the RF probe fits snugly within the central 14:24:37
11 cannula of the tip. Is that correct? 14:24:41
12 A Well, someplace there has to be good 14:24:48
13 contact because that's -- you want that -- that 14:24:52
14 probe to energize the filaments. So if it touches 14:24:57
15 at the tip, or if it touches back along the probe 14:25:03
16 that's metal, anywhere along there will make good 14:25:08
17 connection if there's, you know, metal on metal, 14:25:11
18 and you'll be able to energize the filaments with 14:25:15
19 that probe. 14:25:21
20 Q What frequencies for RF radiation are 14:25:31
21 used for neurotomy? 14:25:35
22 A The general frequency for all 14:25:38

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1 electrosurgery is about 450,000 cycles per second 14:25:41
2 to 500,000. Now, some dermatologists use two 14:25:47
3 megahertz, two million hertz, and there are 14:25:52
4 advantages for that. There are also a lot more -- 14:25:57
5 there's more problems with it. But everyone is 14:26:01
6 pretty much agreed on about 500,000. 14:26:05
7 Q So if 500 kilohertz -- do these pieces 14:26:12
8 act like simple conductors or wave guides? 14:26:21
9 MR. KELLY: Objection to form. 14:26:25
10 A Simple conductors, or almost all. These 14:26:27
11 are not wave guides. That's high frequency. 14:26:30
12 Q At 450 kilohertz, do you have to take 14:26:46
13 into account stray capacitance in the design of a 14:26:53
14 needle such as this? 14:26:58
15 A Yes. 14:27:01
16 Q And at 450 kilohertz, do you have to 14:27:07
17 take into account stray inductance in a device 14:27:10
18 such as this? 14:27:13
19 A Not really. But you do have to worry 14:27:15
20 about stray capacitance. 14:27:18
21 Q At 450 kilohertz in a design such as 14:27:22
22 this, do you have to worry about resident 14:27:26

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1 frequencies? 14:27:30
2 A No. This is simple. 14:27:31
3 Q Referring to the figure on page 85 of 14:27:36
4 your Declaration, is this drawing intended to be 14:27:47
5 to scale? 14:27:51
6 A Not at all. I would put a scale on it 14:27:52
7 if it was. 14:27:58
8 Q Well, I guess I mean relative scale. 14:28:01
9 For example, it looks like the probe is bigger 14:28:08
10 than the filaments. 14:28:11
11 A Would not have to be. 14:28:14
12 Q Would not have to be. Okay. 14:28:16
13 A This is not to scale. 14:28:18
14 Q And it looks like the main cannula 14:28:24
15 sidewalls in this rendition are -- is thicker than 14:28:29
16 the -- in the Racz device as illustrated in Racz. 14:28:34
17 Was that intentional? 14:28:42
18 MR. KELLY: Objection to form. 14:28:43
19 A No, it's not to scale. 14:28:44
20 MR. KELLY: Dr. Tucker, just give me a 14:28:47
21 second to object. 14:28:48
22 THE WITNESS: Yes, my fault. 14:28:51

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1 Q I'm sorry, Dr. Tucker, can you repeat 14:28:52
2 your answer? 14:28:54
3 A Yes, it's not to scale. 14:28:55
4 Q Is it fair to say what's shown here on 14:29:06
5 page 85 is a conceptual drawing? 14:29:09
6 MR. KELLY: Objection to form. 14:29:13
7 A Aren't all drawings? This is not an 14:29:15
8 engineering drawing that would go to an FDA that's 14:29:21
9 got to have numbers on it, scale on it. This is a 14:29:25
10 rendition of what it would look like, what you 14:29:32
11 could do with it. An engineer can take this and 14:29:36
12 start playing around with it. 14:29:43
13 Q Okay. What size is this intended to be? 14:29:49
14 A The filaments are, say, .1 millimeter, 14:30:04
15 .1, a tenth of a millimeter. 14:30:09
16 Q And how big is the main cannula? 14:30:16
17 A Between 30 and 10. 14:30:21
18 Q Gauge? 14:30:25
19 A Correct. 14:30:25
20 Q What features of Fitz are incorporated 14:30:37
21 into Racz's modified design? 14:30:39
22 A Fitz showed that single electrodes, like 14:30:45

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1 Racz, only destroy millimeter-ish, two 14:30:49
2 millimeter-ish around the electrode. And if you 14:30:58
3 go back to Fitz, he makes some comments about why 14:31:05
4 the device -- what problems it's got with it 14:31:28
5 because it's a single. 14:31:32
6 He shows a diagram that demonstrates 14:31:34
7 only two millimeters of coagulation and in many 14:31:39
8 cases, that's just not enough. You can actually 14:31:50
9 miss the nerve, you can overcoagulate, and he 14:31:53
10 gives three or four reasons why filaments are 14:32:00
11 better than a single electrode. 14:32:06
12 This is not a single electrode in this 14:32:12
13 depiction, and you can look at 33 page in my 14:32:27
14 little report, and you can see Fitz's Figure 1 14:32:36
15 where it's only two millimeters around the active 14:32:42
16 tip. And that's not going to work in some 14:32:45
17 instances. It's just not enough. You're going to 14:32:55
18 have to reposition the needle. Patients don't 14:32:58
19 like that. I've had three of these ablations. 14:33:02
20 Patients don't like it in single tip. That's what 14:33:04
21 I had. They got to make sure they get the nerve. 14:33:08
22 Sometimes they miss it because that two 14:33:11

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1 millimeters isn't very much. Pain to the patient. 14:33:14
2 And that's what he was trying to 14:33:19
3 overcome with his statement of adding -- adding 14:33:23
4 filaments. And that's certainly in that diagram. 14:33:29
5 Q I'm not sure you answered my question, 14:33:45
6 so I'm going to ask it again. 14:33:46
7 A Sure. 14:33:49
8 Q Maybe a little bit differently, because 14:33:51
9 it sounds like you're saying that the general idea 14:33:53
10 of having filaments is a feature taught by Fitz 14:33:57
11 that is incorporated into Racz's modified design. 14:34:04
12 A Yeah, I thought you asked what was 14:34:07
13 Fitz's contribution to that design, and it's 14:34:09
14 filaments, and what -- the filaments for -- to 14:34:13
15 increase the ablation size. 14:34:17
16 Q I guess my question was a little 14:34:20
17 imprecise. What I meant to ask is, what specific 14:34:22
18 features, not concepts, but actual features from 14:34:26
19 Fitz are in Racz's modified design? 14:34:35
20 A Filaments. 14:34:40
21 MR. KELLY: Objection. Form. 14:34:41
22 Q Okay. But it's labeled here on page 85, 14:34:46

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1 they're Lee's filaments, correct? 14:34:52
2 A Lee to me demonstrates more of how to do 14:35:00
3 it than Fitz did. He gives more detail. And 14:35:05
4 that's why I probably put Fitz's -- or Lee's and 14:35:11
5 not Fitz's. Or I should say Fitz-Lee filaments, 14:35:15
6 but ... 14:35:20
7 Q Okay. 14:35:25
8 MR. PHILLIPS: For my next question or 14:35:25
9 two I think it would be useful to pull up the -- 14:35:26
10 this exhibit, Exhibit 1031, from the 1202 -- 14:35:31
11 sorry, the 1209 case, and put page 85 on the 14:35:38
12 screen. 14:35:44
13 AV TECHNICIAN: 1085? 14:35:46
14 MR. PHILLIPS: 1031, page 85. 14:35:59
15 AV TECHNICIAN: 1030 -- okay, thank you. 14:36:03
16 Please stand by. 14:36:04
17 Now showing Exhibit 1031, page 85. 14:36:05
18 MR. PHILLIPS: 85 as labeled on the 14:36:37
19 bottom -- in the center of the bottom. There you 14:36:41
20 go, yeah, thank you. 14:36:48
21 Can you please enlarge that so we can 14:36:49
22 get a zoom in on the drawing on the bottom half. 14:36:52

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1 Thank you. 14:36:58
2 BY MR. PHILLIPS: 14:37:05
3 Q Okay. Can you see that, Dr. Tucker? 14:37:07
4 A Yep. 14:37:10
5 Q Can you see my pointer on your screen? 14:37:12
6 A Nope. 14:37:17
7 MR. PHILLIPS: I'm going to ask the 14:37:19
8 technician if -- do you have a pointer that 14:37:21
9 everyone can see? 14:37:24
10 AV TECHNICIAN: Yes. Would you like to 14:37:27
11 have remote control to do something? 14:37:29
12 MR. PHILLIPS: Oh, if I could, that 14:37:31
13 would be fantastic. 14:37:33
14 AV TECHNICIAN: Yes, give me one moment. 14:37:35
15 You should see -- just click the screen 14:37:37
16 and it should allow you to ... There you go. 14:37:52
17 MR. PHILLIPS: Okay. All right. 14:37:55
18 BY MR. PHILLIPS: 14:37:56
19 Q So, Dr. Tucker, can you see my pointer? 14:37:56
20 A Yes. 14:38:00
21 Q I'm trying to move my pointer along a 14:38:05
22 squiggly line that goes from the top of the red 14:38:07

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1 part to the bottom of the red part, and it's about 14:38:11
2 three-quarters of the way from left to right 14:38:18
3 across the drawing. I don't know what to call 14:38:23
4 this line, but I'm going to ask you about it. 14:38:27
5 A It's what engineers put on drawings to 14:38:34
6 show that there's a cutout. 14:38:40
7 Q Okay. 14:38:44
8 A The top of everything to the left of the 14:38:44
9 squiggly line, the top has been removed. It's in 14:38:48
10 longitudinal section. Everything to the right is 14:38:53
11 encased 360 degrees in the metal. That's why you 14:38:57
12 can't see the filaments on the other side. You 14:39:03
13 can only see two, because that cutout. That 14:39:06
14 signifies to all engineers that that's a cutout. 14:39:10
15 Q Okay. All right. Thank you. 14:39:16
16 So where is the cutaway taken? I 14:39:18
17 understand you're saying the cutaway extends from 14:39:22
18 left to right up to the squiggly line. Is it 14:39:25
19 taken down the middle of the red tip? 14:39:30
20 MR. KELLY: Objection. Form. 14:39:35
21 A Taken down the middle. 14:39:40
22 Only the stuff to the left of the 14:39:44

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1 squiggly line has been cut out. Everything else 14:39:46
2 is solid metal, 360 degrees. 14:39:51
3 Q Okay. I understand that. 14:39:56
4 In the portion of this drawing where 14:39:57
5 there is a cutaway that's left of the squiggly 14:40:02
6 line, where is that cutaway taken, and depth-wise 14:40:06
7 into the page? 14:40:11
8 A I told you this wasn't to scale, but if 14:40:20
9 those filaments are two millimeters, then it's 14:40:24
10 halfway through the filament. So that's the 14:40:29
11 important part, as it goes through halfway through 14:40:34
12 the filament. 14:40:37
13 So it shows a cross-section. It's 14:40:38
14 however far -- whatever cannula size that was that 14:40:43
15 it took to make the cutout. 14:40:46
16 Q How many filaments did you intend for 14:40:54
17 there to be in this rendition? 14:40:57
18 A What you see is what I intended. Four. 14:41:01
19 I didn't want to junk up the drawing with eight, 14:41:06
20 and simply one filament didn't show what I wanted 14:41:09
21 to show. 14:41:14
22 Q So am I to understand that at that 14:41:23

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1 cross-sectional plane left of the squiggly line is 14:41:24
2 through the center of the topmost and bottommost 14:41:31
3 filaments? 14:41:35
4 A Through the topmost -- I didn't hear 14:41:37
5 you, and you trailed off. 14:41:41
6 Q Sorry, through -- so there are four 14:41:44
7 filaments here? 14:41:46
8 A Right. 14:41:47
9 Q Two on the backside and two that are cut 14:41:47
10 through in the -- according to the cutaway. And 14:41:52
11 my question is, is the cross-sectional plane for 14:41:56
12 the cutaway through the center of the two cutaway 14:42:01
13 filaments? 14:42:09
14 A First of all, it's a longitudinal cut, 14:42:13
15 it's not a cross-section, it's longitudinal, and 14:42:17
16 it goes through the top electrodes, through their 14:42:22
17 halfway point, and that's how deep it is. 14:42:26
18 Q Okay. You said electrodes. Is that the 14:42:32
19 same as filaments here in this drawing? 14:42:34
20 A Electrodes, filaments, stylets. They 14:42:38
21 are the workhorse that -- what the RF is connected 14:42:40
22 to. Those are electrodes. 14:42:47

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1 Q And does the longitudinal plane of the 14:42:49
2 cutaway go through the center of the RF probe? 14:42:51
3 A Well, it appears to in that particular 14:42:57
4 rendition, but I told you it was not to scale. 14:43:00
5 It's diagrammatic. Some people call them cartoons 14:43:08
6 in engineering. 14:43:16
7 Q Okay, thank you. I think we can take 14:43:23
8 down this document for now. 14:43:41
9 In your Declaration you specifically 14:43:44
10 mention a first example and a second example of 14:44:03
11 Racz's modified device. Do you specifically 14:44:06
12 mention any other examples of Racz's modified 14:44:16
13 device? 14:44:20
14 A No. 14:44:23
15 Q Did you consider other examples of 14:44:34
16 Racz's modified device? 14:44:36
17 MR. KELLY: Objection. Form. 14:44:41
18 A I thought those were sufficient to show 14:44:44
19 that those devices are prior art to the four 14:44:50
20 patents in question. I don't think I needed to 14:44:59
21 add 12. I thought that two was enough. 14:45:01
22 Q Yeah, my question is whether you 14:45:09

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1 considered other examples of Racz's modified 14:45:11
2 device. 14:45:13
3 MR. KELLY: Same objection. 14:45:15
4 A I just answered the question. No. I 14:45:16
5 didn't. 14:45:21
6 Q You answered -- 14:45:21
7 A I didn't -- I didn't feel it was 14:45:23
8 necessary. 14:45:24
9 Q I'm not asking whether you felt it was 14:45:26
10 necessary, I'm asking you whether you considered 14:45:28
11 other examples of Racz's modified device. 14:45:31
12 MR. KELLY: Objection. Asked and 14:45:34
13 answered. 14:45:35
14 A As I said, since I considered those two 14:45:36
15 were sufficient, or believed they were sufficient, 14:45:41
16 I wouldn't consider any others. 14:45:45
17 Q Did you consider any other combinations 14:45:50
18 of Racz, Fitz and Lee in your analysis? 14:45:52
19 A Yeah. I mean I brought Young into it 14:46:04
20 and Scheibe into it and two Youngs. Scheibe, 14:46:07
21 Cohen. So ... 14:46:14
22 Q Yeah, and I'm not asking about 14:46:21

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1 additional embellishments to Racz's modified 14:46:27
2 device. I'm asking about just the three base 14:46:32
3 references, Racz, Fitz, and Lee. Did you consider 14:46:35
4 any other combinations of those three references 14:46:39
5 in your analysis? 14:46:42
6 A In what fashion? In how they would 14:46:48
7 look? I mean my point -- I was asked to do was to 14:46:50
8 look at the four patents and tell if I thought 14:46:56
9 there were prior art and the patent was valid. 14:47:03
10 That's what I did. 14:47:06
11 Q And as part of that, did you consider 14:47:09
12 whether some other combination of Racz, Fitz, and 14:47:15
13 Lee or some subset of them could be made that 14:47:20
14 would increase ablation volume? 14:47:26
15 A The four patents don't mention anything 14:47:32
16 else. Therefore, that's what I was analyzing. I 14:47:35
17 wasn't analyzing if we could put a mushroom shape 14:47:40
18 into it and that increases the volume. I -- four 14:47:45
19 patents limited my scope, and when I did this, my 14:47:52
20 job was done. 14:48:01
21 The prior art shows that those four 14:48:02
22 patents could have been made by anybody with 14:48:09

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1 ordinary skill in the art, given the patents I've 14:48:14
2 pointed out. 14:48:17
3 Q And your motivation for modifying Racz, 14:48:21
4 according to Racz's modified device, is to improve 14:48:26
5 ablation volume and control of the ablation 14:48:34
6 volume, correct? 14:48:37
7 A That is correct. 14:48:38
8 Q Okay. To achieve those objectives, did 14:48:39
9 you consider modifying Racz in light of Fitz or 14:48:44
10 Lee in any other way? 14:48:50
11 A I said no. 14:48:52
12 Q You did not, okay. 14:48:53
13 Why did you retain the RF probe from 14:48:54
14 Racz in Racz's modified the device? 14:49:12
15 A Because it -- it matched the four 14:49:24
16 patents that I was asked to tell -- to give an 14:49:28
17 opinion if they were prior art, and the modified 14:49:33
18 -- and the prior art had a -- had a -- the same 14:49:39
19 removable active as four patents. So it was 14:49:46
20 retained. 14:49:51
21 Q Dr. Tucker, why didn't you consider 14:50:26
22 simply putting Lee's trocar point and Lee's 14:50:30

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1 filaments or stylets into the tip of Racz? 14:50:39
2 MR. KELLY: Objection. Form. 14:50:46
3 A I think I've already answered that. I 14:50:48
4 mean it's -- the four patents had a removable 14:50:51
5 probe, which easily fits into Racz, because Racz 14:50:56
6 talks about a removable probe. It's pretty 14:51:00
7 obvious that's where to start. So that's what I 14:51:04
8 did. 14:51:08
9 Q But why, if your objective is to 14:51:09
10 increase ablation volume, did you retain the 14:51:12
11 removable probe -- let me withdraw the question. 14:51:14
12 Why would a person of ordinary skill in 14:51:22
13 the art have been motivated to retain Racz's RF 14:51:25
14 probe if their objective is to increase ablation 14:51:31
15 volume? 14:51:36
16 A Look, the removable probe almost has to 14:51:42
17 be there so you can take the probe out and put 14:51:44
18 fluid down through a lower proximal end. So you 14:51:48
19 have to have a big hole there. And Racz says put 14:51:51
20 the RF electrode down. So it seems reasonable to 14:51:55
21 keep that. 14:51:59
22 The patents I'm looking at, my job is to 14:52:00

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1 see are these valid because of prior art. And so 14:52:05
2 I looked at the prior art, and this is what I come 14:52:12
3 up with. 14:52:15
4 Q Does Lee teach injecting fluids through 14:52:21
5 a central lumen? 14:52:24
6 A No. But Racz does. It's an obvious 14:52:26
7 argument. All of them together. It's not an 14:52:29
8 anticipation argument, I give you that. Not one 14:52:34
9 of these references has every component, but it's 14:52:37
10 an obvious argument that the goal should be using 14:52:42
11 every component in its initial function, and I did 14:52:48
12 that. And not have it be so hard that it can't be 14:52:55
13 routine to an engineer with the qualifications I 14:53:06
14 laid out, and that's what I did. This is what I 14:53:13
15 come up with. 14:53:16
16 I mean you can make the argument about a 14:53:16
17 mushroom tip makes it easier or a bigger volume. 14:53:24
18 You have the control, but ... 14:53:36
19 Q All right. Look again at page 85 of 14:53:41
20 your Declaration. 14:53:44
21 A Uh-humh. 14:53:45
22 Q Can you tell from this drawing whether 14:53:56

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1 the tip is curved or straight? 14:53:57
2 A No. 14:54:04
3 Q Does anything in your Declaration 14:54:09
4 specify whether the tip of Racz's modified device 14:54:11
5 is curved or straight? 14:54:16
6 A No, and as I read to you earlier, one of 14:54:18
7 the variables that Racz said a person of ordinary 14:54:21
8 skill in the art could control was the angle of 14:54:24
9 the bend. You can have various angles. So the 14:54:28
10 answer is, it could be zero. It could be -- it 14:54:33
11 couldn't be 90, it'd be hard to put in, but you 14:54:38
12 know, it could be 20 degrees, it could be 10, it 14:54:41
13 could be 5. That's up to the engineer and the 14:54:44
14 doctor, and that's why I find that attractive, 14:54:49
15 because the corporation had multiple products to 14:54:55
16 sell. 14:54:59
17 Q Where do you explain in your Declaration 14:55:03
18 that a person of ordinary skill in the art could 14:55:05
19 vary the curvature of the tip of Racz's modified 14:55:08
20 device? 14:55:13
21 A I took it out of Racz's patent. 14:55:13
22 Q I'm asking you where in your 14:55:15

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1 Declaration. 14:55:18
2 A I don't know if I said that -- I think I 14:55:24
3 said it could be straight. 14:55:26
4 Q Yeah, please point that out. That's my 14:55:33
5 question. 14:55:35
6 A I think that's up to the person of 14:55:43
7 ordinary skill in the art what angle you want it 14:55:45
8 at. You can have it like Racz at an angle. Racz 14:55:50
9 doesn't even tell me what the angle is. So you'd 14:55:53
10 go by his teaching. 14:55:56
11 It's up to you, it's up to the doc 14:55:57
12 because he knows what he's trying to get to, what 14:56:02
13 will work the best. So he controls the angle that 14:56:06
14 he wants. 14:56:10
15 Racz has even got -- Racz even has one 14:56:10
16 where the bend is variable, he teaches that. I 14:56:15
17 wouldn't do that, but he teaches it. 14:56:19
18 I'm sorry, what was -- 14:56:25
19 Q Yeah, the question is, where in your 14:56:26
20 Declaration do you discuss the curvature of the 14:56:29
21 tip in Racz's modified device. 14:56:35
22 A I think I stayed with the curvature that 14:56:45

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1 he used because the one in A and B is curved, page 14:56:46
2 91, but again, Racz said it's variable. I'm going 14:56:54
3 to say that 2B is also curved, it's just at 14:57:04
4 90 degrees. 14:57:08
5 Q 2B of what? 14:57:12
6 A 2B. Racz Figure 2B on page 92. 14:57:16
7 Q Racz's Figure 2B? 14:57:20
8 A Yes. 14:57:22
9 Q Let's talk about Racz's Figure 2A. Do 14:57:22
10 you see that? 14:57:27
11 A Yes. 14:57:30
12 Q So Racz's Figure 2A is a side view of 14:57:34
13 Racz's device from a 90-degree angle compared to 14:57:40
14 Racz's Figure 2B? 14:57:46
15 A That is correct. 14:57:48
16 Q Okay. 14:57:50
17 A That is correct. 14:57:50
18 Q And it looks to me like your rendition 14:57:51
19 of Racz's modified device is based on Figure 2B 14:57:55
20 from the same perspective; is that correct? 14:58:01
21 A Probably is. Yep, it looks that way. I 14:58:05
22 don't know that I really intended that, but -- 14:58:09

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1 Q And so why did you not include a version 14:58:14
2 or some drawing of Racz's modified device from a 14:58:23
3 90-degree perspective like Racz's Figure 2A? 14:58:28
4 A I don't think it would add anything. I 14:58:44
5 mean I think the way to look at it is the way I 14:58:52
6 did it. I think it was pretty explanatory to a 14:58:54
7 person of ordinary skill in the art. 14:58:59
8 Q And looking at the rendition of Racz's 14:59:02
9 modified device on Figure [sic] 85, you can't tell 14:59:08
10 from looking at that how far the filaments extend 14:59:11
11 within the tip, can you, to the left? 14:59:21
12 A Well, they go up to the actuator that 14:59:30
13 drives them out. 14:59:35
14 Q Okay. But it's not showing, this 14:59:35
15 drawing, how the filaments are connected at the 14:59:41
16 proximal end, physically or electrically, right? 14:59:44
17 A Certainly not from this diagram. If you 14:59:50
18 wanted further detail, that's why I included 14:59:55
19 Scheibe. 14:59:59
20 Q You keep mentioning Scheibe. I'm not 15:00:00
21 familiar with that reference. Is that -- maybe 15:00:03
22 I'm just pronouncing it differently. There's a 15:00:05

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1 reference in this case that I've been calling 15:00:10
2 Scheibe. 15:00:12
3 A Okay, Scheibe. 15:00:14
4 Q It's Exhibit 1013. 15:00:16
5 A It is Exhibit 1013. 15:00:22
6 Q And how do you pronounce that? 15:00:27
7 A I don't know how you pronounce it, to be 15:00:28
8 honest with you. I'll go with Scheibe. 15:00:31
9 Q All right. Thanks. 15:00:34
10 A I don't know the man, so ... 15:00:38
11 Q It just looks like a German name to me, 15:00:42
12 so I tried to give it a German pronunciation. 15:00:45
13 A Fair enough. 15:00:51
14 Q Okay. So looking again -- when you're 15:00:52
15 ready, tell me when you're ready. 15:00:55
16 A Any time. 15:00:59
17 Q Okay. Looking again at your drawing on 15:00:59
18 Figure 85 -- I'm sorry, page 85 of your 15:01:03
19 Declaration -- it appears that the blue filaments 15:01:07
20 are in channels in the red tip. Is that what you 15:01:13
21 intended with this drawing? 15:01:22
22 A Again, they could be. They don't have 15:01:24

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1 to be. They can be free floating. In the device 15:01:27
2 I'm working on right now, we've got eight of them 15:01:30
3 that are just free floating nitinol. So we don't 15:01:33
4 have channels for them. 15:01:38
5 So one of ordinary skill in the art 15:01:39
6 would see this is a cartoon, a diagram. That it's 15:01:43
7 up to them to work out the details. They can all 15:01:48
8 be in a separate little hypotube. Could be eight 15:01:52
9 little hypotubes going down there. That would be 15:01:58
10 one way to do it. If this was plastic, they could 15:02:00
11 all be drilled out separately. I mean those are 15:02:08
12 things that would still fit the patent. 15:02:18
13 Q Where in your Declaration do you 15:02:21
14 describe that the channels could be hypotubes? 15:02:29
15 A I don't. Any engineer would realize you 15:02:33
16 could do a tube. Do I think that's a reasonable 15:02:42
17 thing to do. No. It adds cost. So I would have 15:02:44
18 them free floating. And that's what I did in my 15:02:49
19 design I'm working on now. They just free float 15:02:53
20 in the catheter. 15:02:57
21 Q In the catheter, where is that in Racz's 15:03:00
22 modified design? 15:03:05

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1 A It's not. But when you look at some of 15:03:09
2 these other devices, they say they're catheters, 15:03:14
3 and this could work in a catheter or it could work 15:03:21
4 in a metal cannula. 15:03:26
5 Q And you said earlier that it -- that the 15:03:30
6 red piece is metal, correct? 15:03:33
7 MR. KELLY: Objection. Form. 15:03:36
8 A Yes, I did. I think that's -- I talk 15:03:44
9 about that being metal because it is energized 15:03:47
10 with RF. Would it have to be? I don't think so. 15:03:59
11 As long as the metal touches the filaments so they 15:04:05
12 can be activated. 15:04:14
13 So I'm not sure the whole face of that 15:04:16
14 would have to be metal. It makes sense to me 15:04:19
15 because then you've got an extra electrode, like C 15:04:23
16 -- like Lee's central piece. Again, that depends 15:04:27
17 upon what the engineer that's making this thing 15:04:32
18 and the doc want. 15:04:38
19 Certainly that would increase the volume 15:04:40
20 of the tissue destroyed, to have that be metal. 15:04:51
21 Energized by the central probe that's removable. 15:04:58
22 Q You referred to the engineer and the 15:05:09

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1 doc. I assume you mean doctor? 15:05:13
2 A Uh-humh. 15:05:16
3 Q To create a device like Racz's modified 15:05:23
4 design, would an engineer and a doctor work 15:05:26
5 together? 15:05:29
6 A Possibly. That's why I said on many of 15:05:30
7 the companies that I work for, we do both. A 15:05:34
8 doctor will be on one project, and he's a 15:05:38
9 practicing doctor, you just go out and meet with 15:05:41
10 him and show him things, or a marketer, clinical 15:05:44
11 applications engineer sometimes. They're the guy 15:05:47
12 that goes out to the doctor and he's saying, you 15:05:51
13 know, damn, I need more volume, this Racz probe, 15:05:54
14 I'm missing things. I'm not getting enough 15:05:58
15 volume. And that's when they come back and say 15:06:03
16 hey, look, we got to do something about this. 15:06:06
17 So it's market-driven. All of this 15:06:08
18 stuff is market-driven. Engineers work with the 15:06:12
19 end user. If they don't, they invent something 15:06:19
20 that's useless. 15:06:22
21 Q Okay. I want to explore with you some 15:06:23
22 more this idea that you mentioned of the filaments 15:06:29

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1 being free floating. In Racz's modified design, 15:06:32
2 where would they be free floating? 15:06:38
3 A You would have -- the way you would do 15:06:43
4 it is you would have an inner hypotube and they 15:06:45
5 would be inside that hypotube. 15:06:50
6 Q Is that the same hypotube in which the 15:06:56
7 RF probe goes? 15:06:58
8 A No, it would only have to meet at the 15:07:05
9 distal end. So if that distal end was all metal, 15:07:10
10 the hypotube ends, the electrode goes where 15:07:14
11 they're supposed to go, the probe goes down the 15:07:19
12 center, contacts a metal tube. The filaments are 15:07:22
13 all energized because they're going through a 15:07:25
14 metal tip, and that tip has deflectors in it so it 15:07:28
15 moves the filaments where you want them to be. 15:07:35
16 So in the one I'm doing, we don't even 15:07:37
17 have a hypotube. We don't have anything to put 15:07:41
18 fluid in. We have a separate tube for the fluid 15:07:47
19 tube. 15:07:51
20 Q Okay. Now, this hypotube or tubes that 15:07:53
21 you're talking about for the filaments, are they 15:07:56
22 within the sidewall of the red cannula? 15:08:01

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1 A Certainly could be. Could be 15:08:09
2 manufactured that way. If the whole thing is 15:08:11
3 plastic, you could drill it out. If the whole 15:08:13
4 thing is a conductor, you could laser drill it. 15:08:17
5 You could actually -- you could actually 15:08:20
6 make that through a mold, an ejection mold, 15:08:24
7 ejection mold it, and then they would be in 15:08:29
8 periphery of the hypotube that the probe goes, the 15:08:32
9 RF probe, that would be ideal. 15:08:38
10 Q And is that what is intended to be 15:08:44
11 illustrated in this drawing on page 85, that the 15:08:46
12 channels are within the sidewall of the main 15:08:52
13 cannula? 15:08:58
14 A That's correct. 15:08:58
15 Q Okay. 15:09:00
16 A That's the way it really appears, yep. 15:09:00
17 Q Okay. And how would those channels be 15:09:03
18 formed? Let's ask -- let me ask that first in 15:09:09
19 about the first example. 15:09:12
20 In the first example you said that the 15:09:13
21 tip and the cannula are just one continuous piece. 15:09:19
22 MR. KELLY: Objection. 15:09:24

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1 Q Right? They're not separate pieces. 15:09:26
2 A Right. 15:09:30
3 Q So in the first example, you have these 15:09:31
4 channels for the filaments going the entire length 15:09:37
5 of the cannula, correct? 15:09:41
6 A Correct. 15:09:44
7 Q Okay. 15:09:46
8 A Well, no, they wouldn't go the entire 15:09:46
9 length of the cannula. They wouldn't have to. 15:09:49
10 You'd want them to stop at the deflector, to 15:09:53
11 create the deflector, so it can't go the entire 15:09:58
12 length, okay? 15:10:01
13 Q Gotcha. Okay. 15:10:03
14 But in the proximal direction from the 15:10:04
15 deflection ramps, those channels within the 15:10:13
16 sidewall of the main cannula would extend all the 15:10:17
17 way along the length of the cannula proximally, 15:10:21
18 correct? 15:10:27
19 A Correct. That's correct. 15:10:27
20 Q Okay. 15:10:29
21 A Well, maybe not all the way. They'd 15:10:30
22 come up to the actuator that's pushing them in and 15:10:32

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1 out. So the actuator, which might not have to 15:10:35
2 come up the full length of the cannula, it could 15:10:38
3 be down in the cannula. The gear, the rotator. 15:10:41
4 Q Okay. And if the tip is bent, would 15:10:46
5 these channels for the filaments bend along with 15:10:55
6 the bent tip? 15:11:01
7 A It depends where you wanted them to come 15:11:05
8 out. If you wanted them to come out on the bent 15:11:07
9 tip, yeah; if you wanted them to come out previous 15:11:10
10 to the bend, no. I mean that's an engineering 15:11:14
11 decision, it's a doctor decision, it's a variable 15:11:17
12 left up to one of ordinary skill in the art. 15:11:20
13 Simple things like all kind of routine engineering 15:11:22
14 details. 15:11:28
15 Q Did you consider, Dr. Tucker, how to 15:11:35
16 make these channels that we're talking about in 15:11:38
17 your first example that extend along most of the 15:11:41
18 cannula within the sidewalls of the cannula? 15:11:50
19 A The easiest way to do it is as Racz 15:11:55
20 said, I'm going to vary the amount of bend and put 15:11:59
21 zero or a small bend in it, and then I could 15:12:02
22 injection mold the whole thing out of metal. Or I 15:12:06

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1 can injection mold the whole thing out of a 15:12:11
2 conductive plastic, polyacetylene. There are 15:12:15
3 doped plastics that are conductive. 15:12:24
4 Q And where is that described in your 15:12:32
5 Declaration? 15:12:35
6 A Man, Matt, come on. This is not a 15:12:37
7 manufacturing patent. Some of these are details 15:12:42
8 left to the engineer. How to make it. I could 15:12:45
9 tell them ways to make it. 15:12:52
10 I don't know what polyacetylene costs 15:12:53
11 per foot. It may be prohibitive. Then you could 15:12:58
12 inject it out of metal, if it's straight, with the 15:13:02
13 holes right in it. You know how -- with the 15:13:08
14 length you want, then you can laser drill the 15:13:12
15 holes. That's easy enough to do. 15:13:16
16 Q Are you aware of limits on how long a 15:13:22
17 laser drilled hole can be? 15:13:28
18 MR. KELLY: Objection. Form. 15:13:31
19 A No, I'm not, but I know that those exit 15:13:33
20 ports can be drilled with a laser. 15:13:36
21 Q You're talking about the part -- the 15:13:43
22 ports -- 15:13:45

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1 A Correct. 15:13:46
2 Q -- where the filaments exit actually 15:13:47
3 from the tip? 15:13:50
4 A That's correct. 15:13:54
5 Q Yeah. I'm asking about the channels 15:13:55
6 proximal to the ports. 15:13:59
7 A Proximal to the ports. 15:14:02
8 Q Yeah. How would you drill such 15:14:04
9 channels? 15:14:09
10 A I don't know, Matt, I'm not an engineer. 15:14:10
11 That is a manufacturing engineer. I know -- I 15:14:12
12 know that you could use a metallized plastic, 15:14:16
13 polyacetylene, that is a decent conductor. And 15:14:20
14 then you could just drill with the damn drill 15:14:25
15 press. That's how I'd start out making ones and 15:14:28
16 twosies. But you know, once you're doing a 15:14:32
17 plastic, then you can injection mold the whole 15:14:35
18 thing as a straight tube. 15:14:40
19 Q Okay. Are there any other ways that 15:14:47
20 you're aware of right now in which you could make 15:14:51
21 these channels that the filaments go down? 15:14:53
22 A You could take the metal cannula, groove 15:15:00

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1 it on a slight groove on the inside, put your wire 15:15:04
2 in there, and then put a plastic keeper in it. 15:15:07
3 And just -- you'd put that in front of your 15:15:12
4 actuator or -- in front -- distal to the actuator 15:15:17
5 head that moves them up and down. That would keep 15:15:21
6 them in the low grooves that you've been cut in or 15:15:26
7 molded into the metal cannula. 15:15:31
8 It gets out of the end, and you could 15:15:36
9 put another one, another little -- little keeper 15:15:40
10 that would keep them in their grooves as they go 15:15:44
11 out the ports for the little deflection area, 15:15:47
12 which is bent. 15:15:54
13 MR. KELLY: Hey, Matt, I need to take a 15:15:57
14 bathroom break if this is a good time to stop in 15:16:00
15 the next five or 10 minutes. 15:16:03
16 MR. PHILLIPS: Yeah, we can stop there. 15:16:05
17 MR. KELLY: Okay. Come back in 10? 15:16:08
18 MR. PHILLIPS: Sure. 15:16:10
19 THE VIDEOGRAPHER: Stand by. Going off 15:16:11
20 the record at 3:16 p.m. 15:16:12
21 (A recess was taken.) 15:16:13
22 THE VIDEOGRAPHER: We are back on the 15:16:13

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1 record, 3:27 p.m. 15:27:46
2 BY MR. PHILLIPS: 15:27:48
3 Q Okay, Dr. Tucker, referring again to 15:27:51
4 your drawing of the Racz modified device on page 15:27:56
5 85 of your Declaration, Exhibit 1031, I want to 15:27:59
6 make sure I understand what you're saying. 15:28:07
7 I believe in the last session you said 15:28:09
8 that the blue filaments could be free floating or 15:28:15
9 in a hypotube or in these channels in the main 15:28:20
10 cannula sidewall? 15:28:30
11 A That's correct. 15:28:31
12 Q Okay. So those are three cases. In all 15:28:34
13 three cases, do the filaments eventually get to a 15:28:40
14 point where they go into channels in the main 15:28:43
15 cannula sidewall as like shown here on page 85? 15:28:47
16 A Again, I'm not -- I'm not an industrial 15:28:55
17 engineer, but that to me would make more sense. 15:28:57
18 Because they get down to the point where the 15:29:02
19 channel ends and where they got to go, they got to 15:29:06
20 go out. 15:29:09
21 Q Right. 15:29:10
22 A You could drill the hole at 90 degrees, 15:29:11

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1 they'd go out straight out. You could drill the 15:29:14
2 hole at 45 degrees and they'll come out at 15:29:17
3 45 degrees. 15:29:20
4 Q Uh-humh. 15:29:22
5 A If they're memory shape metal, you can 15:29:22
6 have a bend to it, they can bend around, and I 15:29:24
7 think that would be the way to do it. 15:29:27
8 Q Well, let's consider the situation in 15:29:31
9 which you said the filaments are free floating. 15:29:36
10 Where in the cannula would they be free floating? 15:29:41
11 A That would be the problem. Free 15:29:55
12 floating is probably a bad idea in a cannula. 15:29:57
13 Works in our catheter, but not in this. I don't 15:30:03
14 think free floating would work real well. It 15:30:05
15 would be because it bumps around. 15:30:10
16 Q Okay. In the case in which the 15:30:14
17 filaments are in a hypotube, where exactly would 15:30:17
18 the hypotube be? 15:30:25
19 A Proximally it'll be by the actuator, 15:30:27
20 Scheibe's turn actuator, and it has a piece that 15:30:30
21 the actuator moves linearly depending upon how 15:30:40
22 much you rotate it, and then the electrodes are 15:30:45

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1 connected to that. So they'd be connected up 15:30:48
2 there, up to the right on this diagram, and then 15:30:51
3 you could come down and you could have a circle, a 15:30:55
4 piece of plastic with a hole in it for the main -- 15:31:01
5 main electrode to come out, that had indentation, 15:31:03
6 that would hold them up against the wall, and then 15:31:08
7 when they get down to this place where there's no 15:31:13
8 more -- no more, they can't go straight, they bend 15:31:17
9 out. Nitinol is good at that. 15:31:23
10 Q And where is the RF probe in relation to 15:31:31
11 this hypotube you described? 15:31:34
12 A Right down the center. 15:31:37
13 Q So from the center out -- tell me if 15:31:39
14 this is correct -- you're saying the RF probe is 15:31:42
15 in the middle, there's a hypotube around it, the 15:31:46
16 filaments are outside of that hypotube, and then 15:31:50
17 you have the outer wall of the red main cannula? 15:31:54
18 A I don't think you have to have a 15:31:59
19 hypotube in the example I described. They would 15:32:01
20 just run down the sidewall of the metal cannula. 15:32:04
21 The only hypotube you would have would be for the 15:32:12
22 center, for the RF probe and the fluid. It's nice 15:32:16

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1 to contain the fluid and put it in a hypotube. 15:32:21
2 Q Is it important to isolate the fluid 15:32:26
3 from the filaments? 15:32:31
4 A It depends. Saline can give you a lot 15:32:36
5 of trouble if you do it, because it can make your 15:32:42
6 ablation volume huge and erratic depending on how 15:32:45
7 it diffuses through tissue. 15:32:51
8 In the case where I was working on this, 15:32:53
9 it was like a Racz tube, and it's straight, and 15:32:59
10 the injected center was -- was fluid saline on 15:33:04
11 continuous drip, and -- so that there was no 15:33:12
12 center catheter, it was all the outside was 15:33:17
13 connected. 15:33:21
14 And it's amazing how saline will diffuse 15:33:21
15 everywhere, you know, 90 percent saline or 15:33:27
16 80 percent, and so it makes really erratic shapes. 15:33:31
17 I would never want saline injected on a neurotomy. 15:33:37
18 If anything, distilled water would be better. 15:33:44
19 Something to rinse it with. Or saline when you're 15:33:51
20 done with your neurotomy. 15:33:55
21 So you wouldn't care if -- you might 15:33:56
22 care, though, if it's distilled water. It doesn't 15:34:07

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1 spread the current as well. If it's saline, it 15:34:10
2 spreads too much current. 15:34:14
3 So it's best just to keep -- keep those 15:34:15
4 filaments so that they don't come in contact with 15:34:19
5 fluid you're injecting. Drugs, just contain it. 15:34:23
6 Q Okay. 15:34:31
7 A So you're right, the hypotube would be 15:34:34
8 for your electrode and fluid. 15:34:37
9 Q The electrode would be the probe, you 15:34:41
10 mean? 15:34:44
11 A Oh. Yes, that's probe, electrode. 15:34:44
12 Q So in that case, do the blue filaments 15:34:49
13 ever go through channels in the red sidewall? 15:34:55
14 A They certainly can if you want to make 15:35:04
15 that -- if it's feasibly possible to make it out 15:35:05
16 of a conductive plastic, then it's easy to drill 15:35:08
17 them out. I mean then you can mold the damn 15:35:12
18 thing. Because you got a mold that'll put the 15:35:15
19 holes right in it. 15:35:19
20 Q Uh-humh. 15:35:20
21 A That'd be the way you could have a 15:35:20
22 conductor and have it be in the sidewalls. Keeper 15:35:26

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1 that contains them at the sidewall. Again, I 15:35:30
2 don't know how far a laser can drill a hole in a 15:35:42
3 tubular piece of metal. I have no idea. 15:35:46
4 Q Do you know how far a mechanical drill 15:35:49
5 bit can drill a hole in a -- 15:35:52
6 A Oh, a different story -- come on. 15:35:55
7 Different story. Different story. I mean -- 15:35:56
8 (Simultaneous speaking.) 15:36:01
9 A You can't -- you can't compare laser to 15:36:02
10 a drill from my -- in regards bit, no. And that 15:36:06
11 worked for quarter of an inch stuff, or two 15:36:14
12 inches, wood, but not going through metal. Over a 15:36:18
13 long distances. 15:36:21
14 Q Okay. All right. Sorry for so many 15:36:23
15 questions, but I'm still just struggling to 15:36:26
16 understand what you're describing and maybe it's 15:36:30
17 because it's not illustrated in your Declaration, 15:36:33
18 but -- 15:36:37
19 A That's because it's up to one of 15:36:38
20 ordinary skill in the art. You're asking a lot of 15:36:40
21 routine engineering questions. 15:36:45
22 Q That's a phrase you refer to many times 15:36:50

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1 in your Declaration, and I guess I'm trying to get 15:36:53
2 a sense of what you consider to be routine 15:36:58
3 engineering. 15:37:01
4 That's not a question. I'm just trying 15:37:01
5 to explain why I'm asking you the questions that 15:37:06
6 I've asked you. 15:37:08
7 But going back to this example where you 15:37:09
8 have a hypotube containing the RF probe, the 15:37:16
9 filaments still need to go outside of the red tip, 15:37:21
10 right? 15:37:32
11 A On the outside, correct. 15:37:33
12 Q Yeah. So do they do that by going all 15:37:35
13 the way down the inner lumen of the red piece and 15:37:41
14 then through the volume and out, or do they do it 15:37:46
15 by going proximally inside the inner lumen of the 15:37:50
16 red piece into the sidewall of the red piece and 15:37:56
17 then out external from the red piece? 15:38:00
18 MR. KELLY: Objection. Form. 15:38:04
19 A Yes. 15:38:08
20 Q Both? 15:38:09
21 A Yes, they can do that. No, I'd do one 15:38:10
22 or the other. 15:38:13

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1 Q Which one? 15:38:14
2 A One or the other. You might have to 15:38:14
3 have some routine engineering see which was the 15:38:17
4 easiest and then get marketing in or manufacturing 15:38:19
5 guy, find out which is the cheapest. 15:38:24
6 I mean even a keeper, a plastic keeper, 15:38:26
7 would hold down the center for the probe that 15:38:29
8 shoves them up against the wall, and you do that 15:38:34
9 proximally and distally. And that would keep them 15:38:37
10 at the outside of that metal cannula. That's 15:38:42
11 cheap. A hypotube goes down the center. 15:38:47
12 That's actually what we're doing in the 15:38:54
13 catheter, use two insert, drill out for each of 15:39:00
14 the electrodes, put one proximal to -- we're using 15:39:03
15 a slide, and I don't like that, but we're using a 15:39:07
16 slide, and then one very proximal to where they're 15:39:11
17 going to go out. So right up where they're going 15:39:20
18 out through the catheter. 15:39:23
19 Q I believe you've referred to this device 15:39:26
20 that you just mentioned several times now. This 15:39:29
21 is a device that is currently under development? 15:39:34
22 A That's correct. 15:39:37

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1 Q And you keep referring to it as an 15:39:39
2 example of routine engineering; am I right? 15:39:43
3 A Right, it is. 15:39:47
4 Q Okay. So you're not planning to patent 15:39:48
5 this device you're developing in any sense? 15:39:50
6 A We are. But it won't be -- it won't be 15:39:54
7 in the sense of these patents. It won't be like 15:39:57
8 that. 15:40:01
9 MR. KELLY: Dr. Tucker, I caution you 15:40:02
10 that the transcript of this deposition will be 15:40:05
11 made public. 15:40:07
12 THE WITNESS: Correct. 15:40:09
13 A Yeah, and that's about enough said about 15:40:11
14 it. 15:40:13
15 Q Yeah, no, I wish I could ask you more, 15:40:13
16 because -- 15:40:16
17 (Simultaneous speaking.) 15:40:19
18 Q Okay. You testified already that the 15:40:24
19 size of the needle in Racz's modified device would 15:40:32
20 be between 10 gauge and 30 gauge. I believe you 15:40:37
21 said that a couple of times? 15:40:40
22 A Yes. 15:40:42

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1 Q What is your basis for that? 15:40:42
2 A Racz. Young. 15:40:44
3 Q Let's look at Racz. I believe it's on 15:40:47
4 column 8, and Racz is Exhibit 1009. 15:40:51
5 A And you want to go to column 8? 15:41:10
6 Q Yes, please. 15:41:13
7 Okay, there's a paragraph that begins at 15:41:14
8 line 10. 15:41:22
9 A Yes. 15:41:28
10 Q And this paragraph mentions various 15:41:31
11 sized electrodes, from extremely small gauges; 15:41:34
12 e.g., 30 gauge, to much larger sizes; e.g., 10 15:41:39
13 gauge. Do you see that? 15:41:45
14 A Correct. 15:41:46
15 Q Is it your opinion that this size range 15:41:53
16 is appropriate for a neurotomy needle? 15:41:56
17 A I think it's a good point to start, and 15:42:04
18 I would go out and canvass physicians that do this 15:42:07
19 and ask them how big can you tolerate and how 15:42:11
20 small can you tolerate, and I think that's how you 15:42:15
21 decide. Those are starting points. 10 to 30. 15:42:19
22 It's easier -- I mean usually you can 15:42:23

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1 shrink something, so if you do a 10 and they want 15:42:26
2 a 28, you can probably do that. I mean a 30. And 15:42:29
3 you could probably oversize that pretty easy. 15:42:34
4 Q So sitting here right now, you don't 15:42:38
5 know what the largest practical size for a 15:42:42
6 neurotomy needle is? 15:42:48
7 MR. KELLY: Objection. Form. 15:42:50
8 A I think if we look at some of the rest 15:42:53
9 of the references, they also provide guidance on 15:42:55
10 that. And -- 15:43:00
11 Q Yeah, I believe you reference a couple 15:43:07
12 of them in paragraph 46 of your Declaration. 15:43:09
13 A (Reviewing.) 15:43:23
14 Paragraph 46, not page 46. Okay. 15:43:33
15 Q Page 23. 15:43:36
16 A Yeah. 15:43:37
17 Q Paragraph 46. 15:43:38
18 A Got it. 15:43:39
19 Q In this paragraph you quote from Exhibit 15:43:45
20 1009, that's Racz that we just looked at, and you 15:43:50
21 also cite to Exhibit 1014 and Exhibit 1022. Do 15:43:59
22 you see that? 15:44:06

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1 A 23 to 16 and 12 to 26. 15:44:16
2 Q Okay. Do you have any reason to doubt 15:44:21
3 the statement in Exhibit 1014 that for spinal 15:44:25
4 high-frequency treatment of pain the tubing can 15:44:31
5 range in gauge size from 23 gauge for the smaller 15:44:34
6 range to 22, 20, 19, 18, 17, or 16 gauge for the 15:44:38
7 larger target sites? 15:44:45
8 A No, I just look at it and say, well, the 15:44:50
9 next guy got 12 gauge as his largest, he's got 16 15:44:53
10 in that reference, he's got 26, and he's got 23. 15:44:58
11 So I think -- I think 10 -- 10 to 30 is a 15:45:06
12 reasonable size to start with. But so are these. 15:45:11
13 I mean if that's what you want to start with, go 15:45:15
14 for it. 15:45:18
15 As someone that's going to be 15:45:22
16 knowledgeable in routine engineering, when docs 15:45:27
17 tell him no, I don't want any 30 gauge, I want a 15:45:32
18 17 gauge, I mean I think that's the kind of 15:45:36
19 marketing analysis you do, so you incorporate it 15:45:41
20 into your device. That doesn't mean that you 15:45:45
21 don't start working on the device because you can 15:45:50
22 always change the size of it. 15:45:54

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1 So you'd start working on it, while 15:45:55
2 Marketing goes out and determines what is the 15:46:00
3 actual span for the gauge of these devices. 15:46:04
4 Q Have you ever seen a 10-gauge neurotomy 15:46:16
5 needle? 15:46:18
6 A No, but I've worked with 10-gauge 15:46:24
7 needles, not as neurotomies, but for other 15:46:26
8 reasons. 15:46:29
9 Q Have you ever seen a neurotomy needle 15:46:32
10 bigger than 16 gauge? 15:46:35
11 A As I said, this guy is saying 16, and 15:46:38
12 the other guy is saying 12. So obviously there's 15:46:43
13 guys using 12s. One guy is using 16. 15:46:48
14 Q So I'm not asking you what you've read. 15:46:55
15 I'm asking you of actual awareness of a neurotomy 15:46:58
16 needle in use bigger than 16 gauge. 15:47:03
17 A I'm sure there are. If this guy says 15:47:08
18 12, I'll bet you there are. 15:47:13
19 Q Okay. Are you speculating or are you -- 15:47:16
20 A I'm reading what that author said. 15:47:24
21 Q Okay. Let me ask the question again. 15:47:27
22 Have you ever personally seen in 15:47:28

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1 physical tangible form an RF neurotomy needle 15:47:35
2 bigger than 16 gauge? 15:47:40
3 MR. KELLY: Objection. Form. 15:47:42
4 A I really can't answer that. I don't 15:47:44
5 know where -- when I've seen neurotomies, I'm not 15:47:47
6 sure what gauge they've used. 15:47:52
7 Q To the best of your recollection, you're 15:47:54
8 not aware of ever having seen a neurotomy needle 15:47:57
9 that you know to be bigger than 16 gauge, correct? 15:48:04
10 MR. KELLY: Objection. 15:48:10
11 THE WITNESS: Sorry, Chris. 15:48:10
12 MR. KELLY: Go ahead. 15:48:12
13 A I've seen neurotomy needles; I don't 15:48:12
14 know what the gauge was. I've had them stuck in 15:48:15
15 my back, and I didn't ask what the gauge was. So 15:48:21
16 I can't -- I have no information on that subject. 15:48:24
17 Q How big are the nerves that are ablated 15:48:30
18 in a typical RF neurotomy procedure -- well, let 15:48:33
19 me ask it this way. 15:48:40
20 How big is a medial nerve that is often 15:48:42
21 ablated in an RF neurotomy procedure? 15:48:47
22 A Where is it coming out of? 15:48:51

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1 Q The spine. 15:48:54
2 A Where in the spine? I knew that. 15:48:58
3 Q The medial nerve at the -- the AFRED 15:49:04
4 medial nerve, but coming out between two 15:49:07
5 vertebraes. 15:49:16
6 A Right. Where? You know, a lot of 15:49:17
7 these -- a lot of these nerves -- medial is one of 15:49:20
8 them -- they'll come out between three vertebraes 15:49:23
9 and merge together and form one nerve that will 15:49:26
10 then innervate something. 15:49:31
11 So it depends where you're doing it. If 15:49:33
12 you just do part of it between one vertebrae, 15:49:37
13 they're millimeter-ish or a millimeter. That's 15:49:42
14 about all you can bet on. 15:49:48
15 And the other thing is that it varies 15:49:51
16 from person to person. There -- some people say, 15:49:53
17 well, what's the typical size. I'm not sure 15:49:56
18 what -- if you can answer that question, because 15:50:00
19 it depends where you are, what nerve it is, is it 15:50:03
20 before it joins together with its next vertebrae 15:50:08
21 up and next down, is it right at one vertebrae, 15:50:13
22 are you doing it right at the foramen where it 15:50:18

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1 comes out, just -- there's -- your question -- 15:50:21
2 it's kind of meaningless, impossible to answer -- 15:50:26
3 not meaningless, but it's impossible to answer 15:50:29
4 without more detail. 15:50:32
5 But millimeter-ish. You know, not a 15:50:32
6 huge nerve will be three millimeters, sciatic 15:50:37
7 nerve, but that's after a lot of the sacral nerves 15:50:46
8 have joined together. And what you want to do is 15:50:49
9 for efferent nerves, you want to get them right up 15:50:52
10 by the sacrum, and they're smaller than the 15:51:01
11 sciatic nerve is because they have so many parts 15:51:04
12 that join it. So I just can't answer that 15:51:07
13 question. Millimeter-ish. 15:51:10
14 Q So would a physician ever want to ablate 15:51:14
15 one of those larger nerves that you mentioned? 15:51:21
16 A Sciatic? No. Of course not. They're 15:51:24
17 going to do it at the sacrum, which is a bear to 15:51:27
18 get to. 15:51:31
19 One of the reasons that Racz was, I 15:51:31
20 think, using a bent tip is because the sacrum is a 15:51:36
21 wedge with holes in it, and nerves could just pour 15:51:41
22 out of that. So you've got to -- you've got to 15:51:45

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1 get it at -- close to the source. But they're 15:51:48
2 still big nerves when they come out. They're not 15:51:55
3 tiny little nerves. That's when they get down 15:51:58
4 into your leg and start dividing. Your back or 15:52:01
5 shoulders. 15:52:06
6 Q Okay, thank you. 15:52:19
7 Do you know where physicians who perform 15:52:20
8 RF neurotomy try to ablate the nerve of, say, a 15:52:38
9 medial nerve at a facet joint near the spine? 15:52:46
10 MR. KELLY: Objection. Form. 15:52:53
11 A That's where the two vertebrae join 15:52:56
12 together, and that's a difficult place to do it. 15:52:58
13 I don't know the size of the nerves there. I know 15:53:03
14 they're hard to get to. 15:53:04
15 Q Let's look at paragraph 167 of your 15:53:15
16 Declaration. It begins on page 1505. And this is 15:53:19
17 Exhibit 1031. 15:53:31
18 A Got it. 15:53:34
19 Q Do you see on the next page, still in 15:53:57
20 the same paragraph, but on page 106, near the 15:54:00
21 bottom of the paragraph, about five lines up, it 15:54:03
22 says: 15:54:06

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1 In short, a POSA would have recognized 15:54:06
2 that by implementing Lee's perimeter filaments 15:54:12
3 around the internal perimeter of Racz's cannula, 15:54:15
4 the internal lumen of Racz's cannula would be 15:54:19
5 preserved. 15:54:23
6 What do you mean by that statement? 15:54:23
7 A Well, you can't have -- you got to have 15:54:31
8 the internal lumen, and it -- usually you want to 15:54:34
9 put that in a hypotube, because you don't want 15:54:43
10 liquid leaking all over, drugs. 15:54:46
11 So you've got the hypotube that the 15:54:48
12 electrode goes down, electrode, your probe, RF 15:54:54
13 probe, and fluid is injected. And if you do that, 15:55:00
14 you're going to want the filaments, so you got 15:55:04
15 eight filaments around the periphery because 15:55:08
16 that's the only place to put them. The center is 15:55:10
17 taken up by the probe, and the lumen for drugs and 15:55:13
18 saline or fluid introduction. 15:55:18
19 Q Let's turn ahead to paragraph 169. 15:55:40
20 What do you mean when you say in this 15:55:51
21 paragraph: 15:55:53
22 Lee's perimeter filaments 22/1622 and 15:55:53

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1 deflection surfaces 12/1612, around the inner 15:56:02
2 perimeter of Racz's distal tip 14/38 such that 15:56:08
3 Racz's probe, 22/52, could still be received into 15:56:14
4 the cannula's central lumen. 15:56:18
5 MR. KELLY: Objection. Form. 15:56:21
6 A Okay. And that's shown on the next two 15:56:23
7 figures on the next -- 108 and 109. The 15:56:27
8 filament's in blue, and the deflection surface is 15:56:31
9 that bend it's making because it hits the metal 15:56:35
10 and deflects out. Physical contact would be in 15:56:38
11 that hypotube or straight cannula to the tip. 15:56:42
12 This could be -- the hypotube could be 15:56:49
13 ended right about at where the filaments come out 15:56:53
14 so there's a good area length on both sides to 15:56:56
15 physical contact. 15:57:02
16 Q When you refer to "the hypotube" in your 15:57:06
17 answer, are you referring to the channels in which 15:57:10
18 the blue filament goes in the red -- in the red 15:57:14
19 sidewall in Racz's modified device? 15:57:23
20 A No, I'm referring to the center of the 15:57:25
21 device to contain fluid. I would put it in that 15:57:29
22 way. I think it could be without -- you know, it 15:57:32

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1 could just be metal in there, that would be fine. 15:57:37
2 Again, engineering choice. Docs don't like to 15:57:40
3 waste their anesthesia and drugs out of filaments 15:57:46
4 where they can't control it or in some other area 15:57:52
5 to have it leak back in. 15:57:56
6 Q Uh-humh. 15:57:57
7 A I'd put it in a hypotube, but you don't 15:57:57
8 have to. It can just be the center of the solid 15:58:00
9 cannula where the probe fits down in it. 15:58:06
10 Q And in that case, describe to me how the 15:58:11
11 RF probe and the filaments would fit in that 15:58:17
12 central lumen. 15:58:22
13 A Filaments aren't in the central lumen, 15:58:25
14 they'd be in the sidewall. 15:58:27
15 Q Okay. Now I'm totally confused. I 15:58:32
16 thought I asked you if the filaments were in the 15:58:35
17 sidewall and you said no. 15:58:39
18 A I said yes. 15:58:40
19 Q Oh, you said -- okay. 15:58:41
20 A I don't know. I may guess. I mean 15:58:44
21 that's what the picture shows. 15:58:48
22 Q Right. 15:58:52

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1 A I may guess, that's what the picture 15:58:55
2 shows. 15:58:57
3 Q Let's turn ahead to paragraph 191. It's 15:58:58
4 on pages 121 and 123. 15:59:12
5 A Oh, 121 to 123? 15:59:20
6 Q Yeah. And the part I want to ask you 15:59:24
7 about is on page 121. 15:59:28
8 A Uh-humh. 15:59:30
9 Q Three or four lines up from the bottom 15:59:31
10 in parentheses you say: 15:59:33
11 (E.g., with Lee's filaments positioned 15:59:35
12 around the two tubes.) 15:59:39
13 A Right. 15:59:45
14 Q What are these two tubes? 15:59:45
15 A Well, read right up above. 15:59:48
16 A suitable configuration would be to 15:59:50
17 provide two tubes within the metal shaft. One for 15:59:54
18 the probe, one for the liquid, and have the 15:59:57
19 filaments -- Lee's filaments around that. That 16:00:03
20 would contain the fluid. I mean that would be one 16:00:07
21 way to do it. 16:00:11
22 Q I see. 16:00:13

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1 A Two hypotubes. One for the probe, one 16:00:14
2 for the liquid. 16:00:17
3 Q These -- okay, let's go to the case in 16:00:28
4 which the filaments travel down channels in -- 16:00:32
5 fully within the sidewall of the red tip. Okay. 16:00:43
6 A So it's got metallized plastic if you 16:00:52
7 want it metal; is that right? It's metal? 16:00:55
8 Q I don't know, you tell me. 16:01:02
9 A I have. 16:01:03
10 Q Okay. 16:01:05
11 A Because it could be either. It could be 16:01:06
12 conductor or non-conductor. And they still go 16:01:07
13 down the sidewalls, inside. 16:01:13
14 Q Okay. Well, I think your Declaration 16:01:15
15 says that both the filaments and the red tip are 16:01:18
16 metal, right? 16:01:23
17 A Correct. 16:01:25
18 Q Okay. And in fact, you explain that 16:01:26
19 they have to be conductive and in physical contact 16:01:30
20 with each other, and the red tip must be in 16:01:33
21 physical contact with the green RF probe, which is 16:01:38
22 metal, right? 16:01:42

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1 A But they could do that just at the tip. 16:01:43
2 Q Sure. Some -- anywhere along the length 16:01:46
3 of the -- 16:01:49
4 A Correct. Or it could be plastic 16:01:50
5 cannula, which would be easier to manufacture, and 16:01:52
6 then just have the metal insert. That was the 16:01:55
7 example 2 I gave. A separate tip that's metal 16:02:00
8 that fits onto the end of a plastic cannula. 16:02:05
9 Q Okay. I understand that much. 16:02:09
10 A Okay. 16:02:12
11 Q But in your figure -- and maybe we 16:02:17
12 should -- we can just turn back a few pages to 16:02:20
13 page 108 to look at your drawing. 16:02:22
14 A Page 108? 16:02:29
15 Q Yes, please. At the top. 16:02:30
16 A Got it. 16:02:33
17 Q Okay. So as depicted here, the blue 16:02:33
18 filaments go through channels in the sidewall of 16:02:41
19 the red tip. 16:02:46
20 A Correct. 16:02:50
21 Q The question is, what is the 16:02:54
22 cross-sectional shape of those channels? 16:02:56

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1 A They could be 90 degrees. I would -- 16:03:03
2 that's going to have to be one of those things of 16:03:08
3 routine engineering is to -- and you can do this 16:03:11
4 on a handrail damn near -- is try one at 10 16:03:14
5 degrees off of perpendicular to it and see what 16:03:21
6 that does when it comes out. Take one off at 16:03:25
7 60 degrees. I think what you'll find is you'll 16:03:29
8 have different configurations. 16:03:33
9 The higher numbers, like 60 degrees off, 16:03:38
10 30 degrees off of the lateral line of the cannula, 16:03:41
11 30 degrees off, will give you a very shallow close 16:03:49
12 to the electrode when it comes off. And you see 16:03:55
13 if that's what you want. 16:03:59
14 I think, again, this is going to be 16:04:01
15 where you call in the docs, the marketers, you 16:04:06
16 have a -- we always have had -- every company I've 16:04:09
17 worked with, they have Medical Advisory Boards, 16:04:15
18 and that's where you call a meeting with the 16:04:19
19 Medical Advisory Boards and you sit down and you 16:04:23
20 say, here's what we're thinking, what angle do you 16:04:26
21 want this at? And then you can cut it right. If 16:04:30
22 it's metal, a laser; if it's plastic, it can be 16:04:32

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1 drilled, metallized plastic. 16:04:35
2 If they want it to come back proximally, 16:04:36
3 you have memory shaped nitinol with a permanent 16:04:42
4 bend in it that will come out straight and then 16:04:48
5 start to bend. And those are the different shapes 16:04:50
6 that you'd have to ask your docs what they want. 16:04:54
7 And maybe you want to make two or three of those. 16:04:57
8 So you have different -- different devices for 16:05:04
9 different situations. 16:05:07
10 Maybe the sacral -- the sacral is a bear 16:05:08
11 to get into, and maybe that's going to look 16:05:12
12 different than a thoracic which is relatively 16:05:14
13 easy. Lumbar which is kind of in between. 16:05:19
14 Q Okay, I appreciate that. Thank you. I 16:05:27
15 was not asking -- 16:05:29
16 A I should say ramps. You said what's it 16:05:31
17 look like in cross-section, they're ramps. 16:05:34
18 Q I'm sorry, I did not intend to ask you 16:05:38
19 about the ramps, which are at the ends of the 16:05:40
20 channel, the distal ends of the channel -- 16:05:44
21 A Uh-humh. 16:05:46
22 Q -- where the filaments actually exit 16:05:47

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1 from the needle. 16:05:49
2 I meant to ask you -- it's my fault, I 16:05:50
3 apologize -- but I meant to ask you about the 16:05:53
4 portion of the channel proximal from the ramp and 16:05:56
5 the exit. What is the cross-section of that? 16:06:00
6 A Enough that the wire can go in and out 16:06:07
7 and move. I mean it's -- it can't be real tight, 16:06:10
8 it can't be real loose. You can coat your wires, 16:06:14
9 filaments, electrodes with a lubricious substance 16:06:20
10 so it slides easier. But that's got to be that 16:06:26
11 routine engineering where you decide what it is 16:06:30
12 that I'm going to make those channels so I can get 16:06:35
13 them out of the electrode without a lot of force. 16:06:39
14 Q Okay. So those channels could be -- 16:06:50
15 could have a circular cross-section, right? 16:06:52
16 A They could indeed. As could the 16:06:56
17 filaments. 16:06:58
18 Q Right. 16:06:59
19 A That would be the easiest. 16:07:02
20 Q And as drawn here, it looks like it's a 16:07:07
21 snug fit between the filaments and the interior of 16:07:10
22 these channels. 16:07:15

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1 A Looks like real snug, yeah. I mean it's 16:07:17
2 not. I mean you got to have some leeway to get 16:07:20
3 them out of there and in there. It's where you 16:07:24
4 play the game that you've got to have it so it 16:07:28
5 slides easily enough that you can get it in and 16:07:31
6 out with a screw, rotator, but not so tight that 16:07:36
7 you're having to really ramp on it. And that's -- 16:07:44
8 you're going to have to try a couple of different 16:07:48
9 iterations to find what works the best, because 16:07:52
10 these aren't manufacturing patents. They leave a 16:08:00
11 lot to the guy that's of average skill in the art. 16:08:03
12 But I mean that kind of problem is relatively easy 16:08:08
13 to solve. 16:08:11
14 Q Okay. Would the cross-section of these 16:08:14
15 channels be uniform along the length of the 16:08:20
16 channel? 16:08:23
17 A It wouldn't have to be, but I would 16:08:26
18 suspect that's the easiest way to do it. 16:08:28
19 Q And would that be true even if the tip 16:08:31
20 is bent? Bent in such a way and in such a place 16:08:34
21 that the channels traverse through the bend? 16:08:38
22 A Remember, nitinol isn't bent. It can 16:08:44

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1 have a memory shape to it that it wants to do 16:08:49
2 that, but it will be straight in that channel 16:08:53
3 until you start to get it out, and then it will go 16:08:56
4 back to its memory that you made it with. So it 16:09:00
5 will be straight until you deploy it. 16:09:03
6 Q Yeah, I'm not asking about the nitinol 16:09:07
7 filaments. I'm asking about the cross-section of 16:09:09
8 the channels through which the filaments go, 16:09:12
9 and -- 16:09:17
10 A Yeah, I understand that. I mean I 16:09:20
11 think -- I think whatever is easiest for them to 16:09:22
12 make. I don't think that -- I mean obviously down 16:09:26
13 here at the end where it's coming out, it's got to 16:09:31
14 be a pretty good fit. I mean it can't be real 16:09:35
15 sloppy in there. But it has to have some room or 16:09:38
16 you won't be able to get it out. 16:09:44
17 Q And referring again to these channels, 16:09:53
18 you know, not the portion with the ramp where the 16:10:00
19 filaments exit, but the part of the channel 16:10:04
20 proximal from there, how long length-wise would 16:10:08
21 those channels be in the shortest example you can 16:10:15
22 think of? 16:10:20

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1 A I don't think most docs would want to do 16:10:24
2 a neurotomy with a six-inch needle. The ones I've 16:10:28
3 seen are nine inches. Nine inches. 16:10:32
4 Q So the shortest these channels would be 16:10:38
5 nine inches? 16:10:43
6 MR. KELLY: Objection. Form. 16:10:45
7 A Nine inches? No. You got to remember 16:10:47
8 you got to have your actuator in there to move it. 16:10:49
9 So -- but it still -- it's in the channel at that 16:10:52
10 point. I -- yeah, so you're right. They'd 16:10:56
11 probably -- I would guess around 9 to 10 inches. 16:10:58
12 Q Okay. 16:11:02
13 A But again, that's a guess for me. Not 16:11:03
14 looked at the market. 16:11:06
15 MR. PHILLIPS: Why don't we take a 16:11:29
16 little break. I might not have a lot more 16:11:30
17 questions. 16:11:34
18 THE WITNESS: Hey. I'm going to hold 16:11:35
19 you to that. 16:11:36
20 MR. PHILLIPS: Okay. 16:11:37
21 THE VIDEOGRAPHER: Stand by. Going off 16:11:40
22 the record at 4:11 p.m. 16:11:40

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1 (A recess was taken.) 16:11:42
2 THE VIDEOGRAPHER: Back on the record. 16:11:42
3 4:23 p.m. 16:23:38
4 BY MR. PHILLIPS: 16:23:41
5 Q Dr. Tucker, referring to your example 2, 16:23:45
6 or second example of Racz's modified device, I 16:23:49
7 want to ask you about the area where the cannula 16:23:54
8 interfaces with the separate tip. 16:24:00
9 A Uh-humh. 16:24:02
10 Q What -- where are the filaments at that 16:24:09
11 interface? 16:24:13
12 A They could be on the periphery of the 16:24:16
13 tube, hypotube, if you use it, but where the probe 16:24:23
14 goes, they'll be at the sides of that. And in 16:24:29
15 your insert, there'd be a stepdown like Lee shows, 16:24:34
16 a stepdown where the cannula -- it would fit into 16:24:39
17 the cannula, and then they'd come out of that 16:24:43
18 cannula into the tip. 16:24:47
19 Q And at the part of the device proximal 16:24:52
20 to this interface, where are the filaments? 16:24:59
21 A Well, they'd be -- at least be lateral 16:25:05
22 around the outside of the probe hole tube. They 16:25:10

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1 could be in the -- as I showed it on that one 16:25:16
2 figure, modified Racz, they'd be in the actual 16:25:19
3 sidewall. 16:25:24
4 This would actually be more of a type 1 16:25:26
5 diagram (indicating). I think Lee covered the 16:25:28
6 type 2 where it's a device, and at that point 16:25:35
7 they're in the -- there was a stepdown, remember, 16:25:40
8 that goes into the tube, they would be coming out 16:25:43
9 of the tube, into the metal right there. 16:25:47
10 Q So correct me if I'm wrong, but I 16:25:56
11 understood you to say that proximal to the 16:25:58
12 interface one possibility is that the filaments 16:26:01
13 are in the sidewall of the cannula? 16:26:05
14 A Yeah, they would come out before the 16:26:09
15 insert is put in. So they'd be free. 16:26:11
16 Q And in that case, those channels in the 16:26:16
17 cannula would need to be lined up with the 16:26:21
18 channels in the tip piece; is that right? 16:26:24
19 A Easy enough to do the lock and key. 16:26:26
20 Q And did you also describe an example in 16:26:32
21 which filaments proximal to the interface are not 16:26:34
22 in the sidewalls of the cannula but in the 16:26:40

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1 interior lumen of the cannula? Is that what you 16:26:43
2 said? 16:26:47
3 A Outside the hypotube. So the hypotube 16:26:47
4 would have to end and then you would bring them 16:26:51
5 in. I think those are all details that a -- you'd 16:26:54
6 have to make it, see which works the best. 16:26:59
7 Q I'm not sure what this hypotube is that 16:27:04
8 you're referring to. 16:27:06
9 A It's where the probe goes and the fluid 16:27:07
10 goes once the probe is removed. That could be a 16:27:10
11 hypotube. Or it could just be the center lumen of 16:27:14
12 the cannula. 16:27:22
13 Q So the hypotube is optional? 16:27:23
14 A Yeah, I think it could be. 16:27:27
15 Q Okay. When the hypotube is present, is 16:27:28
16 it basically a tube within a tube? 16:27:31
17 A Correct. 16:27:34
18 Q Okay. And the RF probe goes down this 16:27:35
19 inner -- I-N-N-E-R -- hypotube, right? 16:27:40
20 A Uh-humh. 16:27:44
21 Q And the filaments go outside this inner 16:27:45
22 hypotube? 16:27:49

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1 A Uh-humh. 16:27:50
2 Q Until they reach the interface? 16:27:51
3 A Uh-humh. 16:27:53
4 Q I see. Okay. 16:27:54
5 A And even more, that's why I had that one 16:28:01
6 discussion of two hypotubes, one for fluid and the 16:28:05
7 other for the RF probe. 16:28:08
8 Q In all cases in your second example you 16:28:15
9 have what I think you called a stepdown piece that 16:28:17
10 is the part of the tip that goes inside the distal 16:28:21
11 end of the cannula, right? 16:28:25
12 A Uh-humh. 16:28:29
13 Q Okay. So that necessarily has a smaller 16:28:30
14 outer diameter than the rest of the tip? 16:28:37
15 A Well, only at that one piece. It -- 16:28:41
16 that goes into the tube. Then it is a stepdown, 16:28:44
17 and then it's all flush, and then you can come 16:28:47
18 right of the sidewall and into the metal cannula. 16:28:51
19 Q Okay. And so the RF probe has to be 16:28:55
20 small -- well, that -- scratch that. 16:29:00
21 The stepdown would have a hole down its 16:29:04
22 middle for the RF probe to go, right? 16:29:12

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1 MR. KELLY: Objection. Form. 16:29:16
2 A Correct. 16:29:17
3 Q Okay. 16:29:19
4 A You got to -- you got to get it to make 16:29:19
5 contact somewhere on a piece of metal. So if you 16:29:24
6 make it metal, the second piece out of metal, then 16:29:27
7 it's pretty easy. Because the tube's in the 16:29:32
8 center of the cannula as well as the center of the 16:29:37
9 hole for the probe. 16:29:42
10 Q So in that case, the RF probe has to be 16:29:49
11 small enough to fit through the hole down the 16:29:56
12 center of the stepdown piece? 16:30:01
13 A Correct. 16:30:04
14 Q Okay. 16:30:06
15 A And again, you'd have the same problem 16:30:08
16 with making good contact. So it's got to be snug 16:30:10
17 but not so hard that you just got to ram the thing 16:30:15
18 in. But it doesn't -- that's not hard to do. 16:30:18
19 Q All right. In paragraph 228 of your 16:30:30
20 Declaration that's on page 143 through 144 -- 16:30:33
21 A Almost there, 143, paragraph 228. 16:30:51
22 Q Right -- you refer to the inner and 16:30:55

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1 outer diameters of the 10-gauge cannula, and you 16:31:06
2 refer to filaments being 0.2 millimeters wide, and 16:31:13
3 you say that in sizes as small as 0.2 millimeters 16:31:24
4 wide, and easily implemented, interacts as 16:31:32
5 neurotomy cannula that is as large as 10 gauge. 16:31:36
6 What is the point you're trying to make 16:31:40
7 here? 16:31:44
8 MR. KELLY: Objection. Form. 16:31:44
9 A Well, here we don't have an ethic, this 16:31:47
10 would be one option, the filaments are not round, 16:31:50
11 but they're wider and thin. So it would be easier 16:31:53
12 to put them in a sidewall. You wouldn't take up 16:31:57
13 as much. 16:32:02
14 So if you've got eight times .05, that's 16:32:02
15 .2 millimeters you lose because you got to have 16:32:07
16 enough thickness to have that. But the inner 16:32:15
17 diameter is huge. I mean it's 2.6 millimeters. 16:32:19
18 And that's my point, 10 gauge is roomy. 16:32:25
19 Q Are you saying in this paragraph that 16:32:44
20 the wall of the cannula is thick enough to 16:32:47
21 accommodate channels in which filaments 16:32:52
22 0.2 millimeters by 0.05 millimeters would fit? 16:32:55

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1 A That's correct. 16:33:07
2 Q And is there any other point to this 16:33:08
3 paragraph that you're trying to make? 16:33:10
4 MR. KELLY: Objection. Form. 16:33:13
5 A Well, if you look at Lee's filaments, 16:33:31
6 certainly they're going to fit in a 10 gauge and 16:33:33
7 leave space to go lower than that. I think -- I'd 16:33:39
8 have to go back and look at the patent, but I 16:33:43
9 think it says he would go down to .1 millimeter 16:33:46
10 wide, but certainly it would fit in a 10. 16:33:51
11 Q In paragraph 137 of your Declaration you 16:33:59
12 say that, quote, Fitz's device is also an RF 16:34:02
13 neurotomy needle. 16:34:08
14 Let me know when you see that. 16:34:09
15 A 137 paragraph? 16:34:13
16 Q Yes. 16:34:15
17 A Okay. Yeah, you asked before what did I 16:34:22
18 take away from Fitz. I mean here is what I said. 16:34:34
19 The single tip has a two millimeter, and 16:34:38
20 he shows that over here on page 80, Figure 1, of 16:34:46
21 say two millimeters away, and if you're not within 16:34:50
22 two millimeters, you miss it. And -- so you get 16:34:53

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1 reducing instances where the target lesion is 16:34:56
2 not -- lesion is not lesioned at all, target 16:35:00
3 nerve. You miss it. 16:35:05
4 Reducing the need for multiple lesions 16:35:06
5 which is time-consuming and more painful to the 16:35:10
6 patient. And let me tell you, it is. I had that. 16:35:13
7 Provides greater flexibility in lesion 16:35:16
8 placement and there's a real bugaboo. It was easy 16:35:22
9 in physics to change one variable. You can't do 16:35:28
10 that in humans. There's so many variations in 16:35:32
11 people where the nerve comes off, how big it is, 16:35:37
12 and that's really a bugaboo with small lesion size 16:35:40
13 is that you -- the anatomy varies. 16:35:47
14 So if you can expand the coverage, make 16:35:49
15 it bigger volume and still make it deployable 16:35:53
16 through muscle, that's a good deal. 16:36:02
17 That was Fitz's contribution to me. 16:36:04
18 Q Yeah, I'm sorry, I think you missed the 16:36:07
19 point of my question. 16:36:09
20 My question is, the second-to-last 16:36:10
21 sentence in this paragraph says: 16:36:15
22 As Fitz's device is also an RF neurotomy 16:36:16

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1 needle, a POSA would have understood that Fitz's 16:36:22
2 deployable electrodes could be easily implemented 16:36:26
3 on Racz as tip 1438. 16:36:29
4 Why is it important that Fitz's device 16:36:32
5 is also an RF neurotomy needle? 16:36:35
6 MR. KELLY: Objection. Form. 16:36:39
7 A Why Fitz's device is -- it is a 16:36:47
8 neurotomy needle. 16:36:49
9 Q And you appear to state in the sentence 16:36:51
10 that that fact has some significance to support 16:36:54
11 the rest of the sentence that a POSA would have 16:37:00
12 understood that Fitz's deployable electrodes could 16:37:04
13 be easily implemented onto Racz's tip. 16:37:08
14 A Yeah, I think what he's done is -- the 16:37:11
15 point I'm making is that Fitz gave me the 16:37:13
16 motivation, or somebody that's a POSA, would want 16:37:16
17 to add those distal electrodes, those could come 16:37:23
18 out of different areas to make that -- that lesion 16:37:26
19 a bigger volume. That's the point of it. Because 16:37:32
20 it would get around some of Fitz's four -- four 16:37:37
21 reasons why you want a bigger lesion. And that is 16:37:43
22 why Fitz added the deployable needles. 16:37:48

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1 Q Yeah, I know what Fitz teaches, and I 16:37:54
2 know that you're proposing implementing Fitz's 16:37:58
3 deployable electrodes on to Racz's tip. 16:38:03
4 What I'm trying to ask you is, what is 16:38:06
5 the significance of the fact that Fitz's device is 16:38:10
6 also an RF neurotomy needle as opposed to a needle 16:38:15
7 for some other type of RF ablation? 16:38:19
8 MR. KELLY: Objection. Form. 16:38:23
9 Q Do you understand what I'm asking, 16:38:24
10 Dr. Tucker? 16:38:26
11 A Well, not really, because he's explained 16:38:27
12 from a -- a neurotomy lesion, and a device that 16:38:30
13 does it, why he wanted a bigger area, and his 16:38:37
14 pictures on 4 is really nice because you can see 16:38:43
15 how that's going to make a bigger volume lesion, 16:38:49
16 and he's trying to get it so that you have that. 16:38:53
17 With those deployable electrodes, you have it. 16:39:00
18 And that's what would take me to Lee, because Lee 16:39:08
19 is really good at detail of how to do it. 16:39:15
20 And so Fitz told me why I should do it 16:39:17
21 and how to get from Racz's tip cannula, Lee tells 16:39:21
22 me how to do it in a better fashion than Fitz did. 16:39:32

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1 Q Well, here in the sentence you say, 16:39:40
2 Fitz's deployable electrodes could be easily 16:39:42
3 implemented onto Racz's tips. You didn't -- you 16:39:46
4 don't refer to Lee's deployable electrodes in this 16:39:49
5 sentence. So what would it look like in your view 16:39:53
6 if you implemented Fitz's deployable electrodes 16:40:00
7 onto Racz's tip? 16:40:06
8 A Well, I could, because I'd take 5 to the 16:40:11
9 right, and I'd make deployable electrodes, and I'd 16:40:16
10 make that tip a hot electrode, and then I've 16:40:19
11 got -- I still won't have Racz because I have no 16:40:22
12 way to irrigate the thing, so I'm going to have to 16:40:26
13 cut it off like Racz did and still make a tip out 16:40:29
14 there. But he doesn't -- he doesn't talk about 16:40:33
15 that. 16:40:35
16 Q When you say "5," do you mean Figure 5 16:40:38
17 of Fitz? 16:40:40
18 A Yeah, right. To the left of Figure 4. 16:40:42
19 Q To the left of Figure 4? 16:40:49
20 A To the right, to the right. Figure 4 is 16:40:50
21 to the left. The other left. 16:40:53
22 Q Oh, oh, in your Declaration, on page 81? 16:40:55

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1 A Right, page 81. 16:41:01
2 Q I got confused, because in -- 16:41:02
3 A Oh. 16:41:04
4 Q -- Fitz, 5 is above 4. 16:41:04
5 A Oh, okay. Yeah, I don't have Fitz out. 16:41:07
6 Q Okay, okay, I understand what you're 16:41:14
7 saying. Very good. 16:41:18
8 Now, Dr. Tucker, you mentioned probably 16:41:18
9 10 times or more in your Declaration the phrase 16:41:30
10 "routine engineering." Can you define what you 16:41:32
11 mean by "routine engineering"? 16:41:38
12 A Yeah, I think that the way these patents 16:41:44
13 fit together is taking a group of patents that are 16:41:49
14 neurotomy and that are supposed to, according to 16:41:58
15 Fitz, cure this problem, so -- and then taking Lee 16:42:03
16 and seeing how Lee could do it modifying -- I 16:42:11
17 could modify Lee, and everything in modifying Lee 16:42:14
18 takes existing patented ideas and formulating them 16:42:20
19 into something that is meant to function the way 16:42:31
20 it did in the original patent, and that means it's 16:42:37
21 probably routine. That would mean to me it's 16:42:42
22 routine, and that one could do it with not a lot 16:42:45

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1 of -- certainly no inventiveness, a lot of -- not 16:42:51
2 even a lot -- a fair amount of just routine 16:43:01
3 engineering. 16:43:04
4 Like we've been saying, how -- what kind 16:43:04
5 of a hole could go through the sidewall, what kind 16:43:08
6 of hole down the center, how big would the probe 16:43:11
7 have to be. That's just routine stuff, where 16:43:16
8 someone at a bench can sit and play with that and 16:43:22
9 say well, look, the hole when I do it, if I want 16:43:25
10 to get it down a 20-gauge cannula, here's how I'd 16:43:28
11 have to do it. And that's routine. 16:43:32
12 I mean they've already told me sizes. 16:43:34
13 Even if I just go by their sizes, the .2 wide by 16:43:37
14 .05 thick, I use nitinol, I can have -- I can have 16:43:42
15 nitinol come out in any shape I want it. 16:43:53
16 Straight. Not straight. Curved. And it's all -- 16:43:56
17 those are routine things that these guys know how 16:44:03
18 to do. 16:44:06
19 What they don't know is they didn't come 16:44:07
20 up with the inventiveness to put these three -- 16:44:12
21 it's not even inventive if you put the three 16:44:16
22 together. But that's what they can do, is put the 16:44:19

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1 three together and do it so that every part 16:44:21
2 functions as it did in each of these three 16:44:26
3 patents, and they'll have a high degree for 16:44:30
4 success because they haven't changed the function, 16:44:33
5 and that's routine engineering with a high success 16:44:35
6 rate. 16:44:42
7 Q Are you done? 16:44:45
8 A Yeah. 16:44:46
9 Q Okay. I understand your position, that 16:44:47
10 all of the modifications that would have to be 16:44:52
11 done to result in Racz's modified device are 16:44:54
12 nothing more than routine engineering, but that 16:44:56
13 wasn't my question. My question is what is your 16:45:00
14 definition of routine engineering? 16:45:04
15 MR. KELLY: Objection. Form. 16:45:09
16 A Routine engineering is when somebody 16:45:11
17 tells you what works and what you can do. And all 16:45:13
18 you have to do is make it. The cookbook has 16:45:18
19 already been laid out in these three patents. And 16:45:23
20 all I have to do is copy what they say. 16:45:26
21 If I want an actuator, I look up 16:45:30
22 Scheibe, or Scheibe, or whatever his name is. And 16:45:33

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1 now I know how to move them in and out. Even Lee 16:45:37
2 talks about a slider. I could try that. 16:45:41
3 But all of this stuff has been in 16:45:45
4 previous patents, and that's my definition of 16:45:49
5 routine, is somebody's already written the 16:45:53
6 playbook for me. All I have to do is mix and 16:45:56
7 match one from column A, one from column B, one 16:46:01
8 from column C, and that's what these three patents 16:46:04
9 do. 16:46:07
10 And with the other side patents, there's 16:46:07
11 more detail. You know, Gough, he tells me how big 16:46:11
12 lesions are, using the same technology. 16:46:19
13 So that's the kind of thing that -- by 16:46:23
14 routine engineering. I don't have to spend -- I 16:46:27
15 wouldn't have to spend two years making this. I'd 16:46:30
16 pull all these patents off the shelf and it'd be 16:46:37
17 done within months. 16:46:41
18 I could turn it over to a manufacturing 16:46:42
19 engineer, sit down with him saying, dear God, is 16:46:45
20 this easy to make? And he says, well, this isn't, 16:46:48
21 maybe change that. So you change it, tweak it 16:46:50
22 here and there, and then you could make it. 16:46:53

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1 Q Is it your position that routine 16:46:57
2 engineering encompasses all of the manufacturing 16:47:01
3 considerations that would have to go into making 16:47:09
4 something like Racz's modified device? 16:47:13
5 A No, cost. You can manufacture it, but 16:47:16
6 there are some ways to manufacture the device 16:47:26
7 cheaper, and that's what a manufacturing guy can 16:47:30
8 help you with. You know, this will cost a 16:47:32
9 thousand bucks to make, that means I got to sell 16:47:36
10 it for 1600 to make any money. 2,000. 16:47:40
11 Now, that's not out of the realm, you 16:47:43
12 know, when you're messing around with somebody's 16:47:47
13 back. But changing certain things would make it 16:47:50
14 cheaper. And again, that's just manufacturing 16:47:55
15 details. You can still make it. 16:47:58
16 Q So in your view, do all of the 16:48:07
17 considerations of manufacturing feasibility, aside 16:48:12
18 from cost, fall within the realm of routine 16:48:16
19 engineering? 16:48:22
20 MR. KELLY: Objection. Form. 16:48:23
21 A No, the routine engineering is to make 16:48:25
22 it. I don't see anything in here on making stuff. 16:48:27

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1 These are not -- the four patents in question are 16:48:31
2 not manufacturing patents, they're device patents. 16:48:34
3 And that is what I'm looking at, was 16:48:39
4 this in the previous art putting these three 16:48:44
5 patents together, and it is. I'm -- no comment on 16:48:48
6 making it. If they had a manufacturing patent, we 16:48:52
7 could talk about manufacturing. But it's not. 16:48:56
8 These patents as far as prior art is not 16:48:59
9 manufacturing. They're how to make a device. 16:49:05
10 Q What in your view is a manufacturing 16:49:10
11 patent? 16:49:13
12 A Oh. 16:49:14
13 MR. KELLY: Objection to the form. 16:49:15
14 A You know the answer to that. 16:49:17
15 Manufacturing is do I use -- just give 16:49:19
16 you some -- do I use a microcontroller or do I use 16:49:25
17 a 32-bit chip. That's manufacturing. Will it 16:49:29
18 work? Which is easier to implement, which is 16:49:34
19 easier to augment. That's all that is. That's 16:49:39
20 manufacturing of. 16:49:43
21 Do I use -- do I use metallized plastic 16:49:43
22 or do I use metal. Which is cheaper. Those are 16:49:48

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1 manufacturing. This is a playbook on how to make 16:49:54
2 a device, and it was in the prior art prior to 16:49:59
3 your client's patents. 16:50:05
4 Q Do you assume that -- 16:50:11
5 (Simultaneous speaking.) 16:50:13
6 Q Okay. Are you done? 16:50:14
7 A Uh-humh. 16:50:15
8 Q Do you assume that everything disclosed 16:50:18
9 in a patent is manufacturable? 16:50:20
10 MR. KELLY: Objection. Form. 16:50:24
11 A No, I have been associated with 16:50:28
12 companies that have got patents that can't follow 16:50:30
13 their own patents because it's not manufacturable. 16:50:33
14 I've seen that happen. 16:50:38
15 Q Do you assume that everything that can 16:50:44
16 be envisioned from the teaching of prior patents 16:50:45
17 can be assumed to be manufacturable? 16:50:55
18 MR. KELLY: Objection. Form. 16:50:59
19 A I don't have to assume anything. I can 16:51:01
20 -- I don't -- all it says is the prior art that 16:51:04
21 validates the four patents we're talking about. 16:51:10
22 That's all it is. No manufacturing involved. It 16:51:14

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1 is the prior art there that would lead one of 16:51:19
2 ordinary skill to make it. And the answer is yes. 16:51:22
3 I have no comments on manufacturing. And I don't 16:51:29
4 see any in any of the patents. 16:51:34
5 So that's all I can consider, that's all 16:51:36
6 I can consider, is it's a prior art that is before 16:51:40
7 the four patents in question. Three patents, 16:51:45
8 sorry. 16:51:51
9 Q Do you believe that -- well, in your 16:52:09
10 view, is it necessary that the prior art enable 16:52:11
11 one of ordinary skill in the art how to make and 16:52:16
12 use the claimed invention that is allegedly 16:52:19
13 obvious from the prior art? 16:52:23
14 MR. KELLY: Objection. Form. 16:52:25
15 A Exactly. I -- that is -- this is a game 16:52:26
16 plan on how to make the device that I've shown in 16:52:30
17 a modified Racz. 16:52:35
18 Q I believe you said several times that 16:52:41
19 all of the elements of Racz's modified device are 16:52:45
20 taken from the prior art exactly as they were 16:52:49
21 disclosed and intended in the prior art. 16:52:54
22 So where in any reference is there 16:52:58

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1 disclosure of the longitudinal channels in the 16:53:04
2 sidewall of the cannula that filaments go through? 16:53:11
3 A There is not one patent that encompasses 16:53:20
4 what I've done. There's a little bit from Racz, 16:53:27
5 little bit of motivation from Fitz on the amount 16:53:33
6 of volume of tissue. And there's quite a bit in 16:53:38
7 Lee, in that those are put together by someone 16:53:44
8 that is just an engineer with a couple of years -- 16:53:51
9 three years experience that has a -- maybe a 16:53:56
10 bachelor's degree. If he has a master's, Ph.D., 16:53:59
11 maybe a year's experience, and maybe more, but at 16:54:03
12 least a year to put it together. 16:54:06
13 Q Yeah, I've asked you about one 16:54:14
14 particular little piece, not the whole thing, but 16:54:16
15 one particular little piece, and that is, a 16:54:19
16 channel length-wise in the interior of a sidewall 16:54:25
17 of a cannula, which you show in your drawing of 16:54:29
18 Racz's modified device, where the blue -- part of 16:54:33
19 the blue filament before it -- the part that's not 16:54:39
20 deployed, is within a channel within the red part, 16:54:43
21 where is that little piece taught in any 16:54:47
22 reference? 16:54:53

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1 MR. KELLY: Objection. Form. 16:54:54
2 A Lee discloses -- this is my paragraph 16:55:01
3 140 -- deployable filaments can be arranged around 16:55:03
4 the inner perimeter of a cannula so that they 16:55:06
5 surround and provide space for the central 16:55:09
6 element. 16:55:18
7 I mean that's what he taught. I -- put 16:55:18
8 them in the sidewall, don't put them in the 16:55:20
9 sidewall. I told you how you don't have to put 16:55:22
10 them in the sidewall. They have to be around the 16:55:24
11 perimeter of that cannula so that the active 16:55:28
12 electrode, the probe, can still go down the center 16:55:32
13 and energize the metallic tip and the filaments 16:55:36
14 that are deployed. They have to go around the 16:55:41
15 perimeter. 16:55:45
16 Q Where does Lee disclose channels in the 16:55:47
17 sidewall of his cannula? 16:55:53
18 A I just -- I said it doesn't have to be 16:55:54
19 in the channels. I've explained that. Can be 16:55:57
20 around the perimeter, it can go down grooves and 16:56:01
21 be held in place by small pieces of plastic that 16:56:06
22 holds them on the perimeter. It doesn't have to 16:56:10

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1 go down channels. I said that. 16:56:13
2 Channels would be easy if you make this 16:56:15
3 thing out of a polymer. That would be one way to 16:56:18
4 do it. One way to do it is grooved metal, and 16:56:25
5 that you can certainly do on tubing. 16:56:29
6 And once there, put your plastic inserts 16:56:31
7 that hold it against the tubing around the 16:56:42
8 perimeter, that's not in the sidewall, it's 16:56:46
9 against the sidewall, but it's around the 16:56:48
10 perimeter, and that's what he says, that's what -- 16:56:51
11 Lee's got a central filament. 16:56:53
12 And I guess that's the -- really the 16:56:56
13 real answer, is he's got to have perimeter 16:57:02
14 channels because he's got a central filament. 16:57:06
15 Take a central filament out of there and put the 16:57:10
16 RF probe of Racz in there. Same thing. The 16:57:13
17 perimeter around the perimeter channels. And 16:57:18
18 that's what he teaches. 16:57:24
19 I'm thinking about three or four ways to 16:57:25
20 make this thing. 16:57:30
21 Q In your second example of Racz's 16:57:33
22 modified device, you said the tip is a separate 16:57:36

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1 piece from the cannula? 16:57:39
2 A Correct. 16:57:41
3 Q So is the tip a single unitary integral 16:57:45
4 piece of metal? 16:57:53
5 A Could be. 16:57:55
6 MR. KELLY: Objection. Form. 16:57:56
7 A Could be. Doesn't have to be, it can be 16:57:57
8 an insert on a plastic cannula. If you look at 16:57:59
9 Lee's picture. With a stepdown piece that goes 16:58:07
10 into either a metal cannula or a plastic cannula. 16:58:15
11 Q And again, where is that described in 16:58:30
12 your Declaration? 16:58:32
13 A All through it. I mean -- 16:58:34
14 Q Can you be more specific, please? 16:58:38
15 A 87 -- page 87: 16:58:39
16 One skilled in the art would be 16:58:40
17 motivated to preserve the functionality of Racz's 16:58:46
18 probe and would therefore provide channels or 16:58:50
19 guides guiding the deployable filaments around the 16:58:55
20 lumen that receives the RF probe; e.g., perimeter 16:59:01
21 channels and filaments are arranged to accommodate 16:59:08
22 Lee's central filament. Take Lee's filament out 16:59:12

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1 of that central channel, all the filaments are 16:59:18
2 along the outside of that channel, and put Racz's 16:59:20
3 probe down that channel. 16:59:24
4 Q And you believe that would be routine 16:59:31
5 engineering? 16:59:33
6 A Amen. 16:59:34
7 Q All right. We've taken a number of 16:59:41
8 breaks during this deposition. During any of the 16:59:43
9 breaks have you spoken with anyone? 16:59:47
10 A Yes. 16:59:50
11 Q With whom did you speak? 16:59:52
12 A We talked to two of the guys from -- 16:59:55
13 including Chris -- MCC, we talked about deer 16:59:56
14 hunting in Iowa, we talked about the CDC and their 17:00:01
15 management, we talked about Ebola, we talked 17:00:04
16 about -- I got a layout of the park system in 17:00:09
17 Atlanta and said how beautiful it was. 17:00:15
18 Q Uh-humh. 17:00:17
19 A I have a graduate student used to work 17:00:17
20 for Bard and had been on part of it. We talked 17:00:22
21 about housing prices in Atlanta. I'm not moving 17:00:25
22 here. Their housing prices are high. Just things 17:00:29

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1 like that. That was it. 17:00:35
2 Q Anything else? 17:00:37
3 A Nope. 17:00:37
4 Q Did you talk about the substance of your 17:00:38
5 testimony during any break? 17:00:40
6 A No, that's verboten. 17:00:42
7 Q Do you have any financial interest in 17:00:47
8 Avanos? 17:00:50
9 A No. 17:00:50
10 Q Do you have any financial interest in 17:00:51
11 Stryker? 17:00:53
12 A No. 17:00:55
13 Q Do you have any financial interest in 17:00:57
14 Medtronic? 17:00:58
15 A No. Now, I own mutual funds, and I know 17:01:00
16 Medtronic has been a favorite. Maybe they have -- 17:01:06
17 my mutual fund is invested in Medtronic, but I 17:01:09
18 don't know, I have no idea. 17:01:13
19 Q Well, just a couple more and I'll ask 17:01:16
20 for the sake of completeness, do you have any 17:01:18
21 financial interest in Abbott Labs? 17:01:20
22 A No. 17:01:23

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1 Q Do you have any financial interest in 17:01:24
2 Boston Scientific? 17:01:25
3 A Again, not that I know of. 17:01:27
4 Q So you've got four Declarations in these 17:01:35
5 cases, and we really only looked at one of them, 17:01:37
6 Exhibit 1031, but I want to ask you about the 17:01:42
7 similarities and differences among the four 17:01:50
8 Declarations. So I think it would be helpful to 17:01:53
9 turn to the Table of Contents of Exhibit 1031. 17:01:59
10 A Okay. There's a lot of similarities. 17:02:03
11 Q Yeah. Yeah. I know. Okay. 17:02:12
12 Section I, are you aware of any 17:02:14
13 significant differences in Section I among the 17:02:19
14 four Declarations? 17:02:23
15 MR. KELLY: Objection. Form. 17:02:24
16 A Well, I don't. 17:02:26
17 Q Okay. Same question for Section II. 17:02:29
18 Are you aware of any significant differences in 17:02:33
19 Section II among the four Declarations? 17:02:37
20 MR. KELLY: Same objection. 17:02:40
21 A (Reviewing.) 17:03:00
22 No. On the '688, the needle shaft and 17:03:21

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1 tip is shorter than it was in the '722 -- '782. 17:03:26
2 So that looks like that's a difference there. So 17:03:34
3 it's even less information. 17:03:38
4 '722, bipolar and monopolar starts on 17:03:41
5 51, and the monopolar and bipolar starts on 49. 17:03:53
6 So I suspect there's less in that needle and shaft 17:03:58
7 tip D subsection 1. 17:04:04
8 Normal ordinary skill in the art is all 17:04:06
9 the same, claim construction is all the same, 17:04:13
10 invalidity changes. 17:04:17
11 The prior art overview of -- starts on 17:04:19
12 70 in the '688, and in the one we've been talking 17:04:35
13 about all day, overview of Racz starts at 65, so 17:04:44
14 there's the grounds of -- obviousness grounds A is 17:04:51
15 shorter, and that's because I filed two. I only 17:04:59
16 did part of the -- part of the claims in one 17:05:03
17 report and part of the claims on '688 in a second 17:05:07
18 one. So that's why it's shorter. 17:05:11
19 And then the claims will be different 17:05:14
20 because claims are different. There's a lot of 17:05:17
21 repetition in them, but in essence, grounds, some 17:05:20
22 of the probes will be different in those. 17:05:32

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1 I added -- if you look at X in 10, Roman 17:05:34
2 numeral X in the '688, you see that we've brought 17:05:43
3 Young '201 in and Young '969, and Young I think 17:05:49
4 '201 is different, and Gough is different. 17:05:59
5 We talked about Cosman, the 7, it's left 17:06:15
6 out of the '688. Racinco (phonetic), that wasn't 17:06:23
7 in the one we've been talking about all afternoon. 17:06:29
8 So there's a section on Racinco in there 17:06:32
9 which is part of the rotator and has a clicks, if 17:06:35
10 you will, so that as you turn it, you know how far 17:06:42
11 the electrodes are moving out. Nice feel, touch 17:06:46
12 to it. 17:06:53
13 On 184753 to 74, RF needles start at 16 17:06:54
14 and 17. RF needles. I'm not sure why that is. 17:07:12
15 Doesn't look like there's much change there. 17:07:31
16 The deployable electrode configurations 17:07:33
17 on the second group of the '688 of claims starts 17:07:36
18 on 36, and the 7, it starts at 38, so there has 17:07:42
19 been some shortening of the Roman numeral IID 1 17:07:49
20 through 6. 17:07:57
21 49 and 51. So there is shortening 17:08:01
22 there. Less information. Ordinary skill in the 17:08:04

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1 art. Certainly claims construction is the same, 17:08:09
2 grounds for invalidity will be different, because 17:08:15
3 we brought different patents in, and it's just 17:08:19
4 further detail from the first three. 17:08:26
5 They're still obvious under our first 17:08:29
6 three patents, Racz, Fitz and Lee, but if you want 17:08:36
7 more information, we've added other patents that 17:08:41
8 could be used to bolster -- to emphasize what's in 17:08:46
9 the first three. 17:08:53
10 Ground B, overview of Young, so one 17:08:55
11 starts at 32 and the other starts at 140, so the 17:09:14
12 second group of claims is obviously shorter 17:09:20
13 because of the number of claims on ground A. So 17:09:25
14 shortened. 17:09:32
15 Young again, '965. Scheibe -- overview 17:09:33
16 of Scheibe on 45, on 36, so it's shorter mainly 17:09:59
17 because of the claims, I believe. And the 17:10:04
18 discussion of claims is shorter, even in Scheibe, 17:10:09
19 because you're honing in on the rotating gear to 17:10:12
20 drive the cannulas out of the shaft. 17:10:19
21 We've got Cosman. Cosman looks to be -- 17:10:22
22 overview of Cosman seems to be about the same, and 17:10:29

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1 then it stops. So there's less in that because of 17:10:36
2 the claims. 17:10:40
3 And '644 is a method patent. So 17:10:42
4 monopolar in the 7 is page 51, it's 50 in the 17:11:01
5 '644, probably again because maybe the needle 17:11:08
6 section or one of these is shorter, not by much. 17:11:14
7 The overview of the patent is different. 17:11:17
8 Prosecution histories will be different. That 17:11:25
9 does change. And the number of claims is 17:11:28
10 different. Yeah, the claims will be different. 17:11:41
11 Fitz and Lee, that's fine. 17:11:53
12 Let me go to invalidity grounds -- yeah, 17:11:57
13 E, F have been added for claims 11 through 17, 19, 17:12:34
14 27, and 29, because Godara has been added. Godara 17:12:41
15 is a new addition, so that takes up some time. 17:12:50
16 Cohen, which is a paper, was added for 17:12:54
17 18 and 28, which he is not in the original '782. 17:13:00
18 I don't know if that helps. There are 17:13:10
19 some changes because the claims change. 17:13:15
20 We've lost you. I can't hear you at 17:13:27
21 all. 17:13:31
22 Q Can you hear me now? 17:13:35

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1 A Got you. 17:13:36
2 Q Gee, I was just saying, thank you, 17:13:37
3 that's very thorough. 17:13:39
4 I was actually just curious about a 17:13:40
5 couple more specific subsections, and I'm not sure 17:13:44
6 if you addressed those, so this will only take a 17:13:48
7 minute if I can ask about those. 17:13:52
8 A Okay. 17:13:53
9 Q Okay. So I think you said Section IV of 17:13:54
10 the level of ordinary skill in the art is the same 17:13:58
11 in all four? 17:14:01
12 A I think so. I'm not sure, but I thought 17:14:03
13 it was. 17:14:06
14 Q Okay. And same with the claim 17:14:07
15 construction section, Roman numeral V, right? 17:14:10
16 A Let me go back to the beginning. We're 17:14:21
17 in '688? 17:14:23
18 Q Well, I think you just take ordinary 17:14:28
19 meaning in all Declarations. But tell me if you 17:14:31
20 have a special claim construction in any case. 17:14:35
21 A No claim constructions, no. 17:14:38
22 Q Okay. Last section I want to ask about 17:14:40

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1 is Section VII, subsection (a), Prior Art 17:14:42
2 Overview. 17:14:49
3 Are you aware of any differences in that 17:14:49
4 subsection from Declaration to Declaration? 17:14:52
5 MR. KELLY: Objection. Form. 17:14:56
6 A The claims are all different. 17:15:04
7 Q Yeah, this is an overview of the prior 17:15:06
8 art where you have an overview of Racz, overview 17:15:08
9 of Fitz and overview of Lee. 17:15:12
10 A In 7, no, those don't change. 17:15:16
11 Q Okay. Is the Racz modified device the 17:15:18
12 same in all four Declarations? 17:15:22
13 A I believe so. Yes. 17:15:26
14 Q Is the motivation to combine Racz, Fitz 17:15:27
15 and Lee the same in all Declarations? 17:15:30
16 MR. KELLY: Objection. Form. 17:15:32
17 A In 14 and -- lost my Table of Contents 17:15:38
18 for '728 -- or here it is. 17:15:49
19 Five pages -- well, no, because again, 17:16:07
20 there are other sections in that, in the Racz. 17:16:17
21 There's a H that wasn't in '782, there's a K, H, 17:16:23
22 I. There's Fitz, F and I, F, J and I. H on 1 -- 17:16:35

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1 I think they're the same, or really very close to 17:17:05
2 it. But once you go on to -- I mean once you go 17:17:08
3 after that, ground D, the claims are different, so 17:17:23
4 those sections will be different. 17:17:28
5 Q Okay, I'm not asking about any 17:17:32
6 particular sections or subsection, I'm just asking 17:17:35
7 if your motivation to combine Racz, Fitz -- sorry, 17:17:39
8 Racz, Fitz, and Lee is the same in all four 17:17:46
9 Declarations. 17:17:50
10 MR. KELLY: Objection. Form. 17:17:52
11 A A through -- so preamble 90 is five 17:18:06
12 pages, and Racz is preamble to 100, so they're 17:18:10
13 different. Because the limitations are different. 17:18:19
14 Q Okay. Why don't we stop there. 17:18:26
15 MR. PHILLIPS: Thank you very much, 17:18:28
16 Dr. Tucker. Mr. Kelly might have some Redirect 17:18:29
17 for you. 17:18:33
18 MR. KELLY: We'll take a -- let's see. 17:18:35
19 Reconvene at 5 -- we maybe need 15 or 20 to get 17:18:36
20 ready for Redirect. So we'll be back on 5:40; is 17:18:46
21 that okay? 17:18:51
22 MR. PHILLIPS: Okay. 17:18:52

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1 MR. KELLY: All right. Thank you. 17:18:53
2 THE VIDEOGRAPHER: Off the record. 17:18:55
3 5:18 p.m. 17:18:55
4 (A recess was taken.) 17:18:57
5 THE VIDEOGRAPHER: Back on the record. 17:18:57
6 The time is now 5:54 p.m. 17:53:58
7 EXAMINATION BY COUNSEL FOR THE PETITIONER 17:54:01
8 BY MR. KELLY: 17:54:02
9 Q Dr. Tucker, thank you for your time 17:54:02
10 today, I know it's been a long day. I just have a 17:54:07
11 few follow-up questions for you following your 17:54:10
12 Cross Examination by Mr. Phillips. 17:54:14
13 Dr. Tucker, do you recall Mr. Phillips 17:54:16
14 asking you earlier today about your experience 17:54:21
15 with RF neurotomy? 17:54:23
16 A I do. 17:54:25
17 Q Have you ever designed a device for 17:54:29
18 ablating nerve tissue? 17:54:31
19 A Yes. Not in the spinal cord, but in 17:54:36
20 peripheral nerves, I have. 17:54:39
21 Q About how many devices of that type have 17:54:44
22 you designed in your career? 17:54:46

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1 A Over 50. 17:54:49
2 Q And would each of those 50 devices have 17:54:51
3 been configured for ablating nerve tissue? 17:54:57
4 A Yes, peripheral nerves, yes. 17:55:02
5 Q I know it's been many hours, but I 17:55:07
6 believe you testified earlier today that you had 17:55:10
7 not specifically designed devices whose intended 17:55:15
8 use is RF neurotomy. 17:55:19
9 Do you recall that testimony? 17:55:21
10 A I do, and I thought that it was 17:55:23
11 referring only neurotomy around spinal nerves. 17:55:27
12 That, I have not done. But there are similarities 17:55:31
13 in peripheral nerves and in some different -- 17:55:38
14 differences. So I have destroyed them in the 17:55:42
15 brain and in peripheral nerves. 17:55:46
16 MR. KELLY: Okay. That's all the 17:55:52
17 questions I have. Pass the witness. 17:55:53
18 FURTHER EXAMINATION BY COUNSEL FOR THE 17:55:55
19 PATENT OWNER 17:55:55
20 BY MR. PHILLIPS: 17:55:55
21 Q Dr. Tucker, what is a peripheral nerve? 17:55:55
22 A Somewhere outside of the central nervous 17:56:07

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1 system. So once it gets out into your leg, your 17:56:12
2 belly, it's a peripheral nerve. 17:56:16
3 Q And you said you have designed over 50 17:56:24
4 devices for doing RF neurotomy on peripheral 17:56:28
5 nerves? Did I understand that correctly? 17:56:34
6 A Correct. And central nervous system, 17:56:36
7 because I have divined -- designed, along with 17:56:39
8 Valley Lab, a microneedle for destroying brain 17:56:43
9 tissue, and that's central nervous system, but 17:56:47
10 there's no bone involved. You cut the hole and 17:56:51
11 you go in and find where the people are having 17:56:54
12 epileptic seizures that are uncontrollable, and 17:56:57
13 you destroy that part of the brain. 17:57:00
14 Q Of these over 50 devices that are used 17:57:05
15 for RF neurotomy on peripheral nerves, how many of 17:57:11
16 them were FDA approved? 17:57:14
17 A All. 17:57:17
18 Q Were any of those devices commercially 17:57:25
19 successful? 17:57:28
20 A All. There's nothing -- once you start 17:57:28
21 working in soft tissue -- and a nerve is soft 17:57:33
22 tissue -- electrosurgery started with a brain 17:57:37

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1 surgeon, and so anything is grandfathered in by 17:57:44
2 the FDA because of that. Soft tissue. 17:57:49
3 Q And when was the last time you designed 17:57:55
4 a device for RF neurotomy of peripheral nerves? 17:57:57
5 A It would have been in the last 10 years. 17:58:07
6 Q Dr. Tucker, did you discuss the 17:58:28
7 substance of your testimony at any time during the 17:58:30
8 last break with counsel for Avanos? 17:58:33
9 A We talked about what he wanted to ask on 17:58:36
10 Cross, because I thought that neurotomy in this 17:58:39
11 case meant only ablation of nerves originating 17:58:43
12 near the spinal cord, and he said no, a neurotomy 17:58:50
13 was any nervous [sic] tissue. I said uh-oh, I 17:58:53
14 made a mistake. 17:58:58
15 Q Did you discuss anything else with 17:59:00
16 Avanos's counsel during the last break? 17:59:02
17 A No. 17:59:04
18 Q Okay. 17:59:04
19 MR. PHILLIPS: Thank you, Dr. Tucker, 17:59:04
20 I'm done. Appreciate your time. 17:59:08
21 THE WITNESS: Appreciate it. Thank you. 17:59:11
22 THE VIDEOGRAPHER: Off the record, 17:59:17

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1 counsel? 17:59:18
2 MR. PHILLIPS: Yes, please. 17:59:19
3 THE VIDEOGRAPHER: We're going off the 17:59:20
4 record at 5:59 p.m. 17:59:22
5 (Off the record at 5:59 p.m.)
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1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC
2
3 I, Dawn M. Hart, Certified Reporter and
4 Notary Public within and for the State of
5 Maryland do hereby certify:
6
7 That Robert Dennis Tucker, M.D., Ph.D., the
8 witness whose deposition is hereinbefore set
9 forth, was duly sworn by me before the
10 commencement of such deposition and that such
11 deposition was taken before me and is a true
12 record of the testimony given by such witness.
13
14 I further certify that the adverse party,
15 Avanos Medical, Inc., was represented by counsel
16 at the deposition.
17
18 I further certify that the deposition of
19 Robert Dennis Tucker, M.D., Ph.D., occurred
20 remotely on Wednesday, May 7, 2025, commencing at
21 10:02 a.m. to 5:59 p.m. Eastern Time Zone.
22

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1 I further certify the inspection, reading
2 and signing of said deposition was not waived.
3
4 I further certify that I am not related to
5 any of the parties to this action by blood or
6 marriage, I am not employed by or an attorney to
7 any of the parties to this action, and that I am
8 in no way interested, financially or otherwise, in
9 the outcome of this matter.
10
11 IN WITNESS WHEREOF, I have hereunto set my
12 hand this 13th day of May, 2025.
13 My commission expires:
14 January 2, 2029.
15
16
17 _____
18 NOTARY PUBLIC IN AND FOR THE
19 STATE OF MARYLAND
20
21
22

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A

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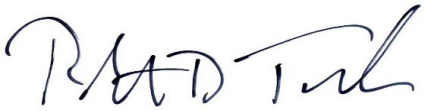
Deposition Date: May 7, 2025
Deponent: Robert Dennis Tucker, M.D., Ph.D.

Page	Line	Correction and Reason for Same
27	4	Delete “as long” (typographical error)
30	10	Change “How long and drawn out?” to “Long and drawn out.” (typographical error)
42	13	Change “1957” to “1947” (typographical error)
46	3	Delete “improved lines” (typographical error)
68	19	Change “pricking” to “working” (typographical error)
72	6-7	Change “center of withdrawal electrode” to “center for withdrawal of the electrode” (typographical error)
95	18	Change “it” to “he” (typographical error)
124	15	Delete “C” (typographical error)
127	6-7	Change both instances of “ejection” to “injection” (typographical error)
131	10	Change “an” to “a manufacturing” (clarification)
131	14	Insert “them” between ‘drill’ and ‘with’ (clarification)
131	14	Change “the” to “a” (clarification)
139	21	Change “No,” to “Both,” (typographical error)
152	20	Change “may guess” to “meant yes” (typographical error)
153	1-2	Delete “I may guess, that’s what the picture shows” (typographical error – erroneous repetition by stenographer)
156	11	Insert “angle” between ‘shallow’ and ‘close’ (typographical error)
156	12	Change “off” to “out” (typographical error)
159	7	Change “ramp” to “cramp” (typographical error)
167	4	Change “, interacts as” to “into Racz’s” (typographical error)
167	9	Change “ethic” to “edict” (typographical error)

Errata Acknowledgment

I, Dr. Robert D. Tucker, do hereby certify under penalty of perjury that I have read the foregoing transcript of my deposition taken on May 7, 2025; that I have made such corrections as appear noted herein; and that the same, as corrected, is a true, correct, and complete transcription of my testimony.

SIGNATURE OF WITNESS:



DATE: 5/22/2025